
STATE AND FEDERAL POLICIES TO ACCELERATE BROADBAND DEPLOYMENT: A POLICY CHECKLIST

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I. INTRODUCTION

For the last decade, ubiquitous availability of broadband service has been a goal of national and state telecommunication policy.¹ Notwithstanding this goal, there is a dearth of reliable information about the availability of broadband services in rural and remote regions of the United States.² Additionally, there is a lack of reliable information about the nature of broadband services deployed in terms of location, cost, and speed.³ According to data collected by

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¹ See Telecommunications Act of 1996, Pub. L. No. 104-104, § 706(a), 110 Stat. 56, 153 (establishing that state and federal policies should encourage the deployment of “advanced telecommunications capability to all Americans”).

² See *In re* Deployment of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscribership Data, and Development of Data on Interconnected Voice Over Internet Protocol (VoIP) Subscribership, *Notice of Proposed Rulemaking*, 22 F.C.C.R. 7760, ¶¶ 10-17 (Feb. 26, 2007) [hereinafter *Deployment of Nationwide Broadband Data NPRM*].

³ In 2007, the Federal Communications Commission (“FCC” or “Commission”) sought comment on how it could improve its data collection efforts to gain a better understanding of the availability and deployment of broadband services; whether current speed definitions capture the existing market, and whether and how to improve data collection regarding the demographic profiles of households in served and unserved areas; and price information for available broadband services. See *id.* ¶¶ 10–21, 39–47. The FCC subsequently adopted an order on March 19, 2008, which is intended to “greatly improve the ability of the Commission to understand the extent of broadband deployment, and will enable the Commission to continue to develop and maintain appropriate broadband policies.” *In re* Development of

the Federal Communications Commission (“FCC” or “Commission”), there is a gap between broadband subscribership in the least densely and most densely populated regions of the country.⁴ The gap, however, appears to be shrinking—falling from a difference of 25.5% in June 2004 to 9.2% in June 2007.⁵ Broadband subscription rates may be affected by various factors including income, education and age; geographic location; and the price of broadband service.⁶

Broadband deployment is a necessary precondition for broadband subscription and use, but it is not a guarantee.⁷ Broadband access is ineffective if subscribers need basic computer literacy training or special accommodations to actually use the service. In spite of these complications, or perhaps to overcome them, Congress adopted a broad policy of encouraging broadband de-

Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscribership Data, and Development of Data on Interconnected Voice Over Internet Protocol (VoIP) Subscribership, *Report and Further Notice of Proposed Rulemaking*, 23 F.C.C.R. 9691, ¶ 1 (Mar. 19, 2008) [hereinafter *Deployment of Nationwide Broadband Data Report and Order*]. One of the reporting requirements in this order was revised in *Order on Reconsideration. In re Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscribership Data, and Development of Data on Interconnected Voice Over Internet Protocol (VoIP) Subscribership, Order on Reconsideration*, FCC 08-148, WC Docket No. 07-38, ¶ 1 (June 11, 2008). Providers must include in the information submitted in their Form 477 filings the percentage of connections that are residential. *Deployment of Nationwide Broadband Data Report and Order, supra*, at 1.

⁴ See Industry Analysis and Technology Division, Wireline Competition Bureau, HIGH-SPEED SERVICES FOR INTERNET ACCESS: STATUS AS OF JUNE 30, 2007 4, tbl.18 (2008) [hereinafter *HIGH-SPEED SERVICES AS OF JUNE 30, 2007*].

⁵ *Id.* The FCC defined the gap as the difference between the percentage of densely populated zip codes and sparsely populated zip codes where broadband subscribers are located “high-speed subscribers are reported to be present in more than 99% of the most densely populated zip codes and in 91% of zip codes with the lowest population densities.” *Id.* at 4. The Commission indicated that “for this comparison, we consider the most densely populated zip codes to be those with more than 3,147 persons per square mile (the top decile of zip Codes) and the least densely populated zip codes to be those with fewer than six persons per square mile (the bottom decile).” *Id.* at 4, n.11. See *In re Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, Fifth Report*, 23 F.C.C.R. 9615, ¶ 36 (June 12, 2008) [hereinafter *Deployment of Advanced Telecommunications Capability Fifth Report*].

⁶ These are among the factors considered for countries in an empirical study comparing Organization for Economic Co-operation and Development (“OECD”) countries in terms of broadband adoption. See GEORGE FORD, THOMAS M. KOUTSKY & LAWRENCE J. SPIWAK, THE BROADBAND PERFORMANCE INDEX: A POLICY-RELEVANT METHOD OF COMPARING BROADBAND ADOPTION AMONG COUNTRIES 1, 10 (2007), available at <http://www.phoenix-center.org/pcpp/PCPP29Final.pdf> (developing and describing a broadband performance index as an alternative to the existing OECD ranking methodology).

⁷ See *id.*

ployment.⁸

Section 706(b) of the Telecommunications Act of 1996 (“1996 Act”) establishes that advanced services should be made available to all Americans.⁹ Under section 706, the FCC defines broadband as a service with transmission speed exceeding 200 Kilobits per second (“Kbps”) “upstream” and “downstream.”¹⁰ Section 706(a) of the 1996 Act recognizes the shared goal of the FCC and state regulatory commissions to ensure the ubiquitous deployment of advanced services.¹¹ Despite this goal, the FCC declined to include advanced services in the federal telecommunications support mechanism established by the 1996 Act.¹²

⁸ See Telecommunications Act of 1996 § 706(b), 47 U.S.C. § 706(b) (2000).

⁹ See *id.* Section 706(b) states:

The Commission shall, within 30 months after the date of enactment of this Act, and regularly thereafter, initiate a notice of inquiry concerning the availability of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms) and shall complete the inquiry within 180 days after its initiation. In the inquiry, the Commission shall determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion. If the Commission’s determination is negative, it shall take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market.

Id.

¹⁰ Congress did not specify any speed requirements in section 706. The FCC defined “broadband service,” a word used interchangeably with “advanced service,” as “having the capability of supporting, in both provider-to-consumer (downstream) and consumer-to-provider (upstream) directions, a speed (in technical terms, “bandwidth”) in excess of 200 kilobits per second (Kbps) in the last mile.” *In re Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, Report*, 14 F.C.C.R. 2398, ¶ 20 (Jan. 28, 1999) [hereinafter *First Section 706 Report*]. Over time, the FCC has expanded the number of broadband speed tiers for reporting purposes, most recently in March 2008 from five to seven, with the highest speed tier being greater than 100 Mbps, as was the case prior to that order. See *Deployment of Nationwide Broadband Data Report and Order, supra* note 3, ¶ 20.

¹¹ See 47 U.S.C. § 706(a) (2000).

The Commission and each State commission with regulatory jurisdiction over telecommunications services shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms) by utilizing, in a manner consistent with the public interest, convenience, and necessity, price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment.

Id.

¹² See §§ 254 (b)(2), (h)(2); see also *In re Federal-State Joint Board on Universal Service, Report and Order*, 12 F.C.C.R. 8776, ¶¶ 587–88 (May 7, 1997) [hereinafter *Universal Service Report and Order*] (finding that “additional steps were not needed to meet Congress’s goal of enhancing access to advanced telecommunications and information ser-

The FCC explicitly refrained from addressing advanced services when it established the Universal Service Fund (“USF”), which provides support for schools, libraries, rural healthcare providers, and others.¹³ According to the FCC, Congress intended that it address advanced services in a separate proceeding.¹⁴ However, the FCC acknowledged the complementary and reinforcing nature of the goals for universal service support of sections 254 and 706.¹⁵ Universal service objectives are also intended to co-exist with objectives that foster competition among service providers. According to the FCC, Congress intended for regulatory measures to accelerate ubiquitous deployment of advanced services to fit into the context of a “pro-competitive and de-regulatory national policy framework.”¹⁶ However, current data suggests that the federal competitive de-regulatory framework has not yet led to ubiquitous deployment of advanced services.¹⁷ It is apparent, then, that there is reason to modify the federal regulatory scheme to achieve a better balance between the twin policy goals of encouraging deployment and competition.

In this article, we explore how the federal and state partnership has evolved since 1996 in accelerating broadband deployment in rural regions of the United States and how this partnership has addressed broadband subscription and the use of broadband services. Since 1996, this partnership has promoted deployment of broadband services to a delineated set of universal service support recipients—eligible schools, libraries, and rural health care providers authorized under section 254(h) of the 1996 Act and to a more expansive population—as contemplated under section 706 of the 1996 Act. However, as discussed below, universal deployment and access to broadband services are always considered within the context of another objective: promoting competition among broadband providers in order to stimulate investment in broadband networks. This ongoing balancing act between two sometimes incompatible objectives—

vices.”).

¹³ See 47 U.S.C. § 254(h)(1)(a) (discussing the treatment of discounted rates for rural health care providers); *id.* § 254(h)(1)(b) (discussing the treatment of discounted rates for schools and libraries).

¹⁴ Universal Service Report and Order, *supra* note 12, at ¶ 604.

¹⁵ *Id.* ¶ 605.

Although we do not rely on section 706 in this proceeding, we note that section 706 reinforces the goals of section 254 by requiring the Commission and the states to encourage carriers to deploy “advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms)” through the utilization of “price cap regulation, regulatory forbearance, measures that promote competition in local telecommunications market, or other regulating methods that remove barriers to infrastructure investment.”

Id.

¹⁶ *Id.* ¶¶ 2, 4.

¹⁷ See HIGH-SPEED SERVICES AS OF JUNE 30, 2007, *supra* note 4, tbl. 2, 4, chart 3, 7.

promoting competition on one hand, and reducing gaps in broadband deployment and access on the other—is not likely to end at either the federal or state level, at least not in the short term. Therefore, there may be a greater role for states to play to supplement the federal policy for encouraging deployment through subsidies and other means.

Part I of this article discusses efforts to measure the magnitude of the broadband deployment and subscription gap as viewed from the national and state levels. Part II explains the evolution of the federal-state regulatory dichotomy since the enactment of the 1996 Act, specifically with regard to deployment and universal service goals. Part III explains how policymakers in both the federal and state governments have viewed broadband deployment as a critical means for providing healthcare services and education, promoting economic development, and implementing safety and security measures to benefit Americans. Part IV examines the arguments for and against a more interventionist national broadband policy and the need for state broadband policies. Part V concludes with an outline of jurisdictional and economic issues that, in our view, warrant further consideration in reducing the gap in deployment of, access to, and use of broadband services.

II. THE BROADBAND DEPLOYMENT GAP BETWEEN URBAN AND RURAL AREAS

Since 1998, the FCC has conducted several inquiries to measure broadband deployment.¹⁸ Each concluded with the observation that deployment was “reasonable and timely on a general, nationwide basis.”¹⁹ The most recent inquiry from March 2008 observed that the most sparsely populated zip codes continued to lag behind those with the greatest population density,²⁰ although the Commission also noted that the gap has shrunk over time—for example the difference has fallen from 25.5% in June 2004 to 9.2% in June 2007.²¹

However, because the Commission measures broadband by the availability of the service, not by the number of connections, the difference may be severely understated.²² For example, the most recent report from the Pew Internet

¹⁸ First Section 706 Report, *supra* note 10, ¶ 11.

¹⁹ Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, *Notice of Inquiry*, 22 F.C.C.R. 7816, ¶ 6 (Mar. 12, 2007) [hereinafter *Deployment of Advanced Telecommunications Capability NOI*].

²⁰ *Id.* ¶ 25.

²¹ See HIGH-SPEED SERVICES AS OF JUNE 30, 2007, *supra* note 4, at tbl.18.

²² See *Deployment of Advanced Telecommunications Capability Fifth Report, supra*

& American Life Project shows that 55% of all adult Americans have high-speed Internet connections in their homes.²³ However, the percentage of home broadband users ranges from 38% in rural communities to 60% in suburban communities and 57% in urban communities.²⁴ As measured by the project, the gap between rural and urban residents served by broadband is 19%.

Furthermore, a study conducted by the Government Accountability Office (“GAO”) also found a gap between subscription rates of households located in rural and urban areas.²⁵ Based on a 2005 survey, the GAO found that 29% of urban households, 28% of suburban households, and 17% of rural households subscribed to broadband service.²⁶ This phenomenon is exemplified by the difference between state-wide broadband subscription rates in states with a large portion of residents living in urban areas, and those with a large portion of residents living in rural areas.²⁷ For example, in New Jersey, the state with the one of the largest urban populations, there is a greater percentage of broadband subscribers than in Mississippi, the state with one of the largest rural populations.²⁸

The rural, suburban, and urban distinction is more apparent in studies of broadband subscription rates and deployment within states. For example, a

note 5, ¶¶ 1, 4, 31.

²³ John B. Horrigan & Aaron Smith, *Home Broadband Adoption 2008* i (2008), available at http://www.pewinternet.org/pdfs/PIP_Broadband_2008.pdf. This survey of 2,251 adult Americans was conducted in April and May of 2008. *Id.*

²⁴ *Id.* at 3.

For the definition of community type, we follow the U.S. Census Bureau definition whereby respondents are categorized as “rural” if they reside in a non-metropolitan statistical area (MSA) county. Respondents are categorized as “suburban” if they reside in any portion of an MSA county that is not in a central city. Respondents are categorized as “urban” if they reside within a central city of an MSA.

Id. at 13.

²⁵ U.S. Gov’t. Accountability Office, TELECOMMUNICATIONS: BROADBAND DEPLOYMENT IS EXTENSIVE THROUGHOUT THE UNITED STATES, BUT IT IS DIFFICULT TO ACCESS THE EXTENT OF BROADBAND DEPLOYMENT GAPS IN RURAL AREAS 10 (2006) [hereinafter GOV’T. ACCOUNTABILITY OFFICE, RURAL BROADBAND REPORT].

²⁶ *Id.* at 12–13. The Government Accountability Office (“GAO”) used a survey that was based on interviews of 1,500 randomly sampled households. *Id.* at 2.

²⁷ See GEORGE FORD, THOMAS M. KOUTSKY & LAWRENCE J. SPIWAK, THE DEMOGRAPHIC AND ECONOMIC DRIVERS OF BROADBAND ADOPTION IN THE UNITED STATES, 7 at tbl. 1, available at <http://www.phoenix-center.org/pcpp/PCPP29Final.pdf>.

²⁸ See *id.*; see also U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES: 2008 34 at tbl. 29 (127th ed. 2007). Only Vermont, Maine, and West Virginia had larger portions of their populations living in rural locations than Mississippi at the time of the 2000 Census. However, the total number of rural Mississippians was significantly greater than the numbers of rural residents in those other states. California and New Jersey were tied as the most urban states in the nation, based on the portion of the population living in urban areas when the 2000 Census was taken. *Id.*

report on broadband connectivity and computer ownership in Minnesota households found that at the end of 2006, the number of Minnesota rural households with a broadband connection was approximately 39.7%, while approximately 57% of metro-area households had a broadband connection.²⁹ A survey prepared by the New York State Department of Public Service found that 10% of high-speed Internet subscribers lived in rural areas, 46% lived in suburban areas or small towns, and 44% lived in urban areas or cities.³⁰ Also, an analysis conducted by the Tennessee Broadband Task Force in the fall of 2005 found that there was significant broadband deployment in urban areas of the state “but assessment of deployment in rural areas is difficult.”³¹

The various means of analyzing broadband service availability and subscription rates within states and throughout the country complicates the task of determining what aspects of deployment the government should target.³² For instance, the government needs to determine if it should be responsible for reducing or eliminating the gap in broadband deployment, subscriptions, or both; to what extent the gap should be reduced; and the proper means for minimizing the gap.³³ Moreover, results of the analysis raise the question of the appropriate role of governments in removing barriers to accessing services.³⁴ Without accurate data on broadband deployment and adoption, policymakers cannot determine the optimal policies for promoting broadband deployment. Therefore, any state or federal policy aimed at encouraging broadband deployment must begin with an accurate measurement of the current level of deployment and adoption.

²⁹ CENTER FOR RURAL POLICY AND DEVELOPMENT, THE 2006 MINNESOTA INTERNET STUDY: BROADBAND ENTERS THE MAINSTREAM 2 (2007), available at <http://www.mnsu.edu/ruralmn/pages/Publications/reports/Telecom2006.pdf>.

³⁰ NEW YORK STATE DEP'T OF PUB. SERV., NEW YORK STATE RESIDENTIAL TELECOMMUNICATIONS CONSUMER SURVEY 18 (2007), available at [http://www3.dps.state.ny.us/pscweb/webfileroom.nsf/Web/C1E3726AF5E55793852572C3005A49F7/\\$File/RESIDENTIAL%20TELECOMMUNICATIONS%20CONSUMER%20SURVEY.pdf?OpenElement](http://www3.dps.state.ny.us/pscweb/webfileroom.nsf/Web/C1E3726AF5E55793852572C3005A49F7/$File/RESIDENTIAL%20TELECOMMUNICATIONS%20CONSUMER%20SURVEY.pdf?OpenElement).

³¹ TENNESSEE BROADBAND TASK FORCE, REPORT & RECOMMENDATIONS 9 (2007), available at <http://tennessee.gov/tra/bbtaskforce/Tenn.%20Broadband%20Task%20Force%20Report%20and%20Recommendations.pdf>.

³² See generally GOV'T. ACCOUNTABILITY OFFICE, RURAL BROADBAND REPORT, *supra* note 25.

³³ See generally *id.* The GAO notes that there are “[a] variety of market and technical factors, as well as federal and state government efforts and access to resources at the local level have influenced the deployment of broadband infrastructure.” *Id.* at 4.

³⁴ See *id.* at 5. (“Targeted government assistance might help facilitate the deployment of broadband service, and stakeholders we spoke with identified several options to spur greater deployment of broadband service in rural America. However, each of the policy options that stakeholders discussed with us had challenges to their implementation.”).

III. THE EVOLVING FEDERAL-STATE PARTNERSHIP

Section 254 of the 1996 Act articulates Congress' recognition that telecommunications services and broadband services should be available to all Americans regardless of where they live.³⁵ Section 706(a) of the 1996 Act supports ubiquitous deployment of broadband services.³⁶ Also, section 706(b) underscores Congress' commitment to eliminate barriers to ubiquitous deployment of broadband services.³⁷ State governments have partnered with the federal government to attempt to eliminate barriers to broadband deployment and access.³⁸

As of 2002, twenty-one states had universal service funds that enabled companies that received high-cost support to deploy broadband facilities in rural areas.³⁹ In 2007, the Federal-State Joint Board on Universal Service ("Joint Board"), a board composed of FCC Commissioners, state utility commissioners, and a consumer advocate representative,⁴⁰ issued a *Recommended Decision* acknowledging that federal high-cost Universal Service Fund ("USF") support is extensively used to deploy broadband infrastructure in rural areas.⁴¹ The Joint Board also recognized the importance of the federal-state partnership.⁴² Specifically, the Joint Board recommended the creation of a "Broadband Fund" within the federal USF that would allocate funds to states to issue grants for the construction of broadband facilities in unserved areas.⁴³ The Joint Board

³⁵ See Telecommunications Act of 1996, §254(b)(3), 110 Stat. 56, 72.

Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas.

Id.

³⁶ See *id.* §706(a).

³⁷ *Id.* §706(b) (referring to "removing barriers to infrastructure investment . . .").

³⁸ See GOV'T. ACCOUNTABILITY OFFICE, RURAL BROADBAND REPORT, *supra* note 25, at 4.

³⁹ GOV'T. ACCOUNTABILITY OFFICE, TELECOMMUNICATIONS: FEDERAL AND STATE UNIVERSAL SERVICE PROGRAMS AND CHALLENGES TO FUNDING, GAO-02-187, at 47 app.III, tbl.2 (2002), available at <http://www.gao.gov/new.items/d02187.pdf>.

⁴⁰ Federal-State Joint Board on Universal Service, http://www.fcc.gov/wcb/tapd/universal_service/JointBoard/welcome.html (last visited Oct. 12, 2008).

⁴¹ See *In re* High-Cost Universal Service Support, Federal-State Joint Board on Universal Service, *Recommended Decision*, 22 F.C.C.R. 20,477, ¶ 30 (Nov. 19, 2007) [hereinafter High-Cost Universal Service Support *Recommended Decision*] (commending rural local exchange carriers for "providing broadband to nearly all their customers.").

⁴² See *id.* ¶¶ 14–15.

⁴³ *Id.* ¶¶ 14–15. In this proceeding, the Joint Board recounted congressional and judicial pronouncements that recognized the importance of states maintaining universal service as

did not propose a specific methodology for allocating funds to individual states but suggested “that a major input factor should be the number of residents of each state who are unable to purchase terrestrial broadband Internet service at their residences.”⁴⁴ In order to direct USF support to broadband service, the Joint Board requested that the FCC include broadband in the list of services eligible for USF support pursuant to section 254 of the 1996 Act.⁴⁵ While the Commission has not acted on the Joint Board’s proposal, some states have modified their own support mechanisms to encourage broadband deployment.⁴⁶

Several states have crafted incentives both to spur broadband deployment in unserved or underserved regions, and to encourage broadband use.⁴⁷ For example, four states—Tennessee, Kentucky, Arkansas, and Illinois—enacted legislation in recent years to encourage broadband deployment.⁴⁸ In addition to deployment objectives, some of these states also seek to encourage broadband use. Illinois’ statute provides incentives to stimulate demand and computer literacy.⁴⁹ Arkansas’ statute provides grants for establishing Connect Arkansas, a program aimed at facilitating “[b]roadband education so that the citizens of every home and business in Arkansas can take full advantage of broadband services.”⁵⁰ The state policies addressing issues other than infrastructure deployment recognize that broadband adoption may require a multifaceted strategy.⁵¹ As a complementary strategy for other efforts to improve access to broadband, the National Association of Regulatory Utility Commissioners

part of the federal-state partnership to that end. *See id.* ¶ 45.

⁴⁴ *Id.* ¶ 15.

⁴⁵ *Id.* ¶¶ 56–57. Section 254(c) currently defines supported services by considering the extent that the services:

(A) are essential to education, public health, or public safety;

(B) have, through the operation of market choices by customers, been subscribed to by a substantial majority of residential customers;

(C) are being deployed in public telecommunications networks by telecommunications carriers; and

(D) are consistent with the public interest, convenience, and necessity.

Telecommunications Act of 1996, §254(b)(3), 110 Stat. 56, 72

⁴⁶ GOV’T. ACCOUNTABILITY OFFICE, TELECOMMUNICATIONS: FEDERAL AND STATE UNIVERSAL SERVICE PROGRAMS AND CHALLENGES TO FUNDING, *supra* note 39, at 12–13.

⁴⁷ *Id.*

⁴⁸ TENN. CODE ANN. § 7-52-410 (2007); KY. REV. STAT. ANN. § 224A.1121 (LexisNexis 2007); ARK. CODE ANN. § 4-113-101–105 (2007); 20 ILL. COMP. STAT. ANN. 661/1, 5, 10, 15, 20, 25, 30, 35, 99 (West 2008).

⁴⁹ 20 ILL. COMP. STAT. ANN. 661/15-a(2)–(3).

⁵⁰ ARK. CODE ANN. § 4-113-103(c)(1).

⁵¹ *See, e.g.*, 20 ILL. COMP. STAT. ANN. 661/20-a (creating a “deployment strategy and demand creation initiative”); *see also* RYAN MILLER, STATE EFFORTS TO EXPAND BROADBAND ACCESS, *available at* <http://www.nga.org/Files/pdf/0805BROADBANDACCESS.pdf> (summarizing a variety of state strategies to encourage broadband access and use).

(“NARUC”), adopted a policy statement promoting Information and Communication Technologies (“ICT”) Digital Literacy.⁵² While the FCC has not acted on the Joint Board’s recommendations to promote broadband through USF support, it has taken deregulatory actions that are intended to spur deployment of broadband.⁵³

Perhaps most significantly, the FCC has designated various types of broadband services as “information services,”⁵⁴ including: cable modem service, digital subscriber line service, broadband over power line, and wireless broadband Internet access.⁵⁵ The designation of a service as an information service does

⁵² Board of Directors, Nat’l Ass’n of Regulatory Util. Comm’rs, RESOLUTION PROMOTING INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) DIGITAL LITERACY (2008), available at <http://www.naruc.org/Resolutions/Digital%20Literacy.pdf>. NARUC “is a non-profit organization dedicated to representing the State public service commissions who regulate the utilities that provide essential services such as . . . telecommunications” About NARUC, <http://www.naruc.org/about.cfm> (last visited Oct. 22, 2008).

⁵³ See, e.g., *In re* Inquiry Concerning High-Speed Access to the Internet over Cable and Other Facilities; Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities, *Declaratory Ruling and Notice of Proposed Rulemaking*, 17 F.C.C.R. 4798, ¶ 38 (Mar. 14, 2002) [hereinafter *Inquiry Concerning High-Speed Access*].

⁵⁴ An “information service” is defined as:

[T]he offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, and includes electronic publishing, but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service.

47 U.S.C. § 153(20) (2000).

⁵⁵ The FCC has classified cable modem Internet access as an “information service.” See *Inquiry Concerning High-Speed Access*, *supra* note 53, ¶ 38. This classification was guided by the principle, among others, of “ensuring that broadband services exist in a minimal regulatory environment that promotes investment and innovation.” *Id.* ¶ 5. The Supreme Court upheld the classification of cable modem service as an information service. See *Nat’l Cable & Telecomms. Ass’n v. Brand X Internet Servs.*, 545 U.S. 967 (2005). Wireless broadband Internet access service was the most recent service to be classified as an “information service.” See *In re* Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks, *Declaratory Ruling*, 22 F.C.C.R. 5901, ¶¶ 1–4 (Mar. 22, 2007) [hereinafter *Appropriate Regulatory Treatment of Wireless Broadband Declaratory Ruling*]. See also *In re* Appropriate Framework for Broadband Access to the Internet over Wireline Facilities; Universal Service Obligations of Broadband Providers; Review of Regulatory Requirements of Incumbent LEC Broadband Telecommunications Services; Computer III Further Remand Proceedings: Bell Operating Company Provision of Enhanced Services; 1998 Biennial Regulatory Review – Review of Computer III and ONA safeguards and Requirements; Conditional Petition of the Verizon Telephone Companies for Forbearance Under 47 U.S.C. § 160(c) with Regard to Broadband Services Provided via Fiber to the Premises; Petition of the Verizon Telephone Companies for Declaratory Ruling, or Alternatively, for Interim Waiver with Regard to Broadband Services Provided via Fiber to the Premises; Consumer Protection in the Broadband Era, *Report and Order and Notice of Proposed Rulemaking*, 20 F.C.C.R. 14,853 (Aug. 5, 2005); *In re* United Power Line Council’s

not preclude FCC jurisdiction.⁵⁶ When a service is designated as an “information service” the FCC can impose fewer regulatory requirements on the service.⁵⁷ The justification for the designation is that the market for the service is sufficiently competitive and that increasing or maintaining the existing oversight would impede competition.⁵⁸ Similarly, since 1997 states have tended to relax regulation of historically rate-regulated telecommunications services in order to stimulate competition.⁵⁹

At the local level, states must balance their federal partner’s policies focused on promoting competition among providers with their residents’ needs for regional equity in broadband deployment. At the regional level, competitive market-based strategies might not resolve inequities in access to broadband services. Furthermore, states are preempted from regulating broadband services, even if the services are offered by providers over which the state exercises regulatory oversight.⁶⁰ That leaves states with only a basket of carrots and

Petition for Declaratory ruling regarding the Classification of Broadband over Power Line Internet Access Service as an Information Service, *Memorandum Opinion and Order*, 21 F.C.C.R. 13,281 (Nov. 3, 2006).

⁵⁶ Appropriate Regulatory Treatment of Wireless Broadband *Declaratory Ruling*, *supra* note 55, ¶ 2.

⁵⁷ *See id.* ¶¶ 2, 4 (noting that classifying a service as an “information service” reduces “regulatory requirements and uncertainties that could have slowed development of these broadband services.”).

⁵⁸ *See id.* ¶ 4. The FCC described its regulatory stance toward the classification of “information service” as follows:

In proceedings involving cable, wireline, and BPL, the Commission has examined the regulatory classification applicable to certain broadband services and determined to adopt a *procompetitive, deregulatory regime* for these services. In particular, the Commission has classified cable, wireline, and BPL broadband Internet access services as “information services,” thus reducing regulatory requirements and uncertainties that could have slowed development of these broadband services.

Id. (emphasis added).

⁵⁹ States have moved incrementally toward lighter or no rate regulation of incumbent local exchange carriers (“ILECs”) and competitive local exchange carriers (“CLECs”) for telecommunications services that have been historically price regulated. As of December 2006, thirty-three states used price caps to regulate one or more ILEC, with all the largest ILECs in five states and all ILECs in seven states experiencing complete pricing flexibility or rate deregulation. Twenty-five states no longer review the rates of CLECs. LILIA PÉREZ-CHAVOLLA, THE NAT’L REGULATORY RESEARCH INST., STATE RETAIL RATE REGULATION OF LOCAL EXCHANGE PROVIDERS AS OF DECEMBER 2006 i, 83, tbl.6 (2007), *available at* <http://nrri.org/pubs/telecommunications/07-04.pdf>.

⁶⁰ For example, the FCC preempted an order by the Minnesota Public Service Commission that applied traditional rate regulation to VoIP services provided by Vonage and extended the same preemption to others states that interconnected regulated VoIP services. *See In re Vonage Holdings Corporation Petition for Declaratory Ruling Concerning an Order of the Minnesota Public Service Commission*, *Memorandum Opinion and Order*, 19 F.C.C.R. 22,404, ¶ 46 (Nov. 9, 2004). The FCC argued that sections 230 and 706 of the 1996 Act comported with its decision. *Id.* ¶ 33.

no sticks.

Despite having a reduced policy tool set, states may be better positioned than the federal government to respond to community broadband deployment needs and craft solutions to reduce the broadband deployment gap at the state level.⁶¹ In areas of regulation where state and local government traditionally have jurisdiction over communications providers, policies can be crafted to meet the convergent needs of the locality and service providers.⁶²

IV. FEDERAL AND STATE PERSPECTIVES FOR BROADBAND DEPLOYMENT

Policymakers at the federal and state level have carved out at least four discrete areas for which broadband deployment is critical: healthcare; education; economic development, specifically, job retention and growth; and the safety and security of United States citizens.⁶³ Telemedicine and telehealth services are critical in rural areas where the population faces the challenge of traveling long distances for routine healthcare.⁶⁴ Broadband impacts education by enabling distance learning programs and providing educational resources that might otherwise not be available to rural residents.⁶⁵ Economic competitiveness is also a serious concern to rural communities with shrinking populations.⁶⁶ In these communities, broadband services often are part of statewide economic development strategies.⁶⁷ Additionally, federal, state, and local governments have created systems to inform and protect residents against local and national safety threats or natural disasters.⁶⁸ Increasingly, broadband is an essential

⁶¹ See Curt Stamp, Note, *Left Behind: The Lack of Advanced Telecommunications Services in Rural America and Its Strain on Rural Communities—Policy Options for Closing the Digital Divide*, 7 DRAKE J. AGRIC. L. 645, 665–69 (2002) (providing examples of how states have responded to reduce the broadband deployment gap).

⁶² *Id.* at 666. (“Laws that give telecommunications providers access to property for the laying of wires and other infrastructure work allow providers to continue to build out. On the other hand, zoning restrictions on the siting of cellular towers can impede the deployment.”).

⁶³ In lockstep with these federal policy concerns, the FCC identified several areas that have made a difference to Americans: broadband capability for business operations and job growth; distance learning, particularly in rural areas; and telemedicine, particularly in sparsely populated rural areas. See Deployment of Advanced Telecommunications Capability *NOI*, *supra* note 19, ¶¶ 2–4.

⁶⁴ *Id.* ¶ 4.

⁶⁵ *Id.* ¶ 3.

⁶⁶ See RURAL MARYLAND COUNCIL, 2020 RURAL PROSPERITY INVESTMENT INITIATIVE 1–3 (2006), available at http://www.rural.state.md.us/2020_Report.pdf.

⁶⁷ See *id.*

⁶⁸ See, e.g., Press Release, Dep’t of Homeland Sec., Homeland Security Advisory System (Oct. 6, 2006), available at <http://www.dhs.gov/xinfo/share/programs/>

component of these systems.⁶⁹

Despite shared interest in these critical areas, state policymakers differ from federal policymakers in their perspectives on the appropriate policies for increasing broadband deployment for three primary reasons. First, state policymakers are attuned to their communities' demand for education and healthcare services. State policymakers are also better positioned to measure their communities' access to services, and whether the necessary workforce exists in the state to meet the communities' needs.⁷⁰ Second, state legislators must respond to community needs as articulated by the electorate in a much more nuanced manner than the federal government.⁷¹ Third, many states face significant budgetary constraints that the federal government does not. The differing perspectives between federal and state regulators affect: (1) the relative significance placed on international comparative broadband rankings versus inter- and intra-state broadband rankings; and (2) the nature of the policy framework for broadband deployment and access based on the comparative needs of critical areas.

A. Comparative Rankings

Several studies attempt to measure and rank levels of broadband access between countries.⁷² Perhaps the most commonly cited international ranking, the Organisation for Economic Co-operation and Development ("OECD") ranking, placed the United States fifteenth in broadband deployment among thirty nations in 2007.⁷³ The OECD methodology compares countries by using raw per capita subscription data and is not without its critics.⁷⁴ The extent to which

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⁶⁹ See *id.*

⁷⁰ See CHRIS O'BRIEN, JOHN ERIK GARR & JACK REITMAN, MUNICIPAL BROADBAND STRATEGY: BEYOND WIRELESS 2 (2007), available at http://www.diamondconsultants.com/publicsite/ideas/perspectives/downloads/muni%20broadband_diamond.pdf.

⁷¹ See W.K. KELLOGG FOUND., PERCEPTIONS OF RURAL AMERICA: NATIONAL STATE LEGISLATOR SURVEY 1 (2002), available at <http://www.wkkf.org/pubs/FoodRur/Pub3782.pdf>.

⁷² See, e.g., ROBERT D. ATKINSON, DANIEL K. CORREA & JULIE A. HEDLUND, EXPLAINING INTERNATIONAL BROADBAND LEADERSHIP 6 (2008), available at <http://www.itif.org/files/ExplainingBBLeadership.pdf>.

⁷³ ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, BROADBAND GROWTH AND POLICIES IN OECD COUNTRIES 25 (2008). Broadband connections included in the rankings must have download speeds of at least 256 Kbps. *Id.* at 49.

⁷⁴ See GEORGE S. FORD, PHOENIX CENTER PROSPECTIVES NO. 08-03, BROADBAND EXPECTATIONS AND THE CONVERGENCE OF RANKS 1 (2008) (arguing that the OECD broadband rankings are converging towards telephone penetration rankings, and that the United States should be around fifteenth in the OECD). See also *State Department Official Challenges OECD Data Showing United States Lagging in Broadband*, TELECOM. MONITOR, Nov. 29,

these results are relevant to individual state policymakers within the United States (as opposed to intra-country comparisons) is a valid question. However, state policymakers may want to familiarize themselves with the economic, demographic, and product factors used in the OECD's methodology. State policymakers should study the methodologies used in other rankings, such as the rankings from the Phoenix Center and the Information Technology and Innovation Foundation ("ITIF").⁷⁵ Each methodology has explanatory limitations and strengths: the OECD rankings do not account for speed and price while the ITIF model does not account for the demographic and economic factors that may affect broadband adoption.⁷⁶ The Phoenix Center's broadband perform-

2007, available at <http://www.ilrweb.com/showSingleDoc.asp?iName=newsIndex&docID=NEWS11509§ion=all&pformat=true>. The Chairman of the FCC, Kevin Martin, discounted the OECD rankings because "it doesn't account for population density and other factors." See Corey Boles, *States Step in to Close Broadband Gap*, WALL ST. J., Nov. 1, 2007, at B3.

⁷⁵ The Phoenix Center recommended an alternative approach for comparing OECD countries based on a broadband performance index. See FORD ET AL., *THE BROADBAND PERFORMANCE INDEX*, *supra* note 6. Economic and demographic characteristics used in the index explain 86% of the difference in broadband adoption among OECD countries. *Id.* at 26. The remaining 14% difference accounts for differences in telecommunications policy not related to price. *Id.* These factors include: broadband price in the country; income inequality in the country; GDP per capita in the country; education (post-secondary and above); age over sixty-five years old; population density; percentage of population in the biggest city in the country; number of phones per capita; household size, number of persons per business establishment. *Id.* at 13. Interestingly, population density has a less significant effect on broadband subscription in the inter-country comparisons than do other factors, although there is a positive relationship between density and subscription rate. *Id.* at 19. One might expect density to affect availability that, in turn, affects subscription. However, at least in the Phoenix Center's analysis, the most significant demographic factors affecting subscription ranked with the largest factor first, appear to be income inequality, income (measured as per capita GDP), age, and existing telephone subscription. *Id.* at 20, tbl.3. The authors elaborated, "[o]ur analysis suggests that broadband adoption is intimately tied to demand-side factors like income inequality and education, and policies directed at those factors may be more cost effective than supply-side subsidies and regulation." GEORGE S. FORD, THOMAS M. KOUTSKY & LAWRENCE J. SPIWAK, *THE BROADBAND EFFICIENCY INDEX: WHAT REALLY DRIVES BROADBAND EFFICIENCY ACROSS THE OECD?* (2008), available at <http://www.phoenix-center.org/pcpp/PCPP33Final.pdf>. Another alternative to the OECD ranking is a metric developed by the Information Technology and Innovation Foundation ("ITIF") that accounts for average download speed and price per bit of the fastest generally available technology, in addition to household penetration. See DANIEL K. CORREA, *ASSESSING BROADBAND IN AMERICA: OECD AND ITIF BROADBAND RANKINGS* (2007), available at <http://www.itif.org/files/BroadbandRankings.pdf>. According to Robert Atkinson, president of ITIF, speed is a more significant metric than the number of broadband connections for measuring broadband adoption although the latter is also important. See *State Department Official Challenges OECD Data Showing United States Lagging in Broadband*, *supra* note 74, at 2.

⁷⁶ CORREA, *supra* note 75, at 3 (explaining that the ITIF model accounts for speed, cost, and penetration).

ance index does not address the speed and quality of available broadband connections.⁷⁷ Regardless of the ranking used by state or federal policymakers, each methodology yields very different results.⁷⁸ The variations in results affect the identification of the barriers to broadband deployment or subscription, and, therefore, help discover the appropriate policy response.

B. Nature of the Policy Framework

Federal policymakers are responsible for developing a framework for broadband deployment for the entire nation that responds to overarching national concerns.⁷⁹ The federal government partners with state governments and private sector providers to spur broadband deployment in rural areas in order to achieve national objectives shared by states.⁸⁰ As noted, shared federal and state government interests in broadband deployment include four critical applications—healthcare, education, employment, and homeland security.

1. Healthcare services

Healthcare costs in the United States increased between 2000 and 2007 from \$1.2 trillion to \$1.9 trillion, reflecting 14.4% of the GDP.⁸¹ Consequently, federal and state governments face the challenge of containing healthcare costs, while ensuring that rural and remote regions have access to medical services. Rural communities experience a general shortage of healthcare—20% of the nation's population lives in rural areas, but rural areas only have 9% of the physicians.⁸² Compared to urban areas, federally supported community health

⁷⁷ FORD ET AL., *THE BROADBAND PERFORMANCE INDEX*, *supra* note 6, at 31. Even though speed and quality of connections are not included in the index, the authors note that “improving the bandwidth and diversity of the broadband connections is an important goal, and some recent decisions by the Federal Communications Commission and state governments have nudged the country in the right direction.” *Id.* at 31-32.

⁷⁸ See CORREA, *supra* note 75, at 1.

⁷⁹ See Kevin Martin, Chairman, FCC, Address at the National Summit on Broadband Deployment (Oct. 26, 2001), available at <http://www.fcc.gov/Speeches/Martin/2001/spkjm101.pdf> (“Encouraging broadband deployment should be a fundamental priority of the Commission and government in general.”).

⁸⁰ See *id.* at 2 (“To truly help spur broadband deployment, every level of government should be committed to minimizing and eliminating these excess financial burdens [imposed on broadband providers].”).

⁸¹ Ronald C. Merrell & Charles R. Doarn, *The Necessity of Telemedicine*, 13 *TELEMEDICINE & E-HEALTH* 359 (2007).

⁸² Roger A. Rosenblatt, C. Holly A. Andrilla, Thomas Curtin & L. Gary Hart, *Shortages of Medical Personnel at Community Health Centers: Implications for Planned Expansion*, 295 *JAMA* 1042, 1043 (2006).

centers in rural areas have a difficult time recruiting primary care physicians.⁸³ Despite barriers to implementation, telemedicine and telehealth are viable delivery systems for expanding access to healthcare and containing healthcare costs in rural communities.⁸⁴ In addition, broadband can facilitate patient care administration, record management by patients, and management of chronic conditions through electronically based disease registries.⁸⁵

In 2006, in recognition of the ability of broadband to improve healthcare in rural communities, the FCC initiated the Rural Health Care Pilot Program.⁸⁶ Participants in the program received USF support for up to 85% of the costs associated with construction of state or regional broadband networks to deliver healthcare services.⁸⁷ The FCC selected sixty-nine participants to receive a total of \$139 million annually for three years.⁸⁸ One grant recipient, the Wyoming Telehealth Network, proposed a broadband network to improve data sharing among the state's healthcare professionals:

⁸³ See Janet Coffman, Emily Rosenoff & Kevin Grumbach, IMPROVING RECRUITMENT AND RETENTION OF PRIMARY CARE PRACTITIONERS IN RURAL CALIFORNIA 1 (2002), available at <http://cpac.berkeley.edu/documents/carerural.pdf>; see also MASSACHUSETTS MEDICAL SOCIETY, PHYSICIAN WORKFORCE STUDY 2 (2007), available at www.massmed.org/Content/NavigationMenu/NewsandPublications/ResearchReportsStudies/PhysicianWorkforceStudy/2007MMSWorkforceStudy_full.pdf ("Massachusetts faces the problem of a disproportionate supply of physicians in urban areas versus rural areas."). But see Donald E. Pathman, Thomas Konrad, Rebekkah Dann & Gary Koch, *Retention of Primary Care Physicians in Rural Health Professional Shortage Areas*, 94 AM. J. PUB. HEALTH 1723, 1723–26 (2004) (noting that three of four relevant studies "found no differences in rural and urban retention.").

⁸⁴ See JARED RHOADS, TELEMEDICINE IN THE AMBULATORY SETTING: TRENDS, OPPORTUNITIES AND CHALLENGES 3–4 (2007), available at <http://www.fcg.com/research/serve-research.aspx?rid=335>. Several constraints, particularly restrictions on reimbursements, have affected telemedicine deployment in rural areas to date. See *id.* However, a recent report by First Consulting Group ("FCG") predicts a growing use of telemedicine for home monitoring throughout the country. FCG cites a finding from the National Association for Home Care and Hospice that more than half of the 8,000 home care agencies providing services to Medicare patients already use some type of remote monitoring. *Id.* at 6. Moreover, FCG cites a projection by Forrester Research that by 2015, 12% of seniors, 40% of all chronically ill, and 60% of all patients discharged from lengthy hospital visits will be directed to some type of remotely delivered program. *Id.*

⁸⁵ See Neil Neuberger, *Advancing Healthcare through Broadband: Opening Up a World of Possibilities: A White Paper for the Internet Innovation Alliance* 4 (2007), available at <http://www.internetinnovation.org/DesktopModules/iBN%20News%20Articles/Download.aspx?AttachmentID=6>.

⁸⁶ *In re Rural Health Care Support Mechanism, Order*, 21 F.C.C.R. 11,111 ¶ 1 (Sept. 26, 2006) ("These networks will be designed to bring the benefits of innovative telehealth and, in particular, telemedicine services to those areas of the country where the need for those benefits is most acute.").

⁸⁷ *Id.* ¶ 3.

⁸⁸ *In re Rural Health Care Support Mechanism, Order*, 22 F.C.C.R. 20,360, ¶¶ 1–2 (Nov. 16, 2007).

Wyoming ranks 45th in physicians per 100,000 people and has only 18 psychiatrists, four certified psychological practitioners, and two school psychologists statewide. Wyoming Telehealth Network's proposed network will extend the reach of health care professionals by linking the entire state's 72 hospitals, community mental health centers, and substance abuse centers, which will enable these facilities to transmit data to one another and videoconference.⁸⁹

Although the program is ongoing, the initial interest by states and rural healthcare programs is evidence of the demand in these areas for broadband healthcare services. A similar positive effect can be achieved from education in rural areas.

2. Education

The education system in the United States faces many challenges.⁹⁰ Math and science education is vital for workforce preparation and for propelling innovation in advanced telecommunications services.⁹¹ The United States' top math students rank twenty-fifth out of thirty nations' top math students.⁹² Graduate degrees in math, technology, engineering, and science increased by 14% between 1985 and 2002, while graduate degrees in other fields increased by 64% over the same period.⁹³

The lack of math and science teachers represents both a symptom and a cause of the problem.⁹⁴ Furthermore, workforce preparation has not focused on

⁸⁹ *Id.* ¶ 28.

⁹⁰ See, e.g., STRONG AMERICAN SCHOOLS, WEAK EDUCATION LEAVES AMERICANS UNPREPARED 1 (2008), available at <http://www.edin08.com/uploadedFiles/FAQs/SAS.Unprepared.FactsAboutEdCrisis.Mar26.2008.pdf> ("Our schools are failing to prepare all students for college, for careers, and for life, and they are failing to prepare our nation to compete in today's high-tech global economy.").

⁹¹ ROBERT D. ATKINSON & DANIEL K. CORREA, THE 2007 NEW ECONOMIC INDEX: BENCHMARKING ECONOMIC TRANSFORMATION IN THE STATES 58 (2007), available at http://www.itif.org/files/2007_State_New_Economy_Index_Small.pdf ("If America and states are to succeed in the innovation-powered global economy, boosting science, technology, engineering and mathematics degrees is particularly important.").

⁹² STRONG AMERICAN SCHOOLS, *supra* note 90, at 5.

⁹³ ATKINSON & CORREA, BENCHMARKING ECONOMIC TRANSFORMATION IN THE STATES, *supra* note 91, at 9.

⁹⁴ As a representative example of an individual state's problem, California "faces a persistent and critical shortage of fully prepared math and science teachers and lacks the capacity to produce enough math and science teachers to meet future needs . . ." Press Release, California Council on Science and Technology, California Faces Critical Shortage of Math and Science Teachers (Mar. 5, 2007), available at <http://www.ccst.us/news/2007/20070305TCPA.php>. Additionally, "Texas schools continue to face a shortage of certified math and science teachers, students continue to be taught by individuals without math or science training." Brooke Dollens Terry & Raz Shafer, *Solving the Math and Science Teacher Shortage*, POL'Y PERSPECTIVE, Oct. 2007, at 1, available at <http://www.texaspolicy.com/pdf/2007-10-PP27-teachershortage-bt-rs.pdf>.

science and engineering.⁹⁵ Between 2006 and 2012, scientific and engineering occupations are expected to increase at a greater rate than all occupations.⁹⁶ Specifically, scientific and engineering occupations are expected to grow 26% and 15%, respectively, translating to 1.2 million additional science and engineering-related jobs by 2012.⁹⁷ As FCC Commissioner Jonathan Adelstein described in his testimony to a Senate Committee, there is a role for Congress in “improving math and science education so that we have the human resources to fuel continued growth, innovation, and usage of advanced telecommunications services.”⁹⁸ Congress should allocate resources to these fields now to help meet perceived future needs.

Rural regions are particularly affected by the scarcity of math and science teachers.⁹⁹ Using broadband capability to deliver advanced math and science courses to students and instructional materials to teachers is one way of linking educational content to individuals who might not receive it any other way. One competitive local exchange carrier stated:

[D]istance learning curricula are critically important to rural schools that cannot afford to hire a teacher of advanced math and science programs for only a few children. Young people graduating from rural high schools and entering college often found themselves at a competitive disadvantage with students from metropolitan area high schools with large enrollments, where college level math and science programs are a common offering.¹⁰⁰

For example, Iowa uses distance learning to connect ninety rural schools simultaneously to participate in a variety of environmental education programs.¹⁰¹ Aside from improving math, science, and general work force training, broadband impacts employment growth in a more direct manner—job creation.

⁹⁵ DEBORAH D. STINE & CHRISTINE M. MATTHEWS, *THE U.S. SCIENCE AND TECHNOLOGY WORKFORCE* i (2008), available at <http://www.fas.org/sgp/crs/misc/RL34539.pdf>.

⁹⁶ NAT'L SCI. BD., *SCIENCE AND ENGINEERING INDICATORS 2006*, 3–8 to 3–9 (2006), available at <http://www.nsf.gov/statistics/seind06/pdf/volume1.pdf>.

⁹⁷ *Id.*

⁹⁸ *The State of Broadband: Hearing Before the S. Comm. on Commerce, Science, and Transportation* 110th Cong. 5 (2007) (statement of Jonathan Adelstein, Commissioner, FCC), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-276283A1.pdf.

⁹⁹ See EXECUTIVE SUMMARY *TEACHERS FOR TOMORROW'S SCHOOLS: ANALYSIS OF THE WORLD EDUCATION INDICATORS, 2001 ED.*, 12 (2001), available at http://www.uis.unesco.org/TEMPLATE/pdf/wei/wei_execsum_EN.pdf.

¹⁰⁰ *Maximizing the Value of Broadband Services to Rural Communities: Hearing Before the Subcomm. on Rural and Urban Entrepreneurship of the H. Comm. on Small Business*, 110th Cong. 52 (2007) (statement of Brandon Stephens, Chairman of the Board, Balsam West FiberNET, LLC). Balsam West collaborates in a public-private partnership to connect seventy public schools, two community colleges, and a university through a fiber-optic network in Southern Appalachia, North Carolina. *Id.* at 67–68.

¹⁰¹ JOSEPH FUHR, JR. & STEPHEN B. POCIASK, *BROADBAND SERVICES: ECONOMIC AND ENVIRONMENTAL BENEFITS* 41 (2007), available at http://www.internetinnovation.org/Portals/0/Documents/Final_Green_Benefits.pdf.

3. Employment growth

Although it might be a contributing factor at the margins, broadband service is considered a means of promoting economic development and job growth.¹⁰² According to a study by scholar Robert Crandall and his colleagues, “for every one percentage point increase in broadband penetration in a state, employment is projected to grow by 0.2 percent to 0.3 percent per year.”¹⁰³ For the non-farm economy in the United States, this translates to approximately 300,000 jobs.¹⁰⁴ On a granular level, for example, a 1.0% increase in broadband penetration would result in an estimated 17,600 additional jobs in Florida or an addition of 0.25% to the 2006 employment base.¹⁰⁵

A recent study found that broadband penetration in Kentucky had a positive impact on employment growth in some industries in the state.¹⁰⁶ The study utilized county-level data aggregated from the ConnectKentucky database, a public-private partnership to measure and fill deployment gaps.¹⁰⁷ Findings suggest that broadband deployment contributes to job growth most in industry sectors, such as mining, construction, information, waste management, and remediation services.¹⁰⁸ However, the study finds that returns for job growth are diminishing as deployment approaches complete build out.¹⁰⁹ Further, employment growth seems most robust in counties where there is moderate deployment, but

¹⁰² See SHARON E. GILLET, WILLIAM H. LEHR, CARLOS A. OSORIO & MARVIN A. SIRBU, MEASURING THE ECONOMIC IMPACT OF BROADBAND DEPLOYMENT 3 (2006), available at http://www.eda.gov/ImageCache/EDAPublic/documents/pdfdocs2006/mitcmubbimpactreport_2epdf/v1/mitcmubbimpactreport.pdf. The study, done for the Economic Development Administration, U.S. Department of Commerce, quantified the effect of broadband on job growth in communities.

¹⁰³ Robert Crandall, William Lehr & Robert Litan, *The Effects of Broadband Deployment on Output and Employment: A Cross-Sectional Analysis of U.S. Data*, ISSUES IN ECONOMIC POLICY, July 2007, at 2, available at <http://www3.brookings.edu/views/papers/crandall/200706litan.pdf>.

¹⁰⁴ *Id.*

¹⁰⁵ *Id.* at 14 tbl.5. Whereas information technology, including broadband, has been a major driver of job growth in the past, its contribution to the nation’s job growth and economic competitiveness in the future is less clear because “ICT enhancements . . . may be relatively easily imitated which means that competitive advantage premised on differences in ICT use may be short-lived.” *Id.* at 5.

¹⁰⁶ David Shideler, Narine Badasyan & Laura Taylor, *The Economic Impact of Broadband Deployment in Kentucky*, 3 REGIONAL ECON. DEV. 88, 89 (2007).

¹⁰⁷ *Id.* at 89. ConnectKentucky is one of the state initiatives briefly described *infra*, Part IV.B.

¹⁰⁸ Shideler et al., *supra* note 106, at 94.

¹⁰⁹ *Id.* at 117 (“From a productivity perspective, this result captures the notion that a critical amount of broadband infrastructure may be needed to sizably increase employment, but once a community is completely built out . . . additional broadband infrastructure will not . . . further affect employment growth.”).

broadband deployment is neither sparse nor widespread.¹¹⁰ While the extent to which the findings for Kentucky can be applied to experiences of other states remains an open question, it is clear that broadband deployment likely has some positive impact on employment growth. The fourth critical area for broadband deployment is national safety and security.

4. National safety and security

National safety and homeland security measures rely on interoperable broadband networks that cross state borders to respond to emergencies and major natural disasters.¹¹¹ Much of the information used to alert and protect Americans is now posted on federal agency Web sites.¹¹² Additionally, broadband is used for national security purposes, which by definition is the domain of the federal government. For example, the ability of the National Security Agency to eavesdrop on international communications in the aftermath of September 11 was made possible through broadband communications.¹¹³

Local government agencies are responsible for broadcasting local public safety communications, which are often facilitated by high-speed broadband facilities.¹¹⁴ For example, a “virtual command center” in Anaheim, California supports an integrated law enforcement and public safety system that can be accessed remotely via broadband.¹¹⁵ Additionally, there is support for a na-

¹¹⁰ *Id.*

¹¹¹ See *Interoperability in the Next Administration: Assessing the Derailed 700MHz D-block Public Safety Spectrum Auction: Hearing Before the Subcomm. On Emergency Commc'ns, Preparedness, and Response of the H. Comm. on Homeland Sec. 2-3* (Sept. 16, 2008) (statement of Richard Mirgon, President Elect, Association of Public-Safety Communications Officials International), available at http://apointl.org/new/government/documents/Richard_Mirgon091608_Final.pdf.

¹¹² According to a 2003 survey conducted by Pew Internet & American Life, ninety-seven million Americans (77% of Internet users) had searched for information on issues of safety, security and other matters from government agencies or communicate with them electronically. See JOHN B. HARRIGAN, *HOW AMERICANS GET IN TOUCH WITH GOVERNMENT* v (2004), available at http://www.pewinternet.org/pdfs/PIP_E-Gov_Report_0504.pdf.

¹¹³ See Eric Lichtblau, James Risen & Scott Shane, *Wider Spying Fuels Aid Plan for Telecom Industry*, N.Y. TIMES, Dec. 16, 2007, at A1 (“The government’s dependence on the phone industry, driven by the changes in technology and the Bush administration’s desire to expand surveillance capabilities inside the United States, has grown significantly since the September 11 attacks.”).

¹¹⁴ See A06: Establish the Intergovernmental Wireless Public Safety Network, available at <http://govinfo.library.unt.edu/accessamerica/docs/wireless.html> (last visited Oct. 9, 2008).

¹¹⁵ CALIFORNIA BROADBAND TASK FORCE, *THE STATE OF CONNECTIVITY: BUILDING INNOVATION THROUGH BROADBAND 15*, available at http://www.calink.ca.gov/pdf/CBTF_FINAL_Report.pdf (“Broadband, however, is required to effectively use the portal’s numerous mapping and video applications.”).

tionwide broadband public safety network that local public safety agencies can access.¹¹⁶ At times, wireless broadband may be better than broadband wireline networks for use by those responding to emergencies, particularly when wireline connections fail or remote areas are affected.¹¹⁷

In early 2008, the FCC attempted to auction a portion of the broadcast spectrum that will be reclaimed following the transition to digital television for the establishment of a nationwide interoperable wireless broadband network for first responders.¹¹⁸ However, the FCC imposed a reserve price on the spectrum block, and the reserve was not met.¹¹⁹ The FCC is currently revising the rules in an effort to re-auction the spectrum.¹²⁰

In a recent article, Professor Gerald Faulhaber argues that “we have yet to see a compelling business case for [broadband for public safety communica-

¹¹⁶ See, e.g., *Oversight of NTIA and Innovations in Interoperability: Hearing Before the Subcomm. on Telecommunications and the Internet of the H. Energy and Commerce Comm.* (Mar. 22, 2007) (statement of Jon M. Peha, Professor, Carnegie Mellon University), available at http://www.ece.cmu.edu/~peha/Peha_testimony_public_safety_comm_March2007.pdf (advocating a single national broadband public safety network for both local and federal first responders).

¹¹⁷ See National Association of Regulatory Utility Commissioners, *Mobile Technologies 21* (NARUC Telecomm. Comm. Wireless Workgroup, 2007), available at <http://www.naruc.org/resolutions/res.accepting.wireless.white.paper.pdf>. Federal and state needs for public safety communications can also be met through emergency management communications over a satellite backhaul network in combination with terrestrial cellular systems that allow first responders to interconnect. *Id.* An example is a system developed by Globalstar called GEMCOMS that was used by first responders in New Orleans after Hurricane Katrina came ashore in August 2005. *Id.*

¹¹⁸ *In re* Service Rules for the 698-746, 747-762 and 777-792 MHz Bands; Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems; Section 68.4(a) of the Commission's Rules Governing Hearing Aid-Compatible Telephones; Biennial Regulatory Review—Amendment of Parts 1, 22, 24, 27, and 90 to Streamline and Harmonize Various Rules Affecting Wireless Radio Services; Former Nextel Communications, Inc. Upper 700 MHz Guard Band Licenses and Revisions to Part 27 of the Commission's Rules; Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band; Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements through the Year 2010, *Report and Order and Further Notice of Proposed Rulemaking*, 22 F.C.C.R.8064, ¶ 1 (Apr. 25, 2007).

¹¹⁹ See Press Release, FCC, Statement by FCC Chairman Kevin J. Martin 1–2 (Mar. 18, 2008), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-280887A1.pdf (discussing the disposition of the 700 MHz auction, and noting that the “D-Block” dedicated for public safety “did not receive a bid that met the \$1.3 billion reserve price established for [the] block.”).

¹²⁰ See *In re* Service Rules for the 698-746, 747-762 and 777-792 MHz bands; Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, *Third Further Notice of Proposed Rulemaking*, FCC 08-230, WT Docket No. 06-150, PS Docket No. 06-229 (Sept. 25, 2008).

tions].”¹²¹ According to Faulhaber, part of the problem is that “public safety communications is primarily oriented to voice.”¹²² Similarly, while there is discussion about the use of Wi-Fi-like radio networks for public safety communications, the proponents of this solution have not established a feasible network design.¹²³ While advanced technologies might not yet be feasible, current technology also has its shortfalls.

For example, current radio technology lacks interoperability between federal and state first responders.¹²⁴ This is obviously a more serious problem in times of emergency where joint response by state and federal first responders is necessary.¹²⁵ While the case for a nationwide interoperable broadband network for first responders is evolving, such a network could alleviate the problem and be used to effectively inform the public of emergencies. The four critical areas for federal and state interests in broadband deployment—healthcare, education, employment, and homeland security—can be enhanced by utilizing effective deployment policies at both the federal and state level. However, because federal policymakers lack a coherent broadband policy, states are positioned to craft broadband deployment strategies to meet the four critical areas and continue to reduce the deployment gap between urban and rural areas.

V. THE NEED FOR A FEDERAL OR STATE BROADBAND POLICY AND THE STATE POLICY CHECKLIST

Given the broadband deployment and access gaps developed above and the lack of a coherent federal broadband policy, states are positioned to develop strategies to meet their needs. In light of federal actions like the recent *Recommended Decision* on high-cost USF support by the Joint Board,¹²⁶ and the federal-state nature of broadband policy, states need to determine how to most effectively complement and reinforce federal actions.

Section 706(a) of the 1996 Act espoused a vision for broadband deployment

¹²¹ Gerald R. Faulhaber, *Solving the Interoperability Problem: Are We on the Same Channel? An Essay on the Problems and Prospects for Public Safety Radio*, 59 FED. COMM. L.J. 493, 513 (2007).

¹²² *Id.*

¹²³ *Id.* at 513–15 (“Perhaps someday this might be a solution, but we are very far from such a network being feasible, and certainly not in life-threatening situations.”).

¹²⁴ *Wireless Interoperable Communications Between First Responders: Testimony Before H. Subcomm. on Tech., Info., Policy, Intergovernmental Relations and the Census*, 108th Cong. (Sept. 8, 2004) (Statement of William O. Jenkins, Jr., Director, Homeland Security and Justice Issues), available at <http://www.gao.gov/new.items/d041057t.pdf>.

¹²⁵ Faulhaber, *supra* note 121, at 511–12.

¹²⁶ See High-Cost Universal Service Support *Recommended Decision*, *supra* note 41.

and access.¹²⁷ However, a vision is distinct from a broadband policy that articulates discrete steps toward its realization. Before policymakers can address how states might proceed to expedite broadband deployment in unserved or underserved areas, an overarching question must be answered: Whose responsibility is broadband deployment? This is where the two policy objectives of the 1996 Act have not always converged—ubiquitous broadband deployment of advanced services and a “pro-competitive and de-regulatory national policy framework.”¹²⁸ In a competitive marketplace, rural and remote areas may be unserved because the cost-benefit analysis made by service providers has identified investments in broadband facilities as unprofitable.

The importance of broadband technology for Americans with disabilities is significant. A report by the California Broadband Taskforce framed the issue:

For people with disabilities in particular, broadband provides an important link to employment and education opportunities. This group is typically employed at half the rate of people without disabilities, but access to advanced technology at home increases, for example, the availability of distance-learning programs that provide job certifications and other preparation. High-speed Internet access combined with assistive technology also creates opportunities for home-based businesses. Despite these benefits, children and adults with disabilities are still less likely to have broadband and computer access at home.¹²⁹

Arguably, a more interventionist national policy for broadband deployment might be a means of more effectively integrating elderly and disabled Americans into the workforce.¹³⁰

Although there have been piecemeal efforts in the past to move toward creating a national policy, it is safe to conclude that the United States has no national broadband deployment policy. To be sure, there are some federal policies that spur deployment, including the use of high-cost USF support for telecommunications and often by extension, broadband deployment—in rural areas. Additionally, the Department of Agriculture’s Rural Utilities Service administers grants and loans for broadband deployment.¹³¹ Further, the FCC recently initiated proceedings to remove barriers to deployment.¹³² Broadband data collection has also gained attention in Congress—legislation was intro-

¹²⁷ See *supra* note 8 (quoting the text of section 706(b)).

¹²⁸ See H.R. REP. NO. 104-458, at 1 (1996) (Conf. Rep.).

¹²⁹ CALIFORNIA BROADBAND TASK FORCE, *supra* note 115, at 13.

¹³⁰ This assumes that there is some acceptable way to measure the effectiveness of integrating the elderly and disabled into society.

¹³¹ See USDA Telecommunications Program, <http://www.usda.gov/rus/telecom/index.htm> (last visited Oct. 13, 2008).

¹³² *In re Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, And Possible Steps to Accelerate such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, *Third Report*, 17 F.C.C.R. 2959 (Feb. 6, 2002) (Martin, Comm’r, separate statement).

duced to create fund grants for, among other things, geographic maps of broadband deployment.¹³³ Finally, the Joint Board's *Recommended Decision*, if adopted by the FCC, would authorize federal universal support funds to be used for new broadband infrastructure construction in unserved areas.¹³⁴

These federal efforts bring to question whether there should even be a national broadband deployment policy that is less dependent on market forces. In a recent article, Robert Atkinson makes the case for such a policy.¹³⁵ He contends that the United States lags behind other nations in broadband adoption, whether the ranking is based on OECD or ITIF comparisons.¹³⁶ In his view, a national policy promotes equity in broadband deployment—to date deployment decisions have favored more affluent, densely populated areas.¹³⁷ Atkinson also argues that broadband deployment produces positive externalities that benefit society as a whole and contribute to the competitiveness of the United States in the information technology sector.¹³⁸ Broadband technologies also enable consumers to access services that would not have been available to them otherwise.¹³⁹ Aside from the critical areas in need of broadband deployment developed above, other applications, such as telecommuting, online volunteering, and opportunities for the elderly to work at home are also facilitated through access to broadband.¹⁴⁰ These applications may warrant a government interventionist approach.

The case against a national policy involving government intervention is articulated by former FCC Commissioner, Harold Furchtgott-Roth:

There is little if any meaningful relationship between broadband penetration and eco-

¹³³ For example, the proposed Connect the Nation Act, introduced in September 2007, would establish a state broadband data and development matching grant program, calling for \$40 million a year from 2008-2012. H.R. 3627, 110th Cong. § 3(i) (2007). Grants may be used for, among other purposes, the creation within each state of geographic inventory maps of broadband service gaps and a baseline assessment of broadband deployment of high-speed availability on the basis of households. *See id.* § 3(e)(9)(B).

¹³⁴ *See* High-Cost Universal Service Support *Recommended Decision*, *supra* note 41, ¶¶ 11–12.

¹³⁵ *See* Robert D. Atkinson, *Framing a National Broadband Policy*, 16 COMMLAW CONSPECTUS 145 (2007); *but see* Lynne Holt & Mark Jamison, *Broadband and Contributions to Economic Growth: Lessons from the U.S. Experience* 12–14 (Public Utility Research Center, University of Florida, Working Paper 08-15, 2008), available at http://www.cba.ufl.edu/purc/purcdocs/papers/0815_Holt_Broadband_and_Contributions.pdf.

¹³⁶ Atkinson, *supra* note 135, at 146–47.

¹³⁷ *Id.* at 152–53.

¹³⁸ *Id.* at 154–55, 161–62 (discussing network and competitive externalities). Atkinson explains that “network externalities are the effects on a user of a product or service of others using the same or compatible products or services.” *Id.* at 154.

¹³⁹ *Id.* at 163–64.

¹⁴⁰ *Id.* at 158–59. The critical areas in need of broadband deployment include telehealth and telemedicine, education, employment growth and national security. *See supra* Part IV.B.

conomic growth among the OECD countries, and much less among non-OECD countries. The most rapidly growing countries in the world tend to have lower levels of broadband penetration. Twenty years from now, all OECD countries will have roughly the same degree of broadband penetration but not necessarily the same economic growth rates, regardless of government programs today.¹⁴¹

Furchtgott-Roth explains that broadband deployment may actually harm and not help the nation's economy.¹⁴² He argues that ubiquitous broadband deployment would provide the means for many service-sector jobs to migrate to lower-wage employees in other countries.¹⁴³ In short, government intervention to facilitate broadband expansion can lead to a paradox where "costly and ineffective programs" are used to accelerate broadband deployment and "costly and harmful programs" are used to limit competitive trade exposure in response to expanded broadband deployment.¹⁴⁴

There is also an efficiency argument against a more interventionist national broadband policy.¹⁴⁵ If the market is providing the proper supply of broadband, government intervention will contribute to allocation inefficiencies by creating incentives for the production of too much broadband at sub-optimally low prices.¹⁴⁶ The same logic could be applied to state broadband policies.

Another argument against a more interventionist national broadband deployment policy is supported by research published in 2004 by Laura Stanton, which suggests that once the barriers of computer ownership and Internet access in homes are overcome, consumers are likely to adopt broadband technology.¹⁴⁷ Increased consumer demand will encourage expanded supply. Stanton argues that public policy might better be focused on computer ownership and computer literacy than on deployment subsidies.¹⁴⁸

Notwithstanding the ongoing debate about the optimal national broadband policy, a number of states, as noted, have taken the initiative to develop their own broadband strategies.¹⁴⁹ Other states may opt not to pursue their own poli-

¹⁴¹ Harold Furchtgott-Roth, *National Policy Would Be Bad for Broadband*, N.Y. SUN, Apr. 2, 2007, available at <http://www.nysun.com/business/national-policy-would-be-bad-for-broadband/51637>.

¹⁴² *Id.*

¹⁴³ *Id.*

¹⁴⁴ *Id.*

¹⁴⁵ See Holt & Jamison, *supra* note 135, at 11.

¹⁴⁶ See *id.* at 20.

¹⁴⁷ Laura J. Stanton, *Factors Influencing the Adoption of Residential Broadband Connections to the Internet*, HAW. INT'L CONF. ON SYS. SCI. 1, 8, available at <http://www2.computer.org/plugins/dl/pdf/proceedings/hicss/2004/2056/05/205650128a.pdf?template=1&loginState=1&userData=anonymous-IP1224615278594>.

¹⁴⁸ *Id.* at 9.

¹⁴⁹ See GOV'T. ACCOUNTABILITY OFFICE, TELECOMMUNICATIONS: FEDERAL AND STATE UNIVERSAL SERVICE PROGRAMS AND CHALLENGES TO FUNDING, *supra* note 39, at 47 (discussing programs in Tennessee, Kentucky, Arkansas, and Illinois). See, e.g., The State of

cies because they do not see a need for government programs directed at accelerating broadband deployment and access. However, a state may also decide that a state broadband policy is in its best interest for two reasons. First, the state may determine that government intervention is necessary and a national broadband policy with less of a market-based orientation is not likely to evolve in a timely manner, or at all. Second, state regulators may feel that the responsibility to develop a broadband policy falls on the states, so a more interventionist national broadband policy is unnecessary. In either case, there are several steps a state can take to spur broadband provider investments—if part of the state’s objective is to provide incentives to stimulate demand. The steps include:

1. clearly articulate the policy goal for a state’s broadband policy;
2. improve data collection efforts to create the factual basis to establish a goal and in order to measure progress toward its accomplishment;
3. conduct cost-benefit analyses of proposed strategies;
4. identify funding mechanisms and accountability measures to reduce or eliminate deployment gaps; and
5. determine methods of accomplishing its broadband deployment goal.

A. Articulate Policy Goals

In order to achieve broad support for any government-driven measures for meeting a state’s objectives, state policymakers should determine and clearly articulate the policy goal for broadband deployment, access to and use of broadband services. One policy goal might be to remedy a market failure. To do so, policymakers must first answer the question: Is there a market failure (and how should it be defined), is there a lack of demand, or both? The definition of what constitutes a market failure is critical. For example, is it a market failure—in light of current technological changes—if a provider offers the lowest minimum data transmission speed to satisfy the FCC’s definition of “high-speed” transmission at 200 Kbps?¹⁵⁰ Is it a market failure if available

Broadband Index: An Assessment of State Policies Impacting Broadband Deployment and Demand 26–28, *available at* http://www.technet.org/resources/State_Broadband_Index.pdf (discussing the LinkMichigan initiative to increase statewide broadband deployment).

¹⁵⁰ As FCC Commissioner Jonathan Adelstein stated:

I am pleased that the Commission finally moves away from its antiquated definition of broadband as 200 Kbps per second, which had become something of a running joke. Recognizing that the definition of broadband must evolve as technology evolves is a good first step, although the practical implications of these new categories are less clear.

Deployment of Nationwide Broadband Data *Report and Order*, *supra* note 3 (Adelstein, Comm’r, approving in part, concurring in part).

broadband services are unaffordable to residents of a region? However defined, state policymakers would need to determine the acceptable percentages or numbers of residents who cannot afford the service.

Some states will see their role primarily in terms of assessing and stimulating supply. These states will help fund the data collection and analysis needed to determine where broadband service is available and where service gaps exist and identify local price sensitivity and the probability of subscription to broadband service. For example, Kentucky and Tennessee allied themselves with Connected Nation, a national nonprofit organization that maps broadband gaps and seeks government and private funds to help fill those gaps.¹⁵¹ Other states might determine that their intervention should involve securing binding commitments by providers to deploy broadband in unserved areas.

Legislation enacted in Vermont establishes and authorizes the Vermont Telecommunications Authority (“Vermont Authority”) to identify areas unserved by cellular and broadband services and solicit competitive bids for eliminating deployment gaps by the end of 2010.¹⁵² The winners of the bidding process can deploy either through the development of new facilities or through commitments from existing providers to expand service to those areas.¹⁵³ The Vermont Authority is authorized to establish partnerships with private service providers¹⁵⁴ and construct its own facilities and infrastructure to make broadband services available.¹⁵⁵ In Maine, legislation was enacted to create an authority to identify unserved and underserved areas of the state and expand the availability of broadband services to residential and small business consumers.¹⁵⁶

Even if a state is committed to subsidizing broadband deployment, the investment is likely to yield greater returns if demand for the service can be leveraged.¹⁵⁷ Public sector involvement may also include a form of identifying ways to generate and aggregate community demand from various sectors in-

¹⁵¹ See Connected Nation, State Programs, http://www.connectednation.com/state_programs (last visited Oct. 13, 2008). For performance outcomes from Kentucky’s initiatives, see *Maximizing the Value of Broadband Services to Rural Communities: Hearing Before the Subcomm. On Urban and Rural Entrepreneurship*, 110th Cong. 99–101 (2007) (testimony of Brian R. Mefford, CEO, Connected Nation) [hereinafter Testimony of Brian R. Mefford].

¹⁵² VT. STAT. ANN. tit. 30, §§ 8060–61 (2007).

¹⁵³ §§ 8060–61.

¹⁵⁴ §§ 8062(a)(4), (b)(1).

¹⁵⁵ § 8062(b)(8).

¹⁵⁶ ME. REV. STAT. ANN. tit. 35-A, §§ 9201–9215 (2007), tit. 36, § 2017 (2007).

¹⁵⁷ See Stanton, *supra* note 147, at 8–9 (finding that computer adoption drives significantly demand for broadband: “It is evident that the purchase of a computer and access to a narrowband Internet connection have an effect on the willingness of the household to move forward to the more advanced technology in the form of broadband.”).

cluding local government, businesses, schools, healthcare providers, agriculture, tourism, libraries, and community-based organizations. In Kentucky, demand was generated through the partnership of businesses and public sector community-based groups called “eCommunity Leadership Teams.”¹⁵⁸ Tennessee plans to follow Kentucky’s model in this respect.¹⁵⁹

Clear articulation of a broadband policy goal will likely require a consensus regarding the meanings of “unserved” and “underserved” for the purpose of state broadband policy.¹⁶⁰ At a minimum, that terminology might require further clarification at the federal level. In the *Recommended Decision*, the Joint Board recommended that the FCC seek comment on defining “unserved” for the proposed Broadband Fund.¹⁶¹ The Joint Board also recommended that the FCC seek comment on how to ensure service in “underserved” areas.¹⁶²

State strategies directed at spurring broadband investments in underserved regions in addition to unserved regions, might involve committing more funding to meet the expanded objective. In establishing its strategies, a state will need to engage service providers in order to balance the pro-competition goal with deployment goals. That is particularly true when obtaining service in a given area is simply a matter of time. That is, there is always a question of whether underserved areas need public support if providers have included those regions in future broadband service deployment plans. Information asymmetry, which develops when providers know their plans but governments lack that same information, causes public funding decisions to be made without the necessary knowledge to target subsidies most effectively.¹⁶³

Clarifying broadband policy goals may require examination of current state laws and regulations. Existing state policies may impede emerging broadband goals, so policymakers might consider identifying potential barriers as new strategies are developed. For example, state laws prohibiting cities and counties from owning and operating broadband systems as municipal utilities is an obvious barrier to achieving a deployment strategy that involves a municipal broadband network.¹⁶⁴ Another impediment might be a lack of explicit authori-

¹⁵⁸ Testimony of Brian R. Mefford, *supra* note 151, at 93–94.

¹⁵⁹ *Initiative Announced to Create a Connected Tennessee*, GOV’T TECH., May 2007, at 2, available at <http://www.govtech.com/gt/119460?topic=117673>.

¹⁶⁰ See High-Cost Universal Service Support *Recommended Decision*, *supra* note 41, ¶ 16 (defining “underserved” and “unserved” areas).

¹⁶¹ See *id.* ¶ 71.

¹⁶² *Id.* (“underserved” areas in this context are qualified as those that “may be receiving marginal or unacceptable levels of mobility or broadband service.”).

¹⁶³ See *id.* ¶ 13.

¹⁶⁴ See Matthew Dunne, Note, *Let My People Go (Online): The Power of the FCC to Preempt State Laws that Prohibit Municipal Broadband*, 107 COLUM. L. REV. 1126, 1138 (2007) (“Twelve states have at least some explicit restriction on municipal broadband ser-

zation for certain types of utilities—such as electric utilities—to deploy broadband services.¹⁶⁵ Additionally, eliminating or reducing taxes or fees on broadband service providers could be considered a demand-side strategy to expand service levels.¹⁶⁶

Clear goals are particularly important for any proposed data collection activities. States may want to see one or more of the following: an expanded supply of broadband infrastructure, an increased number of providers, higher data transmission speeds, or lower costs to providers for broadband infrastructure installation and to consumers for access to service. Additionally, states may be concerned with increasing public awareness of existing broadband availability, the potential benefits of broadband, and aggregating demand to make deployment a more appealing proposition to private sector providers.

B. Improve Data Collection

States need reliable data on existing broadband coverage to make informed decisions about the need for subsidizing broadband deployment.¹⁶⁷ In 2007, the FCC acknowledged better data was needed to determine the effects of its policies under its section 706 mandate, and the extent to which broadband services are actually deployed and accessed.¹⁶⁸ Although the *Deployment of Nationwide*

vice, though these vary in severity.”).

¹⁶⁵ To address this possible impediment, New Jersey law authorizes county and municipal sewerage and utility authorities to develop broadband telecommunications infrastructure that may be used to provide broadband telecommunications service via wireless community networks. N.J. STAT. ANN. § 40:9D-2 (West 2008). This law does not appear to be restricted to rural or unserved areas. *Id.*

¹⁶⁶ See Atkinson, *supra* note 135, at 173.

¹⁶⁷ Absent accurate and reliable data, it is clear that policymakers are not able to effectively target underserved or unserved areas.

¹⁶⁸ Deployment of Nationwide Broadband Data *NPRM*, *supra* note 2, at ¶ 1.

First, we seek comment about how the Commission can best ensure that it receives sufficient information about the availability and deployment of broadband services nationwide, particularly in rural and hard-to-serve areas, including tribal lands Fourth and finally, we seek information about how the Commission can best collect information about subscribership to interconnected Voice over Internet Protocol (interconnected VoIP) service. Information about broadband availability and deployment throughout the nation is essential to enable us to assess the success of our broadband policies in order to further discharge our statutory mandate, pursuant to section 706 of the Telecommunications Act of 1996, to “encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all [Americans].” Improved information about subscribership to the new communications services that are enabled by the widespread availability, and consumer adoption, of end user broadband connections would enable us to better understand how subscriber choice among communications services is affecting the federal universal service fund, and will thereby assist us in discharging our statutory mandate to secure the viability of universal ser-

Broadband Data Order changes the federally-required data collection effort, states may continue to have an important role in the ongoing effort of identifying broadband service gaps, perhaps through a reconstituted federal-state conference.¹⁶⁹ Some background on FCC data collection efforts provides context for the FCC's conclusions.

The FCC collects data through its Form 477 filings, which were created in 2000.¹⁷⁰ As the FCC explained in 2007:

Initially, broadband providers reported a single list of zip codes per state [in which they had at least one broadband subscriber]. The Commission modified this requirement in the 2004 Data Gathering Order. For data as of June 30, 2005, and later, broadband providers report have technology-specific lists of zip codes. The technology-specific lists enable the Commission to identify, for example, those zip codes that are listed only by satellite broadband providers.¹⁷¹

In its 2005 report, the GAO identified the shortcomings of having providers report broadband service in a zip code if only one subscriber is served.¹⁷² The GAO found that the Commission's subscribership numbers could be overstated because they are very localized, only businesses and not residential customers may have access to broadband service, and several providers may be relying on the same infrastructure to provide service.¹⁷³

While there are several federal broadband support programs, measuring their effectiveness (and imposing accountability) depends upon accurate data on broadband deployment. Examples of federal support include USF support, the Community Connect Program, the Rural Broadband Access Loan and Loan Guarantee Program administered by the RUS in the U.S. Department of Agri-

vice.

Id. (footnotes omitted).

¹⁶⁹ FCC Commissioner Deborah Taylor Tate observed:

I am encouraged by the dozens of States and localities that are currently conducting or exploring initiatives in broadband deployment like Connect-Tennessee. They are on the ground, know the providers and needs of the communities better than us here in Washington D.C. and we should enhance and not burden State and local efforts. To enhance cooperative federalism I join my State colleagues in suggesting reinvigorating the Federal-State Joint Conference on Advanced Services to serve as a vehicle for an ongoing dialogue between the Commission, state regulators, and local and regional entities regarding the deployment of broadband services.

Statement, Deployment of Advanced Telecommunications Capability Fifth Report, supra note 5, at 2.

¹⁷⁰ *In re Local Competition and Broadband Reporting, Report and Order*, 15 F.C.C.R. 7717 (Mar. 24, 2000).

¹⁷¹ Deployment of Nationwide Broadband Data *NPRM, supra* note 2, n.11. For the 2004 Data Gathering Order, see *In re Local Telephone Competition and Broadband Reporting, Report and Order*, 19 F.C.C.R. 22,340 (2004). For a brief description of the data submittal process, see HIGH-SPEED SERVICES AS OF JUNE 30, 2007, *supra* note 4.

¹⁷² See GOVT. ACCOUNTABILITY OFFICE, RURAL BROADBAND REPORT, *supra* note 25.

¹⁷³ *Id.* at 16–17.

culture, and the Appalachian Regional Commission's Information Age Appalachia Program.¹⁷⁴ However, evaluating the effectiveness of these federal programs and determining where to target federal funding is challenging if data fails to capture the extent of broadband deployment to residential consumers.¹⁷⁵

An effective data collection and analysis effort will enable a state to establish whether a market failure exists. For example, the statute authorizing the Indiana Broadband Development Program articulates a policy directed at correcting a perceived market failure: "The general assembly finds that certain areas of Indiana are not being adequately served with broadband services."¹⁷⁶ To remedy this problem, parameters are established for market intervention: "As used in this chapter, 'affordable broadband services' means broadband services that are available at a price reasonably comparable to the price charged for broadband services in an area that is not an underserved area."¹⁷⁷ In addition, necessary data collection for administration of the program is authorized:

The powers of the authority under this chapter include all those necessary to carry out and effectuate the purposes of this chapter, including the following: . . . (6) To investigate, evaluate, and assess the current broadband infrastructure and the future broadband infrastructure needs of Indiana and to encourage and participate in aggregation strategies for the broadband services of all public entities and nonprofit corporations in Indiana to maximize the interconnectivity and efficiencies of the broadband infrastructure.¹⁷⁸

In terms of potential demand for broadband service, well-designed surveys may provide states with information regarding residents' appreciation for, understanding of, and willingness to pay for various types of broadband services. It is intuitive that unserved regions have a disproportionately high percentage of residents who may not understand and appreciate the applications of broadband technologies because they cannot access, or use, the services in their homes. In some regions in a single state, depending on the state's definition of "market failure," the issue of lack of supply may be paramount, and in other regions a lack of demand may be paramount. Solutions, likewise, will vary. For example, a state may decide to subsidize service for only those regions that it determines are unserved or underserved based on a specified set of criteria—without reliable data this cannot be achieved.¹⁷⁹

¹⁷⁴ *Id.* at 23–25. We note that the federal universal service support mechanism funds telecommunications infrastructure and that infrastructure also may provide broadband service. *Id.*

¹⁷⁵ *See id.* at 38.

¹⁷⁶ IND. CODE ANN. § 8-1-33-1 (LexisNexis 2008).

¹⁷⁷ *Id.* § 8-1-33-2.

¹⁷⁸ *Id.* § 8-1-33-16.

¹⁷⁹ GOV'T. ACCOUNTABILITY OFFICE, RURAL BROADBAND REPORT, *supra* note 25, at 38–

Inevitably, there are costs and benefits associated with more detailed data collection efforts. States may receive superior data for analysis but providers and eventually their customers may bear the cost associated with more expansive collection efforts. In preparing its report, the GAO cited comments from trade groups comprised of providers in a 2004 FCC proceeding on the costs and burdens of more detailed filings on broadband deployment.¹⁸⁰ In response to the comments it received, the GAO recommended that the “FCC develop information regarding the degree of cost and burden that would be associated with various options for improving the information available on broadband deployment” to inform any further actions.¹⁸¹ In response to the GAO report, the FCC sought comment on whether to require additional data from broadband providers or make better use of existing data, including international rankings of broadband adoption and other metrics.¹⁸² The FCC also sought comment on other options for changes to the type of data required in Form 477 (9-digit zip codes,¹⁸³ geo-coded information about subscriber locations),¹⁸⁴ alternate approaches to obtaining additional data (purchase of commercial databases or services,¹⁸⁵ voluntary reporting by non-served households),¹⁸⁶ and the nature of the information that might be required (boundaries of service provided,¹⁸⁷ demographic and economic information,¹⁸⁸ and price information).¹⁸⁹

39.

¹⁸⁰ *Id.* at 14.

¹⁸¹ *Id.* at 39.

¹⁸² Deployment of Nationwide Broadband Data *NPRM*, *supra* note 2, ¶¶ 25–30.

¹⁸³ *Id.* ¶ 31 (“We seek comment about whether we should require Form 477 data filers to submit 9-digit zip codes and associated customer counts.”).

¹⁸⁴ *Id.* ¶ 33 (“We seek comment about non-zip code-based approaches to using subscriber-based information to more precisely identify the geographic areas where broadband is deployed, such as requiring providers to report geocoded information (*e.g.*, latitude and longitude) for the premises of their subscribers.”)

¹⁸⁵ *Id.* ¶ 32 (“We seek specific comment regarding the availability of commercial sources of broadband deployment data or data-processing programs that could augment or otherwise add value to our use of Form 477 data, or reduce the associated costs and other burdens imposed on reporting providers.”).

¹⁸⁶ *Id.* ¶ 34 (“We also seek comment about the feasibility and value of implanting a voluntary self-reporting system by non-served households, patterned after the National Do-Not-Call Registry.”).

¹⁸⁷ *Id.* ¶ 35 (“We seek comment about the need for and feasibility of requiring broadband providers to report information that delineates in detail the boundaries of their broadband-enabled service territories.”).

¹⁸⁸ Deployment of Nationwide Broadband Data *NPRM*, *supra* note 2, ¶¶ 40–41 (seeking comment on whether to collect “key demographic information” such as education, race, and income).

¹⁸⁹ *Id.* ¶¶ 45–47 (seeking comment on collecting price information “that depicts competitive choice in representative areas” and on collecting price information “from all entities that report broadband connections.”).

The FCC's subsequent order on this matter, the *Deployment of Nationwide Broadband Data Order*, requires that providers furnish data on the number of subscribers by both speed tier and technology type using census tract specifications.¹⁹⁰ The FCC sought further comment on several issues, including the adoption of a national program for mapping broadband availability.¹⁹¹

In addition to the FCC's proceeding on broadband data collection, Congress enacted the Broadband Data Improvement Act which was signed by the President on October 10, 2008.¹⁹² The Act amends section 706 of the Telecommunications Act of 1996 by requiring the FCC to annually assess broadband availability by compiling a list of areas not served by broadband providers and using available Census data to determine specified demographic data for these areas.¹⁹³ The Act also amends section 706 to require the FCC to include in its assessment and report information comparing broadband capability in the United States to that of other countries.¹⁹⁴ To evaluate broadband use, the FCC is required to survey consumers in urban, suburban, and rural areas to determine the type of technology used, the monthly amounts paid for services, the broadband data transmission speeds, the reasons given for non-subscription, any other sources of broadband service capability, and any other information deemed appropriate.¹⁹⁵ The Act requires expansion of the annual American Community Survey conducted by the U.S. Census to include information on computer ownership and Internet access.¹⁹⁶ The Act also requires the Comptroller General to conduct a study on broadband metrics and standards with the goal of improving comparisons of broadband deployment and penetration in the United States and other countries.¹⁹⁷ The Small Business Administration Office of Advocacy is required to conduct a study assessing the impact of broadband speed and price on small businesses.¹⁹⁸

State data collection and broadband deployment efforts are encouraged via a grant program. The Secretary of Commerce is required to award competitive grants "for the development and implementation of statewide initiatives to identify and track the availability and adoption of broadband services within each state," including, among other authorized actions, the creation of a state

¹⁹⁰ See *Deployment of Nationwide Broadband Data Report and Order*, *supra* note 3, ¶¶ 10–18.

¹⁹¹ *Id.* ¶ 34.

¹⁹² S. Res. 1492, 110th Cong., 122 Stat. 4096 (2008).

¹⁹³ *Id.* § 103(a).

¹⁹⁴ *Id.* §§ 103(b)(1)–(3).

¹⁹⁵ *Id.* §§ 103(c)(1)(A)–(G).

¹⁹⁶ *Id.* § 103(d).

¹⁹⁷ *Id.* § 104.

¹⁹⁸ *Id.* § 105.

geographic inventory map that could identify gaps in broadband service availability.¹⁹⁹ Grants made under the Act also would fund local planning and other efforts to encourage broadband deployment in underserved areas. Certain public information, including broadband inventory maps, gathered by grantees will be aggregated and made available by the Secretary of Commerce on a single web page.²⁰⁰

Several states preceded the Broadband Data Improvement Act and the FCC's *Deployment of Nationwide Broadband Data Order* with their own more detailed data collection initiatives and deployment programs. One of the most discussed approaches at the state level stems from the strategy deployed by Connected Nation, a national nonprofit organization that is "improving digital inclusion."²⁰¹ Kentucky has taken the most comprehensive approach of any state, with an initiative called ConnectKentucky—the "demonstration project" of its parent company, Connected Nation.²⁰² The Connected Nation approach is to form public-private partnerships with state government and private-sector broadband providers to address both the supply side and demand-side barriers of deployment and access.²⁰³ As the CEO of Connected Nation explained,

[I]t was discovered that broadband availability was only half of the problem. The remainder of the challenge related to the actual use of broadband-related technology. Any resulting turn-around strategy had to be comprehensive in nature: addressing both sides related to broadband availability and the use of broadband and related technology.²⁰⁴

To address the broadband availability barriers, ConnectKentucky collected service-level data from broadband providers to create broadband inventory maps for the entire state.²⁰⁵ These maps are very detailed because they display data collected on broadband access at the household level.²⁰⁶ Connected Nation is now working with West Virginia, Ohio, and Tennessee to undertake similar initiatives.²⁰⁷ Accurate and useful data are the heart of these states' initiatives.

¹⁹⁹ *Id.* § 106.

²⁰⁰ *Id.* §§ 106(b)(1), (e)(10)(A).

²⁰¹ See Connected Nation, Who We Are, http://www.connectednation.com/who_we_are/ (last visited Oct. 13, 2008).

²⁰² Testimony of Brian R. Mefford, *supra* note 151, at 92.

²⁰³ See *id.* at 93.

²⁰⁴ *Id.*

²⁰⁵ See ConnectKentucky, Kentucky's Broadband Interactive Map, http://www.connectkentucky.org/broadband_landscape/interactive_map.php (last visited Sept. 1, 2008).

²⁰⁶ See ConnectKentucky, Broadband Landscapes, http://www.connectkentucky.org/broadband_landscape/availability_maps.php (last visited Aug. 11, 2008) (including state-wide broadband inventory maps and adoption maps).

²⁰⁷ Connected Nation, State Programs, http://www.connectednation.org/state_programs/ (last visited Oct. 21, 2008). Verizon is working with Connected Nation in West Virginia to

The objective is to use maps to help policymakers analyze where broadband coverage exists and might be lacking—a necessary precondition for progress toward statewide broadband coverage.²⁰⁸ Mapping initiatives were also undertaken in California,²⁰⁹ New York,²¹⁰ and Wyoming.²¹¹ As an alternative to mapping, Connect Arkansas is developing a method that requires broadband service providers to register their service areas, allowing it to identify where broadband is not currently offered.²¹² Legislation mandating or encouraging broadband mapping or data collection, analysis efforts, and subsidies was considered by a number of states during the 2007 and 2008 legislative sessions.²¹³ Additionally, NARUC recently approved a resolution that, among other things, proposed that states “be delegated specific authority for broadband data collec-

produce detailed county-by-county maps. See Sarah K. Winn, *High-speed Internet Coming to Rural Areas*, CHARLESTON GAZETTE, Aug. 16, 2007, available at http://www.connectednation.com/documents/Article_Highspeedinternetcoming_WV_CN_Charlestown_81607.pdf; see also *Nashville-Based Non-Profit Unveils First-Ever Assessment of High-Speed Internet Access*, SEYMOUR HERALD, July 30, 2007, available at http://www.connectednation.com/documents/Article_CTNreleasesbbinventory_SeymourHerald_CTN_73007.pdf.

²⁰⁸ By using accurate maps, ConnectKentucky has achieved 95% availability. See CONNECTKENTUCKY, SETTING THE PACE: ACCELERATING BROADBAND EXPANSION, 2008 PROGRESS REPORT 4 (2008) available at http://www.connectkentucky.org/_documents/ConnectKentuckyProgressReport2008.pdf. Connected Tennessee has as one of its objectives: “[a]ffordable broadband availability for all Tennessee.” See *Nashville-Based Non-Profit Unveils First-Ever Assessment of High-Speed Internet Access*, *supra* note 207. Verizon West Virginia, the largest telecommunications company in the state, partnered with Connected Nation to undertake the mapping initiative for the state; Verizon’s intent is to expand DSL coverage to one-hundred new communities in the state. See Winn, *supra* note 207; *W.Va Broadband Survey to be Conducted*, FORBES, Aug. 15, 2007, available at http://www.connectednation.com/documents/Article_WVbroadbandsurvey_CN_WV_81507.pdf.

²⁰⁹ CALIFORNIA BROADBAND TASK FORCE, *supra* note 115, at 32, 37–49.

²¹⁰ N.Y. State Office of the Chief Info. Officer and N.Y. State Office for Tech., *Universal Broadband Strategy for the State of New York “Connecting New York to the World”* 17 (State Office of the Chief Info. Officer, N.Y. State Office for Tech., Working Draft, 2007), available at http://www.oft.state.ny.us/oft/UniversalBroadband/Universal_Broadband_Strategy.pdf.

²¹¹ COSTQUEST ASSOCIATES, COST AND BENEFITS OF UNIVERSAL BROADBAND ACCESS IN WYOMING 4 (2006), available at <http://www.costquest.com/costquest/docs/CostsAndBenefitsofUniversalBroadbandAccessInWyoming.pdf>.

²¹² ARK. CODE ANN. § 4-113-105(a) (2007). To protect the business interests of the service providers, Connect Arkansas will “execute nondisclosure agreements with providers to guarantee confidentiality.” *Id.* § 4-113-105(b).

²¹³ See H.B. 2634, 82nd Leg., Reg. Sess. (Kan. 2008); S.B. 748, 78th Leg., Reg. Sess. (W.Va. 2007); H.B. 2959, 85th Leg., Reg. Sess. (Minn. 2007); H.B. 2521, 59th Leg., Reg. Sess. (Wash. 2008); H.B. 1662, 115th Gen. Assem. 1st Sess., Reg. Sess. (Ind. 2007); A.B. 9117, 230th Leg., Reg. Sess. (N.Y. 2007); H.B. 243, Reg. Sess. (Ala. 2008).

tion and analysis purposes” to supplement the FCC’s efforts.²¹⁴ The recently enacted Broadband Data Improvement Act appears to be the most likely means of shaping future state data collection efforts, but grants to eligible entities will be competitive and subject to appropriation. If Congress finances the grant program, some provisions of the Act may limit its usefulness as a data collection tool: State entities may or may not be grant recipients; the four-year limitation on receipt of grant funds may limit continuity of data collection and analysis efforts; and grant funds may be insufficient to both collect broadband and analyze data and fulfill all the other requirements placed on grant recipients.²¹⁵ Therefore, states may still decide to collect their own data at the appropriate granularity for the area being examined. For example, in some areas of the state, census tracts may be an appropriate level of analysis, while in other areas, wire center service areas may provide a superior picture of deployment.²¹⁶ The policy goal identified by an individual state ideally will drive data collection and analysis. For example, if the policy objective is to narrow or eliminate the gap between rural and urban areas in both residential and commercial markets, states might need more detailed data sets than if the policy objective is solely to provide public information and education to stimulate take-up rates and broadband service usage.

C. Cost-Benefit Analyses

Prior to diving into a broadband subsidy program, states might consider conducting a carefully crafted cost-benefit analysis that allows policymakers to identify the most cost efficient allocation of resources. States should utilize two types of cost-benefit analyses. The first looks at cost at the provider or technology level in order to determine the most cost effective technology to provide service in unserved or underserved areas. For example, a state may examine the cost of deploying terrestrial broadband as opposed to satellite broadband services in a given service area. Part of this analysis is a determination of the technology platform that is economically viable for providers to deploy. This is the type of cost-benefit analysis undertaken as part of the

²¹⁴ Carrie DeLeon, *NARUC Adopts Policies on Wireless ETFs, Broadband Deployment, DTV Transition*, TELECOMM. REP., Aug. 1, 2007, at 3.

²¹⁵ See S. Res. 1492, 110th Cong. § 106(b)(2), (f), 122 Stat. 4096, 4099 (2008) (regarding the competitive nature of grants and the the 4-year limitation).

²¹⁶ See KENNETH FLAMM, AMY FRIEDLANDER, JOHN HARRIGAN & WILLIAM LEHR, *MEASURING BROADBAND: IMPROVING COMMUNICATIONS POLICYMAKING THROUGH BETTER DATA COLLECTION 15*, available at http://www.pewinternet.org/pdfs/PIP_Measuring%20Broadband.pdf. For an example of state-mandated data collection, see CAL. PUB. UTIL. CODE § 5960 (West Supp. 2008).

Wyoming Broadband Gap Analysis study.²¹⁷

The second type of cost-benefit analysis examines the costs and benefits to the general public for making an identifiable set of broadband services available in a currently unserved or underserved region. This analysis is at the heart of the rationale for making broadband services available through public subsidies to either expand supply, stimulate demand, or both. It may not be in the public interest to leave the cost-benefit analysis effort entirely to the telecommunication providers, because the parameters of a cost-benefit analysis for policy formulation include taking into account broader community benefits such as access to information, which is not easily quantifiable on a company's balance sheet.²¹⁸

Any attempt to determine the benefit of broadband applications to the public must consider the impact of the rapid evolution of technology to ensure that the analysis remains valid long enough to be printed and distributed. According to Professor Marvin Sirbu, "[i]t is hard to measure the impact of information technology. One difficulty is that investments made five years ago are not the equivalent of investments made today."²¹⁹

Another difficulty of developing an effective cost-benefit analysis of broadband deployment is the challenge of quantifying "public" benefits. Most of the benefits for governments are indirect and have positive externalities that benefit more than the individual using the broadband application.²²⁰ For example, how does one quantify the benefit of a healthy, well educated population; the benefit of elders remaining in their own homes despite chronic diseases; the benefit of a single calculus teacher who is able to simultaneously instruct students in multiple classrooms? Some states have chosen to approach the challenge of identifying the public good by utilizing a task force or commission to examine the need for broadband services and to design appropriate strategies for encouraging deployment and adoption.²²¹ Such an approach may result in identification of a public interest goal and may be a tool for reaching public consensus regarding broadband deployment.

²¹⁷ See generally COSTQUEST ASSOCIATES, *supra* note 210 (measuring the costs and determining the benefits of achieving universal broadband access in Wyoming).

²¹⁸ See Robert W. Hahn & Cass R. Sunstein, *A New Executive Order for Improving Federal Regulation? Deeper and Wider Cost-Benefit Analysis*, U. PA. L. REV. 1489, 1503 (2002) ("Industry will try to exaggerate the costs and minimize the risks [of proposed regulation].").

²¹⁹ Marvin A. Sirbu, Session Summary, The Economic Benefits of Broadband, <http://www.ncsl.org/programs/lis/AM07Benefits.htm> (last visited Oct. 13, 2008).

²²⁰ See *supra* note 138 (discussing network externalities).

²²¹ See H.B. 346, 2008 Reg. Sess. (Ala. 2008); H.B. 388, 25th Leg., Reg. Sess. (Alaska 2007); S.B. 1918, 85th Leg., Reg. Sess. (Minn. 2007); H.B. 2107, 85th Leg., Reg. Sess. (Minn. 2008); S.B. 1580, 105th Gen. Assem., Reg. Sess. (Tenn. 2007).

The development and application of telemedicine and telehealth services provide an example. The exploration of the effectiveness and practicality of telemedicine began in the early 1960s with a variety of pilot studies.²²² Full adoption, however, has taken a relatively long time because of the large number of players in the field, all of whom must see a positive cost-benefit relationship from their unique perspective, notwithstanding documented evidence of the societal benefit.²²³ For example, findings from pilot projects on telemedicine include a 40% reduction in emergency room visits, a 63% reduction in admissions to hospitals through a remote monitoring program,²²⁴ and a reduction of 69% for the cost of hospital care of a group of diabetes patients using remote home health monitoring.²²⁵ Another pilot project, undertaken from 1997 to 1999 in rural Alaska, entailed transmitting digital pictures of patients' ear conditions via e-mail from community health practitioners to physicians at regional clinics.²²⁶ Estimated economic benefits to patients totaled \$40 per visit, although the researchers performing the analysis noted that their findings could not necessarily be translated into net societal benefits or to the experience of telemedicine innovations elsewhere.²²⁷

As with telemedicine and telehealth applications, computer applications for classroom instruction often must prove their worth via pilot projects. While broadband deployment and access is seen as one means of exposing students and their teachers to curricula that they otherwise would not have access to, it is not clear whether computer use actually results in improved academic achievement. For example, the Texas Technology Immersion Program—a laptop provision program affecting students at twenty-two middle schools in Texas—showed no evidence that computer use affected achievement test scores in core academic subjects.²²⁸ Another study showed little discernible evidence that

²²² Nancy Brown, A Brief History of Telemedicine, http://tie.telemed.org/articles/article.asp?path=articles&article=tmhistory_nb_tie95.xml (last visited Oct. 21, 2008).

²²³ TELEMEDICINE: A GUIDE TO ASSESSING TELECOMMUNICATIONS IN HEALTH CARE 1–2, 19 (Marilyn J. Field, ed., National Academies Press 1996).

²²⁴ Neuberger, *supra* note 85, at 13; Marlis Meyer, Rita Kobb & Patricia Ryan, *Virtually Healthy: Chronic Disease Management in the Home*, 5 DISEASE MGMT. 87, 91 (2002), available at <http://www1.va.gov/vsn8/v8/clinical/cccs/articles/virtually.doc>.

²²⁵ Hospital care decreased from almost \$283,000 to \$87,000 per patient. Katherine. H. Danksy, Lisa Palmer, Dennis Shea & Kathryn H. Bowles, *Cost Analysis of Telehomecare*, 7 TELEMEDICINE J. & E-HEALTH 225, 231 (2001), available at <http://www.liebertonline.com/doi/pdfplus/10.1089/153056201316970920> (subscription necessary).

²²⁶ Matthew Berman & Andrea Fenaughty, *Technology and Managed Care: Patient Benefits of Telemedicine in a Rural Health Care Network*, 14 HEALTH ECON. 559, 563 (2005).

²²⁷ *Id.* at 569.

²²⁸ TEXAS CENTER FOR EDUCATION RESEARCH, EVALUATION OF THE TEXAS TECHNOLOGY IMMERSION PROJECT: AN ANALYSIS OF THE SECOND-YEAR (2005-06) IMPLEMENTATION 77

expanded Internet access affected reading and math scores in California's public schools.²²⁹

Pilot studies raise the question: to what extent do the findings apply to the specific populations of regions lacking broadband deployment? For example, how similar are the populations and the nature of their needs in remote areas of Vermont versus those in Wyoming or Alaska, or to those in larger states such as Texas and California? The same question might be posed for applications other than health and education. The challenge is developing cost-benefit projections for unserved regions throughout the nation in light of the regions' unique demographic profiles. Ongoing rigorous economic analyses are important for demonstrating the effectiveness of broadband services in realizing policy objectives. With respect to education, analyses should demonstrate some quantifiable metric such as improved academic achievement in public schools, as the previously cited study of laptop immersion in Texas middle schools aptly illustrates.²³⁰

Finally, even if a compelling case for a broadband application is made—whether it is health, education, economic development, or security or safety—the infrastructure question remains. Policymakers must determine if the public good can best be served by a partnership created from public investment in infrastructure with private investment in applications, or could public investment in applications help drive the demand for the build-out of the infrastructure.

D. Identify Funding Mechanisms and Accountability Measures to Reduce or Eliminate Deployment Gaps

In many cases, policymakers will determine that strategies for reducing or eliminating deployment gaps will require state funding such as direct financial subsidies, use of government staff and operations, other types of funding such as government bonds, or state universal service support mechanisms. The determination of policy objectives is constrained by the costs of achieving the objectives.

(2007), available at http://www.etxtip.info/images/etxtip_0506_qualrpt_exsum.pdf. While the study did not find a significant effect of the laptop program on test scores, it did find that students and educators “thought technology immersion had enabled students to gain valuable skills that prepared them for the future in terms of their college and career readiness.” *Id.*

²²⁹ Austan Goolsbee & Jonathan Guryan, *The Impact of Internet Subsidies in Public Schools*, 88 REV. ECON. & STAT. 336, 372 (2006) (“The results do not show evidence that Internet investment had a significant effect on student test scores.”).

²³⁰ See TEXAS CENTER FOR EDUCATION RESEARCH, *supra* note 228, at 1.

If the cost-benefit analysis recommended above shows that estimated benefits exceed estimated costs, policymakers would then need to decide the form of funding and the accountability measures that must be met in exchange for funding. For example, ConnectKentucky committed approximately \$7 million over a four-year period,²³¹ which ultimately resulted in 14,500 new technology jobs.²³² Vermont's governor said that \$40 million in state-backed bonds would leverage as much as \$200 million in private funds to provide incentives to providers deploying broadband to regions of the state that would not be economically attractive to them absent public funds.²³³ Arkansas' legislation authorizes the use of grants for the Connect Arkansas Broadband Program to increase broadband deployment in unserved areas and improve education.²³⁴ Utah's legislature established the Rural Broadband Service Fund and credited \$1 million from the General Fund in fiscal year 2007-2008 for grants to providers for broadband deployment in rural areas of the state where broadband service is not available.²³⁵

States may also elect to use their state universal service funds for broadband deployment.²³⁶ The ConnectME program in Maine received \$500,000 from the

²³¹ Press Release, ConnectKentucky, ConnectKentucky Remains Dedicated to Technology Expansion for All Kentuckians (Apr. 16, 2008), *available at* http://www.connectkentucky.org/_documents/CKPR_VetoResponse_041508_final.pdf.

²³² Press Release, Commonwealth of Kentucky Governor's Communications Office, Results Validate ConnectKentucky as Model for Technology Growth (Apr. 23, 2007), *available at* http://www.connectkentucky.org/_documents/ResultsValidateCKasModelforTechnologyGrowth_42307_FinalGovsOffice.pdf.

²³³ *Vermont Governor Signs Broadband Deployment Bill*, TELECOM. REPS., June 15, 2007, at 15.

²³⁴ ARK. CODE ANN. §§ 4-113-101–105 (2008). The statute requires establishment of a process to register providers. *Id.* § 4-112-105.

²³⁵ See UTAH CODE ANN. §§ 63-38f-2301–2304 (2007). Providers interested in deploying broadband under the Act must submit an application to the Governor's Office of Economic Development and meet specified criteria. *Id.* § 63-38f-2304(1)(a).

²³⁶ Currently, the federal USF support may be used to discount rates to eligible schools and libraries for telecommunications, Internet access, and internal wiring, and for discounted telecommunications and Internet access for eligible rural health care providers. See Universal Service Administration Company, Schools and Libraries, <http://www.usac.org/sl> (last visited Oct. 13, 2008); Universal service Administrative Company, Rural Health Care, <http://www.usac.org/rhc/> (last visited Aug. 14, 2008). The FCC is considering expanding the types of services eligible for these discounted rates. See *In re Schools and Libraries Universal Service Support Mechanism, Notice of Proposed Rulemaking*, FCC 08-173, CC Docket No. 02-6 ¶ 1 (July 25, 2008). If a state decides to use its state universal service funds to support broadband deployment, it might shrink the deployment gap between urban and rural areas while increasing any distortions created by that type of funding mechanism. For a discussion on the effects of universal service obligations, see HELMUTH CREMER, FARID GASMI, ANDRÉ GRIMAUD, & JEAN-JAQUES LAFFONT, *THE ECONOMICS OF UNIVERSAL SERVICE: THEORY* (1998) *available at* <http://www.worldbank.org/wbi/regulation-f/pdfs/theory.pdf>.

state universal fund for mapping and deployment activities.²³⁷ In Illinois, each incumbent telephone company was required to offer 80% of its customers advanced telecommunications services by January 1, 2005.²³⁸ Funding from the state universal service mechanism enabled approximately forty rural carriers to meet the requirement.²³⁹ Georgia's legislation took a different approach by creating an authority—the South Georgia Regional Information Technology Authority—that is authorized to issue revenue bonds for infrastructure projects confined to a five-county region of the state.²⁴⁰

Once financial support is allocated, reporting requirements are perhaps the simplest means of ensuring transparency and accountability for state investments. For example, Utah's legislation requires the Governor's Office of Economic Development to report to specified legislative committees on the disposition of the grant funds.²⁴¹

Perhaps most important for ensuring accountability, funding should be included—in any state program—for research to assess the effectiveness of the proposed strategies for broadband deployment. The research should measure access to the services made available through deployment and measure the use of those services. For example, if one of the policy objectives is to improve academic achievement in science and math through computer-based instruction, measures of accountability should be designed to control for general changes in educational processes that also may facilitate improved performance. Evaluation of any program where multiple variables impact outcomes presents a challenge, however, where public funds are involved, accountability is often an unstated program goal.²⁴² The public has the right to know whether the progress is made toward realizing the policy objective, and ultimately whether the objective is realized.

²³⁷ See Paul Barbagallo, *States Not Waiting Around for Congress to Push Rural Broadband Deployment*, TELECOM. REPS., Nov. 15, 2007, at 44.

²³⁸ 220 ILL. COMP. STAT. ANN. 5/13–517(a) (West 2007). The statute defines “advanced telecommunications services” as “services capable of supporting, in at least one direction, a speed in excess of 200 kilobits per second (Kbps) to the network demarcation point at the subscriber's premises.” *Id.* 5/13–517(c).

²³⁹ E-mail from Jeffrey Hoagg, Illinois Commerce Commission, to Lynne Holt, Policy Analyst for the PURC, the University of Florida (Oct. 26, 2007, 11:15 EST) (on file with the author).

²⁴⁰ H.R. 804 § 2(a), 149th Gen. Assem., Reg. Sess. (Ga. 2007).

²⁴¹ See UTAH CODE ANN. § 63-38f-2305 (2007).

²⁴² See, e.g., *id.* (requiring annual reports on the disposition of funds from a broadband grant program).

E. Determine Methods of Accomplishing Broadband Deployment Goals

Policymakers may decide that they need some type of formal authorization to begin to achieve their broadband deployment objective. That authorization may take the form of legislation, regulation, public service commission orders, or local initiatives. Several states began the process of information gathering and the identification of strategies for expanded broadband deployment by creating special forums.²⁴³ In several states, the program was started through legislation.²⁴⁴ In other states, executive orders authorized the broadband program.²⁴⁵ In at least one case, the statutorily created task force did not recommend public subsidies, despite incomplete information concerning the exact number of providers and the speed, quality, and pricing of the service provided.²⁴⁶ The task force concluded that wholesale provision of publicly supplied broadband service would not result in deployment in rural regions of the state.²⁴⁷

In some instances, the initial study is followed up by the creation of a body specifically to oversee implementation of the policy objective. For example, in North Carolina, the body charged with starting the broadband deployment effort was dissolved upon achievement of its objectives by the state statute that created it, and a new entity was established to complete implementation.²⁴⁸

Statutes may also be enacted for financing mechanisms, such as the use of state high-cost fund to support the deployment of broadband services²⁴⁹ or for

²⁴³ See The National Conference of State Legislatures, State Broadband Task Forces, Commissions, or Authorities, <http://www.ncsl.org/programs/lis/ConnectAmericaPubs.htm#Other%20Resources> htm (last visited Oct. 13, 2008). The states include: California, Hawaii, Kentucky, Tennessee, Maryland, Missouri, Nebraska, New York, South Carolina, Vermont, and Virginia. *Id.*

²⁴⁴ See H.R. 310, 24th Leg., 1st Spec. Sess. (Haw. 2007); TENN. CODE ANN. § 7-52-410 (2008); MD. CODE ANN., [Exec. Dept.] § 21-102 (LexisNexis 2007); NEB. REV. STAT. ANN. § 86-599 (LexisNexis 2007); VT. STAT. ANN. tit. 30 §§ 8061, 8062, 8072, 8077, 8078 (2007).

²⁴⁵ See Exec. Order S-23-06, Office of the Governor, State of California, (2006), *available at* <http://gov.ca.gov/index.php?executive-order/4585>; RURAL HIGH-SPEED INTERNET TASK FORCE, PRELIMINARY REPORT (2008) (referencing Exec. Order 07-31, Office of the Governor, State of Missouri (2007)), *available at* <http://www.ltgov.mo.gov/ruralhsi/pdf/RHSIATPreliminaryReport2-1-08.pdf>.

²⁴⁶ THE BROADBAND SERVICES TASK FORCE: FINAL REPORT 19, 22 (2006), *available at* <http://www.nitc.state.ne.us/reports/BSTFfinalreport.pdf> (“[T]he task force gained a general understanding of broadband deployment within the state and recognized it is difficult to identify the specific number of providers, speed and quality of service, and pricing available to consumers.”).

²⁴⁷ See NEB. REV. STAT. ANN. § 86-599 (LexisNexis 2007) (enabling legislation for the task force); see also THE BROADBAND SERVICES TASK FORCE: FINAL REPORT, *supra* note 245, at 22 (finding of the task force).

²⁴⁸ N.C. GEN. STAT. § 143B-437.44 (2007).

²⁴⁹ ARK. CODE ANN. § 23-17-404(a)(4) (2007) (authorizing the use of the Arkansas High Cost Fund to “accelerate and promote” extension of broadband in rural or high cost areas

defining broadband service in terms of speed.²⁵⁰ Public service commission orders may also define broadband in conjunction with any existing statutes.²⁵¹

Statutory definitions of broadband based on speed specifications, like the FCC definition of transmission speed of at least 200 Kbps in both directions, may run the risk of lagging behind technological advances.²⁵² Vermont has avoided that problem by defining broadband in terms of functional performance: “For the purposes of this chapter, ‘broadband’ means high-speed Internet access. The department shall consider the performance characteristics of broadband services needed to support current and emerging applications of broadband services.”²⁵³ Arguably, low-speed specifications for what constitutes broadband, linked to state or federal subsidies may create incentives for providers to deploy suboptimal technologies in unserved areas.²⁵⁴ Furthermore, statutes also may be the appropriate means of authorizing tax incentives for broadband deployment. For example, Hawaii’s broadband deployment statute

“beyond what would normally occur”).

²⁵⁰ ALA. CODE § 37-2A-2(2) (LexisNexis Supp. 2005) (defining broadband as speeds not less than 200 Kbps, either upstream or downstream); GA. CODE ANN. § 46-5-221(1) (Supp. 2008) (defining broadband as speeds not less than 200 Kbps, either upstream or downstream); IND. CODE ANN. § 8-1-2.6-1.3(a) (LexisNexis Supp. 2008) (defining broadband as an average speed of at least 1.5 Mbps downstream and 384 Kbps upstream); KAN. STAT. ANN. § 66-2005(q)(8)(C) (Supp. 2007) (defining broadband as speeds exceeding 200 Kbps in both directions); LA. REV. STAT. ANN. § 51:955.2(1) (Supp. 2008) (defining broadband as speeds of at least the FCC’s definition); MICH. COMP. LAWS ANN. § 484.3203(g) (Supp. 2008) (defining broadband as speeds in excess of 200 Kbps in at least one direction); MISS. CODE ANN. § 77-3-3(k) (West Supp. 2007) (defining broadband speeds as not less than 200 Kbps, either upstream or downstream); NEB. REV. STAT. ANN. § 86-593(1) (LexisNexis 2007) (defining broadband as speeds in excess of 200 Kbps); N.C. GEN. STAT. § 143B-437.45(4) (2008) (defining broadband as speeds consistent with the FCC’s requirements); OKLA. STAT. ANN. tit. 17, § 139.102(9) (West Supp. 2007) (defining broadband as speeds in excess of 150 Kbps, either upstream or downstream); S.C. CODE ANN. § 58-9-10 (Supp. 2007) (defining broadband as speeds not less than 190 Kbps in at least one direction); TENN. CODE ANN. § 65-5-202(a)(1) (Supp. 2007) (defining broadband a speeds not less than 200 Kbps, either upstream or downstream); VA. CODE ANN. § 56-1 (2007) (defining broadband as speeds in excess of 200 Kbps in at least one direction).

²⁵¹ See, e.g., Public Service Commission of Wisconsin, Status of Investments in Advanced Telecommunications Infrastructure in Wisconsin v, available at <http://psc.wi.gov/utilityinfo/tele/infrastructureCompetitive/documents/2008/fullTextReport.pdf>.

²⁵² See *supra* note 10.

²⁵³ VT. STAT. ANN. tit. 30 § 8077(a) (Supp. 2008).

²⁵⁴ Certain applications, however, may perform adequately on technology platforms at lower speeds. For example, voice over Internet protocol, short message service used for text messaging, basic electronic communications, basic Web browsing, and streaming music and low quality video may only require speeds of 500 Kbps to 1 Mbps, which is still far above the historically used FCC definition of broadband. See HIGH-SPEED SERVICES AS OF JUNE 30, 2007, *supra* note 4, chart 1 n.1.

authorizes tax credits for building or improving high-speed telecommunications.²⁵⁵ In short, statutes may either impede or promote high-speed broadband deployment. The outcome of any particular statutory scheme may be the degree to which it provides for flexibility in implementation.

The challenge is the time horizon imposed by the rapidly evolving market and ongoing changes in information technology. The *Deployment of Nationwide Broadband Data Order* indicates that the federal government intends to reinvigorate the partnership with states in developing an effective means to deal with broadband deployment issues. In her capacity as chairperson of the reconstituted Federal-State Joint Conference on Advanced Services, FCC Commissioner Tate acknowledged the lessons that might be derived from states' experiences:

Broadband deployment is one of my chief priorities at the Commission and my state colleagues share this laudable goal as well. In fact, many states are currently conducting or exploring initiatives in broadband deployment like Connect-Tennessee. They are on the ground, know the providers and the unique needs of their communities; and we can certainly learn a great deal from these efforts. In this role, I will reach out to states, consumer advocates and industry providers across all platforms to preserve and advance the principles set forth by Congress.²⁵⁶

Another partnership between the federal government and states may result from the competitive grant program initiatives authorized in the Broadband Data Improvement Act, such as the establishment of local technology planning teams within counties or regions of states to assess and expand the use of broadband applications.²⁵⁷

The lack of a coherent federal broadband policy leaves states in the position of filling the deployment gaps in their communities. States must be careful, however, to avoid the pitfalls of poorly crafted policies that do not include measures of planning, oversight, and accountability. The policy checklist developed in this Comment provides state regulators with a matrix to analyze or craft state plans to meet established deployment objectives.

²⁵⁵ HAW. REV. STAT. ANN. § 235-110.51 (LexisNexis 2008).

²⁵⁶ Press Release, FCC, FCC Expands, Improves Broadband Data Collection (Mar. 19, 2008), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-280922A1.pdf.

²⁵⁷ See S. Res. 1492, 110th Cong. § 106(e)(5)(A)–(B), 122 Stat. 4096, 4100 (2008). We would issue a caveat at this point: evidence to date does not support the perception that broadband service will be a panacea for the multiple problems faced by small communities, by neighborhoods plagued by poverty, or by sparsely populated counties and parishes. Broadband service will never fully compensate for a scarcity of physicians, low educational achievement, and laggardly employment growth.

VI. CONCLUSION

States are struggling to balance the needs of their residents with the complexities of shared state-federal jurisdiction over broadband, rapidly evolving technology, and a resultant tumultuous marketplace for broadband services. Policymakers may decide that waiting for the private sector to realize sufficient profit to serve sparsely populated areas is not in the public interest. If broadband providers do not determine that they can earn a satisfactory return on investment for deploying in unserved areas, policymakers may decide that public subsidies are necessary to ensure access for both residents and businesses regardless of their locations. State policymakers have a much broader base of responsibility than a group of corporate shareholders—they may opt for strategies that consider many more factors than a quantitative return. When a broadband subsidy is involved, states may be best served by submitting to a linear deliberation process for determining identifiable goals and building broad consensus around those goals. The deliberation process should identify whether public investment is justified through a cost-benefit analysis that considers many externalities that may not be easily quantified. An equitable means of deployment and method for demand stimulation and aggregation may need to be devised and implemented. Finally, accountability safeguards should be built into any subsidy to accelerate broadband deployment or stimulate demand for broadband services, whether that subsidy is direct cash support, regulatory forbearance, or sponsored research and development.