The State of New Hampshire

Department of Resources and Economic Development (DRED)
&
The Telecommunications Advisory Board (TAB)

State of New Hampshire
Broadband Action Plan

June 30, 2008

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Executive Summary

For the fifth year in a row the State of New Hampshire was ranked the most livable State in the country according to an annual survey of all 50 states done by CQ Press. The State boasts a top ten ranking in per capita income as well as a top five ranking for computer ownership and Internet access. New Hampshire has consistently outperformed its neighbors economically over the past five to ten years and remains one of the stronger economies in the northeast.

Not willing to stand still when its neighbors have aggressively been pursuing coordinated and centralized broadband policies, the State has worked to develop a statewide Broadband Action Plan. This plan was developed with input from over 350 broadband stakeholders in the State of New Hampshire representing a cross-section of businesses, broadband service providers, citizens, educators, healthcare professionals, and others. Broadband is a statewide issue with layers of complexity and numerous challenges and opportunities. New Hampshire has a tradition for innovation, entrepreneurship, and common sense frugality that was considered when developing this Broadband Action Plan.

This report was developed utilizing the results of:

- Five regional broadband forums open to the public that attracted approximately 200 participants;
- Several fact-finding interviews and meetings with key stakeholders throughout the State;
- Two broadband questionnaires that sought to capture input from both users and providers of broadband services in the State; and
- Research on five States (Kentucky, Maine, Maryland, Massachusetts, and Vermont) to provide perspective in comparison to New Hampshire's current broadband environment.

The report has sought to define how best to move the State forward to ensure that New Hampshire maintains and expands its leadership position on this issue. The synthesis of this highly collaborative process can be summarized by the contents of Section 5.0, which contains the Broadband Action Plan vision, goals, and action plan items.

As a result of completing this project, the State has identified twenty-five (25) broadband action items to be completed within the next three years. Five general findings are summarized as follows:

- In today's world, broadband is a critical infrastructure for both businesses and citizens. The challenge of ensuring that the State of New Hampshire's citizens and organizations have adequate levels of broadband to compete in the 21st century economy will require a consistent and sustainable framework that will include: evaluating best practices, encouraging public-private partnerships where necessary, and understanding both the supply (deployment challenges) and demand (usage of broadband to spur further deployment) dynamics in the State.
- The State is well positioned to compete in the New Economy. The State of New Hampshire when compared to its more rural neighbors fairs well in most indices with

regards to technology capacity, innovation, and digital communications. Overall the State is more comparable to its southern neighbor and other top ranking states.

- Leadership on broadband issues can be improved, however; there is not a lack of effort in the broadband issue. DRED, the State's Telecommunications Advisory Board (TAB), and others have worked hard to ensure that broadband is an issue that must be addressed in New Hampshire. To this end, the State needs to evaluate the feasibility of creating a centralized, leadership function to ensure that broadband initiatives and projects are well coordinated.
- State Government has opportunities to realize cost savings and improve operational efficiencies that could help alleviate some of the current budget challenges. These include, but are not limited to, an increased utilization of broadband technologies such as videoconferencing, and an opportunity to upgrade State communications technologies.
- Goodwill has been created through this process that should be leveraged and maximized going forward. In conducting this effort the Department of Resources and Economic Development ("DRED") and its representatives have met with and heard from over 350 people representing citizens, businesses, broadband providers, local and state government, and non-profits from healthcare, education, and other fields.

The following table provides an overview of the 25 action items, which are outlined in detail in section five of this report. Each action item has a corresponding recommendation, a category identifying the type of broadband issue, the responsible party(s) identified to move the action item forward, and the planned timeframe to address each action item, which is described in more detail in Section 5.2.

#	Action Item	Category	TAB Subcommittee	Priority
1	Develop an independent function to provide leadership and coordination of broadband initiatives in the State of New Hampshire.	Legislative	Legislative Subcommittee	Critical
2	Streamline the wireless facility siting process.	Government & Regulatory	Government Subcommittee	Critical
3	Remove barriers to State rights of way (ROW) access.	Government & Supply	Supply Subcommittee	Critical
4	Identify new financial resources to support broadband initiatives.	Government & Supply	Supply Subcommittee	Critical
5	Evaluate the feasibility of creating a broadband services fund.	Regulatory	Regulatory Subcommittee	Critical
6	Improve utility pole access.	Regulatory	Regulatory Subcommittee	Critical
7	Provide incentives for last mile deployment in unserved and underserved areas.	Government & Legislative	Legislative Subcommittee	Critical
8	Leverage existing resources to support the Broadband Action Plan.	Demand	Demand Subcommittee	High
9	Develop model permitting standards collaboratively with local government.	Government & Supply	Supply Subcommittee	High
10	Engage regional planning commission's to collect	Government &	Supply	High

#	Action Item	Category	TAB Subcommittee	Priority
	data and coordinate broadband efforts.	Supply	Subcommittee	
11	Foster a cooperative relationship with broadband vendors.	Supply and Government	Supply Subcommittee	High
12	Restructure and Refocus the Telecommunications Advisory Board (TAB) through a Subcommittee Structure.	Legislative	Legislative Subcommittee	High
13	Partner with an appropriate Geographic Information Services (GIS) organization.	Supply	Supply Subcommittee	High
14	Take advantage of the State's location to identify new backhaul infrastructure.	All	Supply Subcommittee	High
15	Engage local government in developing and supporting broadband initiatives.	Government	Government Subcommittee	Medium
16	Evaluate State government opportunities.	Government	Government Subcommittee	Medium
17	Support efforts to provide all libraries, schools, and town halls with a broadband connection.	Government & Legislature	Government Subcommittee	Medium
18	Develop broadband and digital literacy awareness programs.	Demand	Demand Subcommittee	Medium
19	Monitor and continually seek ways to improve the State's national rankings for broadband.	Government	Government Subcommittee	Medium
20	Create a broadband website for users, providers, and researchers.	Government	Government Subcommittee	Medium
21	Re-examine the High Speed Heroes project completed in July 2007.	Demand	Demand Subcommittee	Medium
22	Align Broadband Initiatives with the Governor's Smart Growth Policy.	Government	Government Subcommittee	Medium
23	Provide annual regional forums for citizen input of, and feedback on broadband initiatives, utilizing the methodology used for this project.	Government & Demand	Demand Subcommittee	Medium
24	Evaluate the feasibility of implementing a school laptop and computer recycling initiatives for at least some portions of the State of New Hampshire. .	Demand	Demand Subcommittee	Medium
25	Measure the success of BAP recommendations through an annual (or semi-annual) survey.	Government	BAP Steering Committee	Medium

Table 1: Summary of Broadband Action Plan Action Items

The State of New Hampshire has taken the first step to develop a Broadband Action Plan to move the State forward. Having a defined process by which to carry the Action Items of this report forward and assigning ownership for their completion will be essential for the success of this plan.

In the short term, DRED and the TAB are the rightful owners of this document with leadership being provided by the BAP Steering Committee and the TAB Subcommittees to ensure that forward momentum is maintained. The BAP Steering Committee should provide, at a minimum, quarterly updates on the progress of the Broadband Action Plan to the Governor's office to begin carrying out activities identified in this Broadband Action Plan.

The State of New Hampshire Broadband Action Plan is divided into five sections. Section one provides an introduction to the process and methodology used to develop this report. Section two provides the reader with an overview of how broadband is defined generally and presents new definitions for broadband that were released in March 2008. Section three examines what other nations and what other select states have done to address the challenges of broadband access and affordability. The section ends with a state matrix that compares NH to five other states that were researched. Section four shares the results of two questionnaires that were developed and implemented as part of this process for information gathering, details a sample of relevant broadband initiatives already underway in New Hampshire and concludes with a summary of the current broadband environment in the State based upon the findings and research that were conducted for this effort. The final section (five) builds upon the information contained in the preceding sections and outlines a vision statement, goals, and broadband action items that have been developed as a result of this process.

1.0 Introduction

The State of New Hampshire, Department of Resources and Economic Development ("DRED"), Division of Economic Development ("DED") engaged Berry, Dunn, McNeil & Parker ("BDMP") to provide project management, research, and facilitation assistance to establish a Broadband Action Plan ("BAP") to help DRED with its efforts to increase the availability of affordable broadband services throughout the State of New Hampshire. BDMP worked closely and collaboratively with both DRED and the Telecommunication Advisory Board ("TAB") to establish a project plan, set objectives and priorities, and structure and develop this report. The following sections describe the project objectives, approach, and methodology for the work conducted to develop the State of New Hampshire Broadband Action Plan.

1.1 Project Objectives

The primary objective of this project was to develop a Broadband Action Plan for the State of New Hampshire that provides findings and recommendations to improve access to affordable broadband connectivity in all regions of the State. The Broadband Action Plan provides information regarding the importance of broadband, research on other state broadband policy and initiatives, and provides findings and recommendations to be used by DRED, the TAB, and the State of New Hampshire in policy and decision making.

BDMP, DRED, and the TAB set forth the following objectives for this project and the final report:

- Define critical terms and set appropriate expectations.
- Gain input from various project stakeholders representing government, industry, education, non-profits, broadband providers, and households.
- "Connect the dots" between the stakeholders, previous efforts, and current broadband initiatives.
- Identify practical, actionable recommendations that provide a framework to increase statewide broadband availability and affordability.
- Provide State policymakers with research and information that can be used in policy and decision making.

1.2 Project Approach and Methodology

BDMP worked collaboratively with the TAB and Michael Vlacich, Director of the Division of Economic Development, in the design of this project approach. BDMP conducted an initial planning meeting in November 2007, with Michael Vlacich and members of the TAB to review the project plan and refine dates and/or project tasks as appropriate. During this initial planning meeting, a Broadband Action Plan Steering Committee comprised of TAB members was established that would provide guidance over project scope, decision making, and provide continuous involvement and participation throughout the project.

This Broadband Action Plan Steering Committee was comprised of the following TAB members in addition to Mr. Vlacich:

- *Ted Jastrzembski, Chair of the BAP Steering Committee, former CEO of Tally Systems*
- *Kate Bailey, Director of Telecommunications, NH Public Utilities Commission*
- *Art Durette, Chief Deputy Sheriff, Hillsborough County*
- *Chris K. Hodgdon, Director of Legislative Affairs, Comcast Corporation*
- *Martha S. McLeod, Executive Director, North Country Health Consortium, Inc. & State Representative, Grafton, District II*
- *Brian Shepperd, Director of Engineering and Information Technology, New Hampshire Public Television*
- *William Stafford, Chief Operation Officer, Granite State Telephone, Inc.*
- *Lisa Thorne, Director of Economic Development, Verizon*

In addition, Josie Gage from the Telecommunications Division of the New Hampshire Public Utilities Commission ("NH PUC") participated throughout the project, providing research and input into broadband-related topics. She regularly attended Steering Committee conference calls and planning meetings during the course of the project.

Previously completed studies and efforts regarding broadband analysis in the State of New Hampshire were utilized and leveraged during the course of the project. BDMP requested relevant reports, studies, and background data, and met with several of the primary authors of previous reports (including Tom Towle, Stu Arnett, and Greg Franklin).

A project kick-off meeting was conducted in December 2007, with the full TAB group to present the project approach, answer questions, and discuss any issues that may impact the nature or timing of the project. Following the meeting, the project plan was updated and approved by DRED.

Project activities included conducting broadband policy research for five states, and a review of national and international broadband studies and policies. Five regional public forums facilitated by BDMP were held in different geographic areas of New Hampshire. In addition, two broadband provider meetings were held and a web-based questionnaire for users of broadband was posted on the NH Economy site (www.nheconomy.com). Please see Appendix B for a full listing of the meetings and activities facilitated by BDMP with assistance from the Broadband Action Plan Steering Committee members.

Broadband Policy Research

As a part of this project, BDMP conducted policy research for five states including Kentucky, Maine, Maryland, Massachusetts, and Vermont, regarding their current or planned broadband initiatives. Other recent relevant state reports and initiatives were also considered during this process. Additional information on the state research can be found in Section 3.0 of this report.

Regional Meetings

Five public forum meetings were conducted to discuss project objectives and present initial state research regarding broadband. Forum participants and host location information is provided below.

Location	City	Host(s)	Approximate # of Attendees	Date of Forum
Keene Public Library	Keene	Mary Ann Kristiansen, Executive Director, Hannah Grimes Center	45	02/22/2008
Great Bay Community College	Portsmouth	Ginny Griffith Business Development Manager Greater Portsmouth Chamber of Commerce	30	02/29/2008
Lebanon City Hall	Lebanon	Ted Jastrzembski Former Chief Executive Officer Tally Systems Shannon Hastings-Fox Executive Assistant of City Manager City of Lebanon	40	03/03/2008
Plymouth State University	Plymouth	Senator Deborah R. Reynolds State Senator – District 2 New Hampshire State Senate Thad Guldbrandsen & Marsi Wisniewski The Center for Rural Partnerships Plymouth State University	50	03/07/2008
White Mountain Community College	Berlin	Katherine Eneguess & Gloria Tremblay White Mountains Community College	30	03/10/2008

Table 2: Regional Forums

The regional meetings were open to the public and included participation from citizens, businesses, healthcare providers, educational institutions, local governments, broadband providers, and other interested parties. Overall, approximately 200 participants attended the regional forums and participated in the discussions.

Many of the ideas and opinions shared during the facilitated forums were captured and considered in the development of this report. The forums included facilitated work sessions addressing the following topics:

- *Framing the Issue of Broadband* – the audience was asked to provide input and feedback on what broadband was to them, both from a technical (e.g., speed, technology, reliability, etc.) and public policy perspective (e.g., is it critical infrastructure or a premium service).

- *Understanding Broadband Initiatives* – the audience was asked to indicate whether they were part of or had knowledge of any current broadband initiatives in their area. Identifying current initiatives was important to support the project's goal of "connecting the dots". When representatives from a local initiative were present, they were asked to describe their effort, along with their goals, objectives, and challenges. Descriptions of the local initiatives discussed during the regional forums can be found in Appendix C.

- *Considerations for the Broadband Action Plan* – the audience was asked for any additional feedback to be considered in the development of the Broadband Action Plan. During this session BDMP uncovered areas of frustration by end users, barriers for local broadband initiative success, ideas for what role the State of New Hampshire should play in broadband deployment, and other helpful ideas. The feedback received in this session was utilized during the development of this report.

In addition, three of the five forums included a short presentation from a guest speaker who is active in the local broadband discussion or local business community. This provided a local flavor and a more regional "connection" to the forums by discussing either broadband initiatives currently going on in the area, or connections to the local business community.

Project Questionnaire

BDMP and the Project Steering Committee developed and issued a web-based questionnaire for broadband users. The questionnaire covered various topics related to broadband usage, availability and affordability, and what role the State should play in broadband policy. The questionnaire was posted on the DRED website from March through the beginning of April and received 155 responses. The results of this questionnaire are referenced throughout this report and a summary of the overall questionnaire response can be found in Appendix D.

Vendor Questionnaire

BDMP and the Project Steering Committee also developed and issued a questionnaire for broadband providers. The questionnaire focused on why areas of New Hampshire remain underserved or unserved, why providers have not expanded their services into these underserved/unserved areas, what barriers exist for broadband expansion, and what role the State could play in helping providers expand into these underserved/unserved areas. The information provided in the questionnaire responses was considered in the development of this report. Specific vendor responses have not been shared in an effort to provide vendors with greater openness in responding to the questions.

Meetings with State Government and State Agencies

A meeting was held with the Governor's Jobs Cabinet on January 25, 2008, to present the project approach and objectives and inform them of DRED, TAB, and BDMP's combined effort. A meeting also took place with the NH Telecommunications Oversight Committee on March 25, 2008, to describe the project and objectives of the Broadband Action Plan, and to answer any questions that the committee had for us, as well as listen to the Committee's feedback and suggestions on what should be included in the plan.

A meeting was held with representatives of State agencies on March 25, 2008, to make them aware of the effort, and to gain their insight into how the different agencies could play a role in the development of the report and the execution of our recommendations. In addition, getting multiple agencies together to discuss the topic of broadband allowed for some open discussion and collaboration between the agencies and sharing of lessons learned in past initiatives, and opportunities for collaboration for future initiatives. The following agencies participated:

- Department of Transportation
- Office of Energy and Planning
- Department of Safety
- Office of the Governor
- Department of Health and Human Services
- Department of Administrative Services
- Office of Information Technology
- Department of Resources and Economic Development
- Public Utilities Commission

Develop State Broadband Action Plan

Using the information gained from the regional forums, input from broadband users and vendor questionnaires, state research, and a review of existing documentation, the Broadband Action Plan was developed and organized as follows:

Executive Summary – This section provides a high-level overview of the State's broadband and wireless communications environment and key findings and recommendations.

Project Overview – This section describes the methodology that BDMP undertook to conduct this project and gather information used to formulate the Action Plan.

Research and Best Practices – This section provides an overview of the state research conducted on the broadband policy, legislature, and initiatives of Kentucky, Maryland, Maine, Massachusetts, and Vermont. It also compares New Hampshire to those five states, as well as other pertinent research.

Broadband Action Items and Recommendations – This section includes findings and recommendations for the Plan.

2.0 Understanding Broadband

An important step in developing a Broadband Action Plan was to indentify an agreed upon understanding of the term "broadband". During the regional forums, this question was discussed with the participants as to what broadband meant to them, both from a technical (e.g., speed, technology, latency, etc.) and a public policy (e.g., critical infrastructure vs. premium service) perspective. During the state research, the manner in which other states have defined the term broadband was examined. In addition, other studies on broadband from other states, academic institutions, non-profit entities, and the federal government were considered. Finally, New Hampshire broadband providers were asked how they defined broadband in the provider questionnaire.

2.1 What is Broadband?

The word broadband has become a very popular term for people to use. Many policies, political positions, authorities, and initiatives have been initiated to address the need to deliver affordable broadband to consumers, business, healthcare, education, and other organizations. The challenge is that the term is used frequently, but it does not have a universal definition. Broadband does not necessarily mean the same thing to all people.

For example, broadband according to the Computer Desktop Encyclopedia, published by the Computer Language Company, is defined as follows:

> Broadband commonly refers to Internet access via cable and DSL, which is as much as 400 times faster than analog dial-up. The term has always referred to a higher-speed connection, but the speed threshold varies with the times. Widely deployed in companies, the 1.5 Mbps T1 line was often considered the starting point for broadband speeds, while the FCC defines broadband as a minimum upload speed of 200 Kbps. Basic dial-up Internet access is not broadband and typically does not exceed 56 Kbps.

While this is one definition, there are many other organizations who have defined broadband in different terms including; the Federal Communication Commission (FCC), State Governments, broadband entities, non-profit organizations, and educational institutions.

Many states have been actively working on addressing the issue of broadband availability and affordability through initiatives, public authorities, and policy making. Five states were researched (see Section 3.0 for more details): Kentucky, Maine, Maryland, Massachusetts, and Vermont. Appendix F is an excerpt from the final report issued by the California Broadband Task Force and outlines their working definition for defining broadband. The following table summarizes how each of the five states currently defines broadband:

State Name	State definition of broadband
Kentucky	Uses the original FCC definition of 200 kbps in one direction.
Maine	The ConnectME Authority has a definition of 500 kbps.
Maryland	Not clearly defined.
Massachusetts	A connection that can deliver 1 Mbps download speed, and does include satellite.
Vermont	The Vermont Telecommunications Authority ("VTA") has set a goal of having broadband speeds of 1.5 Mbps by 2010.[1]

Table 3: State Broadband Definitions

On the federal level the FCC is the entity that has defined broadband and collected data on broadband availability. On March 19, 2008, the FCC announced new definitions for broadband. This update reflects recognition that the FCC's previous definition had become outdated and that broadband is an important issue to the U.S. economy. Information on broadband availability and affordability that was based on the previous FCC definition will need to be updated. Below is the general, previous, and current FCC definitions for broadband.

The general FCC definition for broadband is as follows:

> The term "broadband" refers to advanced communications systems capable of providing high-speed transmission of services such as data, voice, and video over the Internet and other networks. Transmission is provided by a wide range of technologies, including digital subscriber line and fiber optic cable, coaxial cable, wireless technology, and satellite. Broadband platforms make possible the convergence of voice, video, and data services onto a single network.[2]

The reader can find additional information on all of the technologies listed in the paragraph above by referring to Appendix A – Glossary of Terms. An important aspect of this general definition is that it does not focus on a fixed speed but rather on the services that can be utilized through the use of broadband; voice, video, and data services on a single network. Focusing on the usage and application drivers for broadband is something that New Hampshire should consider as the State defines broadband and looks to address issues of availability and affordability.

The FCC previously used (until March 19, 2008) the following definition for broadband speed:

> Broadband or high-speed Internet access allows users to access the Internet and Internet-related services at significantly higher speeds than those available through "dial-up" Internet access services. The Federal Communications Commission (FCC) generally defines broadband service as data transmission speeds exceeding 200 kilobits per second (Kbps), or 200,000 bits per second, in at least one direction:

[1] Vermont Telecommunications Authority Glossary of Terms, http://www.telecomvt.org/glossary.php
[2] http://www.fcc.gov/broadband/

downstream (from the Internet to your computer) or upstream (from your computer to the Internet).[3]

The former FCC definition for broadband speed has long been criticized as outdated and ineffective in today's Internet economy and environment. Today's Internet usage includes email, Internet surfing, videoconferencing, file sharing, online collaboration, and an increase in both downloading and uploading of files. Services such as telehealth, distance learning and greater use of video and voice services have increased the demand for faster bandwidth speeds. This type of Internet usage has been adopted by businesses, educational institutions, and even presidential candidates as a method of fast and effective communication.

On March 19, 2008, the FCC addressed the previous definition of 200 kbps with new definitions for broadband speeds, and reinforced the need to identify where broadband services are, and are not, available in the U.S.

Below is the new FCC speed definitions for broadband[4]:

Tier	Bandwidth
1st Generation Data	200 kbps to 768 kbps
Basic Broadband Tier 1	768 kbps to 1.5 Mbps
Broadband Tier 2	1.5 Mbps to 3 Mbps
Broadband Tier 3	3 Mbps to 6 Mbps
Broadband Tier 4	6 Mbps to 10 Mbps
Broadband Tier 5	10 Mbps to 25 Mbps
Broadband Tier 6	25 Mbps to 100 Mbps
Broadband Tier 7	Greater than 100 Mbps

Table 4: New FCC Broadband Tiers

What is interesting is that instead of picking one speed to define broadband, the FCC instead selected a tiered structure that begins with basic broadband at 768 kbps, and scales to speeds greater than 100 Mbps. By selecting a tiered definition, it is less likely that it will become outdated as quickly as the previous 200 kbps definition did.

2.2 Why is Broadband Important?

The importance of broadband can be measured by the services, uses and applications that can be achieved by having access to broadband. Access to broadband not only has an economic development impact but also a quality of life impact for many people who have access to it.

Broadband can enable a small business to expand their offerings into e-commerce services such as online purchasing, web content, online video, file sharing, and online collaboration.

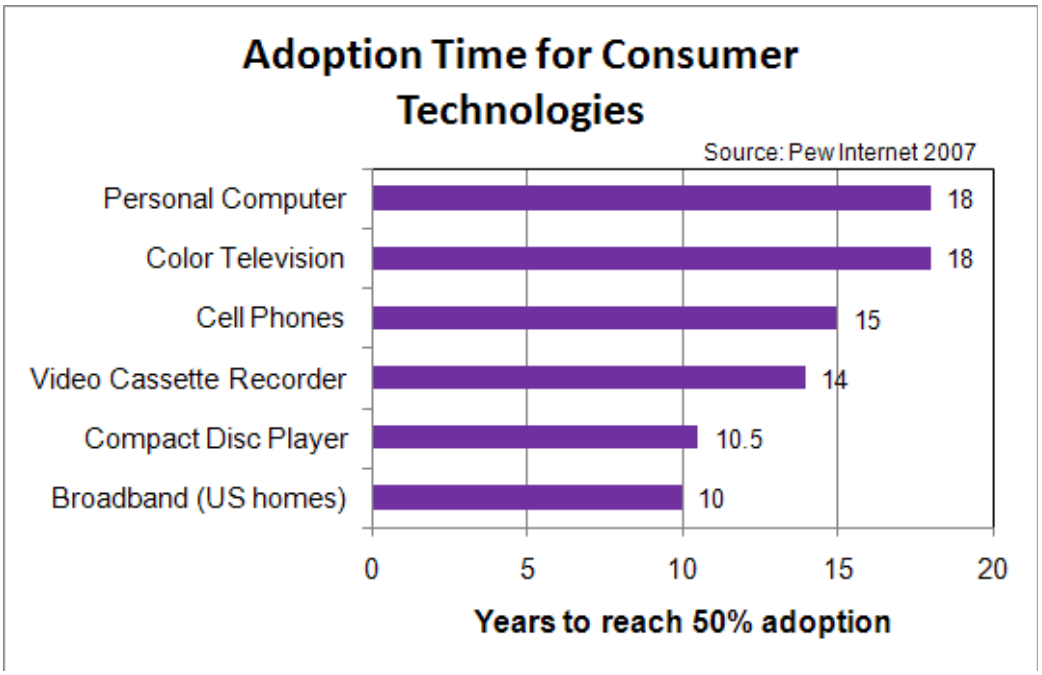
[3] http://www.fcc.gov/cgb/consumerfacts/highspeedinternet.html
[4] http://www.fcc.gov/WCB_031908_open_meeting_slides.pdf

Broadband can allow a school or college to participate in research studies that require access to large data sets, high resolution graphic images, or collaboration with contributors around the world. Broadband can allow a patient from a rural area to have remote access to a specialist that is not available in their town or allow a student to seek education in a subject not offered to them in their local school. Broadband closes the distance between people seeking a common goal, provides new and flexible options for economic development, and provides options to improve the quality of life. Broadband is important because it allows us to communicate, interact, do business, and use the services we desire in today's global economy. The following excerpts come from two widely read reports issued in 2007.

2007 New Economy Index:
Over computer networks, bandwidth measures the "size of the pipes" between the sender and receiver of data. Greater bandwidth allows faster transmission of larger amounts of data, which is critical for the increasing number of businesses that use the Internet to communicate with customers, suppliers, and other parts of the company. Broadband access for households is also important, not only allowing a state's residents to more robustly engage in ecommerce, but also enabling telecommuting, distance education, telemedicine, and a host of other applications that can boost productivity and quality of life.

Brookings Institute:
June 2007 report found that for every 1 percentage point increase in broadband penetration in a state, employment is projected to increase by 0.2–0.3% per year. For the entire U.S. private nonfarm economy, the study projected an increase of about 300,000 jobs, assuming the economy is not already at full employment.

In conclusion, broadband is a tool to improve productivity, quality of life and share information. It is also a commodity, and based on Pew Internet research, broadband is a hot commodity, reaching a 50% adoption rate faster than the following technologies:



2.3 How is Broadband Defined in this Action Plan?

A goal of this project was to provide a specific definition for broadband for this report based on what other state research and feedback received from questionnaires and forums. After researching how other states have defined it, hearing from stakeholders at the regional forums, and considering other best practices, it became evident that assigning a fixed number to define broadband as part of this report may be short sighted and not in the best interest of developing the Broadband Action Plan. Instead, the Broadband Action Plan Steering Committee decided to develop a framework for New Hampshire in this report rather than a strict definition and has set an objective in the recommendations section of this report to identify a more specific definition of broadband.

Based upon research, feedback from questionnaires and the regional forums, the framework for broadband should include the following characteristics:

- **Critical Infrastructure –** broadband must be viewed as critical infrastructure, not unlike roads, electricity or water.
- **Reliable –** broadband must be reliable and consistent. This is particularly important for economic development as businesses rely on web-based services.
- **Always On –** Unlike "dial-up" Internet access, broadband must be always on and provide sustainable bandwidth speeds for the end-user.
- **Based on Application Drivers –** the definition of broadband and broadband speed should be driven by the applications and services that will be used with it.
- **High-Speed –** broadband should be fast enough to allow end users to use the applications and services they need.
- **Latency –** broadband should have low latency.
- **Routinely Updated –** the definition of broadband should be routinely reviewed and updated according to the current demand and application usage. Having a static definition for broadband speed will not be effective.

3.0 Broadband Research and Comparative Analysis

The State of New Hampshire is not alone in seeking a comprehensive strategy for broadband initiatives, deployment, and affordability. As part of this Action Plan research was conducted into how other states have been addressing the topic of broadband, what initiatives have been started, studies performed, and organizations created to address this issue. After research and review with the Action Plan Steering Committee it was determined that the five states to be examined would be Kentucky, Maine, Maryland, Massachusetts, and Vermont. In addition, as a result of the work done in preparing for and delivering the broadband regional forums, it became apparent that there was a desire to examine other states that may have produced timely information and also to look at both general U.S. national policy and the U.S. rankings in broadband vis-à-vis other national broadband markets. This section includes information on the state of California, which released its comprehensive Broadband Task Force Report in January 2008.

The information in this section was developed upon several sources of information, including but not limited to:

1. Information available from each state's website and extensive telephone interviews with one or more broadband leaders from each of the five states using the 20 question matrix as an interview guide (see Table 6 at the end of this section);
2. Research included in the influential (and timely) white paper issued by EduCause titled: "A Blueprint for Big Broadband," written by John Windhausen, Jr.;
3. Research from the a report by the Massachusetts Institute of Technology (MIT) titled: "Broadband Metrics Best Practices: Review and Assessment," by William Lehr et al.;
4. "Framing a National Broadband Policy" by Dr. Robert Atkinson, CommLaw Conspectus Edition 16 (fall 2007) by Catholic University of America;
5. "The 2007 e-readiness rankings" published by the Economist Intelligence Unit;
6. Summary reviews of Kentucky, Maine, and Vermont initiatives conducted by Josie Gage a Telecom Analyst with the NH Public Utilities Commission in 2007; and
7. The experience and background knowledge of the BDMP team and others that contributed to this report.

3.1 International Perspective and National Policy

The United States is a global leader in information technology. IBM, Cisco, Intel and others provide international leadership in the field of information and communications technologies. Bell Labs and other research and development centers were the source of much of the digital innovation that has improved the quality of our lives, the productivity of our work, and the ability to access and collect information at rates that would have been unfathomable just a few decades ago. In the most recent Global Information Technology Report (2008) the U.S. ranked fourth in the world, this was up from seventh just a year ago. The U.S. has one of the most flexible and capable innovation economies in the world, is able to leverage deep capital markets, has access to a highly-educated workforce, and is home to most of the leading technology research facilities and universities in the world. One of the key drivers that connects these critical pieces of economic growth in the 21st century is a robust and diverse

communications infrastructure that allows for time and distances to be minimized so that collaboration and information sharing can take place regardless of location.

Although a leader in the networked economy, the U.S. has seen a consistent decline in its global broadband rankings over the past five years, based upon data from the Organization for Economic Cooperation and Development (OECD). Many broadband studies have indicated that the U.S. lacks a cohesive broadband strategy, and until the FCC statement issued on March 19, 2008, the U.S. has lacked the basic framework from which to create a national strategy. Recent policy studies, including but not limited to: *The Blueprint for Big Broadband; Framing a National Broadband Policy; and the Economic Impact of Stimulating Broadband Nationally,* have urged the U.S. government to adopt a national strategy for broadband because of the primary role of the federal government in regulating communications infrastructure, the global impact of the technology and the maturation of broadband into a critical infrastructure for business and citizen alike.

The following graph is taken from "Framing a National Broadband Policy" and shows U.S. broadband adoption versus other developed nations. For household penetration rates, Dr. Atkinson has converted OECD's April 2007 per capita penetration data using the average household size in each country.

Rank	Nation	Subscribers per Household	Average Speed (mbps)	Price per Month for 1 mbps of fastest service (USD PPP)	Overall Score
1	South Korea	0.9	45.6	0.45	15.73
2	Japan	0.52	61	0.27	14.99
3	Iceland	0.83	6	4.99	12.14
4	Finland	0.57	21.7	2.77	12.11
5	Netherlands	0.73	8.8	4.31	11.87
6	Sweden	0.49	18.2	0.63	11.54
7	France	0.49	17.6	1.64	11.41
8	Denmark	0.7	4.6	4.92	11.37
9	Norway	0.64	7.4	4.04	11.29
10	Canada	0.62	7.6	6.5	11.11
11	Belgium	0.54	6.2	6.69	10.6
12	United States	0.51	4.8	3.33	10.47

Table 5: 2007 OECD Household Broadband Table

According to the Economist report there are many examples of other countries developing both supply and demand type broadband initiatives. In Spain, the government has made available €6m (US$8m) in grants to organizations and focused on women and "vulnerable citizens", such as the elderly and disabled, with online services. In Austria, with 19% broadband density, the country is proactively bringing the elderly online: groups representing the interests of seniors can receive public funding to run their websites and train their members in Internet and computer use. Some 20,000 senior citizens are estimated to have been trained through various initiatives. The incumbent telecommunications carrier, Telekom Austria, and the Austrian Senior Citizen's Council have joined to launch an awareness initiative called "Seniorkom.at" to inform the wider population about the elderly digital divide.

Other international examples include:

- The government of Japan has ordered NTT (national carrier) to deploy fiber whether or not it shows a profit.
- In France, enforced unbundling rules have enabled one of the most competitive markets and new entrants are beginning to deploy fiber.
- In the UK, a Broadband Fund was created. The country has also adopted strict unbundling and wholesale/retail separation of British Telecom.
- Canada adopted a national broadband plan in 2001. The government decided to treat broadband as infrastructure. Canada has a more sparsely populated landmass and smaller economy per capita than the U.S., but it has consistently ranked higher on international broadband rankings. The country has funded three separate national programs:
    - National Satellite Initiative
    - Strategic Infrastructure Fund
    - Broadband for Rural and Northern Development (BRAND)

In 2004, President Bush declared that all U.S. citizens would have access to broadband by 2007. Arguably, that goal has been met if you assume satellite is a broadband technology, and using the old FCC metric for broadband data collection (one user per zip code), and based upon the old FCC definition of 200kbps. However, as more and more digital consumers expand their use of the Internet, and bandwidth intensive applications expand the utility of broadband, the need for more speed will become self-evident.

Again, according to research conducted by Dr. Robert Atkinson, the gap between urban and rural America, at least in terms of access to at least one broadband provider, appears to be closing. This is demonstrated by the data provided by the FCC regarding the number of broadband providers by zip code. The lower the population density, the fewer providers has remained a constant. According to his research, for the foreseeable future, business broadband will continue to be more important in fostering rural economic opportunity than is residential broadband. In terms of business location decisions, affordable high-speed broadband is almost as important as water and electricity, and the absence of broadband effectively makes the community a less attractive location for new or expanding businesses. This reality ultimately affects all locations.

Dr. Atkinson suggests that a broadband policy must work to ensure that all communities have reasonably-priced high-speed broadband for business because such a policy is likely to impact residential broadband as well. Finally, according to his research, exposure to broadband at work is one of the factors most directly responsible for encouraging people without broadband at home to subscribe.

3.2 State Broadband Strategies for Deployment and Adoption

In developing this research, BDMP developed a 15 question framework to examine broadband issues. These questions include, but are not limited to: *What is broadband?*; *Is there a lead agency for broadband initiatives in your state?; Does the state maintain a database and maps of existing broadband services?; Does the state offer broadband funding sources?; Does the state expedite rights of way policies?; Does the state provide digital literacy initiatives to promote broadband utilization?* A full summary matrix of the questions asked and State responses are included in Section 3.3.

3.2.1 Commonwealth of Kentucky

Kentucky was selected because it has been very active on the topic of broadband availability and adoption. Kentucky has been the focus of many state policymakers as they have touted the continued success and expansion of the ConnectKentucky model, which began in 2004. ConnectKentucky is the precursor to the current Connected Nation, a nonprofit 501(c)3 organization which has begun similar efforts to varying degrees in the states of Ohio, West Virginia, Tennessee, California, and South Carolina.

BDMP interviewed two sources on Kentucky's broadband initiatives. The first interview was conducted with Doug Robinson, NASCIO Executive Director and former deputy Director of Information Technology in the State of Kentucky when ConnectKentucky's broadband project was initiated in 2004. We also interviewed Laura Taylor, Chief Analyst and Raquel Noriega, Director of Strategic Partnerships, both with ConnectedNation, and familiar with the Kentucky project.

Kentucky has consistently ranked near the bottom on most national rankings for technology innovation and broadband access. However, in recent years a concerted effort has been made across state and local government, and in cooperation with the Kentucky legislature, to improve the state's standing on issues related to communications infrastructure and knowledge economy benchmarks.

The ConnectKentucky program was funded by a mix of state and federal funds (approximately 80%) and private funds from technology oriented companies (about 20%). Total funding for the project in its first three years (2005-2007) was approximately $7M and ConnectKentucky's operating budget is around $2 million per year, with a staff of about 8. In addition, the Connected Nation staff provides centralized back-end support for ConnectKentucky and the other states in which Connected Nation operates, particularly with regard to mapping, research, and administrative support.

The ConnectKentucky program established a broadband deployment and adoption plan that sought to leverage state, federal and private investments that would provide high-speed Internet access to all homes and businesses by the end of 2007 while improving technology adoption. ConnectKentucky has been able to gather information from the broadband providers in Kentucky, and has conducted detailed mapping of broadband availability in the state, which it updates through an interactive GIS map on the ConnectKentucky website every six months.

Another key component of the ConnectKentucky model was the creation of "e-community" teams in each of Kentucky's 120 counties to expand the knowledge and awareness of broadband capabilities (digital awareness) and to produce a local technology plan for each community. One of the key digital literacy initiatives that Kentucky has undertaken is a government computer distribution program, where ConnectKentucky works in partnership with state agencies and corporate donors to purchase and/or refurbish computers for distribution to low-income children and other disenfranchised populations. More than 2,000 computers have been distributed across the state through the No Child Left Offline program.

According to a recently published study by Connected Nation[5], ConnectKentucky's efforts have dramatically improved the deployment and adoption of broadband services in Kentucky. According to the ConnectKentucky broadband map, broadband availability has gone from 60% of households in 2004 to 95% of households at the end of 2007,

The Governor's Office of Local Development (GOLD) and the Kentucky Cabinet for Economic Development are the lead state agencies in coordinating broadband initiatives, and state funding for ConnectKentucky flows through these agencies. In addition, the Kentucky Infrastructure Authority (KIA) authorizing legislation was amended in 2006 to allow it to engage in broadband deployment projects, focusing on "unserved areas." The KIA is authorized to issue revenue bonds financed through the collection of a tax of no more than 2% of the gross amount of each water service or sewer service purchase. KIA then makes funds available through loans and or grants to governmental agencies within the state to be used for infrastructure development including broadband deployment.

3.2.2 State of Maine

Maine was selected for a number of reasons including its proximity to New Hampshire, similar population size, and the state's active role in developing new broadband initiatives in recent years. Also, Maine has some similar urban-rural conditions to New Hampshire. In 2006, Maine created the ConnectME Authority to expand broadband and cellular infrastructure throughout Maine. Finally, another key reason that we identified Maine was the pending completion of the sale of all Verizon landline assets to FairPoint, which encompassed Maine, Vermont, and New Hampshire.

Maine, similar to Kentucky, has ranked near the bottom on many national rankings for technology innovation and broadband access. However, in recent years a concerted effort

[5] Connected Nation, "The Economic Impact of Stimulating Broadband Nationally," February 2008. http://connectednation.org/economic_impact_study/.

has been made across state and local government to improve the state's standing on issues related to communications infrastructure and knowledge economy benchmarks. BDMP spoke with Phil Lindley, Executive Director of the ConnectME Authority twice in the course of collecting information. Currently the Executive Director has no support staff, but is able to utilize state resources, such as GIS expertise when needed.

In 2005 Governor Baldacci announced a goal of ensuring that 95–98% of Maine communities would have broadband access by 2010. The governor created the Broadband Access Infrastructure Board in May 2005. The initiative identified three tiers of broadband consumers—home, business, and enterprise and three major levels of infrastructure: the connectivity of "backbone" into the state; interregional connectivity from the network backbone to the various towns and cities; and intraregional connectivity that bridges those nodes to individual homes or business premises.

The ConnectME statute authorizes an assessment on every retail communications service provider an annual fee not to exceed 0.25% of revenue received or collected for all communications services provided in the state by that provider. This assessment is used to fund ConnectME initiatives. However, cellular providers were given the option of opting out, and according to the Executive Director all have done so to this point. In addition, Maine provided $500,000 from the Maine Universal Service Fund for the creation of ConnectME, and to accelerate private investment in communication services including wireless, broadband, cellular, and satellite infrastructure especially in underserved areas.

The ConnectME Authority awarded its first seven grants to expand broadband and mobile communications services to unserved and underserved areas in Maine on October 31, 2007. A total of more than $787,000 has been awarded to the recipients, expanding services to an estimated 14,400 residents. Successful projects are to be completed within one year of receiving the grant funding. The Connect ME legislation, requires an annual report to the Governor. The Authority is overseen by five members representing public and private interests.

The Connect ME authority has been tasked with the following objectives:

- Define unserved and underserved areas;
- Enhance infrastructure;
- Monitor wireless coverage where coverage is inadequate;
- Expand the availability of broadband to business, education, and enterprise consumers
- Collect, aggregate, coordinate and disseminate information and data for communications services and technology;
- Track investment in advanced communications technology infrastructure;
- Continually assess the availability of and need for communications technology and infrastructure in unserved and underserved areas;
- Secure funding sources for broadband or wireless deployment or education;
- Identify opportunities for coordination among providers, consumers, and state and local governmental entities; and
- Create and facilitate public awareness and education around broadband services.

3.2.3 State of Maryland

Maryland was selected because it has been active on some broadband initiatives and efforts to increase broadband availability and affordability, it has a similar geographic size to New Hampshire, and has a mix of urban and rural areas in the state. BDMP interviewed Patrick Mitchell, Director of the Maryland Broadband Cooperative, and Greg Urban, Director of Network Services at the Department of Budget and Management, while conducting this research.

In 2001, the Maryland Technology Development Corporation (TEDCO) began a federally-funded study to assess Internet access and affordability across the state. The first recommendation in the final report was to create a statewide Task Force to address these disparities. In the 2003 General Assembly session, the Task Force for the Deployment of Broadband in Rural Maryland was established. Despite the fact that Maryland ranks above most states in both the deployment and usage of information and communication technologies, the report found that households and businesses in rural areas of the state lagged behind other areas in their rate of access and usage of high-speed communications.

The Rural Broadband Communication bill (SB 753) was signed into law in May 2006 and established the Rural Broadband Coordination Board and Rural Broadband Assistance Fund. The board is charged with assisting in the deployment of middle mile broadband communication infrastructure in Maryland's rural and underserved areas and cooperating with public, private and nonprofit entities to establish broadband communication services. The Rural Broadband Assistance Fund (managed by the Department of Business and Economic Development) consists of money appropriated in the state budget, federal money allocated or granted to the fund, and money from other sources accepted for the benefit of the fund. The fund may be used only for planning, construction, and maintenance of broadband communication services in rural areas. The legislation authorized $4 million per year in funding for fiscal years 2008 and 2009.

In addition, the legislation also requires the Department of Transportation to allow the use of any state rights-of-way for the installation of broadband communication infrastructure provided by nonprofit telecommunications services providers in rural and underserved areas of the state without imposition of any charge for the use of the rights-of-way.

Finally, networkMaryland™, which began operation in 2004, is the statewide high-speed network for public sector use. The network was created from an initiative to utilize resource shared fiber optic cable assets throughout the state to provide affordable, high-speed bandwidth to all areas of the State and to provide a cost savings to the citizens of the State of Maryland. Moving forward, networkMaryland's™ goal is to provide WAN connectivity for all public entities in the State by coordinating joint network build-outs, consolidation of services and by providing the necessary information for proper network growth of government assets. This network is available to both State and local government, but not private citizens.

3.2.4 Commonwealth of Massachusetts

Massachusetts was selected because it is a neighbor of New Hampshire and it has been active on broadband initiatives. Though ranked higher on many of the economic and

broadband rankings when compared to New Hampshire, Massachusetts continues to be very active on increasing broadband availability and affordability. BDMP interviewed Adele Burnes, Project Specialist, Broadband Initiative, the Massachusetts Technology Collaborative (MTC) and Ben Dobbs, Policy Advisor, Governor's office for Housing and Economic Development.

Massachusetts consistently ranks as one of the most advanced technology economies within the U.S. With Boston as a center of world learning, a population that enjoys some of the highest per capita incomes in the country, and a strong focus on knowledge workers, it is not surprising that the "Bay State" also ranks highly on most indicators for broadband access. Although considered a "wired" State, Massachusetts still has significant portions of the western part of the state that remain unserved or underserved. However, similar to other states, regardless of broadband rankings, Massachusetts seeks to improve its broadband policies and coordination efforts and continues to see this as a critical issue for the State's well-being.

In October 2007 Governor Deval Patrick submitted a legislative proposal to establish and fund the creation of a Massachusetts Broadband Institute (MBI) to make strategic and targeted public investments with the objective of providing high-speed Internet, or broadband, service to all currently unserved communities by 2010. The proposed MBI is still under consideration within the Massachusetts legislature, but is expected to pass according to our interviewees. In addition, it is proposed that this newly formed entity would be a new division of the existing Massachusetts Technology Collaborative. According to the pending legislation, the Institute would invest public funds into essential, long-lived infrastructure such as fiber and wireless facilities while also measuring and monitoring broadband access conditions. The MBI would have $25 million in bonding capacity and would have full access to the administrative resources available from the MTC.

Currently (pending the passage of the MBI legislation) there are three separate organizations that work to promote, facilitate, and coordinate broadband efforts in Massachusetts; these are the MTC, Housing and Economic Development, and the Department of Telecommunications and Cable (which provides regulatory oversight in MA). In 2007, the MTC defined unserved and underserved communities using the following criteria:

- **Unserved**: The entire town has no access to broadband.
- **Underserved**: Broadband is only available in a limited area. Even if the data indicates that a city/town has cable or DSL, if limited coverage is self reported, a city/town is classified as Underserved.
- **Monopoly**: Access to only 1 broadband provider.
- **Duopoly**: Access to 2 broadband providers.
- **Competitive** Access to 3 or more broadband providers.

According to information available on the MTC website, Massachusetts, a state many think of as densely populated, has 32 towns with no broadband access other than satellite as of June 2007.

3.2.5 State of Vermont

Vermont was selected for a number of reasons, including its proximity to New Hampshire, and its active role in developing new broadband initiatives in recent years. Finally, another key reason that we identified Vermont was the pending completion of the sale of all Verizon landline assets to FairPoint, which encompassed Maine, Vermont and New Hampshire. BDMP interviewed Bill Shuttleworth, Executive Director of the Vermont Telecommunications Authority.

Vermont, similar to Maine and Kentucky, has ranked near the bottom on many national rankings for technology innovation and broadband access. However, in recent years a concerted effort has been made across state and local government and to improve the state's standing on issues related to communications infrastructure and knowledge economy benchmarks.

Governor Jim Douglas proposed that Vermont become an "e-state" by 2010 in his 2007 inaugural address, and announced his goal was to ensure universal access to broadband Internet and cellular phone service. Vermont's Act 79 - *An Act Relating To Establishing The Vermont Telecommunications Authority To Advance Broadband And Wireless Communications Infrastructure Throughout The State* was the legislation that created the VTA. Vermont's legislation was the most detailed and far-reaching of the State's reviewed. At 72 pages in length, Act 79 provides not only information to create the authority, but details additional working groups, addresses land use, and extensively outlines the rights of way policies that the State has adopted.

The VTA can issue up to $40M in Government Obligation bonds, which provides a flexible funding vehicle for initiatives in that state. In addition, the VTA had $200,000 in grant funding available for underserved areas of the state in 2007-08. The VTA was provided with two years of start-up funding by the state, but is expected to become a self-sustaining entity.

The goals of the VTA are to ensure:

- All residences and business in all regions of the state have access to affordable broadband services not later than the end of the year 2010.
- Ubiquitous availability of mobile telecommunication services including voice and high-speed data throughout the state by the end of the year 2010.
- Investment in telecommunications infrastructure in the state which will support the best available and economically feasible service capabilities.
- That telecommunications and broadband infrastructure in all areas of the state is continuously upgraded to reflect the rapid evolution in the capabilities of available mobile telecommunications and broadband technologies, and in the capabilities of mobile telecommunications and broadband services needed by persons, businesses, and institutions in the state.
- The most 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.

3.2.6 California and other States

Although not part of the formal research for this plan, other states were considered that have been particularly active on the topic of broadband availability and affordability recently. The following information is excerpted from the white paper, "Blueprint for Big Broadband" and describes recent efforts in California:

> *Governor Arnold Schwarzenegger established the California Broadband Initiative on October 26, 2006, to clear the government red tape for building broadband networks, ensure all government agencies are using the best technologies to serve the people, and create a broadband task force that lets experts from government and business work together to identify and eliminate obstacles to making broadband Internet access ubiquitous in the state. The executive order, among other things, streamlined the process of using rights-of-way and established a pricing policy for private companies paying for "rights-of- way" access to state roads, and directed state agencies to enable voice over Internet Protocol (VoIP) technologies for business and government use, and include broadband conduit in their infrastructure planning.*
>
> *The California Broadband Task Force issued its report on January 17, 2008, containing perhaps the most comprehensive set of recommendations of any state to date. The report noted that unlike other infrastructure, such as roads, electricity, and water, California's investment in broadband should not be limited to physical infrastructure, but instead should include policies to increase adoption of broadband technologies. The task force noted that increasing both access to and use of broadband would build economic capital, strengthen public safety resources, improve living standards, expand educational and health care opportunities, and raise the levels of civic engagement and governmental transparency.*
>
> *The task force proposed that 75% of California homes should have access to 50 Mbps service by 2015. While acknowledging the positive impact that deregulation has had on private sector incentives to invest, the report also noted that there were significant gaps in the availability of broadband (unserved areas) and that the government had a role to play in funding broadband in these areas (so as not to compete with the private sector).*
>
> *The report suggests a variety of funding proposals: a bond program and two different broadband grant programs. It also encourages tax credits and expanded use of rights-of-way and increased resources toward broadband research and development. In addition to these new initiatives, California has an Emerging Technology Fund, whose mission is to minimize the digital divide by accelerating the deployment and adoption of broadband and other advanced communication services to underserved communities and populations. The California Emerging Technology Fund is a nonprofit corporation established pursuant to California Public Utilities Commission requirements set by the telecommunications industry mergers of SBC-AT&T and Verizon-MCI. The merged telecommunication companies will contribute a total of $60 million over 5 years to advance broadband. The CETC plans to leverage the initial seed $60 million by at least fourfold to achieve impact of about $250 million through partnerships and co-investments with private sector, government and foundations.*

In addition, other states have initiated projects to further access and affordability:

- Georgia: BRIDGE - http://www.onegeorgia.org/bridge-web/
- Minnesota: Get Broadband - http://www.blandinfoundation.org/bsite/index.htm
- New York: Universal Broadband Initiative: http://www.oft.state.ny.us/oft/UniversalBroadband/Universal_Broadband_Strategy.pdf
- North Carolina: Rural Internet Access Authority (E-NC) - http://www.e-nc.org/

3.3 Comparative Analysis of State Broadband Research

The following table was developed as part of the state research. The table was presented at each of the five regional forums and is intended to provide a "snapshot" of current practices in each of the five states researched and compared to the State of NH on certain broadband issues. The table is not intended to represent a comprehensive list of broadband best practices, but allows a side by side comparison of issues that are commonly seen as 'mainstream' broadband policies and tools to address broadband challenges.

#	Question	NH	KY	MD	ME	MA	VT
1	Does the State define Broadband"?	No	Yes	No	Yes	No	Yes
2	Does the State have a definition of "Underserved Area"?	No	Yes	Yes	Yes	No	Yes
3	Is there an identified lead State agency, office, or entity for broadband initiatives and coordination of deployment?	No	Yes	No	Yes	Yes (Pending MBI leg.)	Yes
4	Does the State maintain a database of existing broadband services?	No	Yes	No	Yes	Yes	Yes
5	Does the State maintain maps of existing Wireline services (DSL, Cable, T1, etc.) on an ongoing basis?	No	Yes	No	Yes	Yes	Yes
6	Does the State maintain maps of existing Wireless services (Fixed, Microwave, etc.) on an ongoing basis?	No	Yes	No	No	Yes	No
7	Does the State maintain maps of Other services (satellite, Broadband over Power Lines) on an ongoing basis?	No	Yes (survey)	No	No	No	No
8	Does the State limit municipal deployment of broadband services?	No	No	No	No	No	No
9	Does the State have an ongoing grants program to assist broadband providers?	No	Yes	Yes	Yes	No	Yes
10	Does the State have a grants program for broadband providers for targeted broadband deployment to underserved areas?	No	Yes	Yes	No	No	Yes
11	Does the State offer loans to broadband providers?	No	Yes	No	No	No	No
12	Does the State offer loans to broadband providers for targeted broadband deployment in underserved areas?	No	Yes	No	No	No	No
13	Does the State expedite rights-of-way policies?	No	Yes	Yes	Yes	Yes	Yes
14	Does the State set rates for broadband services? **	No	No	No	No	No	No
15	Does the State regulate broadband service quality? **	No	No	No	No	No	No
16	Does the State utilize universal service funding sources for broadband initiatives?	No	Yes	No	Yes	No	Yes
17	Does the State offer tax incentives to encourage broadband deployment?	No	No	No	Yes	No	No
18	Does the State have any smart growth initiatives related to broadband?	No	No	No	No	Yes	No
19	Does the State provide any digital literacy initiatives to promote broadband utilization?	No	Yes	No	Yes	No	Yes

****** State regulation of broadband is pre-empted by Federal Law.

Table 6: Summary Matrix of State Research

4.0 Overview of the Current Broadband Environment in NH

Based upon the information contained in Section 3.2 and the table on the preceding page, it would appear that Kentucky, Vermont, and Maine have the most broadband initiatives and practices in place, yet these states also sit near the bottom of broadband rankings identified in this report. In many instances New Hampshire is more likely to trend similar to Massachusetts or Maryland when evaluating national data.

The current state of broadband availability and affordability in the State of New Hampshire remains a mixed environment. There are areas that have access to multiple broadband connections at high bandwidth speeds, competitive rates, and services provided by multiple broadband providers. Conversely, there are areas with little or no access to broadband, and if they did need broadband it could only be provided at an exceptionally high cost. These areas rely mostly on either dial-up or satellite Internet connections. Both solutions present challenges for sending or receiving large data files, conducting ecommerce, or participating in online collaboration. In addition, satellite service is not a viable option for Voice over Internet Protocol (VoIP) services due the latency in the signal.

Overall New Hampshire ranks fairly high on most economic indexes. For example, New Hampshire ranks 13th overall on the New Economy State Index for 2007[6]. Below is a table of the top fifteen states for the digital economy according to the same study. The *digital economy ranking* considers 1) the percentage of the population online; 2) Internet domain names; 3) deployment of IT in public schools; 4) the use of IT to deliver state government services; 5) the percentage of farmer's online and using computers; and 6) the deployment of broadband telecommunications[7].

Rank	State	Score
1	Alaska	12.49
2	Massachusetts	12.40
3	Washington	12.33
4	New Jersey	12.00
5	Florida	11.99
6	Virginia	11.91
7	Connecticut	11.79
8	California	11.27
9	Arizona	11.16
10	Nevada	11.07
11	Maryland	10.89
12	New Hampshire	10.89
13	Georgia	10.87
14	New York	10.86
15	Illinois	10.68

Table 7: 2007 New Economy Index – Digital Economy Ranking

[6] The 2007 State New Economy Index, Robert D. Atkinson and Daniel K. Correa
[7] ibid

The table below identifies the availability of DSL and Cable broadband connections based on the most recent FCC data for New Hampshire and the states that were researched in section three of this report. Here, a significant issue is identified that impacts New Hampshire as well as its neighbors in Vermont and Maine. Based upon this table and further research conducted, DSL access rates for northern New England are currently the lowest in the country. It is important to note that the data shown for cable TV providers and telecom providers do not indicate that the providers serve every possible customer in their respective service areas.

State	DSL Availability Where ILECs Offer Local Telephone Service	Cable Modem Availability Where Cable Systems Offer Cable TV Service
Percentage of Residential End-User Premises with Access to High-Speed Services based upon FCC data as of June 30, 2007.		
California	89%	96%
Kentucky	87%	96%
Maine	68%	99%
Maryland	75%	99%
Massachusetts	*	98%
New Hampshire	61%	100%
Vermont	66%	*

Table 8: FCC Data on Residential Access to DSL & Cable High-Speed Connections

The next table shows that New Hampshire ranks behind CA, MA, and MD in percentage of households with high-speed lines, but well ahead of its more rural neighbors and Kentucky. In addition, the State is competitive in the percentage of business lines compared to other States.

State	Percentage Residential	Percentage Business	Total Number Of Households in 2006 *(Based on US Census Bureau)*	Percentage of Households with High-Speed Lines
High-Speed Lines by Type of End User as of June 30, 2007 (Over 200 kbps in at least one direction)				
California	60%	40%	13,174,781	66%
Kentucky	75%	25%	1,888,336	38%
Maine	77%	23%	691,164	39%
Maryland	70%	30%	2,300,749	66%
Massachusetts	64%	36%	2,709,208	63%
New Hampshire	63%	37%	589,840	58%
Vermont	61%	39%	309,566	38%

Table 9: FCC Data on State Residential & Business Access to High Speed Access

A major change in the telecommunications landscape occurred this year when Verizon landline telecommunications assets in the State of New Hampshire were sold to FairPoint Communications on March 31st. In addition, the same sale was completed in the states of Vermont and Maine as part of the deal between these two companies. According to a summary prepared by the NH Public Utilities Commission the negotiated settlement with FairPoint will include a $340 million investment over the next five years in the State. This includes $254 million budgeted for capital expenditures, a minimum of $56 million in broadband investment and $5 million for utility pole work to improve existing poles and remove double poles where necessary.

The FairPoint commitment for DSL services is as follows:

- A minimum 1.5mbps up to 22,000 feet;
- 768kbps beyond 22,000 feet;
- 75% availability in 18 months (September 2009);
- 85% availability in 2 years (March 2010); and
- 95% availability in 5 years (March 2013) with minimum 75% in rural areas as defined.

This is potentially a significant upgrade if you look at the current FairPoint footprint for DSL availability, which stands at 62% in the State. Also, a $500,000 penalty for each percentage point missed by the date agreed upon will be paid to the Telecommunications Planning and Development Fund. Beginning in March 2013, the penalty will be imposed every six months until 95% availability is achieved. There is also a two year freeze on existing broadband rates and services including Fiber (VZ FIOS) service.

4.1 Broadband Users Questionnaire

As part of this project a web-based questionnaire was developed and posted on the NH Economy website. Aimed at the end users of broadband, the questionnaire consisted of 20 questions, asked users about the availability and affordability of broadband in their location. The questionnaire was open to all individuals and included primary households, second homes, small office/home office (SOHO), and small business respondents. Background information was collected and respondents were given an opportunity to tell us how the broadband situation could be improved in the State. 155 people responded to the questionnaire.

Although not a statistically valid sampling, the questionnaire provides an additional resource for decision-makers, and gave broadband stakeholders who may not have been able to join the regional forums an opportunity to contribute to the process. Providing additional options for those unable to attend one of the regional forums was important for this project. Below a few responses have been described that may be relevant to the findings and recommendations of this report.

- Based on the responses to the questionnaire the majority of users (over 90%) would like to see the State take a more active role in coordinating broadband deployment,

access, and usage issues in New Hampshire. More than 40% of Respondents provided additional comments in addition to answering the question. Although there was great variety to the suggestions given, the majority fit into three general areas:

1. Rural areas of the State of NH need help to improve their broadband infrastructure;
2. Broadband is critical infrastructure and crucial for business development; and
3. Provide State resources (money, access, and infrastructure) where existing gaps in service exist in the State today.

- Although an overwhelming number of respondents want to see the State take a more active role, only a quarter of those who took the questionnaire have attempted to use a State website to learn more about broadband services.
- The majority of respondents (over 90%) felt that broadband was critical infrastructure.
- Approximately two-thirds of responds did not feel that broadband services would continue to expand in your community if left to market forces (private sector deployment only).

The chart below depicts which towns had multiple responses to the questionnaire. The responses were geographically diverse in nature.

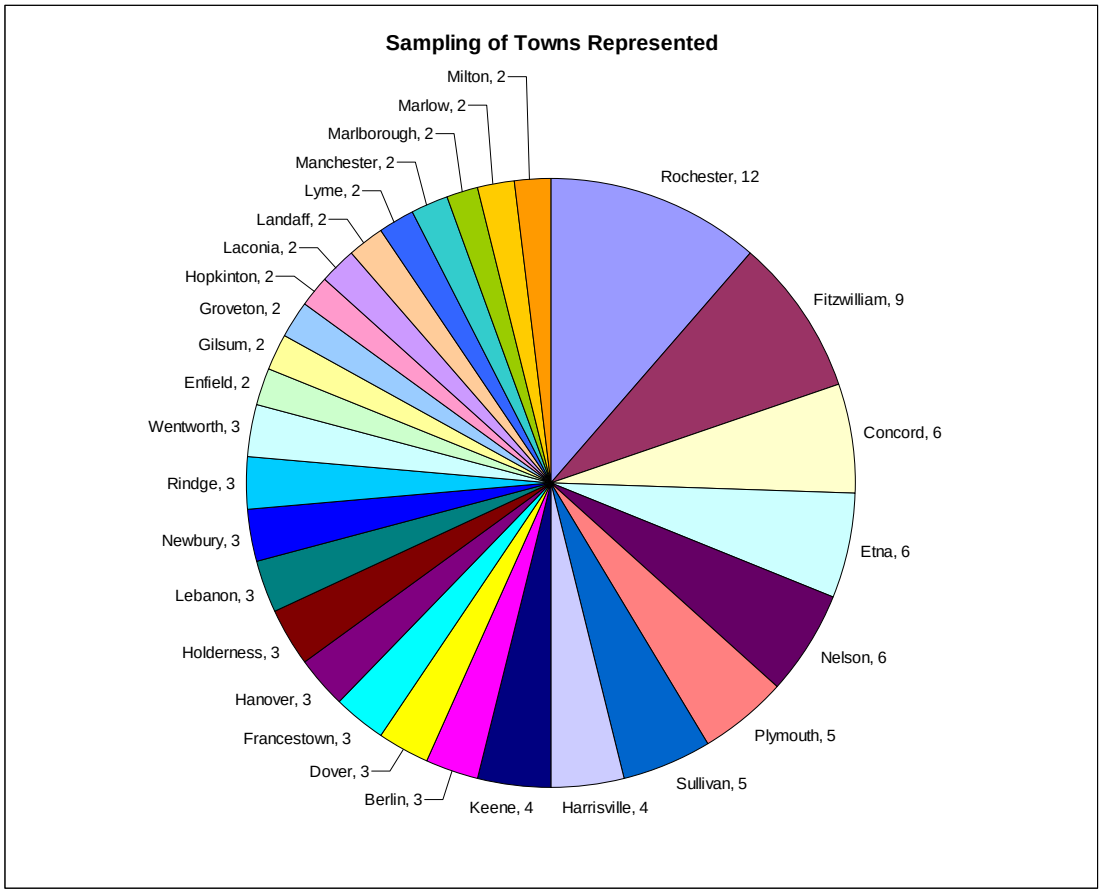


Chart 1: Summary of Towns that Responded to the Project Questionnaire

A full summary of the questionnaire results can be found in Appendix D.

4.2 Broadband Providers and Questionnaire

In addition to developing and issuing a broadband user questionnaire, the project also issued a 10 question request that was sent to all identified existing broadband providers in the State, which included telecom, cable, fixed wireless, cellular and satellite. A full copy of the provider questionnaire is located in Appendix D. Approximately 35 questionnaires were distributed to vendors active in the State, and 12 were fully completed and returned.

In an effort to get more open responses, the providers were informed that all information collected would be aggregated and not shared individually in the final report. The questionnaire was designed to provide respondents with the chance to provide qualitative data, while still being able to collect a consistent baseline of information. Vendor feedback has been incorporated into the action items detailed in Section 5.2 where appropriate. The following represents a brief overview of general themes that emerged from the broadband service providers:

- Demand issues, such as addressing barriers to adoption are a critical component to any broadband policy;
- Local siting restrictions and restrictions on public rights of way hamper the ability to deploy new infrastructure;
- The State should consider subsidizing build-out in underserved/unserved areas;
- Utility pole issues such as make ready and pole attachment fees have a cost impact that can make marginally attractive deployments (where there may be low population densities) less attractive;
- Taxation issues such as the Communications Services Tax in NH is 7%, which is one of the highest rates in the country and suggestions that the State should provide tax credits to spur rural investments;
- For businesses, the continued adoption of web-based applications will drive their demand for increased bandwidth;
- Providers would like to see a more coordinated effort by State leadership;
- Broadband is affordable and available in most of the State; and
- The State should encourage fixed wireless deployments in areas where traditional landline services are not feasible.

4.3 Statewide Broadband Initiatives

The issue of broadband availability and affordability is one which people and organizations in New Hampshire have been working to address for some time. Through the outreach efforts of this project, many broadband initiatives that are underway around the state were indentified. These initiatives ranged from local wireless broadband projects to pending state legislation. During the five regional forums, representatives from many of the initiatives participated in discussion about the challenges and barriers for deploying broadband in New Hampshire.

Below we have highlighted four specific initiatives which could have implications on the State level. A main objective of this project was to “connect the dots” of the many efforts and

initiatives that are going on around the State and identify opportunities to leverage those efforts for greater benefit to the State. In addition, other local or regional initiatives have been cataloged in Appendix C of this report.

Granite State Distance Learning Consortium[8]

The Granite State Distance Learning Consortium (GSDLN) is a public-private partnership focused increasing the availability and affordability of high-speed broadband through the State for primarily educational and professional development purposes. The consortium includes thirty New Hampshire organizations included the New Hampshire Community College System, Plymouth State University, the University of New Hampshire Cooperative Extension, New Hampshire Public Television, numerous K-12 schools, and professional and educational centers.

According to GSDLN's website, "The primary goal is to deliver distance learning, professional development, community-based video conferencing and high-speed access to the Internet across the state."

This initiative has a statewide reach in terms of the broadband network deployment. We hosted the regional forums at some of the Community Colleges and have discussed what role they could play in addressing the broadband issue in New Hampshire. The advantage of the Community College System is that their locations are dispersed around the State. In addition, the Community College System by its nature, is an educational institution that can have a great impact on some of the digital literacy recommendations that are detailed later in this report. Investigating how the GSDLN broadband network could be leveraged to help improve the availability and affordability of broadband for New Hampshire is warranted.

NH Public Television – Wireless Network Expansion[9]

New Hampshire Public Television (NHPTV) is a provider of public television broadcasting and educational services for children, students, adults, and professionals. NHPTV sees itself as a community partner focused bringing a variety of services to increase public awareness and engagement. NHPTV must effectively use technology in order to successfully provide this wide range of services to communities.

According to the NHPTV Website

> "NHPTV uses state-of-the-art digital technology to provide high-quality broadcasts, as well as webcasts, digital conferencing and instructional technology. NHPTV will soon begin producing wide-screen and high-definition local programs (16 x 9) that will enable it to offer expanded content for its high-definition channels. Additionally, using its data transmission capabilities, NHPTV is participating in a law enforcement pilot project to deliver high-speed data to police vehicles."

Brian Shepperd, Director of Technology at the NHPTV, is leading this project and is a member of the Broadband Action Plan Steering Committee. NHPTV is currently considering upgrading their point-to-point wireless network used to provide services around the State. They have the capability to upgrade the service to only address the needs of NHPTV, or there is the potential during their upgrade process to increase the capacity of the NHPTV network

[8] http://www.gsdln.org/
[9] http://www.nhptv.org/

and use the excess capacity for to increase broadband infrastructure in New Hampshire. Please see Appendix G for a visual representation of the proposed wireless backbone network that NHPTV seeks to create. Wireless facilities in blue represent proposed new infrastructure.

New England Teleheath Consortium

The New England Telehealth Consortium (NETC) is the recipient of an FCC Rural Healthcare Pilot Program award of $24.7 million to connect rural healthcare providers in Maine, New Hampshire, and Vermont with a broadband network capable of supporting telehealth services. NETC was founded by ProInfoNet, a telecommunications consulting firm headquartered in Bangor, Maine. ProInfoNet plans to implement this telehealth network to providers in the next three years using the FCC funding.

According to the New Hampshire Business Review, goals of the NETC include[10]:

- To link regional healthcare providers with urban public practices, research institutions, academic institutions, and medical specialists to provide greater efficiency in the sharing of information relevant to health-care applications.

- To provide a shared broadband network with health-care providers thereby increasing and validating telehealth and telemedicine opportunities in the region.

- To provide healthcare providers in rural areas with greater and easier access to current research, advances in medicine, expert support and team consults.

- To allow health-care providers in the region to have access to a common network for provision of electronic health records, remote medical diagnostics, telehealth, telemedicine, population health database, remote surgery, teledentistry, telepsychiatry and behavioral health treatment.

- To enable all 555 consortium health-care sites to share information with more than 6,000 public and nonprofit health-care providers nationwide.

Martha S. McLeod participated in this project and served as a member of the Broadband Action Plan Steering Committee. She is also a board member of the NETC. She spoke at both the Plymouth and Berlin regional forums, and provided a high-level overview of the NETC project and goals.

NETC will be a closed network, specifically designed and implemented to be used by the healthcare providers that are part of the consortium for telehealth and telemedicine services. However, deploying this network during the next three years will involve a tremendous effort in engineering, equipment purchasing, and labor.

An opportunity exists for New Hampshire to consider if collaboration with this project could be feasible. For example, could non-NETC fiber and equipment be installed during NETC's

[10] http://nhbr.com/apps/pbcs.dll/article?AID=/20080215/INDUSTRY03/634865152/-1/Industry03

implementation? There would appear to be a cost savings in installing equipment in parallel to the NETC project, rather then independently. Instead of buying the equipment twice, digging a trench twice, employing the engineering and labor twice, the State could use the shared resources and only focus on the incremental cost added to the project.

In addition to the three initiatives that were highlighted above we identified many other local initiatives ongoing around the state. These initiatives generally fell into a few categories.

- Wireless Broadband Initiatives – there were many different variations of local wireless initiatives including local wireless internet service providers and local Wi-Fi hotspot projects. The biggest barriers to these initiatives was the start up funding and access to wireless facilities and other infrastructure to place their equipment.

- Municipal Broadband Projects – there are several instances of a municipality in New Hampshire working on building a form of broadband access for their citizens and businesses. This included fiber, wireless, and Wi-Fi projects.

- Build Out Projects – there are also instances of other build out projects that are not focused on providing broadband access to citizens and businesses of New Hampshire, but have the potential to be leveraged to provide broadband. Much like the New England Telehealth Consortium project, the incremental cost increase by partnering with these projects may be lower than an independently conducted broadband project of similar geographic scope.

Appendix C provides further details on additional initiatives that were identified during regional forums and outreach activities conducted as part of this project.

4.4 Summary of the Broadband Environment

Most people assume that the “North Country” of upper Grafton and Carroll counties, and all of Coos County, is where broadband challenges exist today in the State of New Hampshire. This is partially accurate, but does not portray a complete picture of the broadband challenges that persist in the State in 2008. The questionnaire research, subsequent regional meetings, and available FCC data depict a more complex picture of the State’s broadband infrastructure. Other areas of the State, including towns near the border with Massachusetts (such as New Ipswich) also have limited broadband services.

As broadband services continue to expand, decision makers must understand that if there is a digital divide it does not simply fall along geographic lines. Although location can play a key role, many studies (such as the work at PewInternet www.pewInternet.org) indicate that education, income and age are all determining factors for who will adopt broadband services. Any attempt to develop an action plan to address broadband therefore must evaluate not only supply-side challenges, but should equally consider demand-side issues such as the need for increased computer ownership, improved digital literacy, and demonstrating the value of broadband to residents and businesses that have yet to adopt these services.

In February 2008, Brian Gottlob, PolEcon Research, evaluated the impact of broadband on New Hampshire employment and towns (www.poleconresarch.com). This research supports other previous efforts, which acknowledge that broadband will not solve economic and social challenges alone. Broadband can, however, be a catalyst for new opportunities. The research cites the migration of younger, more educated individuals as a growing challenge confronting rural areas of New Hampshire, and argues that without broadband services these areas will continue to lose knowledge workers. In addition, the study also indicates that towns without adequate broadband suffer from overall lower wages, rates of employment, and potentially lower home values. If this last point is in fact true, given the State's dependence on property taxes, broadband is not only a critical infrastructure for citizens and businesses, but a critical infrastructure for the State Treasury.

In conclusion, the State of New Hampshire in comparison to other state's, has average to above average broadband services available to most population centers, but significant challenges exist today that warrant continued attention from both the public and private sector. In order for New Hampshire to remain an economic leader as compared to other states, new broadband policies and initiatives must be developed and implemented over the coming years. This will require increased focus, and more importantly, committed leadership from all of the broadband stakeholders that participated in the development of the Broadband Action Plan.

5.0 Broadband Action Items for the State of New Hampshire

The Broadband Action Plan was developed with input from over 350 broadband stakeholders in the State of New Hampshire representing a cross-section of businesses, broadband service providers, citizens, educators, healthcare professionals, and others.

The preceding sections have provided background information, best practices research, and feedback collected from both broadband providers and broadband consumers. Over the course of the five public forums, fact-finding interviews and meetings, and state research, this process has sought to define how best to move the State forward on the issue of broadband access, affordability, and utilization.

The following section of the report presents the synthesis of this collaborative effort by establishing a broadband plan vision and goals, identifying 25 action plan items, and providing a summary overview to implement these initiatives.

5.1 Vision Statement and Goals of the Broadband Action Plan

Creating a vision for broadband in the State of New Hampshire requires thinking strategically about the critical role the technology now plays in our daily lives, and forming a viable concept for ensuring that this infrastructure is accessible for all State stakeholders. A strategic vision conveys substantive ideas about what it intends to strive for and what course the plan should follow. If agreed upon, then the vision is capable of guiding decision making, shaping strategy, and impacting how the State addresses this issue.

Vision Statement:

The State of New Hampshire will utilize broadband best practices learned from other states and nations, seek to "connect the dots" of its existing broadband initiatives, and identify the most efficient ways to maintain and improve its position as a regional leader in economic growth, innovation, and technology access by developing broadband policies and initiatives that enhance the State's digital communications infrastructure, access, and affordability.

Action Plan Goals:

1. Resolve that broadband is viewed as critical infrastructure, and a basic requirement for education, healthcare, and government operations in the 21st Century.
2. Establish baseline standards to define what broadband means for policymaking.
3. Determine that all New Hampshire residents, businesses, and other entities will have at least one viable option to obtain broadband services (at the defined levels outlined in goal #2).
4. Improve coordination of broadband initiatives and outreach throughout the State of New Hampshire.
5. Increase the demand for broadband services through digital awareness and education.

6. Identify opportunities to improve efficiency in government.
7. Provide the New Hampshire Legislature with recommendations to improve overall access and connectivity to affordable broadband services.
8. Monitor and evaluate both national and international broadband rankings to ensure that NH is improving its ranking, or minimally not falling behind.
9. Provide consistent and regular opportunities for citizens to provide their feedback to the Telecommunications Advisory Board via ongoing regional forums and electronic communications.
10. Work with private sector vendors to ensure that public sector entities do not impede private investment that will expand broadband services in New Hampshire.

5.2 Action Plan Initiatives

Based upon the information collected from broadband vendors and user questionnaires, the regional forums, and research on other states, as well as additional meetings and interviews conducted with stakeholders representing a cross-section of business, government, non-profit and citizens, the following section represents the overall findings and recommendations for the Broadband Action Plan. This section identifies 25 broadband action items.

The format for this section is an "action item" and statement of the issue followed by a recommendation to address that issue. The action items are categorized by the following five areas in order to provide structure to the action items. The following five categories are:

1. **Demand:** Action items categorized as Demand issues reflect the need to increase broadband utilization as a driver for improved access, competition, and affordability.
2. **Deployment/Supply:** Action items categorized as Deployment/Supply issues reflect broadband initiatives that could spur additional deployment of infrastructure or improve access to existing broadband services.
3. **Government:** Action items categorized as Government issues could be either State or locally driven and may require access to existing infrastructure, the development of new programs or other action by a government entity.
4. **Legislative:** Action items categorized as Legislative issues have been identified as requiring some type of legislative action for these items.
5. **Regulatory:** Action items categorized as Regulatory issues could require either NH and/or federal regulatory involvement depending on the item.

Each action item identifies a responsible TAB subcommittee that should take the lead role for advocating that action item. In some cases, more than one subcommittee may have involvement for each of the initiatives. The TAB subcommittee is presented in further detail in Action Item #12.

The Broadband Action Plan assumes a three year planning horizon for these Action Items. Each action item has been allocated a priority of critical, high, or medium based upon the Steering Committee's recommendations. Please note that with exception of Action Item #1, the other action items are not additionally ranked within the framework of their level of priority. The time frames used for this report therefore are:

- Critical – the action item should be addressed in the first 12 months of the planning horizon;
- High – the action item should be addressed within 24 months; and
- Medium – the action item should be addressed within 36 months.

Action Item 1

Develop an independent function to provide leadership and coordination of broadband initiatives in the State of New Hampshire.

Currently, the State of New Hampshire does not have a central entity responsible for leading the coordination and facilitation of broadband availability and affordability. Many other states that were researched have created a central broadband entity that is responsible for increasing broadband deployment, data collection, mapping efforts, and coordination of broadband initiatives. Each state has set up their broadband entity in a different fashion, but examples include: creating a position in an existing state agency; creating a position in the Governor's office; creating an independent broadband public authority; and creating a non-profit entity. Each option has advantages and disadvantages, but the underlying benefit and reason for the centralized broadband entity is to provide leadership and coordination on the topic of broadband, and increase visibility to stakeholders.

Recommendation:
The State of New Hampshire should have a "point person" who is solely focused on improving broadband throughout the state. The State of New Hampshire should create an independent broadband entity to coordinate and lead broadband initiatives. Our recommendation is that the State of New Hampshire seeks to establish an independent NH broadband entity with powers not dissimilar from the Vermont Telecom Authority, the ConnectME Authority, or the pending legislation to create a Massachusetts Broadband Institute. Potentially, a public organization would have greater opportunity to create and support public-private partnerships. Below is a list of possible responsibilities for a broadband entity, mechanisms to begin the process, and pros and cons for this type of organization.

Responsibilities for the proposed broadband entity:

- Define critical terms including: unserved, underserved, and what is broadband.
- Collection of broadband availability data from broadband providers.
- Creation, dissemination, and updating of broadband availability maps and databases.
- Coordination of broadband initiatives throughout the State.
- Provide grant funding for local broadband initiatives in unserved and underserved areas.
- Coordinate State agency efforts that are related to or could be leveraged for broadband deployment.
- Have unencumbered rights to all state assets in support of broadband deployment.
- Identify unserved and underserved areas.
- Promote initiatives to increase broadband demand and usage. For example, digital literacy programs.

- Work with private sector vendors to ensure that public sector initiatives do not impede private investment that would expand broadband services in unserved and underserved regions of New Hampshire.

Organizational Structure and Funding:

- Executive Director - The broadband entity will need an experienced, influential, and strong leader with depth of professional experience in technical, financial, and administrative skills.
- Administrative Position - The organization should have at least one administrative position to support operations.
- Project Manager – The organization would best be served if in addition to the above two positions, the proposed entity had a project manager to coordinate the activities of the entity (for example, infrastructure mapping activities, grants applications, etc.).
- The entity should have an independent board of directors that would be chosen by the Governor and/or Legislature and be expected to take an active role in formulating the entity's evolving strategy. Most if not all of the inaugural board members should be selected from the existing Telecommunications Advisory Board to provide continuity.
- The organization would need a sustainable funding mechanism to provide an operating budget and funding source. Initial startup funding for the entity should be provided either from State funds and/or by seeking federal grant funding.
- Ongoing funding will need to be established for the new organization. Based on research, other states that have established these organizations have often relied on revenue generated from some, or all, broadband providers, regardless of service offering or technology. Funding will be required for staff and operational expenses, and if possible should provide monies for awarding grants to broadband initiatives.
- The entity may need to have some level of statewide bonding capacity.
- Any proposed entity should not be created without constraints. The organization should be allotted a five year opportunity to prove its effectiveness. At the end of that time, the organization would be required to "reapply" to the State Legislature for continued operations.

Advantages of an Independent Entity

- Independent entity from the State government that has no particular conflict of interest or bias that other State agencies may have.
- Research indicates that broadband providers are more willing to cooperate with third party entities (Freedom of Information Act – FOIA) based upon state research.
- Centralized leadership that provides a common face to the State of New Hampshire's broadband efforts.

Disadvantages of an Independent Entity

- May be difficult to establish due to current political and budgetary constraints.
- Perceived lack of control by State government could dissuade cooperation with existing State agencies.
- Unique skill set is needed to lead entity, which may make it difficult to fill the position.

Although an independent broadband entity is the suggested approach based upon the findings of this project, an alternative approach may be necessary based upon the challenges inherent with creating a new public organization with the level of autonomy that this entity would require. One alternative could be to create a new Director position within NH DRED to lead and coordinate broadband issues. However, one drawback to this approach is the lack of autonomy that the Director would have in making independent decisions. Another option may be establishing a broadband liaison position in the office of the Governor to further research the economic and political viability of creating the independent entity while continuing to bring greater coordination and visibility to broadband issues.

Regardless of the path chosen, it is recommended that the State of New Hampshire improve the level of leadership, visibility, and coordination that it provides on broadband matters to make progress on the broadband issue. Without a greater focus on broadband, the State could be surpassed by other states that are currently focusing more resources on this important economic development and quality of life issue.

Action Category	TAB Subcommittee	Priority
Legislative	**Legislative Subcommittee**	**Critical**

Action Item 2

Streamline the wireless facility siting process.

According to the map contained in Appendix G, there are hundreds of existing facilities for cellular and fixed wireless operation in the State of NH. Many of these facilities are owned by local or State government. Small, start-up wireless broadband providers state that the process to get wireless facility access, as well as siting for new wireless facilities remain two of their biggest challenges to deploying last-mile infrastructure to rural areas. Many wireless providers that seek to provide last-mile services in more remote areas believe that easy access to public infrastructure and lands is critical.

Recommendation:
The State, in conjunction with local government, should work together to identify ways to improve the process for wireless facility siting in the State. Currently DRED manages 17 State wireless facilities, but does not have the financial resources to properly maintain its infrastructure, or the personnel to expedite requests for new attachments from broadband providers. This leads to a lengthy process to secure space on these wireless facilities. DRED needs to review its existing policy and determine if improvements could be made to

streamline the process. One option is the creation of a formal Site Evaluation Committee that would serve as a clearinghouse for this process. One recent example of this type of oversight framework is the Site Evaluation Committee outlined in "NH Public Utilities Commission Background Report on NH Transmission Infrastructure" (page 12).

In addition, another alternative to new wireless facilities may be to require utility pole owners to install a "tall utility pole" (at least 60 feet high) in underserved areas that could be used for the installation of last mile wireless equipment where other services are not currently available.

Action Category	TAB Subcommittee	Priority
Government/Regulatory	**Government Subcommittee**	**Critical**

Action Item 3

Remove barriers to State rights of way (ROW) access.

In 2002 New Hampshire's Department of Transportation (DOT) conducted an extensive review of the use of Limited Access Rights of Way (LAROW) to determine if broadband vendors would be interested in accessing State ROW for deployment. The results were not encouraging and the State did not pursue a more extensive overhaul of existing policy.

Recommendation:
In 2002, the telecom industry was struggling and fiber optic overbuilds were common throughout the country. Today the climate has changed and the State should revisit this issue. In addition, the State should pursue standards, where feasible, that allow "open trench" policies allowing broadband vendors to deploy fiber during the initial construction phases of public works projects, rather than forcing entrants to retrofit facilities after the fact.

Recently, NH DOT hired an engineering firm to develop a new telecommunications plan. The TAB and DRED should be consulted in the development of this effort by NH DOT to ensure that all the "dots have been connected" between this effort and the work being conducted by DOT.

Action Category	TAB Subcommittee	Priority
Government and Supply	**Supply Subcommittee**	**Critical**

Action Item 4

Identify new financial resources to support broadband initiatives.

The State of New Hampshire and/or local communities may not be taking advantage of the many federal and private programs that exist to provide funding for broadband projects. Appendix E provides a summary of both federal and private funding sources that were identified as part of this project and could be utilized by New Hampshire.

Recommendation
The proposed broadband entity as part of its coordination effort should be aware of the different funding sources and the eligibility requirements. As the broadband entity works with statewide, regional, and local broadband initiatives, it can provide guidance and suggestions for funding sources that may be available. For example, a possibility to fund Action Item 17 may be to seek to increase the State's e-Rate funding provided by the federal government.

The broadband entity can also serve as key resource in assisting local governments to apply for funding. The broadband entity can also maintain a database of funding sources, post this information on their website and guide people to the funding information when they are considering starting an initiative. Lastly, the State itself should consider if there are any funding sources that could be applied toward the start-up of the broadband entity, its ongoing operations, or allow the new organization to award funding for future New Hampshire initiatives.

Action Category	TAB Subcommittee	Priority
Government and Supply	**Supply Subcommittee**	**Critical**

Action Item 5

Evaluate the feasibility of creating a broadband services fund.

Currently the State of New Hampshire lacks a mechanism to develop a committed revenue stream to support broadband initiatives, award broadband grants to unserved communities, or provide match funding for proposed projects that could benefit from federal grants. One example of one state's creation of a broadband fund is the State of Maine, which utilized its existing state Universal Service Fund to create a mechanism for the ConnectME Authority. However, the State of New Hampshire does not have a State Universal Service Fund (USF), and this approach may not be feasible.

Recommendation:
As outlined in the recommendation for Action Item 1, identifying a revenue stream(s) to support broadband initiatives will be critical. A State broadband services funding mechanism should receive further evaluation to determine the appropriate approach to funding both the proposed broadband entity and other future broadband initiatives. Alternatives to explore include utilizing the existing Telecommunications Planning Development Fund, and/or determining if a portion of the existing Communication Services Tax could be apportioned to seed this fund.

Action Category	TAB Subcommittee	Priority
Regulatory	**Regulatory Subcommittee**	**Critical**

Action Item 6

Improve utility pole access.

Based upon research, vendor feedback, and the regional forums, it appears that utility pole access may be an important issue for broadband deployment in the State of New Hampshire. Currently, Docket No. DT 08-004, PUC 1300 Pole Attachments - Regular Rules is before the PUC. In addition, the FCC Pole Attachment rulemaking is currently underway.

Key issues identified include the need for ”make ready” terms and consistency in the attachment fees that broadband providers incur to have access to utility poles when deploying infrastructure. Both of these issues can deter increased deployment. This problem is sometimes compounded in some areas of the State where poles tend to be older, less well maintained, and less likely to be in acceptable condition, but instead need updates from the pole owner before fair “make-ready” work can be determined.

Recommendation:
Ensure that utilities are maintaining the quality of their poles for future deployment. The State may want to evaluate the feasibility of increasing the standard utility pole size to accommodate the increased amount of communications infrastructure now being deployed. Attachment fees for pole access should be consistent and competitive so that they do not hinder the further deployment of broadband services.

The FCC Pole Attachment rulemaking process is currently underway. TAB members should consider participating in the process before it concludes. The results of this rulemaking may influence the options available for this Action Item.

Action Category	TAB Subcommittee	Priority
Regulatory	**Regulatory Subcommittee**	**Critical**

Action Item 7

Provide incentives for last mile deployment in unserved and underserved areas.

If the State of New Hampshire intends to encourage private sector investment to deliver increased broadband services as the preferred vehicle for providing broadband to all areas of the State, even with the Action Items detailed here, it is unlikely that all areas of the State can create, or maintain, a level of demand that will attract enough private sector activity. One opportunity to encourage further private sector deployment is targeted tax incentives and an evaluation of current tax policies.

Recommendation:
Research for this project identified a state (Maine) that offers tax credits for deploying broadband services (please note that these tax credits are set to expire in 2009). The primary advantages of tax credits are that they cost nothing if they are not used, can be made competitively neutral, and allow broadband providers to make investments in a manner that

they deem most likely to succeed. Currently, New Hampshire disallows federal accelerated depreciation, so capital investments by profitable companies tend to be discouraged in the State. This should be reviewed to determine if changes in depreciation schedules could accelerate more broadband investment.

Action Category	TAB Subcommittee	Priority
Government & Legislative	**Legislative Subcommittee**	**Critical**

Action Item 8

Leverage existing resources to support the Broadband Action Plan.

A key objective of this process was to identify and seek ways to leverage existing projects in the State of New Hampshire. Outlined in more detail in Section 4.4, the State has numerous broadband projects that range from local mesh networks to statewide distance learning networks and a central role in the $24.7M New England Telehealth Consortium (NETC) with more than 50 of the State's health care organizations involved throughout the State.

Recommendation:
The State should provide more visibility to existing initiatives that have been successful (see Action Item #4). More specifically, the State should coordinate an outreach program to make sure people are aware of the NETC and identify opportunities for additional build-outs during this project.

Action Category	TAB Subcommittee	Priority
Demand	**Demand Subcommittee**	**High**

Action Item 9

Develop model permitting standards collaboratively with local government.

The permitting process for broadband vendors to use public lands, access infrastructure, and build new wireless facilities remains challenging since it is permitted at the local level. This causes broadband providers to work with different standards and procedures for each town.

Recommendation
The proposed Broadband Entity should work collaboratively with the NH Municipal Association and broadband vendors in New Hampshire to develop a statewide permitting process and standard procedures. This would make it easier for providers to navigate the process, gain approval, and may speed up their ability to deploy technology. The State of California has just developed a similar recommendation that could be used as a framework for this item. Issues to include in this discussion are:

- Standard Municipal Application Process
  - General permit conditions
  - Above-ground equipment standards

- Model dispute resolution process

- Develop E-Permits that could be posted on the website proposed in Action Item #20
- Develop standards for time limits on processing the permit application

Action Category	TAB Subcommittee	Priority
Government and Supply	**Supply Subcommittee**	**High**

Action Item 10

Engage regional planning commission's to collect data and coordinate broadband efforts.

Action Item 1 recommends the creation of a broadband entity for New Hampshire with responsibility to coordinate the broadband efforts throughout the state. New Hampshire will continue to have a strong local flavor when it comes to broadband initiatives and efforts. Action Item 10 recommends that this new organization work with the local governments in supporting local broadband initiatives. A third organization that should have a role in data collection and coordination of broadband efforts is the various state regional planning commissions.

Recommendation
The Broadband Entity should work collaboratively with the regional planning commissions in the coordination of broadband efforts and data collection. By partnering with the regional planning commissions and the local governments (Action Item 15), the broadband entity would have a state-wide, regional, and local focus on broadband initiatives. As the outreach efforts discovered, New Hampshire already has ongoing broadband initiatives that have local, regional, and state-wide impact on broadband availability and affordability.

If broadband is going to be seen as a critical infrastructure, the State should review the existing Statute RSA 674:2 that outlines Master Planning requirements for municipalities and determine how to possibly better incorporate broadband planning into these efforts.

Action Category	TAB Subcommittee	Priority
Government and Supply	**Supply Subcommittee**	**High**

Action Item 11

Foster a cooperative relationship with broadband vendors.

The State of New Hampshire has recently seen its largest provider of landline communication services change. Throughout the Broadband Action Plan process, broadband vendors have expressed their desire to improve broadband deployment by pursuing public-private partnerships where feasible, and through other means, to close the gap on existing broadband services in the State. The State should seek to build upon this transition, the

momentum built through this process, and seek opportunities to improve relationships with all broadband providers throughout New Hampshire.

Recommendation
Assuming the establishment of Action Item 1, the State of New Hampshire will have to foster stronger cooperation with all vendors that provide broadband services in the State. The proposed broadband entity can serve a key role in facilitating cooperation amongst vendors. Sharing of information between providers and the entity regarding broadband initiatives around the state, future deployment plans, and areas of need in broadband availability and affordability will help improve relationships.

Action Category	TAB Subcommittee	Priority
Supply and Government	**Supply Subcommittee**	**High**

Action Item 12

Restructure and Refocus the Telecommunications Advisory Board (TAB) through a Subcommittee Structure.

The TAB has been in existence for more than 10 years and during this time it has served the State as a key resource for ensuring communications access and affordability for the State's citizens and organizations. As the TAB enters the next decade it will be critical to assess the current structure, determine how the TAB can serve as advocates for the Action Items of this plan, and establish how the TAB can complement the Broadband Action Plan's recommendation for a Broadband Entity.

Recommendation:
In light of the efforts made in the Spring of 2008 by the TAB and the Broadband Action Plan Steering Committee to engage citizens, businesses, and other organizations in the State, the TAB has a unique opportunity to assess its role in making the Broadband Action Plan a reality.

To date, the TAB has been underutilized and may be too unwieldy with a body of 25 members. However, the members of the TAB provide a substantial breadth of institutional knowledge of State affairs, broadband subject matter expertise, and cover the spectrum of broadband stakeholders. The TAB should play a central role on broadband matters going forward in New Hampshire.

It is recommended that the TAB adopt a subcommittee structure that will improve its effectiveness and ability to focus on the action items of this report. Each subcommittee should be made up of four to five TAB members. These small, focused groups will provide the needed flexibility to act as effective advocates for the recommendations in this plan. The suggested subcommittee structure is described below.

- Broadband Action Plan Subcommittee – This subcommittee has had ownership of the development of this report and the recommendations set forth. This group has generated significant positive momentum and has an important role to play moving

forward. The subcommittee will focus on the overall advocacy of the Broadband Action Plan and its mission should be to see all of the Action Items addressed.

- Demand Subcommittee – This subcommittee will be focused on advocating for those action items related to addressing demand issues.
- Supply Subcommittee – This subcommittee will be focused on advocating for those action items related to addressing supply issues.
- Government Subcommittee – This subcommittee will be focused on advocating for those action items related to government issues.
- Legislative Subcommittee – This subcommittee will be focused on advocating for those action items related to addressing legislative issues.
- Regulatory Subcommittee – This subcommittee will be focused on advocating for those action items related to addressing regulatory issues.

If a broadband entity is established in New Hampshire, the TAB and its proposed subcommittees will continue to have a critical role. Research in Vermont indicates that the Vermont Broadband Council has served a vital role since the creation of the Vermont Telecom Authority by serving as an instrument of public outreach and "institutional knowledge" on the State's broadband issues during VTA's start-up phase. The TAB can act in a similar role in New Hampshire.

Action Category	TAB Subcommittee	Ranking
Legislative	**Legislature Subcommittee**	**High**

Action Item 13

Partner with an appropriate Geographic Information Services (GIS) organization.

Currently there is no formal process in the State for developing and maintaining databases and maps of broadband availability. Most States that are committed to maintaining this type of information have partnered with existing resources to map broadband infrastructure and data.

Recommendation:
The proposed Broadband Entity should establish a formal relationship with a GIS organization in order to develop and maintain detailed broadband mapping resources. GRANIT is New Hampshire's Statewide Geographic Information System Clearinghouse. GRANIT is an established entity that has the resources and experience to meet this need. A formal relationship between the Broadband Entity and GRANIT should be considered. Regardless, an established GIS entity needs to be engaged if adequate mapping is to be implemented as part of this action plan.

Action Category	TAB Subcommittee	Priority
Supply	**Supply Subcommittee**	**High**

Action Item 14

Take advantage of the State's location to identify new backhaul infrastructure.

According to research from the University of New Hampshire, the State has an opportunity to leverage its location between larger population centers to the south (Boston and beyond) and Canadian population centers to the north (Montreal) and east (Atlantic Maritimes), as well as being an east-west crossroads for connecting Vermont and Maine with any expansion of NEREN (New England Regional Education Network).

Recommendation:
The State should work with the University System of NH (USNH) and other research institutions in the State and the region to identify potential opportunities for new broadband backhaul infrastructure that would link with the Canadian Maritimes and population centers to the south. This would increase the backhaul capacity coming into the State and improve redundancy of core network infrastructure. In addition, the USNH network has some of the most advanced technology capabilities in the State. Officials from the system have expressed their interest in this issue and they want to play an active role in ensuring that the State is a broadband leader.

In addition, New Hampshire, Maine, and Vermont are now in a unique situation having gone from relatively small-state government clients of one of the largest communications companies in the world (Verizon) to becoming the core focus of the company (FairPoint) that now serves the region. This dynamic, coupled with the move towards more coordinated broadband outreach and initiatives could expand opportunities to provide cross-border cooperation to benefit the economy of each state and its citizens.

Action Category	TAB Subcommittee	Priority
All	Supply Subcommittee	High

Action Item 15

Engage local government in developing and supporting broadband initiatives.

Local government has a critical role to play in providing rights-of-way access, access to wireless facility sitings, and developing effective digital literacy initiatives. The State will not be successful without participation and leadership from local governments. Local governments in New Hampshire already have an organizing body that facilitates coordination, the New Hampshire Municipal Association.

Recommendation:
Research shows that one of the key success factors cited by the State of Kentucky was the local involvement in developing, implementing, and sustaining new programs. Both supply side and demand initiatives must be seen as locally important. The NH Municipal Association could serve as the organizing liaison to the proposed statewide broadband entity in order to make this item a reality. Identifying new broadband support programs that local government can lead and participate in is important as well.

Action Category	TAB Subcommittee	Priority
Government	Government Subcommittee	Medium

Action Item 16

Evaluate State government opportunities.

During the fact-finding and research for this project, a number of possible State government issues and initiatives became apparent. A number of discussions have started already based upon meetings conducted for Broadband Action Plan research. Although expanding State broadband and identifying opportunities to utilize more efficient and cost effective technologies was not a focus of this project, the State could benefit from improved coordination of its broadband activities.

Based upon the feedback collected during this project, it is apparent that State government agencies do not have a central coordinating entity to monitor and track all state broadband and telecommunications related activities. At a recent meeting coordinated as part of the action plan research process, communications experts from different state agencies learned for the first time that NHPTV was planning to upgrade its point-to-point wireless network through Mt. Washington to Colebrook.

Recommendation:
Create an intra-agency database to track and communicate opportunities to leverage State resources when proposing new communications deployments. Explore new opportunities to promote videoconferencing to enhance cost savings, reduce transportation costs, and increase demand for broadband services in remote areas of the State.

Action Category	TAB Subcommittee	Priority
Government	Government Subcommittee	Medium

Action Item 17

Support efforts to provide all libraries, schools, and town halls with a broadband connection.

Broadband is seen as critical infrastructure according to the research and feedback received during this process. As more government services become available online it will be more important than ever for citizens and businesses to have high speed access. In addition, the State should see this as a public safety issue, as well as an issue about education and good governance.

Recommendation:
If the State does ultimately believe that broadband is a critical 21st century infrastructure, then the State should ensure that all libraries, schools and town halls are connected and that this service is publically available. Most towns probably already have access and are using high-

speed services. The proposed Broadband Entity, working with the Department of Education and NH Municipal Association, should evaluate which towns may not have access currently. This recommendation may also have a secondary value by deploying services in underserved communities that can expand access to other entities beyond schools and local government.

Action Category	TAB Subcommittee	Priority
Government/Legislative	**Government Subcommittee**	**Medium**

Action Item 18

Develop broadband and digital literacy awareness programs.

A consistent struggle when addressing broadband availability and affordability is whether sufficient user demand exists to warrant the cost of deploying new infrastructure, especially in areas where populations are sparse. The demand side of the broadband issue is well described and discussed in many state and national broadband studies. The need for sufficient demand to warrant expansion was also consistently shared by broadband vendors in their questionnaire responses. The main components that make up the overall demand for broadband are: total population and population density, the percentage of the population online, and how broadband is being used (e.g., what types of applications).

Recommendation:
The State, DRED and the Broadband entity should foster community-based digital literacy programs that teach people about the importance, and various uses of broadband technologies, which in turn help increase the demand for broadband. This is especially important in rural areas where low population density has an adverse effect on broadband deployment. Digital literacy programs have the potential to increase the percentage of the population that is online and change the way that people are using the Internet. If there is an emphasis on evolving from simply emailing and basic web surfing to uses such as e-commerce, online collaboration, and file sharing, the broadband demand per user will likely increase.

Digital literacy programs could also have a positive economic development impact as small businesses can learn new ways to incorporate more web and e-commerce tools into their operations and participate in flexible workforce jobs such as remote call operators, medical transcriptionists, and other small office/home office (SoHo) businesses that are increasingly popular in the State of New Hampshire.

Action Category	TAB Subcommittee	Priority
Demand	**Demand Subcommittee**	**Medium**

Action Item 19

Monitor and continually seek ways to improve the State's national rankings for broadband.

There are many different indexes that rank states and countries on their economy, technology environment, and broadband availability and affordability. New Hampshire is traditionally ranked highly on the overall economic rankings for many reasons. As stated in Section 4.0, New Hampshire ranks 12th on the New Economy Index for digital economy. Concurrently, the U.S. has been decreasing in its rankings for broadband in comparison to other OEDC countries for the last several years.

Recommendation:
New Hampshire should monitor how it is ranked in future years. This will be important as the State puts more emphasis on broadband availability and affordability. Most other states are also addressing broadband through policy and initiatives which causes the rankings to continually change. New Hampshire's goal should be to ensure that at a minimum it maintains its current rankings for digital economy and broadband, if not improve its ranking.

These national and international rankings should not be taken lightly since businesses and individuals often refer to them when considering relocation. For many businesses seeking to expand or relocate, this may be their first exposure to New Hampshire's broadband capacity. These rankings, therefore, play an important role in marketing the State.

Action Category	TAB Subcommittee	Priority
Government	Government Subcommittee	Medium

Action Item 20

Create a broadband website for users, providers, and researchers.

Based upon research and the feedback received from the vendor and user questionnaires it is clear that the State lacks a centralized website presence to communicate broadband policy, identify potential broadband resources, and describe current initiatives. Although a portion of the NH Economy site did have broadband information available until early 2008, due to a lack of resources, the information contained there was several years old.

Recommendation:
The future site of a "broadband website" should reside with the proposed broadband entity outlined in Action Item 1. Regardless of the progress of that item, the State of NH should seek to develop and sustain a central repository of key information, including but not limited to:

- Contact information for broadband providers in the State and their general service areas, types of services provided and prices for those services.
- Any and all State funded broadband projects, whether active or complete, along with contact information so interested parties can easily connect with leaders of the projects.

- Other identified broadband projects across the State, along with contact information so interested parties can easily connect with leaders of the projects.
- Updated research and best practices information that can be a resource for State and local government officials.
- To recognize achievements the site should communicate the State's position as a technology leader, and the high level of technical sophistication enjoyed by its citizens.
- Provide adequate funding to sustain ongoing maintenance of the site.

Action Category	TAB Subcommittee	Priority
Government	**Government Subcommittee**	**Medium**

Action Item 21

Re-examine the High Speed Heroes project completed in July 2007.

A key economic growth area for the New Hampshire economy is small and micro-enterprise businesses. These businesses usually do not have the expertise or resources to take advantage of broadband technologies to expand their businesses (unless it is core to their business). DRED should re-examine ways to take advantage of the previous research and lessons learned from their High-Speed Heroes program. This project was designed to provide technical assistance to selected micro-businesses in Carroll, Coos, Grafton, and Sullivan Counties in New Hampshire, who had expressed interest in expanding their companies via broadband technology. The overall objective was to provide technical assistance to these businesses and then analyze the resulting changes to more fully understand the impact of broadband technology and applications on rural microenterprises.

Recommendation:
It has been reported that this initiative did not result in the progress that had been hoped for, but the merits of the project are worth evaluating. As part of its ongoing efforts to increase the demand for broadband services in rural areas of the State, DRED in partnership with the proposed Broadband Entity and the regional Community Colleges could:

- Review the "best practices" and "lessons learned" from the High Speed Heroes report that can be used to enhance the application of broadband technologies and underlying public policy efforts for rural microenterprises. In addition, based on the findings of this report the State could:
    - Provide onsite, intensive technical assistance to assess how each business is utilizing high speed telecommunications and available broadband technologies;
    - Identify new ways that broadband technologies could be utilized to help expand/enhance their businesses; and
    - Establish and implement a broadband technology plan that includes measurement strategies to help each business transform specific business functions.

Action Category	TAB Subcommittee	Priority
Demand	**Demand Subcommittee**	**Medium**

Action Item 22

Align Broadband Initiatives with the Governor's Smart Growth Policy

Broadband providers seek high population densities where the return on their investment is likely to be higher. The Governor's Office has instigated Smart Growth initiatives to limit sprawl and encourage development in or near town centers. This aligns well with typical broadband deployment strategies.

Recommendation
The State should promote the alignment of Smart Growth policies with increased deployment of broadband services. A task force of planning and economic development officials and broadband providers should be asked to evaluate and determine how best to develop the concept of "wired communities" in the State and identify existing models in New Hampshire.

Action Category	TAB Subcommittee	Priority
Government	**Government Subcommittee**	**Medium**

Action Item 23

Provide annual regional forums for citizen input of, and feedback on broadband initiatives, utilizing the methodology used for this project.

One of the key lessons learned from this process was that the State currently lacks a consistent vehicle for gauging public opinion about broadband issues, or providing a neutral forum for engaging the public on this statewide issue.

Recommendation:
The regional forums conducted as part of this process were mutually beneficial for government officials, members of the TAB, and attendees alike by providing a neutral forum (meetings were not held at State agencies) where stakeholders could discuss, and when necessary debate the broadband issues. The feedback and response from the regional forums was overwhelmingly positive and this momentum should be carried forward regardless of the progress made with Action Item 1. A possible timeframe for these meetings may be the summer or fall before the start of the legislative session. The future annual regional forums should be organized and conducted in a similar manner to the process used during this project.

Action Category	TAB Subcommittee	Priority
Government & Demand	**Demand Subcommittee**	**Medium**

Action Item 24

Evaluate the feasibility of implementing school laptop and computer recycling initiatives for at least some portions of the State of New Hampshire.

The Maine school laptop initiative and the Kentucky computer recycling programs have both received positive press since their implementation. The impact of these two programs on broadband adoption and computer usage has been reported positively.

The Maine laptop initiative was started by former Governor Angus King and has been carried forward by the Maine Learning Technology Initiative and the subsequent administrations in Maine. The initial focus for the program was to prepare students for a technology focused economy and world as well as for Maine to stay competitive with other states that had already begun similar programs. The program provided laptop computers to all 7th and 8th grade students and their teachers.

In Kentucky the state government has undertaken a computer program, where government-owned computers are refurbished and distributed to the state's citizens. Nearly 13,000 students have received refurbished computers and/or training in 40 Kentucky communities.

Recommendation:
Both the laptop program and computer recycling are specific examples of digital literacy programs. Action Item 18 discussed implementing digital literacy programs in a general sense. The school laptop and computer recycling programs are tangible examples that warrant further analysis.

New Hampshire should evaluate the feasibility for establishing a laptop initiative for its schools. Preparing students for college and the 21st century economy is important for the State. There are potential synergies between this Action Item and Action Item 17 which recommends working to support that every school, library and town hall has access to broadband. By providing students with tools to effectively use the Internet (laptops) and reliable connections to the Internet (broadband), the State will be working towards increasing demand, improving its education, and creating a future workforce that is positioned to use technology.

New Hampshire should also consider the feasibility for recycling government computers and providing them to its citizens. Unlike the laptop program, which specifically targets students, a recycling program like this could reach a broader group of citizens. A positive impact on the computer usage and potential for increased broadband demand across a broad group of users would be beneficial. This initiative complements the goal of increasing the amount of affordable broadband for citizens by providing affordable computers to them.

Action Category	TAB Subcommittee	Priority
Demand	**Demand Subcommittee**	**Medium**

Action Item 25

Measure the success of BAP recommendations through an annual (or semi-annual) survey.

A significant effort of this project was to conduct the regional forums and issue a questionnaire to broadband users in order to gauge the status of broadband in New Hampshire. Similar efforts have been conducted in previous years by DRED, the TAB, and other organizations in New Hampshire. A complaint that was shared many times from participants during forums and other project meetings is that often these efforts have a start and stop pattern to them, and lack consistency with providing appropriate follow through.

Recommendation:
In this section, many Action Items have been proposed to help to improve the availability and affordability of broadband in New Hampshire. Many of these goals are focused on bringing a central, consistent, and focused attention to the issue. Ensuring that the efforts made to carry those recommendations forward are effective is very important.

A periodic survey and evaluation (annual or semi-annual) of the progress made towards improving the availability and affordability of broadband should be conducted. An independent third party is recommended for undertaking this survey to ensure objectivity in the evaluation. An organization that has the capacity and experience to produce statewide, statistically valid samples should be considered for this action item.

Action Category	TAB Subcommittee	Priority
Government	**Broadband Action Plan Subcommittee**	**Medium**

5.3 "Connecting the Dots" – Implementing the Broadband Action Plan

The previous section described twenty-five Action Items aimed at improving the availability and affordability of broadband in the State of New Hampshire. Having a defined process by which to carry the Action Items of this report forward, maintain ownership of them, and advocate for their completion will be essential for the success of this plan.

Action Item 1 recommends the creation of a broadband entity that has a mission to focus on the issue of broadband in the State of New Hampshire. This is the logical entity to carry forward the recommendations of this report and work to have them implemented. However, since the creation of the proposed organization is a primary recommendation of this report, an assumption must be made that it will be created. However, the additional 24 Action Items can still be implemented independently of Action Item 1 with likely varying levels of success. The decision that New Hampshire reaches regarding the proposed broadband entity will significantly influence how the remaining 24 action items are implemented and who has ownership to make sure that they are addressed.

This section provides recommendations for implementing the Action Items of this report for the short term, the long term, and also some contingency plans if the broadband entity is not established.

Short Term Ownership – the Broadband Action Plan Steering Committee – FY 2009
Significant leadership has been provided for this project and the development of the Broadband Action Plan by DRED, the TAB, and specifically the Broadband Action Plan Steering Committee (BAP Steering Committee). The BAP Steering Committee has been a leader and primary contributor to the outreach efforts, state research, and development of the recommendations that came out of this project. Members of this group participated in every regional forum, were available to provide BDMP with input and guidance throughout the six month process, and participated in weekly status calls to discuss progress and next steps.

The momentum of this group has been instrumental in the overall success to date and makes it the logical owner for carrying forward the overall recommendations of this report in the short term, specifically until a decision on the proposed broadband entity (Action Item 1) is reached by the State of New Hampshire. As described in the previous recommendation section, a subcommittee structure for the TAB is recommended. The subcommittees are responsible for advocating for specific Action Items of this report.

The subcommittees should start by scheduling meetings with the appropriate parties in the State Government, Legislature, and other relevant stakeholder groups to present this report and its 25 Action Items. Specifically, the Legislative Subcommittee should strongly advocate for a decision on the creation of the broadband entity. Reaching this decision will be pivotal in directing the next steps.

In order to monitor overall progress, the BAP Steering Committee should continue to conduct weekly or semi-monthly conference calls to discuss the status of the recommendations and next steps. Lastly, the BAP Steering Committee should also identify appropriate individuals

that should be involved with each TAB subcommittee. In order for this process to be successful, a collaborative environment will need to continue.

Long Term Ownership – Creating a Broadband Entity – Beyond FY2009

Assuming that the proposed broadband entity is created as described in this report, it will have significant involvement in the implementation of the remaining 24 Action Items, providing leadership on many of them. As described in the recommendation section of Action Item 1, this entity will require a strong leader with excellent people and communication skills. Developing relationships, fostering an environment of collaboration, and coordinating the efforts of different entities are essential to its success. The TAB, the BAP Steering Committee, and the TAB subcommittees will continue to have a role and advocate for the Action Items of this report. Collaboration between the broadband entity and the TAB is central to the overall success of this plan.

The first step that the proposed entity should take is to review this report and specifically review the 25 Action Items it contains. The organization should then schedule meetings with the TAB and TAB subcommittees identified in the Action Item section to discuss, update, and prioritize the Action Items. These meetings will also help to foster buy-in for the entity's role, the Action Item recommendations, and the direction that New Hampshire is going in. Once this is completed the entity can put together a detailed project plan including a timeline of all of the action items and the parties who will work to implement them. The entity can then transition activities to provide constant focus, active involvement, and monitor progress being made on the Action Items.

Contingency Plans

Though it is the strong preference of this report, it is possible that a broadband entity is ultimately not established. In order to ensure that the forward momentum generated by this effort continues and the additional 24 Action Items are addressed, this section provides alternatives for carrying the process forward.

Option 1

The BAP Steering Committee continues to serve as the owner of this document until a more permanent entity is defined. This group is familiar with the process that was undertaken, has endorsed the recommendations, and has the leadership and expertise needed to make this successful. This group will require the support of DRED, the TAB Subcommittees, the full TAB, and some administrative staff in order to make progress and push for the Action Items to be implemented.

Option 2

DRED takes ownership of the Action Plan and pushes for the action items to be implemented. DRED has already been focused on the issue of broadband so this is a good fit with its mission and role. Having DRED focus on the issue of broadband has already been discussed on the State level so this may be a feasible contingency plan should the proposed broadband entity not be established. The TAB and the TAB Subcommittees should work collaboratively with DRED to advocate for the Action Items of this plan.

Sustaining the Process

Much like any planning process, progress will be made to address the issues and implement the recommendations. However, a consistent monitoring and evaluation of the Broadband Action Plan will be required to identify those issues that have been addressed, and to add new issues that have arisen.

In the short term, the TAB and DRED are the rightful owners of this document with leadership being provided by the BAP Steering Committee to ensure that forward momentum is maintained. The BAP Steering Committee should provide, at a minimum, quarterly updates on the progress of the Broadband Action Plan to the Governor's office until a formal broadband entity can be established.