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# The Digital Divide: Broadband Accessibility in Northern New Hampshire

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**The Digital Divide:  
Broadband Accessibility in  
Northern New Hampshire**

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Environmental and Resource Economics

Department of Natural Resources and The Environment

University of New Hampshire, 2013

**Broadband Accessibility in Northern New Hampshire**

## **Introduction**

One of the hallmarks of technological and economic development over recent years has been the spread of broadband accessibility throughout the United States. At the national level, over 68 percent of households are connected to broadband Internet (Exploring the Digital Nation). Comparatively, the State of New Hampshire exceeds this figure, with 84.73% of households subscribing to broadband Internet (UNH Carsey Institute). Recently, the State of New Hampshire has been paying special attention to broadband accessibility in its Northern region, with the distribution of households with such Internet access purportedly skewed throughout the state. Juxtaposed to the wealthy and technologically advanced southern portion of the state, the North Country Region of New Hampshire is noted for its rural landscape and lack of economic development as compared to the south. Due to its bucolic nature and terrain in addition to its position as more isolated than the rest of the state, prevailing wisdom has long suggested that there is less access to broadband Internet in Northern New Hampshire. To date, there is still a question regarding whether or not there is truly a digital divide in New Hampshire, and to what degree it exists. Furthermore, few reasons have been identified as the causes of such a discrepancy in the access to broadband connection thus far. This paper addresses the existence and severity of a digital divide in New Hampshire, provides socioeconomic rationale behind such suggestions and evaluates the ability to test for such a divide within the state.

## **Background**

The Federal Communications Committee (FCC) is the government entity responsible for defining what constitutes as broadband connection. The definition provided by the FCC is integral in understanding the notion of broadband access and its difference from other forms of Internet accessibility throughout the nation. The FCC defines broadband as Internet that: “allows users to access the Internet and Internet-related services at significantly higher speeds than those available through ‘dial-up’ Internet access services”(Getting Broadband). Depending on the type of broadband access, speeds of transmission, “may range from as low as 200 kilobits per second (kbps), or 200,000 bits per second, to 30 megabits per second (Mbps), or 30,000,000 bits per second. Some recent offerings even include 50 to 100 mbps” (Getting Broadband).

Though more expensive, broadband is much more desirable to the greater public due to its increased speed and benefits associated with a more efficient connection. As compared to conventional dial-up connectivity, which requires the usage, and blockage, of a phone-line, broadband “allows more content to be carried though the transmission ‘pipeline’” while simultaneously providing users with access to: “Streaming media, VoIP (Internet phone), gaming, and interactive services...which require the transfer of large amounts of data that may not be technically feasible with dial-up service...Broadband is always on...[and contributes to] less delay in transmission” (What is Broadband?). There are few limits to methods by which broadband can be obtained. In fact, broadband may be accessed by a number of different means, including: Digital Subscriber Line (DSL), cable modem, fiber, wireless, satellite and Broadband Over Power Lines (BPL).

Widespread broadband accessibility is an integral factor contributing to economic growth and development, especially in more rural areas throughout the nation. The advantages of broadband access in a given area are almost limitless, including the

provision of “access to a wide range of educational, cultural, and recreational opportunities and resources” (What is Broadband). With the growing importance of online learning, such as internet-based courses, electronically hosted journal content and open-source educational materials, broadband connection can serve an even larger function in rural communities. Historically, online educational materials and courses even through nationally accredited universities have ranged from no cost up to prices that are still less expensive than their classroom counterparts. In recent years, the University of New Hampshire has begun to push its online course offerings in order to expand its student base and cut down on the overhead costs associated with providing courses taught in person by a professor or lecturer. From the students’ perspective, the availability of online educational materials allows them to draw from a greater pool of resources, classes and content, while reducing the costs and travel time associated with commuting to schools. With the advent of online courses, individuals can be enrolled in courses from host schools anywhere in the world and complete them within their own timeframe, making secondary education an attainable and viable option for those who have broadband connection.

Another source of potentially groundbreaking benefits associated with broadband can be found in the field of e-medicine. Widespread, quick Internet access can easily facilitate the provision of medical care to rural and underserved populations “through remote diagnosis, treatment, monitoring and consultations with specialists” (What is Broadband?). In areas with very low population density, it is not economically feasible for doctors working in a more specialized field of medicine to build their practices. Instead, those skilled professionals must locate in larger towns and cities where they can ensure a larger patient base. For those in more remote areas such as Northern New

Hampshire, this could mean driving hours to see a doctor even multiple times per month, something not necessarily possible given limited income or time.

Telemedicine has been lauded in rural communities for its ability to improve healthcare quality and the perception of it, expand the variety of healthcare services, and recruit and retain qualified medical professionals. In addition to these benefits, telemedicine also contributes to the overall economic wellbeing of rural communities. A 2011 study of rural communities in the Midwestern portion of the United States showed that: “The economy of a rural community is impacted by the very presence of telemedicine: reduced travel lowers transportation costs and decreases missed time from work; the amount of lab and pharmacy work performed locally increases; and hospitals save from outsourcing telemedicine procedures versus having to pay an in-house specialist for the same work (Whitacre, 2011). Comparatively, geographical characteristics in the Southern Midwest are similar to Northern New Hampshire in that they are both very rural and isolated from amenities with low population densities. In both of these areas, key medical centers are located in more metropolitan areas, suggesting that the findings of Whitacre’s study may translate very easily to New Hampshire’s more rural areas. In his aforementioned study, Whitacre determined the presence of telemedicine to have an estimated economic impact ranging from \$20,000 to \$1,300,000 on rural communities (Whitacre, 2011). Currently there are a total of 35 hospitals in the State of New Hampshire. Most of these establishments are concentrated in the lower, more densely populated portion of the state with only 4 being located in the North Country/Upper Connecticut Valley. Given this large disparity in medical care access, Northern New Hampshire could in fact benefit greatly from the widespread availability of telemedicine via broadband access especially among its gentrifying population.

Of the survey respondents, 60 percent of those without Internet access were retired and that same group had an average age of 69 years. As these residents continue to age through the years of a post-retirement fixed income, their healthcare costs will only continue to grow and become a more significant burden on themselves, their families, and their communities. The growing popularity of telemedicine could potentially serve as the means by which these aging individuals can receive world-class medical care without having to worry about the time and expense necessary to travel to specialists in distant metropolitan areas. Additionally, with the availability of new medical treatments of varying complexity from doctors located throughout the nation, access to telemedicine can allow patients to consult with healthcare practitioners nationwide. These patients, especially ones with more advanced and terminal diseases, can therefore still continue to live in Northern New Hampshire without necessarily having to uproot and move for treatment or draw from their savings on travelling to and from doctors.

Benefits of broadband connection also extend to promotion of electronic commerce, job creation, and expanding access to markets within a community. The adoption of broadband technology enables firms in remote locations to interact with other businesses and individuals around the world in order to produce and market their goods and services. Specifically in the North Country of New Hampshire, businesses can take advantage of low property and tax expenses by locating in a more remote region of the state. It could be the case that expanding broadband infrastructure may draw tech-related industry to the North Country. In these areas, large corporations can buy large tracts of land at a low cost in order to build company campuses, while developers simultaneously build up the support infrastructure for the employees of such economic development. Should industry be attracted to less expensive areas in the Northern part of the state due

to their newfound ability to seamlessly connect to their consumers and input producers through broadband, the entire region could see a rise in standard of living. Even on a smaller scale, home-run businesses can see tremendous growth with broadband capabilities and the access to worldwide markets that it provides. Essentially any business that does not require consistent face-to-face interaction with customers or suppliers could theoretically run their business out of a small office space or their home given that they have the ability to subscribe to broadband Internet.

Other advantages associated with the adoption of broadband include the provision of communication services to those with disabilities, availability of telecommunication relay services that enable those living with a disability to communicate with those in a remote location more readily. For those with hearing, speaking and vision impairments that diminish one's ability to work, relay services may extend their ability to live in lower-cost areas such as Northern New Hampshire. Furthermore, the streamlining of interaction with government agencies and facilitation of public safety information through hosting of information online that can be accessed via broadband can further support individuals who are already living in and those who may be drawn to those remote areas which are served by broadband infrastructure (What is Broadband?).

In fact, for these reasons, broadband access is of such importance to the nation's wellbeing that the American Recovery and Reinvestment Act of 2009 dedicated \$7.2 billion in funding towards broadband initiatives (Broadband Opportunities for Rural America). Almost \$5 billion of these funds have been devoted to the Broadband Technology Opportunities Program (BTOP), which in part, aims to provide broadband access to unserved areas. In addition to funding for the BTOP, the Recovery Act also provided \$2.5 billion for the Broadband Initiatives Program, which was put in place to



expand the provision of broadband service in rural areas in order to facilitate economic development in regions that lack high-speed internet access (Broadband Opportunities for Rural America). Though the FCC is working to ensure that all Americans have adequate access to broadband capability, Northern New Hampshire has not been identified as a Key Target Area by the FCC's Building Rural Connectivity Outreach Program (Lands of Opportunity). Given that broadband connectivity has been linked to economic development and consumer welfare, the question remains whether or not there is a digital divide in New Hampshire and if so, why it exists.

### **Granite State Poll Data**

Survey data from the Granite State Poll was used to assess this reported discrepancy. The Granite State Poll is a survey administered each year by survey center within the University of New Hampshire's Carsey Institute. Random digit dialing of landlines and cell phones in the State of New Hampshire in conjunction with the last birthday method within a household is used in order to generate a random sample. Though there is no incentive to complete the survey, there is a 35% response rate among those called (Granite State Poll Background Information). In theory, any adult in a household with a cell phone or landline could be selected, leaving out only an estimated 2% of the population. It should be noted that for the purposes of this analysis, the survey does not do a sufficient job at including those with broadband access in the workplace, but not at home or those without cell phones and landlines. It also does not incorporate those who only use Internet via their cell phone connection. It is assumed that even given these possibilities, there should not be a significant skew in the survey response data. There may be an association between those who have broadband connection in their

homes and a landline to call for surveying, as often they are sold as a bundled deal by Internet Service Providers, but it is assumed that this should not account for a significant portion of the Northern New Hampshire population. Utilizing the FCC's definition of broadband, survey responses citing "satellite" connection are included among those who are considered to have broadband.

For the purpose of analyzing broadband access across New Hampshire, the state has been divided into six regions: North Country, Central/Lakes, Connecticut Valley, Massachusetts Border, Seacoast and the Manchester Area. The towns comprising each of these regions can be found in Appendix A. Interestingly, the state is stratified by income level, with the more wealthy regions clustered in the southern section of the state. Moving further north, population density continues to dwindle along with average income levels. Of the six regions, the North Country consistently stands out as the most rural and having residents of lower socioeconomic status than the other regions. The southernmost portion of the North Country region has Interstate Highway 93 intersecting it, which connects various parts of New Hampshire to Massachusetts and the state capital, Concord. With the exception of those few towns, the rest of the region has little highway access. With easy access to the Interstate Highway System, towns lining the I-93 corridor are denser in population than their northern counterparts. As population density increases, it stands to reason that Internet Service Providers have more of an incentive to establish the infrastructure necessary to maintain widespread broadband accessibility within a region given the ability to spread fixed costs among greater households. Given that telecommunication service access is so connected to highway proximity, logic tells us that within these broader regions, towns not within the I-93 corridor must be less served than those directly near the highway. These areas that may be underserved include all of

Coos County, which is not connected to I-93 and the Northeastern region of the state in the Connecticut River Valley. Without such highway access, there is less ease of cross-state and inter-state travel, making it less attractive for individuals to travel out of and live in Northern New Hampshire and for others to visit the region. Lower levels of economic development due to travel time barriers typically characterize areas with little highway access. Without a strong pull for residents, visitors and businesses, population density is sparse in the North Country and leaves Internet Service Providers with little incentive to expand their broadband infrastructure to these areas. Coverage maps support conventional wisdom indicating that portions of the North Country region do not have the infrastructure to allow individuals to connect to broadband, should they be inclined.

The following map displays broadband connectivity at community anchor institutions in relation to Interstate highways, which is thought to be associated with broadband access in homes throughout the state. There is a clear cluster of institutions with broadband access in the southern half of the state, with a gradual decrease in concentration of such institutions further north. Although lower density of institutions should be associated with a lower population density in the north, a smaller proportion of these institutions the north have broadband connectivity. Whether or not these institutions choose not to have connectivity is unsure, however it is assumed that institutions such as K-12 schools, libraries, governmental institutions, medical centers, public safety establishments, and other community institutions would subscribe to broadband should they have the option to.

NH Broadband Mapping & Planning Program:

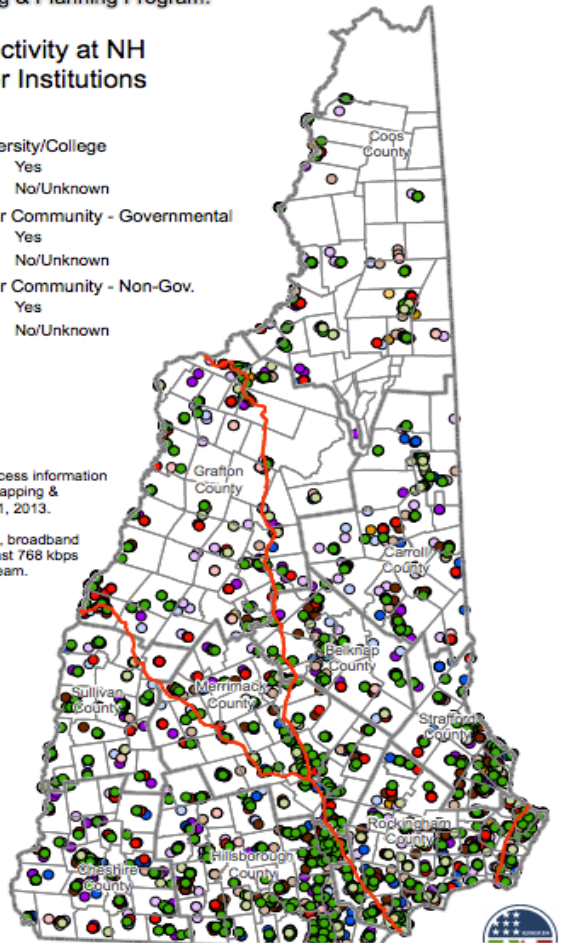
Broadband Connectivity at NH Community Anchor Institutions

- |                            |                                       |
|----------------------------|---------------------------------------|
| <b>K-12 School</b>         | <b>University/College</b>             |
| ● Yes                      | ● Yes                                 |
| ○ No/Unknown               | ○ No/Unknown                          |
| <b>Library</b>             | <b>Other Community - Governmental</b> |
| ● Yes                      | ● Yes                                 |
| ○ No/Unknown               | ○ No/Unknown                          |
| <b>Medical/Health Care</b> | <b>Other Community - Non-Gov.</b>     |
| ● Yes                      | ● Yes                                 |
| ○ No/Unknown               | ○ No/Unknown                          |
| <b>Public Safety</b>       |                                       |
| ● Yes                      |                                       |
| ○ No/Unknown               |                                       |

This map displays broadband access information reported to the NH Broadband Mapping & Planning Program as of March 31, 2013.

For the purposes of this program, broadband is defined as access that is at least 768 kbps downstream and 200 kbps upstream.

Please visit the NHBMPP web site:  
[www.nhroadbandnhi.org](http://www.nhroadbandnhi.org)



Source: Broadband Connectivity at NH Community Anchor Institutions.

## Results

The Granite State Poll Survey data show that 84.73% of the entire State of New Hampshire sample has broadband connection and 93.33% of the North Country has broadband connection, contrary to popular wisdom. Another region within the state that has a high degree of rurality and a low degree of broadband connection on published maps is the Connecticut River Valley Region. Still, survey data shows that 84.84% of the

Connecticut River Valley Region has broadband access, which surpasses the National and State level.

Fisher's Exact p-values have been computed for each applicable survey question in each distinguished region. This p-value is especially useful in situations where low sample sizes are expected and represent the probability that there is no difference in the characteristic in question between the state and the regional level. P-values represent the actual probability of the observed differences occurring if in fact there was no difference between the two categories. In this analysis, very few characteristics were found to have p-values of less than 0.05, so in order to more thoroughly investigate nuanced differences among regions a p-values cut off at 0.16 has been used to assess significance. In the North Country Region in particular, survey data show a statistically significant difference ( $p < 0.16$ ) in the type of internet connection that residents have, whether or not respondents check email at home, whether or not they watch online video at home, their employment status and their home value. As for the significance regarding type of Internet connection within the North Country sample, 93.33% of those with an Internet connection have broadband. This level of significance found is in fact evidence against the idea that the North Country has less broadband access than other regions in the state. Likewise, in the Connecticut River Valley, survey data show a statistically significant difference ( $p < 0.16$ ) in the number of people with Internet access, and home value. A full chart of calculated p-values is displayed below. Bolded numbers are those considered to be of significance in the study.

Tests for Independence: Fisher's Exact Values

<b>Region</b>	<b>Have Internet</b>	<b>Type of Connection</b>	<b>Check Email @ Home</b>	<b>Shop Online @ Home</b>	<b>Watch Online Video</b>	<b>Connect W/ VOIP</b>	<b>Connection Adequate</b>
North Country	0.771	<b>0.12</b>	<b>0.15</b>	0.655	<b>0.137</b>	0.952	0.728
Central NH/Lakes	0.862	0.203	<b>0.005</b>	<b>0.055</b>	0.207	<b>0.000</b>	<b>0.052</b>
CT Valley	<b>0.087</b>	0.527	0.648	0.269	0.580	0.381	0.114
Mass Border	0.294	0.257	0.289	0.327	0.826	<b>0.000</b>	0.735
Seacoast	0.409	0.830	0.180	0.623	1.000	0.572	1.000
Manchester Area	0.547	0.523	0.671	0.351	<b>0.129</b>	<b>0.129</b>	<b>0.128</b>

<b>Region</b>	<b>Education Level</b>	<b>Children Under 18</b>	<b>Adults in Household</b>	<b>Employ. Status</b>	<b>Home Value</b>	<b>Income</b>
North Country	0.385	0.786	0.702	<b>0.16</b>	<b>0.033</b>	0.837
Central NH/Lakes	0.483	0.554	0.830	0.327	Pr = 0.929	Pr = 0.850
CT Valley	0.655	0.929	0.243	0.767	<b>Pr = 0.120</b>	Pr = 0.305
Mass Border	0.857	0.313	0.847	0.942	Pr = 0.284	<b>Pr = 0.16</b>

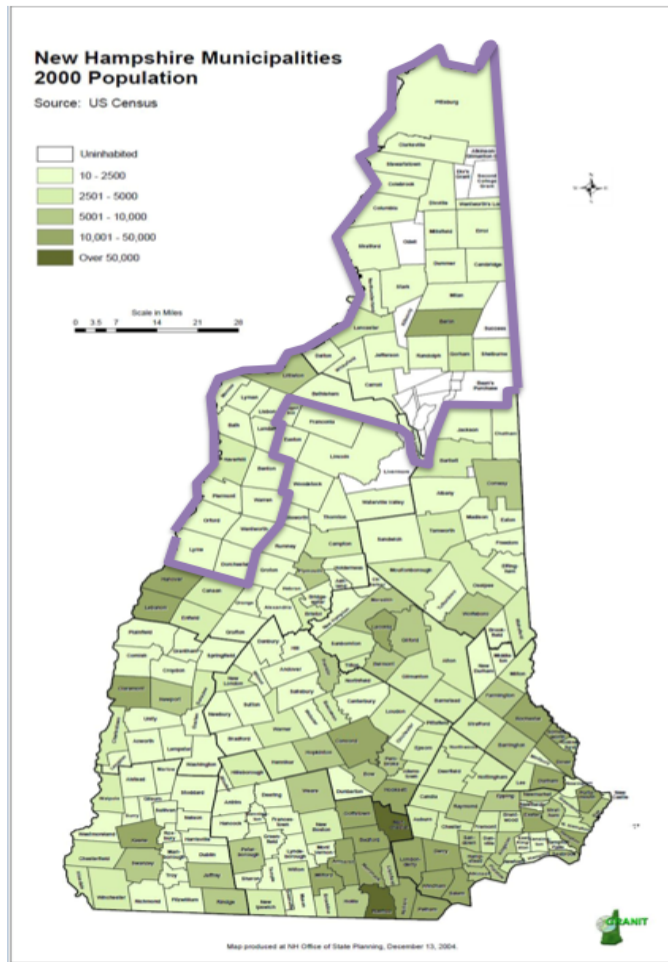
Seacoast	0.721	<b>0.020</b>	0.181	<b>0.049</b>	<b>Pr = 0.073</b>	Pr = 0.586
Manchester Area	<b>0.108</b>	0.337	0.284	0.515	Pr = 0.380	Pr = 0.195

It does seem interesting that the p-value of 0.087 was a result of the test for internet access in the Connecticut River Valley, meaning that statistically there are less people in the region with internet access than in the rest of the state. Still, although connectivity is lower in that region, of those with Internet access, almost 85% had broadband connection. This could simply be representative of the fact that less people choose to subscribe to Internet service. Should they wish to subscribe, the data show that for the most part they still have access to broadband. Unlike the North Country, the CT River Valley has a number of comparatively larger cities and a Dartmouth University, which require the infrastructure necessary to support widespread broadband accessibility.

For this reason, the question still stands to reason: why does the North Country sample have more broadband access than the CT River Valley and other Regional samples? This difference could very well be attributed to the nature of the sample. Although the sample was indeed random, it could just happen to be that the respondents in each region, and particularly the North Country, were located in areas with significant broadband infrastructure. More interestingly, these results could be due to the pre-defined regions that have been used for analysis. It could be that the differences in broadband availability do not necessarily follow the regional borders that have been assigned in Appendix A.

In order to capture the possible disparity in broadband access in the northern part of the state a Revised Northern Region has been created, with the towns that comprise it

listed in Appendix B. The towns that comprise the Revised Northern Region represent the most rural, remote and economically disadvantaged areas within the state that are thought to be most likely to have less broadband access. Barring one respondent to the survey, all respondents from towns lining the I-93 Corridor have Internet access, as suggested by their higher population figures and large amounts of infrastructure. An analysis of this sort, where the regions have been somewhat selected and reformulated to suit research questions may have little statistical reliability, and thus, the resulting inferences are considered to be anecdotal. This Revised Northern Region has been represented graphically in the picture below, outlined in purple overlaying a population density map.





By isolating the most rural regions, the lightest of those on the map, the Revised Northern Region can be used as a tool to look at broadband on a more specified region by creating a group with the population characteristics that would likely lack broadband access. This newer region is comprised of much smaller towns than those below it, is highly mountainous, and is partially separated from the state by unincorporated areas. Although Berlin is a highly populated town compared to the rest of the region, which may increase broadband accessibility, removing it from the region only takes out two observations. Additionally, Berlin shares the characteristics of being somewhat surrounded by unincorporated regions. Due to the small sample size of this Revised Region, those observations from Berlin have been left in so as not to leave the sample size for the new region too small. As compared to an 84.73 percent broadband connectivity level within the state and 93.33 percent connectivity in the original North Country Region, this redefined region has connectivity levels that exceed both of those figures at 95.2 percent of the area having broadband connection. Although that figure is has not been proven to be statistically significant, these results still contradict the conventional wisdom that the rural areas of Northern New Hampshire have a marked disadvantage in obtaining broadband Internet access in their homes.

### **Inferences and Conclusions**

Overall, the results of this investigation contradict the general sentiment that there is a digital divide in New Hampshire. These striking figures of the predefined North Country, Connecticut River Valley and Revised Northern Region having just as good, if not better, access to broadband Internet connection than those areas just south of it. These results could be interpreted in multiple different ways. At face value, these statistics and

survey figures indicate evidence that there is no digital divide. Despite a push among institutional figureheads and researchers, State and local representatives, and community members to fund broadband expansion initiatives, the numbers do not suggest such a cause would be economically necessary. It is true that in certain areas, such as the Connecticut River Valley, significantly fewer people subscribe to Internet services. Still, they have roughly equal access to broadband than does the rest of the state. It could be that many of these people, a greater proportion of whom are older and retired, do not care to subscribe to Internet. In this sense, the lower amount of subscriptions could have been largely misinterpreted as a lower availability of broadband connection in Northern Areas.

Another possible interpretation of this data is that a digital divide exists in the state, but it is much more nuanced than previously thought. While this investigation analyzed broadband access on a larger, regional basis, evidence for a true digital divide may have to be measured on a much smaller scale. Although regional data show there being no significant differences in broadband access, the story could be much different on a town by town or smaller than town locality scale. In researching this matter, it must be addressed that many aspects of the distribution of broadband accessibility are not influenced by jurisdictional divides. Additionally, the assignment of broadband franchise rights are granted by each town based on individual company bids. This limits consumers' choices in Internet Service Providers based on their location and shuts some companies that may be profitable, bringing down the cost of broadband provision and accessibility, out of a region due to not being assigned those rights. This is not such an issue for satellite, while wireless broadband is still dependent on tower coverage in more remote regions. Lastly, the Granite State Poll is not the ideal tool to measure statewide levels of broadband accessibility. Unfortunately, robust statistics could not be computed

for the Revised Northern Region due to such a small sample size. Likewise, if looking to analyze broadband access on a town-basis the same issues would result to a much larger degree. In order to better capture these less populated areas, it could be helpful to use a type of stratified random sampling that draws more respondents from the North of the State than simple random sampling would typically yield.

While these results do very well suggest the lack of a true digital divide, it is suggested for further research that a much bigger sample size be analyzed before any policymaking conclusions are drawn. At this point in time, Dr. Charlie French of the University of New Hampshire is in the process of preparing a policy brief on Broadband challenges and opportunities throughout the State of New Hampshire. This document is targeted at over 4,000 local, state and federal decision-makers and may greatly influence the future of broadband access and its implicated spending at all levels throughout the State of New Hampshire. In order to better inform future broadband policies affecting the State of New Hampshire, it is suggested that future studies have a much larger sample, categorize areas by rurality and terrain, not by jurisdiction, and employ the use of a stratified sample to greater target Northern Respondents.

Appendix A. Six-Region Town List

**NORTH COUNTRY**

Albany  
Alexandria  
Ashland  
Bartlett  
Berlin  
Bridgewater  
Bristol  
Brookfield  
Campton  
Carroll  
Chatham  
Clarksville  
Colebrook  
Columbia  
Conway  
Dalton  
Dummer  
Easton  
Eaton  
Effingham  
Ellsworth  
Errol  
Franconia  
Freedom  
Gorham  
Harts Location  
Hebron  
Holderness  
Jackson  
Jefferson  
Lancaster  
Lincoln  
Madison  
Milan  
Moultonborough  
Northumberland

Ossipee  
Pittsburg  
Plymouth  
Randolph  
Rumney  
Sandwich  
Shelburne  
Stark  
Stewartstown  
Stratford  
Tamworth  
Thornton  
Tuftonboro  
Wakefield  
Waterville Valley  
Whitefield  
Wolfeboro  
Woodstock

**CENTRAL / LAKES**

Andover  
Barnstead  
Belmont  
Boscawen  
Bow  
Bradford  
Canterbury  
Center Harbor  
Chichester  
Concord  
Danbury  
Deerfield  
Dunbarton  
Epsom  
Farmington  
Franklin  
Gilford

Gilmanton  
Henniker  
Hill  
Hopkinton  
Laconia  
Loudon  
Meredith  
Middleton  
Milton  
New Durham  
New Hampton  
New London  
Newbury  
Northfield  
Northwood  
Pembroke  
Pittsfield  
Salisbury  
Sanbornton  
Strafford  
Sutton  
Tilton  
Warner  
Webster  
Wilmot

**CONNECTICUT  
VALLEY**

Acworth  
Alstead  
Antrim  
Bath  
Benton  
Bethlehem  
Canaan  
Charlestown  
Chesterfield

Claremont  
Cornish  
Croydon  
Dorchester  
Dublin  
Enfield  
Fitzwilliam  
Gilsum  
Goshen  
Grafton  
Grantham  
Groton  
Hancock  
Hanover  
Harrisville  
Haverhill  
Hinsdale  
Jaffrey  
Keene  
Landaff  
Langdon  
Lebanon  
Lempster  
Lisbon  
Littleton  
Lyman  
Lyme  
Marlborough  
Marlow  
Monroe  
Nelson  
Newport  
Orange  
Orford  
Peterborough  
Piermont  
Plainfield  
Richmond  
Roxbury  
Springfield  
Stoddard  
Sugar Hill  
Sullivan  
Sunapee  
Surry  
Swanzey

Troy  
Unity  
Walpole  
Warren  
Washington  
Wentworth  
Westmoreland  
Winchester

**MASS BORDER**

Amherst  
Atkinson  
Brentwood  
Brookline  
Danville  
Derry  
East Kingston  
Greenville  
Hampstead  
Hollis  
Hudson  
Kensington  
Kingston  
Litchfield  
Londonderry  
Mason  
Merrimack  
Milford  
Nashua  
New Ipswich  
Newton  
Pelham  
Plaistow  
Rindge  
Salem  
Sandown  
Sharon  
South Hampton  
Temple  
Wilton  
Windham

**SEACOAST**

Barrington  
Dover

Durham  
Epping  
Exeter  
Greenland  
Hampton  
Hampton Falls  
Lee  
Madbury  
New Castle  
Newfields  
Newington  
Newmarket  
North Hampton  
Nottingham  
Portsmouth  
Rochester  
Rollinsford  
Rye  
Seabrook  
Somersworth  
Stratham

**MANCHESTER  
AREA**

Allenstown  
Auburn  
Bedford  
Bennington  
Candia  
Chester  
Deering  
Francestown  
Fremont  
Goffstown  
Greenfield  
Hillsborough  
Hooksett  
Lyndeborough  
Manchester  
Mont Vernon  
New Boston  
Raymond  
Weare  
Windsor

Appendix B. Revised Northern Region Town List

Pittsburg	Cambridge	Monroe
Clarksville	Milan	Lyman
Stewartstown	Lancaster	Lisbon
Wentworth's location	Kilkenny	Landaff
Dixville	Berlin	Haverhill
Colebrook	Success	Benton
Columbia	Dalton	Piermont
Stratford	Whitefield	Warren
Odell	Jefferson	Orford
Millsfield	Randolph	Wentworth
Errol	Gorham	Lyme
Northumberland	Shelburne	Dorchester
Stark	Littleton	
Dummer	Bethlehem	
	Carroll	

## References

- "Broadband Connectivity at NH Community Anchor Institutions."  
"IWantBroadbandNH.org. New Hampshire Broadband Mapping and Planning Program, n.d. Web. 29 Apr. 2013.
- "Broadband Opportunities for Rural America." *FCC: Broadband for Rural America: Recovery Act Funding*. Federal Communications Commission, n.d. Web. 29 Apr. 2013.
- "Exploring the Digital Nation - Computer and Internet Use at Home." *Esa.gov*. United States Department of Commerce, 08 Nov. 2011. Web. 12 May 2013.
- "Getting Broadband." *FCC.gov*. Federal Communications Commission, n.d. Web. 29 Apr. 2013.
- "Granite State Poll Background Information." Message to Stephen Canale and Andrew Smith. 22 Apr. 2013. E-mail.
- "Lands of Opportunity: Bringing Telecommunications Services to Rural Communities." *FCC.gov*. Federal Communications Commission, n.d. Web. 29 Apr. 2013.
- UNH Carsey Institute, Granite State Poll, 2012.
- "What Is Broadband?" *Broadband.gov*. Federal Communications Commission, n.d. Web. 29 Apr. 2013.
- Whitacre, Brian E. "Estimating the Economic Impact of Telemedicine in a Rural Community." *Agricultural and Resource Economics Overview* 40.2 (2011): 172-83. Print.