New Hampshire Broadband Access

Policy Options to Provide Broadband to Underserved Areas

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EXECUTIVE SUMMARY

In spite of the many uses and likely economic benefits of broadband Internet access, several geographic and demographic factors suggest that New Hampshire's broadband Internet accessibility is not as prevalent as more populated and urban states throughout the country. In particular, New Hampshire's more rural areas remain underserved as roughly 30 percent of New Hampshire citizens do not have access to broadband internet service.

This report first introduces the reader to broadband Internet access' capabilities and then evaluates other states' projects that were designed to overcome similar barriers when promoting broadband access.

Findings were divided into four overall classifications:

- **Public service networks:** States such as Colorado and Washington created a statewide high-speed network to transfer data for a part of the public sector, such as local governments or schools. The network then serves as a branching-off point for broadband carriers wishing to expand service to private homes and businesses.
- **Public-private partnerships:** In Utah, private providers opt to pay participating cities to use the government-controlled network. In North Carolina and Kentucky, public-private entities consolidate broadband availability data and work to research, promote, and fund connectivity efforts.
- **Nearby states:** Vermont and Maine have recently created statewide programs to promote Internet access through financial incentives and gathering information.
- **Collaboration beyond the single-state level:** States can work with other states or receive assistance from the federal government. Compacts provide broadband to multiple states, such with the Wireless LINC project, the Mid-Atlantic SMART Organization, and the Connecting Appalachia Task force. On the federal level, USDA and HUD funding are available for broadband access expansion in rural areas.

The report concludes with five policy recommendations of best practices found among the different models for broadband Internet access.

These recommendations support:

1. A statewide advocate for broadband access,
2. An assessment of supply and demand of broadband in New Hampshire,
3. Aggregating demand to drive down costs,
4. A program of financial incentives, and
5. A plan for collaboration between the public and private sectors and across similar regions.

1. INTRODUCTION

Broadband Internet access has the potential to provide a variety of services. Previous studies have indicated a great likelihood that it can also notably contribute to economic growth. However, several factors, such as a rural setting and a relatively smaller population density, may have hindered broadband Internet accessibility throughout the state of New Hampshire. While many states have undertaken programs to improve accessibility, studies have conflicted over the extent to which various policies can be effective.

Rural broadband access is particularly pertinent right now to the state of New Hampshire due to the approved sale of Verizon's telecom infrastructure in northern New England to North Carolina-based Fairpoint Communications in February of 2008.[1] Given Fairpoint's promise to expand rural broadband access, and critics of the deal doubting Fairpoint's ability to do so, the issue of expanding broadband access has never been so critical.[2]

According to the May 2008 statewide survey of New Hampshire registered voters conducted by the Policy Research Shop at the Rockefeller Center of Dartmouth College, just over 70 percent of the respondents reported having access to broadband Internet service (71.6 percent). Close to 80 percent of respondents reported daily use of the Internet, yet just over half reported spending more than one hour online everyday (21 percent spend no time and 26 percent spend less than one hour a day online).[3]

The purposes of this report are the following: 1) to introduce the reader to broadband Internet access' capabilities, and 2) to deliver a comparative assessment of statewide projects intended to increase broadband Internet access, especially in rural areas.

Multiple state and federal models for providing broadband access are presented. These models have the advantages of visibility, effective policy, and applicability to the state of New Hampshire. The report concludes with policy recommendations of best practices found within these models.

1.1 General Uses of Broadband Internet Access

Broadband access has the potential to boost employee productivity by having workers "use email and web browsing to raise the quality and lower the costs of gathering market intelligence and communicating with suppliers and customers."[4] Broadband access can also provide the following benefits and services:

- Telemedicine
- Telecommuting
- Voice Over Internet Protocol (VOIP)
- Leisure activities, such as listening to the radio, watching television, or viewing movies[5]
- Facilitation toward managing home-based and new businesses

- Online services such as shopping, bill payment, and job searching
- Distance education programs[6]

According to 2003 US Census Bureau data, those who have broadband Internet access tend to engage in more online activities than those with either a dial-up or no connection. They also tend to use the Internet more frequently.[7]

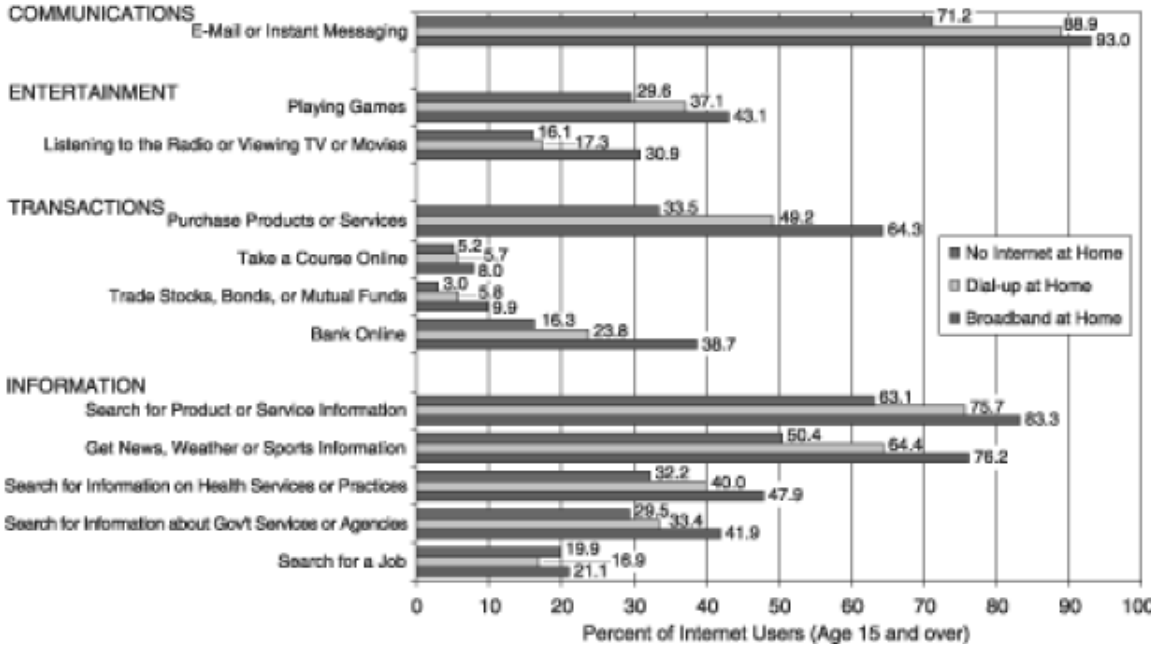

Figure 1: Online Activities by Type of Home Internet Connection, 2003 (Percent of Internet Users 15 and Over)[8]

1.2 Likely Economic Benefits of Broadband Internet

A study performed by professors from the MIT and Carnegie Mellon University attests to broadband availability's positive economic impacts. The authors found that "between 1998 and 2002, communities in which mass-market broadband was available by December 1999 experienced more rapid growth in" the following: [9]

- employment by over five percent, "consistent with the view that broadband had an especially large impact in smaller, rural communities,"[10]
- "the number of businesses overall" by over two percent,[11] and
- "the share of firms in IT [information technology] intensive sectors" by 0.5 percent.[12]

This held true when comparing communities of similar demographics where the major difference was broadband accessibility. The study also stipulates that "the positive impact on establishment growth was higher for larger establishments and for IT intensive sectors of the economy," and while there was no significant growth in wages as a result of the

accessibility, "residential property values" did increase by almost seven percent.[13] According to the authors, broadband accessibility's benefits are "both real and measurable."[14]

The following two case studies suggest a likely link between broadband Internet access and economic growth.

1.2.1 Cedar Falls, Iowa vs. Waterloo, Iowa: Fiber-to-the-Business and Economic Growth

A 2004 case study by the Iowa Association of Municipal Utilities examined economic growth by comparing two adjacent communities in Iowa. Both Cedar Falls and Waterloo possess similar geography, transportation access (highways, railheads, motor carriers, airport), and water source access. Waterloo has several factors working in its favor; it has roughly twice the population and has most of the area's major private employers. Even though Waterloo has higher property taxes ($10 per $1,000 taxable value), the price of land in Cedar Falls is $10,000-$25,000 more per acre than in Waterloo. Additionally, in fiscal year 2002, Cedar Falls recorded over $101 million in construction, while Waterloo recorded less than $53 million.[15]

The author of the study attributes this "disparity" to Cedar Falls having a municipal communications network that – unlike Waterloo's private sector – ensures a fiber network to businesses in the area (Fiber-to-the-Business). Although some may attribute this to economic growth in the more well-connected Cedar Falls, the author refrains from attributing causation and "does not incorporate any degree of sophisticated economic analysis."[16]

1.2.2 South Dundas, Canada: Quantified Economic Growth

A Canadian example also positively correlates broadband access to economic growth. The United Kingdom's Department of Trade and Industry (DTI) contacted Strategic Networks Group (SNG), an economic consulting firm that "helps communities and regions leverage the benefits of broadband…for economic and social development" and specializes in assessing telecommunication investments.[17] The DTI asked SNG to measure the economic impacts a fiber network in which the Township of South Dundas invested.[18] South Dundas, located in southeastern Canada near the northern border of New York, is a rural and semi-rural area with a population of 11,000 whose economy consists mainly of manufacturing and constructions sectors, along with notable agriculture, retail, and service establishments. The township spent $750,000[i] to build the network and $11,000/month for maintenance. Wireless service is used to extend access to some of the most rural areas.[19]

[i] In all references pertaining only to the South Dundas case study, all dollar values refer to Canadian dollars. Throughout the rest of this report, all other references are to US dollars.

By the time SNG conducted the 2003 study, the fiber network had been running for two years. In that time, the township had invested $1.3 million. Also in that time, the consulting firm concluded:

> the following economic effects can be directly attributed to the [fiber] network:
> - 62.5 new jobs
> - $2.8 million in commercial / industrial expansion
> - $140,000 in increased revenues and decreased costs.[20]

Over the following two years, the SNG authors predicted the following effects:

- $25.22 million increase in GDP for Dundas County and $7.87 million increase for the Province of Ontario
- 207 person years of employment for Dundas County and 64 for the rest of Ontario
- $3.5 million in revenue in provincial tax revenues and $4.5 million increase in federal tax revenues.[21]

Thus in Dundas County, broadband access likely led notable economic growth.

1.3 The "Digital Divide": The Rural Disadvantage

Rural areas – such as those throughout New Hampshire – are less likely to have broadband Internet access than more urban areas.[22] A 2000 report by the Departments of Commerce and Agriculture concluded that "rural areas are currently lagging far behind urban areas in broadband availability," particularly due to increased costs from having fewer customers spread out over a larger area.[23] A 2001 scholarly paper from the University of Cincinnati observes that "urban areas are receiving the majority of infrastructure investment, thereby leaving many rural locations with few options for broadband access."[24] According to a 2003 US Census Bureau survey, 40 percent of urban households had Internet access, as opposed to 25 percent of rural households. As it turned out, residents nationwide living in rural areas were over more than four times as likely to be unable to upgrade their dial-up connections than those in urban areas.[25] An analysis of a 2005 Small Business Administration's Office of Advocacy survey revealed that "rural broadband use was 25 percent lower than urban broadband use," with "rural small businesses…tend[ing to] pay 10 percent more for prices for broadband services than urban businesses do."[26] This "digital divide" disadvantages New Hampshire residents in terms of broadband accessibility.

Table 1. Type of Home Connection by Rural/Urban, 2003 (Percent of Households with Internet)

	Total US	Rural	Urban	Central City
Dial-up	62.8	74.7	58.9	58.4
Broadband	36.5	24.7	40.4	40.9
Other	0.8	0.7	0.8	0.8

Source: US Census Bureau's Current Population Survey, October 2003[27]

1.4 Factors Affecting Broadband Accessibility

One scholarly study quantified how various factors affected broadband accessibility from 2001 to 2003. As Table 2 indicates, a one percent increase in the following factors would lead to varying likelihoods over whether an area has broadband access. For example, an a increase in the amount of forests would lead to a six to eight percent decrease in broadband Internet accessibility, while a one percent increase in hilliness is related to a two percent increase in accessibility.

Table 2. Change in Broadband Accessibility due to a One Percent Increase in Given Factors, 2001 to 2003

Factor	Change
Terrain elements (e.g., grasslands, bodies of water, and forests)	–6-8%
"Vertical rise," defined as the range of elevations in a given area	–2%
"Share of rural population"	–1%
Population with a high school degree or above	+2%
"Hilliness"	+2%

Source: Kenneth Flamm, "The Role of Economics, Demographics, and State Policy in Broadband Availability" [28]

Additionally, although at first the author notes that population density leads to a two percent increase in availability, he establishes that it is "absolute market size" that affects that availability "since denser zip codes are also zip codes with larger populations." He also observes that income effects are minimal at best.[29]

Table 3 shows how different industries also affect accessibility. For example, for each additional retail trade establishment, there is a ten percent increase in broadband Internet accessibility.

Table 3. Change in Broadband Accessibility due to an Additional Establishment, 2001 to 2003

Establishment Field	Change
Health care	–9%
Social assistance	–3%
Other	+4%
Manufacturing	+6%
Retail trade	+6%
Accommodation and food services	+8%
Professional, scientific, and technical services	+10%

Source: Kenneth Flamm, "The Role of Economics, Demographics, and State Policy in Broadband Availability" [30]

1.5 Mixed Effectiveness of State-Initiated Policies

Various studies have shown mixed reviews over whether state-initiated policies can be effective. The studies have concluded:

- It is difficult to even measure state-level policies and to discount assessing them "because they represent too high a level of aggregation," according to the aforementioned professors from MIT and Carnegie Mellon.[31]

- The policies "appear to have played a role in accelerating or retarding broadband deployment," according to a professor from the University of Texas at Austin. [32]
- "Most state-level policies are ineffective. Universal service mechanisms and programs targeted at 'underserved areas' do not boost broadband penetration and may even slow it, possibly by giving an artificial advantage to one type of provider over another," according to a scholar at the American Enterprise Institute and AEI-Brookings Joint Center for Regulatory Studies.[33]
- There are mixed results for government subsidies encouraging rural development. There are positive results for one study by scholars from Queens College and MIT,[34] and both significant and insignificant results from the aforementioned scholar from AEI-Brookings.[35]

2. PUBLIC SERVICE NETWORKS

One possible method for increasing broadband access to rural areas — as Colorado and Washington have initiated — is through the creation of a state-wide public service high-speed network. In this model, all of the state's courthouses, hospitals, libraries, schools and other public buildings are linked together in a single high-speed network. By linking these facilities, the state ensures that there are no public services hindered by either poor or lacking Internet service in rural areas. Furthermore, by allowing private telecom companies to extend high-speed service to private homes and businesses from the nodes established at public buildings, the network allows for increased broadband penetration across rural communities.

The drawback for the public service network approach is that it does not provide for services to customers beyond the networks' fringes ("last-mile services"). Although the public sector is provided for, there is no guarantee that the private sector will decide to extend service to rural communities. Even with high speed nodes nearby, telecom companies may still find it unprofitable to provide Internet hookups for many areas. If this occurs on a widespread basis, another alternative would need to be available in order to reach those areas. The states of Washington and Colorado provide examples of the public service network.

2.1 Colorado: MNT

Colorado has had a public service network since 2003 in the form of the Multi-Use Network, or MNT.[36] The MNT is a public-private partnership between the state of Colorado and Qwest Communications and is composed of a high-speed fiber-optic network linking the county seats of all but one of the sixty-four counties in Colorado.[37] All state data travels over the MNT, along with data from some local governments and school districts.[38] In addition, Qwest and other telecom companies provide service to the private sector over the MNT. Ninety-seven percent of county seats now have access to broadband service.[39]

Despite the MNT, last-mile connection difficulties still exist in Colorado, spurring a sister program to the MNT called the Beanpole project. The Beanpole project offers grants and incentives to private companies wishing to expand broadband coverage by latching onto the public network.[40] However, the Beanpole project has not proven effective enough in delivering rural broadband access. In October 2007, Colorado Governor Bill Ritter responded to this by creating an "Innovation Council," which would include among its goals increased broadband penetration into rural areas.[41]

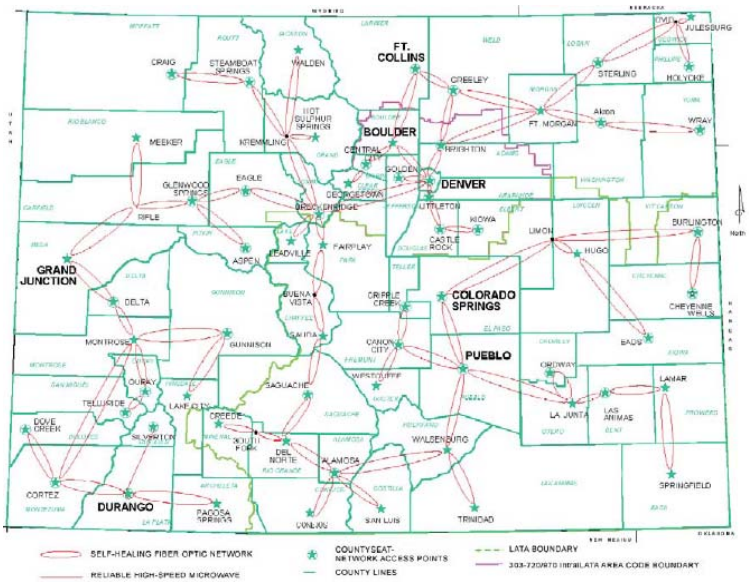

Figure 2. Colorado's Multi-Use Network, Linking the State's County Seats[42]

2.2 Washington: WAN

The state of Washington maintains a public service network through its Department of Information Services' Wide Area Network (WAN) program. Most state, local, and educational data flows over the WAN, which has access points in all 39 of Washington's counties.[43] An essential part of the Washington WAN is the K-20 Education Network, which provides dedicated Internet service to over 2,000 schools and 300 school districts at about half of the cost of private sources.[44] Private or public sources lease the infrastructure for the network in individual contracts corresponding to geographic areas. By aggregating public traffic in a geographic area to a single contract, the state makes it worthwhile for telecom companies to enter places they may otherwise find financially infeasible.[45] Once large state contracts draw the telecom companies into rural areas, the companies then have the incentive to install infrastructure and provide service to homes and businesses that would otherwise lack it. The WAN has considerably advanced broadband access in rural eastern Washington.[46]

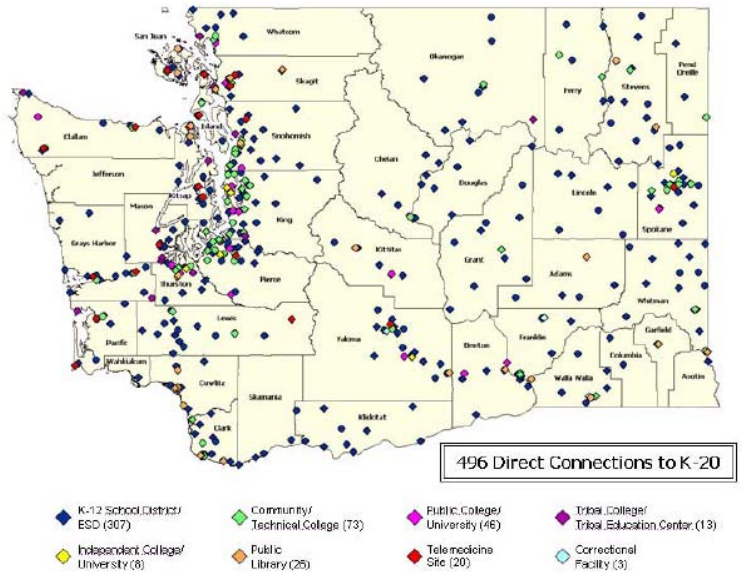

Figure 3. Washington's WAN's K-20 Network, Linking the State's Schools and School Districts[47]

3. PUBLIC-PRIVATE PARTNERSHIPS

Public-private partnership models allow governments and businesses to work together, consolidate information, and promote broadband access projects. Although the state governments may provide some funding, it is ultimately the private companies that extend the network infrastructure. In Utah, the project encourages private companies to extend the infrastructure throughout the participating cities. In North Carolina and Kentucky, programs map out the broadband supply to show companies where potential customers are located. North Carolina cross-references this information with county economic status. Meanwhile, Kentucky works on the community level by appointing local teams to assess the potential demand for broadband Internet access.

3.1 Utah: UTOPIA

The Utah Telecommunication Open Infrastructure Agency (UTOPIA) is a partnership consisting of over fourteen neighboring cities that has been working to provide broadband Internet to its member cities since 2004. The member cities have provided low-interest bonds to help finance the expansion and maintenance of the fiber-optic network's infrastructure to ensure it is accessible throughout the combined region; private companies deliver the services to customers through this Agency-owned infrastructure.[48] The participating service providers all share the same fiber-optic network, but would be able to conduct business independently of each other.

After receiving contracts from the Agency, private companies promise to both build that infrastructure and then to help fund it.[49] Private providers pay UTOPIA a fee to use the shared network and can then provide telecommunications services to interested customers. Meanwhile, these UTOPIA fees are used to pay off the bonds and maintain the infrastructure. The Agency reports that, "No tax dollars are anticipated to be used in

either building or operating the network."[50] Reports confirm that the project will experience positive net revenue within 10 years, and will have paid off its loans within 20.[51]

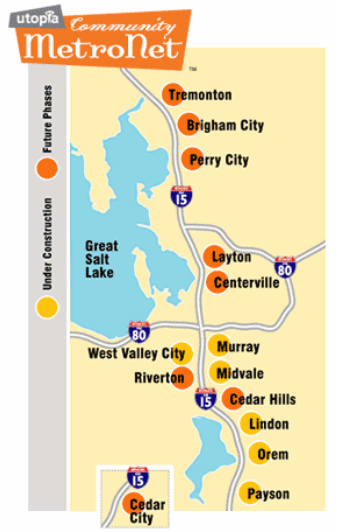

Figure 4. UTOPIA's Fourteen Member Cities[52]

Non-participating vendors have seen UTOPIA as unfair competition. Many competing companies such as Cisco, Qwest, and Comcast tried lobbying against UTOPIA in 2004; the following year, Qwest additionally tried suing UTOPIA and one of its member cities.[53] UTOPIA has also begun providing services to non-member cities, even though it technically should not be doing so.[54] Since UTOPIA's service only includes all providers who choose to pay the fee to opt into the shared network, and since its scope only includes participating cities, non-participating companies throughout the state face stark competition.

3.2 North Carolina: e-NC Authority

In 2003, the North Carolina state government created the e-NC Authority, a government-appointed committee of public sector and private sector employees that aims to "provide high-speed Internet access at competitive prices…to all North Carolinians by 2011.[55] It has worked to research, coordinate, fund, and fundraise to promote statewide connectivity, especially in underserved areas. One example of a project has been the development of several Business and Technology Telecenters, which are "multi-purpose technology, business, training, and public access centers."[56] Overall, the Authority has bestowed over $30 million in grants in support of its mission.[57]

The e-NC Authority has also mapped out the broadband access available across the state.[58] By monitor the connectivity efforts statewide, the Authority can then devote more of its efforts toward encouraging service providers to aid underserved regions. At the same time, providers can easily identify potential markets. Additionally, by incorporating

counties' economic conditions, North Carolina has been able to direct business-development tax credits to high-priority areas.[59]

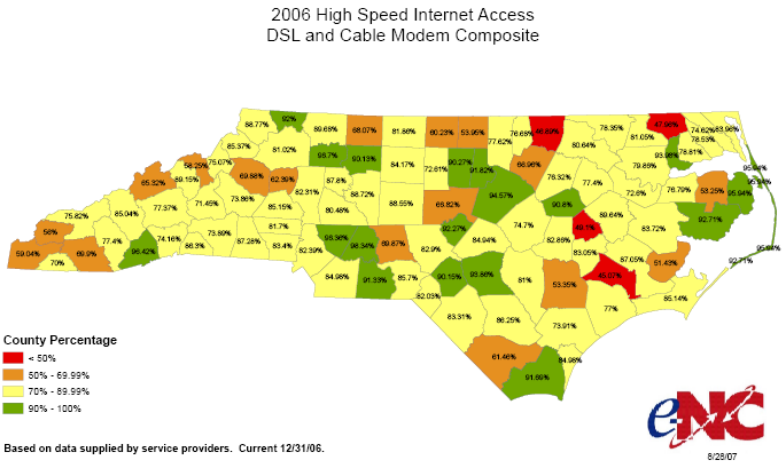

Figure 5. Map of Broadband Internet Availability throughout North Carolina[60]

3.3 Kentucky: ConnectKentucky

Connected Nation, Inc. has collaborated with Kentucky to develop the effective ConnectKentucky model. The program acts as a partnership between the public and private sectors, allowing them to work together to promote broadband accessibility. Additional focuses include research, public relations, recruiting, and mapping out the supply of broadband Internet access.[61] At the same time, local leaders form "eCommunity Leadership Teams" work with their community to assess potential demand and price sensitivity.[62,63] As a result of these steps, businesses know which areas are underserved and where the potential customers are located. ConnectKentucky has acquired funds through both the state and the federal governments and has also gathered over $500 million in private investments.[64]

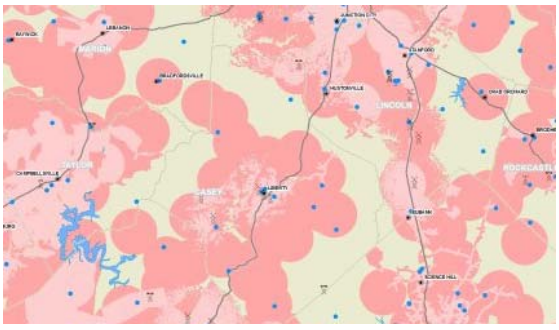

Figure 6. A Selected Portion from the "Broadband Service Inventory for the Commonwealth of Kentucky." The pink circles denote broadband availability, and the blue dots represent water tanks.[65]

Kentucky has been named number one in the nation "for expanding broadband." From 2001 to 2004, broadband availability increased from 60 to 94 percent.[66,67] Due to Kentucky's success, Tennessee is currently replicating the ConnectKentucky model.[68]

4. NEARBY STATES

Both Vermont and Maine have recently created statewide advocates to promote broadband Internet access. Their programs focus on granting financial incentives, gathering information, and supporting various efforts to improve broadband accessibility. Only time will tell how successful their programs are.

4.1 Vermont: Establishing Contacts and Sponsoring Innovation

Vermont established the Vermont Telecommunications Authority in June 2007 to support the development of broadband and wireless infrastructure throughout the state, particularly in unserved and underserved areas. Specific goals include universal access to affordable broadband services by 2010, such as voice and high-speed data delivery; investment in telecommunications infrastructure in the state which will support the best available economically feasible service capabilities, up-to-date telecommunications and broadband infrastructure in all areas of the state; and efficient use of both public and private resources through state policies by encouraging the development of open access telecommunications infrastructure that can be shared by multiple service providers.[69]

Although the Authority was recently created and currently has no staff to assist its volunteer Board, it has made such progress as "establishing contacts in Maine, Kentucky, and New York that are pursuing similar initiatives" and "consulting with" such private sector companies as Verizon, FairPoint, Comcast, and wireless Internet service providers.[70] Currently the Authority is advertising its Broadband Grant Program, seeking applicants "to create demonstration projects to test viable models for providing broadband to all Vermonters."[71]

4.2 Maine: Gathering Information and Using a Surcharge to Fund Underserved Areas

The State of Maine established the ConnectME Authority in May 2007. The ConnectME Authority serves to promote the development, financing, education, and deployment of broadband and wireless throughout the state. It also works to collect and disseminate pertinent communications information. A priority for the Authority is to promote broadband access in unserved and underserved areas.[72]

The ConnectME Authority imposes a 0.25 percent surcharge for revenue collected on all instate communications services.[73] There is a $500,000 grant in place reserved for underserved areas that demonstrate need. The ConnectME Authority can make loans and grants to any other responsible entity or group determined by the Authority to be capable of installing, using, and managing advanced communications technology infrastructure in the area.[74]

5. BEYOND STATE LEVEL

Rather than confining collaboration to within a single state, states also have options to work with their neighbors or even the federal government.

5.1 Multi-State Partnerships

Public-private partnerships among entire regions have the potential to unite nearby states. These states can collaborate to address their shared problems with shared solutions. At the same time, these partnerships share some of the burdens that the participating regions would normally face. The Wireless LINC initiative provides broadband wireless Internet access to New Hampshire's North Country and Vermont's Northeastern Kingdom. The SMART Organization secures federal funding, congressional representation, and contacts from the public and private sectors for Delaware, Maryland, New Jersey, and Pennsylvania.

5.1.1 Wireless LINC: New Hampshire's North Country and Vermont's Northeastern Kingdom

NH-based non-profits Northern Community Investment Corporation and Littleton Industrial Development Corporation have implemented Wireless LINC, a Regional Service Provider providing wide-scale wireless Internet throughout a six-county, 6,000 square mile region.[75] This region spans throughout New Hampshire's North Country (Carroll, Coos, and Grafton Counties) and Vermont's Northeastern Kingdom (Caledonia, Essex, and Orleans Counties).[76] It is currently undergoing a 2008 pilot program throughout the 400 square mile region encompassing Dalton, Groveston, Jefferson, Lancaster, and Whitefield.[77] After the initial stage of testing ends in May 2008, the project will next expand into Littleton and Stratford. [78]

The $13 million project is financed through "a combination of grants, federal earmarks, and tax credits."[79] If the project's fundraising goes according to plan, it will cover the entire region in three years; however, as it gradually expands, its completed parts are expected to become financially self-sustaining.[80]

The Wireless LINC initiative's development has encountered several hurdles. Since the project encompasses two states, and in many cases the funding NCIC and LIDC seek applies to only one state or the other, they have had to deal with the varying fundraising climates in both states. In fulfilling its $13 million mission, it has raised $2.2 million out of $7 million in New Hampshire, but only $70,000 out of $6 million in Vermont. As opposed to dealing with just one state, the Wireless LINC project has had to deal with two states' logistics and political climates to seek appropriate funding.[81]

The project also had to address concerns coming from the private sector. When NCIC and LIDC first introduced the project, local wireless service providers (WISPs) were afraid they were "trying to put them [the WISPs] out of business" by taking away both current and future customers. NCIC and LIDC had to convince the WISPs that the WISPs would be making more money working on the Wireless LINC project than working on their own. So in light of initial concerns from local providers, the Wireless LINC team had to convince them that the providers would actually gain business as opposed to losing it.[82]

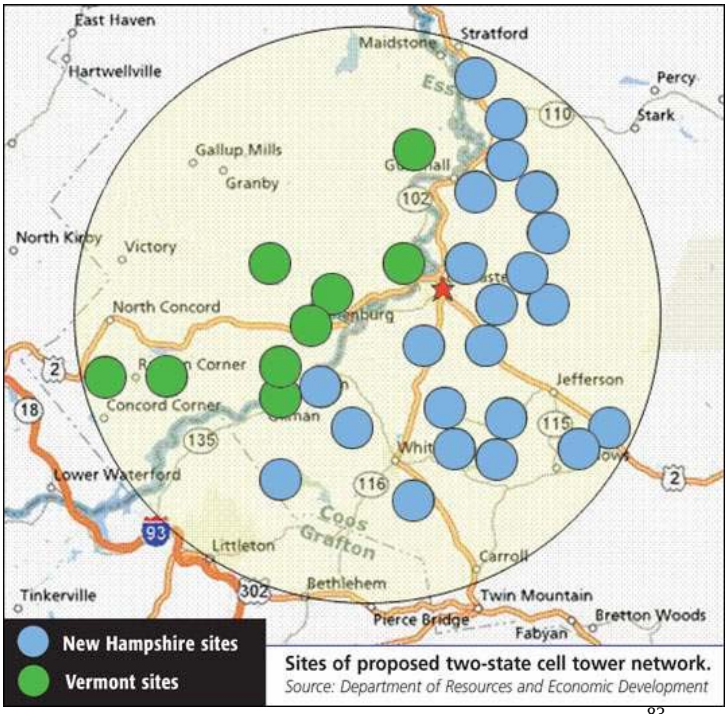

Figure 7. The Wireless LINC Initiative, Final Form[83]

Meanwhile, NCIC and LIDC had to sign "a memo of understanding with Fairpoint [Communications] to 'work jointly' to provide service in the region." Instead of competing to take away one another's business, they agreed to aggregate demand to buy infrastructure and to initially work in different regions. If in the long term, "one side is technologically disadvantaged, then the other should make an effort to take it over." As a result, NCIC and LIDC are working together with Fairpoint to aid an underserved region without putting each other out of business.[84]

5.1.2 SMART Organization: Delaware, Maryland, New Jersey, and Pennsylvania

The SMART (Strengthening the Mid-Atlantic Region for Tomorrow) Organization has utilized a regional partnership to "support R&D and technology based opportunities for economic growth" throughout Delaware, Maryland, New Jersey, and Pennsylvania.[85] Its Board of Directors consists of members from the public and private sector, while its congressional representation consists of all of the US Congress members from the four states.[86] SMART is attempting to pass "legislation to create the nation's first interstate, regional S&T [Science and Technology] Authority."[87] It also supports training and awareness programs throughout the four states. The SMART Organization has secured over $410 million in federal funding for the region.[88]

Figure 8. The Four SMART States: Delaware, Maryland, New Jersey, and Pennsylvania[89]

If SMART can "provide a collaborative model for other regions," then perhaps New Hampshire can adopt a similar model.[90] If several New England states (such as New Hampshire, Vermont, and Maine) all find themselves with similar connectivity issues, and each is pursuing statewide initiatives to improve broadband accessibility, New Englanders may work together to pursue common goals more effectively.

5.1.3 Connecting Appalachia Task Force: Currently Ohio

Rep. Zack Space (D-OH) has very recently created the Connecting Appalachia Broadband Task Force, which first met in July 2007. The Task Force's ultimate goal is to "[bring] broadband technology to everyone in rural Appalachia,"[91] and its representation consists of government officials, community leaders, and various telecommunications representatives. Although this group's representation is predominantly Ohio-based, the Task Force's mission suggests that it nevertheless has the potential to extend the partnership beyond Ohio to the remaining dozen states in the Appalachian region.

Figure 9. The Appalachian Region, Encompassing 13 States[92]

5.2 Funding

5.2.1 USDA: $75 Billion Nationwide, $728 Million to New Hampshire and Vermont

The US Department of Agriculture's Rural Development initiative provides funding in the form of loans and grants with the intent of fostering economic growth, enhanced education, healthcare and public safety services. "The Broadband Access Loan program [within the USDA] provides loans for funding the costs of construction, improvement, and acquisition of facilities to provide broadband service to eligible rural communities.

The Rural Development Community Connect Grant Program provides grants to applicants it deems eligible in areas that are currently underserved." Additionally, the Distance Learning and Telemedicine program brings "electronic educational resources to rural schools and [improves] health care delivery in rural America."[93] From 2001-2006, the program appropriated over $75 billion in grants and loans nationwide, with almost one percent of the total ($728 million combined) going to New Hampshire and Vermont.[94]

5.2.2 HUD: $175 Billion Nationwide

The US Department of Housing and Urban Development's Office of Economic Development's Rural Housing and Economic Development (RHED) Program offers up to $400,000 per applicant to "[provide] for capacity building at the State and local level, for rural housing and economic development, and to support innovative housing and economic development activities in rural areas." From 1999 through 2005, RHED has appropriated over $175 billion in grants.[95] This may be pertinent to the economic development that broadband Internet access can provide.

6. POLICY RECOMMENDATIONS

Today, roughly 30 percent of New Hampshire citizens do not have broadband access to the Internet. By analyzing various state models, several trends emerge that suggest feasible ways to promote broadband Internet access: a statewide broadband advocate, an assessment of accessibility and demand, broadband demand aggregation, financial incentives, and collaboration.

6.1 Statewide Broadband Advocate

Most states that increased efforts to promote broadband access had some advocate promoting statewide broadband Internet access. (Utah's program only targeted participating cities, while Colorado and Washington just focused on government-owned areas.) This entity has been a government entity or a non-profit composed of representatives from the public and private sector. Nevertheless, this advocate has dealt with such tasks as research, public relations, funding, and fundraising.

Additionally, educating citizens about the potential of broadband Internet access can encourage broadband demand that may not exist initially. Although the Blacksburg, Virginia Electronic Village was a 1993 project that involved providing just dial-up Internet access throughout Montgomery County, Virginia, the lessons learned there can be applied to broadband usage as well:

> [t]he obstacle to increased expansion into the less affluent and less educated rural areas of the county is not the availability of computers (many homes already have one) or access to the network (local Internet access is already available), but education…. We believed in the 'field of dreams' model – if we built the network, users would come. We did build it, and they did not come. We had to begin educating them, one by one and group by group. Only when we did that did we begin to use significant use of the network.[96]

6.2 Assessment of Accessibility and Demand

Surveying New Hampshire's broadband environment would help focus expansion efforts, as such information for the state is currently unavailable. As demonstrated by the North Carolina and Kentucky cases, states are able to see who receives the service and who does not by working with regional service providers to map out the supply of broadband Internet access. After identifying these connectivity blind-spots, companies may have a greater incentive to seek out potential customers. North Carolina and Maine assess only the accessibility, but Kentucky utilizes its locally targeted eCommunity Leadership Teams to gauge the demand as well. By getting a better idea of both the current and potential demand in an area, Kentucky further encourages providers to extend services to underserved areas.

By knowing what is available and what is desired, New Hampshire can spur private development and get a better sense of where action may be needed and effective. Over time, the state could also keep track of the progress that results from broadband expansion efforts.

6.3 Demand Aggregation

Consolidating broadband buyer demand reduces costs. Through buying bandwidth in bulk, aggregated customers can save on broadband costs just as they do when buying goods wholesale. Providers are also better able to afford serving an area if they know that there are many customers willing to pay for broadband Internet access. Washington and Colorado are able to aggregate buyer demand when purchasing bandwidth for the public sector, while Utah's UTOPIA network and the Wireless LINC initiative work through public-private partnerships.

One caveat when aggregating demand is that the participating buyers who receive the lower costs do so at the expense of those who do not participate:

> State education and government networks disaggregate demand by taking some of a community's largest bandwidth customers out of the common (community) buying pool. The government customers get lower rates, which appears to save tax dollars, but this is done at the expense of the rest of the community, who in effect pay a use tax in the form of higher fees to support the private state network.

If demand aggregation does take place, combining individual users with larger customers, such as government networks, would allow lower costs for all parties involved.[97]

6.4 Financial Incentives

Traditional revenue-driven deployment of broadband infrastructure and services through private organizations is not able to meet the service requirements of many communities. For this reason, government-sponsored programs and incentives have the potential to assist in decreasing the gap in the digital divide between urban and rural communities.

States can always provide incentives to broadband carriers to provide those services. Additionally, state legislation may include laws, codes and policy guidelines that are meant to serve the interests of the state but impede telecommunication infrastructure development. Specific examples include franchise fees, pole attachment fees, taxes, licenses, and ownership controls.[98] States should remove these barriers and replace them with incentives, grants, and tax credits intended to spur development. All of the states examined except Washington utilized some form of financial incentive.

6.5 Collaboration

Collaboration on some level helps to provide access to underserved areas, such as between the public and private sectors, as well as amongst similar regions.

6.5.1 Collaboration between the Public and Private Sectors

If the private sector alone cannot provide services throughout a state, then government assistance can provide the boost needed to get the job done. States such as Kentucky, North Carolina, and Utah have worked side-by-side with private companies to consolidate information, amass private investment, and secure private funds. Private telecom companies will ultimately be responsible for the expansion of broadband access to rural areas. Thus, any government contracts, grants, and incentives should be available to multiple providers and should not unfairly undercut or exclude particular firms.

6.5.2 Collaboration amongst Similar Regions

This collaboration can extend beyond the intra-state level to the federal government through federal funding. A state can also cooperate with others in the region, just as the four SMART states have, the Connecting Appalachia Task Force could, and as northern New Hampshire recently has with northern Vermont through Wireless LINC. In addition to working with other New England states, New Hampshire may also work nationwide with similar regions that face similar problems.

6.6 Summary of Recommendations Present in Case Studies

Table 3 shows a summary of recommendations present in the case studies addressed in this paper, both for single-state and multi-state initiatives. While no one program exhibited all five recommendations, the programs that have been more successful in promoting statewide broadband access, such as Kentucky and North Carolina, exhibited more recommendations (four).

Table 4. Summary of Recommendations Present in Case Studies

	Statewide Advocate	Assessment	Demand Aggregation	Financial Incentives	Collaboration
Colorado			✓	✓	
Kentucky	✓	✓		✓	✓
Maine	✓	✓		✓	
N. Carolina	✓	✓		✓	✓
Utah			✓	✓	✓
Vermont	✓			✓	
Washington	✓		✓		✓
Connecting Appalachia Task Force (OH)					✓
SMART Organization (DE/MA/NJ/PA)	✓			✓	✓
Wireless LINC (NH/VT)			✓	✓	✓

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