

**The Telecommunications Planning and
Development Initiative**

**The Telecommunications Planning and
Development Advisory Committee (TAB)**



Telecommunications in New Hampshire

June 2013 Report



STATE OF NEW HAMPSHIRE
DEPARTMENT of RESOURCES and ECONOMIC DEVELOPMENT
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Transmittal Letter

June 30, 2013

Christopher S. Way
Interim Director
Division of Economic Development
NH Department of Resources and Economic Development

It is my pleasure to present the Telecommunications in New Hampshire June 2013 Report on behalf of the Telecommunications Planning and Development Advisory Committee (TAB).

The report represents collaborative efforts made to focus on New Hampshire's progress with regards to seven critical action items cited in the Broadband Action Plan of 2008, and recommendations going forward to continue working on opportunities and challenges ahead.

It documents legislation over the last two years affecting the telecom industry and developing policy as the industry maximizes the opportunities deregulation presents to spur innovation in the competitive marketplace. It provides a look at public and private investments in infrastructure, and their effects on economic development initiatives around the state while benchmarking progress made with regards to the availability of broadband technologies statewide.

New Hampshire is well positioned to compete in the knowledge economy due to the efforts of the industry. Penetration of broadband availability increased from 73% in 2010 to 88% in the March 2013 submission data provided by the NH Broadband Mapping and Planning Program. It shows remarkable progress to the goal of fulfilling the needs of the unserved and underserved areas of the state.

The Telecommunications Planning and Development Advisory Committee provides a forum that best addresses the ever changing landscape of availability, affordability, and adoption of broadband and telecommunication services. As the membership grows to include a member from healthcare and public safety, we will continue to assess, and evaluate the impact on New Hampshire's economy.

Respectfully submitted,

Carol Miller
Director of Broadband Technologies
Division of Economic Development
Department of Resources and Economic Development



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DIVISION OF ECONOMIC DEVELOPMENT 603-271-2341

Telecommunications Planning and Development Advisory Committee

Members shall be: (a) the governor; (b) commissioner of resources and economic development; (c) commissioner of administrative services; (d) chairman of the public utilities commission, or their designees. (e) one member of the house of representatives, appointed by the speaker of the house of representatives; (f) one member of the senate, appointed by the president of the senate; (g) the chief information officer or designee; (h) the following persons nominated by the commissioner of resources and economic development for appointment by the governor and council:

WILLIAM CRAIG, Governor's Office, designee

CHRISTOPHER S. WAY, Interim Director of Economic Development, designee

KATE BAILEY, Public Utilities Commission, designee

REP LAURENCE RAPPAPORT, House of Representatives, designee

SEN BOB O'DELL, Senate, designee

FRANK CATANESE, Department of Information Technology, designee

DESIGNEE, Commissioner of Department of Safety

(1) two members representing residential telecommunications customers; (2) one member representing large business telecommunications customers; (3) one member representing small business telecommunications customers; (4) one member representing educational technology; (5) one member representing municipal government; (6) one member representing county government; (7) one member representing a regional economic development organization or a regional planning commission; (8) one member representing healthcare technology and (9) up to 7 members representing several of the following sectors of the telecommunications industry; wireless, paging, incumbent local exchange carriers, competitive local exchange carriers, Internet service providers, cable, long distance providers, and broadcast television.

A member representing one sector may also represent one or more other sectors, as deemed appropriate by the commissioner; and (i) The director of broadband technology planning and development in the division of economic development.

CAROL MILLER, Director of Broadband Technologies, Division of Economic Development

Current Member Appointed by the Governor for three years terms and until a successor is appointed.

RSA 12-A. Chapter 315; 2007 (Chapter 197; 2009 eff. 7/13/09)

Martha McLeod, Franconia (residential telecom user)

Theodore R. Jastrezemski, Hanover (residential telecom user)

Elizabeth H. Merry, Laconia (small business telecom user)

Brian T. Shepperd, UNH, Lee (educational technology)

Robert D. Ciandella, Attorney, New Castle (municipal government)

Arthur Durette, Pembroke (county government)

Michael Blair, Granit, Swanzey (regional economic development organization or planning commission)

Marc A. Violette, Telephone Association of New England, Warner (industry)

Christopher K. Hodgdon, Comcast, Hopkinton (industry)

Brian R. Foucher, WiValley Inc. Harrisville (industry)

Ellen G. Scarponi, FairPoint Communications, Canterbury (industry)

Jeremy L. Katz, segTEL, Lebanon (industry)

Maura M. Weston, Lobbyist, Concord (industry)

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The Telecommunications Planning and Development Advisory Committee

June 2013 Report

Section 1

Legislative Mandate:

The Telecommunications Planning and Development Initiative and Advisory Committee (TAB) was created in 2000 (RSA 12-A;45-47) to identify and publicize the state's telecommunications infrastructure and barriers to deployment as an integral part of the state's economic development efforts. The TAB seeks funding and resources through collaboration for the planning, development, administration, and implementation of programs to assist in the distribution of information regarding telecommunication services, infrastructure, and broadband technologies. The committee has a diverse membership of private industry providers, educators, municipal, county, state, and other governmental officials to assist with planning efforts to enhance the deployment of telecommunications and broadband services. A report is due to the Director of Economic Development at the New Hampshire Department of Resources and Economic Development yearly regarding industry status, opportunities and challenges.

Mission Statement:

Encourage, promote, and support the achievement of affordable universal access and adoption of interoperable advanced telecommunications throughout the state of NH to facilitate economic development, improve the quality and availability of education, healthcare, public safety and government services.

Goals of the Broadband Action Plan of 2008:

The Broadband Action Plan of 2008 summarized general findings, and identified 25 action items to be completed within 3 years to move the state forward to ensure that New Hampshire maintained and improved its leadership position to compete in the new knowledge economy. It further identified that broadband was a necessity for both business and citizens and recognized that a framework to evaluate best practices, public-private partnerships, and an understanding of supply and demand dynamics was needed to spur further broadband deployment. In addition, a state leadership position was extremely important to ensure that broadband initiatives and projects were well coordinated in order for state government to take advantage of opportunities through collaboration and partnerships to realize cost savings, and improve operational efficiencies thereby reducing the burden on state budgets for telecommunications.

To date, responses to a number of action items of the 2008 plan have produced successful advances, as well as discovering significant challenges hindering the development of grant funded projects and/or private investments. On the 25 action items, these 7 items were considered critical to the improvement of broadband in NH.

1. **Leadership**
2. **Streamline the tower siting process**
3. **Remove barriers to state rights of ways access (ROW)**
4. **Identify new financial resources to support broadband initiatives**
5. **Evaluate the feasibility of the creating a broadband services fund**
6. **Improve utility pole access**
7. **Provide incentives for last mile deployment in unserved and underserved areas of the state.**

Progress:

Leadership: A leadership “point person” was hired by the Division of Economic Development at DRED in late 2009. The position, Director of Broadband Technologies, initially funded through discretionary ARRA funds to the State of New Hampshire, has been further funded through additional grant-specific ARRA funds through June 2014. The Director has been working in close collaboration with two grant funded projects; the National Telecommunications and Information Administration (NTIA) Broadband Technology Opportunities Programs (BTOP) Comprehensive Community Infrastructure (CCI) grant, titled Network New Hampshire Now which is an infrastructure development project; and the NTIA State Broadband Initiative (SBI) program, titled the New Hampshire Broadband Mapping and Planning Program (NHBMP), to accomplish the reports recommended responsibilities in broadband mapping and planning.

Streamline the tower siting process: The recent surge in cell carrier activity has been enhanced by the deployment of fiber by public and private investments. Cell carrier investment in the state will reach an estimated \$60 Million this year as new facilities are built out and older facilities upgraded with state-of-the-art technologies. The TAB needs to continue to work on enhancing mobile broadband to unserved pockets around the state to benefit as broadband is critical for public safety. At the state level NHSafeNet, a partnership of DRED, NH Department of Transportation, NH National Guard, NH Department of Safety, and NH Public TV has taken advantage of ARRA grant funding to upgrade mountain top facilities to a new IP based multi-user platform freeing up tower space for private providers. DRED provides management to many tower sites and fire towers throughout the state. DRED has revised policy to accommodate broadband providers and cell carriers making the permitting process for securing space on towers more efficient and timely.

Remove barriers to state rights-of-way access : The Department of Transportation (DOT) has made progress on reducing barriers to state rights-of-way (ROW). A Utility Accommodation Manual, which was revised in 2010, outlines the policy and procedure regarding utility use of and pole placement in the ROW. A committee of legislators have been studying limited access rights of way (LAROW) using interstates for power and fiber. Open trenching does not require permitting for work performed concurrently with DOT highway construction projects. DOT is in the process of finalizing a shared resource policy which would allow providers to use state owned conduit for the deployment of fiber assets.

Identify new financial resources to support broadband initiatives: Although it's not clear how yet, development of partnerships with the NH Community Development Finance Authority (NHCDFA), the NH Charitable Foundation, and NH Municipalities, could enhance broadband availability, affordability, and adoption efforts in the state. Continued collaboration with the University of NH and Cooperative Extension in behalf of the state will continue to be important in seeking grants for training and adoption of the use of broadband and digital tools for economic development. The establishment of the University's Broadband Center of Excellence (BCOE) will be a driving force in the business sector. In addition federal funding from the Universal Service Fund – Connect America Fund, the National Telecommunications and Information Administration (NTIA), United States Dept of Agriculture (USDA) Rural Development Programs, Economic Development Administration (EDA), and the Northern Border Regional Commission has been key to funding many current and further broadband initiatives. FirstNet, the federally NTIA funded National Public Safety Initiative will be a source of funding for organizational and planning of New Hampshire's rollout of an interoperable mission critical system of alert and communication in the event of a national disaster.

Evaluate the feasibility of creating a broadband services fund: The establishment of an independent broadband authority entity by legislation to support and fund public-private initiatives, and expand broadband penetration has not materialized due to budget constraints at the state government level. Efforts put forth to capture funding to create a broadband service fund were not successful in the current economic climate. The TAB is working with the industry to draft legislation to provide tax credit incentives for deploying broadband to unserved markets and make recommendations to legislators who are seeking to help further broadband availability of their respective districts.

Improve utility pole access: There have been some improvements to utility pole access issues while others may continue to be a challenge to the telecom industry in New Hampshire.

Provide incentives for last mile deployment in unserved and underserved

areas: Advances in broadband penetration from 73% in 2010 to 88% in 1st quarter of 2013 indicate progress made to becoming a connected state. We are 14th in the Nation based on leadership, adoption, quality, and economic structure as reported in TechNet's 2012 State Broadband Index. New Hampshire scored 1st and 2nd place in the December 2012 Akamai State of the Internet Report for 4th quarter 2012 high-speed availability and adoption in the Nation. High Tech Business and the NH Advantage along with high-speed broadband availability have enhanced recruitment efforts to bring companies and jobs to our local economies. Broadband expansion based on the efforts of public and private provider investments in 2013 is estimated to increase availability another 5% - 10% statewide. The unserved and underserved pockets where there is no expected return on investment around the state will likely need public financing or some other creative solutions to attract service.

Recommendations and Policy Considerations:

1. Retain a full-time Director of Broadband Technologies. State support is needed to fund a full-time status position at the Division of Economic Development at the New Hampshire Department of Resources and Economic Development.
2. Establish a broadband authority for New Hampshire. An authority has been key in other states to funnel resources into the state for broadband investment. Coordination of and collaboration with broadband initiatives will strengthen New Hampshire's position in the global economy while taking advantage of the economies of scale with regards to public-private partnerships to enhance infrastructure capacity and state of the art telecommunication systems.
3. Secure funding resources for broadband mapping and planning initiatives in health care, education, public safety, government, business and residential sectors. The NH Broadband Mapping and Planning Program is key to the measurement of progress regarding broadband availability, identifying the remaining unserved and underserved areas, and support tools for communities to develop policy regarding broadband and master planning efforts. Based on the recognition that there is a strong connection between economic development and broadband availability, New Hampshire needs to secure funding to continue understanding the state's position with regards to competing and keeping up with the nation and the globe.
4. Monitor on-going proceedings at the NH Public Utilities Commission regarding current pole attachment regulations that will better identify the rights and obligations of all of the parties utilizing the utility poles.
5. Make broadband a priority by rallying bipartisan support for legislation with regards to incentives for last mile deployment to attract private partners to deploy broadband in unserved and underserved markets. Options such as tax credits and direct grants for expansion efforts to unserved areas could help mitigate the lack of return on investment. Any changes to legislation need to ensure fairness to public and private interests.

6. Monitor broadband development. Beyond availability, then affordability, adoption, and capacity will continue to be important challenges in the competitive market place for years to come.
7. Focus goals and objectives of the TAB Agenda to measure the impact of broadband development in terms of economic development and job creation.

Legislation:

There were several pieces of legislation introduced the past two years affecting telecommunications, broadband, and cellular communications. We are just beginning preliminary talks about working with the industry on legislation to provide incentives for providers to attract investment to expand broadband to unserved markets. Below is a list and status of the proposed legislation for 2012 and 2013.

Year 2012:

- **HB1152 – Establishing a committee to study high speed digital subscriber line (DSL) service.** The bill was a result of a service complaint on behalf of a residential DSL customer and was inexpedient to legislate. The complaint was handled by the provider.
- **HB1166 - Relative to Broadband Equipment on Mt Cardigan.** It was moved to inexpedient to legislate due to the Division of Forest & Lands at the Department of Resources and Economic Development's position that it was already negotiating with a Wireless Internet Company for use of facilities.
- **HB1295 – Relative to the potential effects of total deregulation of telecom** was introduced as a backup bill to SB48 and the deregulation of retail voice service and moved to inexpedient to legislate.
- **HB1305 – Reestablishing exemption for taxes on poles and conduits and establishing a committee to study how utilities are taxed by the state and municipalities.** It was unsuccessful in reversing the statute that allowed the exemption to expire for incumbent local exchange carriers. It passed committee but did not pass the house floor as was declared inexpedient to legislate.
- **HB1390 – Relative to regulation of incumbent local exchange carriers** was inexpedient to legislate.
- **HB1391 – Relative to transmission and distribution utility line ext and relative to pole attachments.** It introduced the use of boxing and swing arms on utility poles as a way to utilize pole space more efficiently and speed up the process of make ready for pole attachers. The industry opposed the legislation as it was considered an unsafe practice. The bill was sent to interim study committee where it still resides.
- **HB1418 - Increasing the threshold amounts for taxation under the business enterprise tax and extending the commission to study business taxes; excluding charges for Internet access from the communications services tax and requiring the transfer of insurance premium tax revenue to the department of health and human services; and relative to section 179 expense deductions under the business profits tax.** Passed into law without Governor's signature. It clarified New Hampshire's intent that internet access is not taxable.
- **SB48 – Relative to state regulation of telephone service providers and clarifying the authority of the Public Utilities Commission (PUC) to regulate pole attachments.** The bill passed the House and the Senate and was signed into law by Governor John Lynch August 2012. It established a new designation of

provider as an excepted local exchange provider (ELEC). The bill deregulated retail voice service, VoIP and IP enabled services. It confirmed that the PUC shall retain its authority to regulate pole attachments for safety, vegetation management, emergency response and restoration within the public rights-of-way. The real effects of this bill are still being worked on as the PUC rewrites the 400 rules for telephone providers based on the passage of SB48.

Year 2013:

- **HB273 – Authoring the Commissioner of the Department of Resources and Economic Development to enter into contracts for provision of free Wifi Internet access at Hampton Beach State Park.** It was inexpedient to legislate as the Commissioner of DRED can already enter into contracts.
- **HB284 – Providing for collection of the E-911 surcharge from certain prepaid cellular telephones.** The bill has been retained in committee as there is a dispute between E-911 administration and the industry on who will collect and remit the surcharge on prepaid wireless cards.
- **HB286 – Relative to Broadband Infrastructure.** Proposed changes to enabling legislation would allow municipalities to bond for broadband infrastructure was recommitted to the Science, Technology, and Energy Committee of the House. The changes excluded the service providers by requiring the infrastructure to be open access. It also removed the focus from the unserved allowing municipalities to bond for broadband and serve anywhere and everywhere. The service provider industry maintains that municipalities can bond now and opposed any change to current legislation RSA 38:38, and RSA 33. It did pass the committee but was recommitted before a floor vote. A study committee has been named to look at this issue and decide whether to move forward with revised legislation.
- **HB368 – Relation to the Telecommunication Planning and Development Initiative (TAB).** Written by the TAB and sponsored by a TAB House Member. The essence of the bill is to continue the work of the TAB. It repeals the repeal which means that the committee no longer has to go back to the legislature upon expiration of the term of the legislation. It only needs to go if it decides to disband. It changes committee member designee from Administrative Services to NH Department of Safety, and adds a health care representative to membership. It sets a quorum at 9 members present and freshens up the responsibilities of the TAB with a yearly report due to the Director of Economic Development at DRED. It passed the House and Senate and was signed into law on May 2013 by Governor Hassan.
- **HB372 – Relative to state agency telecommunication services.** The bill was a housekeeping item for the NH Department of Safety to write and update a manual, instructions for users, and billing processes for the statewide VoIP system. Signed into law and effective on 5/16/13.
- **HB542 - Relative to electric renewable portfolio standards.** An amendment was added to the bill that clarified both the wording and the intent of SB 48 (enacted in 2012) such that Voice over Internet Protocol (VoIP) and Internet Protocol (IP) enabled services are not considered public utilities as well as

clarifying that telephone service with any service or feature in addition to basic service is considered non basic service. Passed and awaiting Governor's signature.

- **SB26 – Authorizing state agencies to enter into audit/cost recovery contracts or shared savings agreements for wireless telecommunication services.** The bill was inexpedient to legislate.
- **SB101 – Relative to collocation and modification of personal wireless services facilities.** The recent passage of this bill will make it easier for cell carriers to upgrade their existing facilities to 4G services. It streamlines the municipal process for the carriers. Still awaiting enrollment.
- **SB111 - Permitting municipalities to establish a capital reserve plan for expenditure of capital reserve funds and relative to electronic billing by municipal utilities.** The exact interpretation of the bill is yet to be determined but it shows promise with regards to allowing municipalities to establish a capital reserve plan and appropriate funds beyond a year up to 5 years. The reserve plan and fund is for projects that they would otherwise lawfully issue a bond or note for including broadband. Signed into law 6/24/13 and effective 8/23/13.

Section 2

Broadband is defined by the National Telecommunications and Information Administration (NTIA), as “advanced communications systems capable of providing high-speed transmission of services such as data, voice, video, complex graphics, and other data-rich information over the Internet and other networks.”

Stakeholders often seek to define broadband in terms of download and upload speeds, in part because these are discrete, convenient, and standardized metrics. Download and upload speeds measure the amount of data transmitted per second, as reported in kilobits (kbps), megabits, (mbps) and gigabits (gbps).

At the state level, the New Hampshire Broadband Mapping and Planning Program (NHBMPP) is tasked with mapping where broadband is currently available, determining how it can be made more widely available in the future, and encouraging increased levels of broadband adoption and usage. NHBMPP is also offering broadband planning and technical assistance to a wide range of groups and organizations throughout the state.

For the purposes of discussion and planning, the NHBMPP has developed the attached matrix to assist stakeholders in understanding the diverse levels of broadband available in the state today, and the typical functions a user might be able to perform within a range of download and upload speed tiers. Using these tiers, the Program has established broadband availability categories (“served”, “underserved”, and “unserved”) to describe access to broadband service. These categories are based solely on the maximum speeds available to the end-user or end-device. While some states are also considering the number of providers servicing a given area when determining access levels, e.g. a degree of competition, the NHBMPP has not chosen to incorporate those analyses in its availability categories.

When using the attached matrix to evaluate access, determine the category by assessing both the download and upload speeds. Most broadband technologies (cable, wireless, satellite, etc.) are not capable of sending and receiving data at the same speed, with upload speed typically being more limited.

This document does not seek to supersede other national and/or state efforts to establish a standard definition for “broadband.” It also limits the focus to transmission speed, while recognizing that affordability and functionality are also key factors when assessing broadband needs and barriers to adoption.

Broadband functions, applications and technologies are continually changing. Only 15 years ago, a 56 kbps connection was sufficient to conduct most business on the internet. Today, in order to use many internet applications successfully, a minimum download speed of 3 mbps is required. This trend towards increasing requirements for bandwidth capacity will certainly continue into the future, and the matrix of uses presented herein will evolve as well.

- For more information on the NHBMPP, please visit <http://www.iwantbroadbandnh.org>
- To take a customized speed test and measure your actual delivered upload/download speeds, please visit http://www.iwantbroadbandnh.org/speed_test

Category	Download Speed	Upload Speed	Typical Functions/Use (functions additive to level above)	% of housing units with service equal to or greater than download/upload speed*
Unserved	< 768 Kbps	< 200 Kbps	<ul style="list-style-type: none"> • Email (Client/Server-based; POP) 	00.50%
Underserved	768 Kbps to < 1.5 Mbps	200 Kbps to < 768 Kbps	<ul style="list-style-type: none"> • Web-based email • Limited web browsing and shopping • Minimal social media use • Sending/Receiving small documents/files (photos, word processing, invoices) but not concerned with speed of download/upload • Not interested in streaming content • No VPN needed for business applications • Use of internet not integrated in daily life function • Single user internet device • Don't require multiple functions to be running simultaneously (e.g. web browsing, streaming video/music, downloading content) 	99.48%
	1.5 Mbps to < 3 Mbps	768 Kbps to <1.5 Mbps	<ul style="list-style-type: none"> • Web browsing and shopping • Medium social media use • Sending/Receiving medium-sized documents/files (photos, word processing) • Limited streaming content; buffering a concern Standard Definition (SD) content • VPN access possible, but speed of operation not critical to job function • Internet integrated in daily life, and "always" connected • 1-3 simultaneous internet devices possible • Multiple functions working simultaneously possible (e.g. web browsing, streaming video/music, downloading content) but not concerned with potential slowness of downloads and uploads • VoIP (Voice over IP, i.e. telephone over the Internet) 	99.08%
Served	3 Mbps to <6 Mbps	1.5 Mbps to <3 Mbps	<ul style="list-style-type: none"> • Medium to high social media use • Sending/Receiving medium to large-sized documents or files (photos, word processing) • Streaming SD content; buffering not a concern; downloading High Definition (HD) content (movies, video) speed a concern • 3-5 internet devices possible • VPN access needed, speed of operation important but not critical to job function • Multiple functions performing simultaneously required (e.g. web browsing, streaming video/music, downloading content), but not concerned with potential slowness of downloads • Low quality, small window frame videoconferencing (Skype) • Cloud-based computing and data storage 	87.84%
	6 Mbps to <10 Mbps	3 Mbps to 6 Mbps	<ul style="list-style-type: none"> • Heavy social media use • Sending/Receiving large documents or files (photos, word processing, small videos) 	87.52%



			<ul style="list-style-type: none"> • VPN access needed, speed of operation critical to job junction • Higher quality, codec-based videoconferencing • Multi-player online gaming 	
	10 Mbps to <25 Mbps	6 Mbps to <10 Mbps	<ul style="list-style-type: none"> • Sending/Receiving large files and small to medium-sized databases • HD quality, codec-based, large frame videoconferencing; multiple (bridged) sites/users • Remote synchronous education, professional development, workshops, etc., facilitated simultaneously at multiple classrooms and/or other locations • Telehealth/telemedicine applications possible 	71.60%
	25+ Mbps	10+ Mbps	<ul style="list-style-type: none"> • Sending/Receiving medium to large-sized databases • HD quality, codec-based, large frame videoconferencing (Telepresence) connecting multiple (bridged) sites/users • High speed end to end network and business to business applications • Telemetry-based applications (rely critically on the ability of broadband to continuously monitor and multiplex data, i.e. remote patient monitoring, sensing systems, etc.) • Real-time HD medical imaging and consultation (remote dermatology, etc.) • "Internet 2" connectivity and applications 	71.59%

* Analysis is based on DSL, cable, T-1, fiber and fixed-wireless (WISP) broadband service availability submitted to the NHBMP in March 2013. Business class broadband service providers are included in the analysis and may overstate broadband availability to residential customers. Satellite and cellular service were excluded from these calculations.

NH Broadband Mapping & Planning Program: Number of internet service providers



Map Key

Other Features

-  Interstate
-  County boundary

Number of Providers

Number of Providers

-  1
-  2
-  3
-  4
-  5
-  6
-  7
-  8
-  9
-  10
-  11
-  12

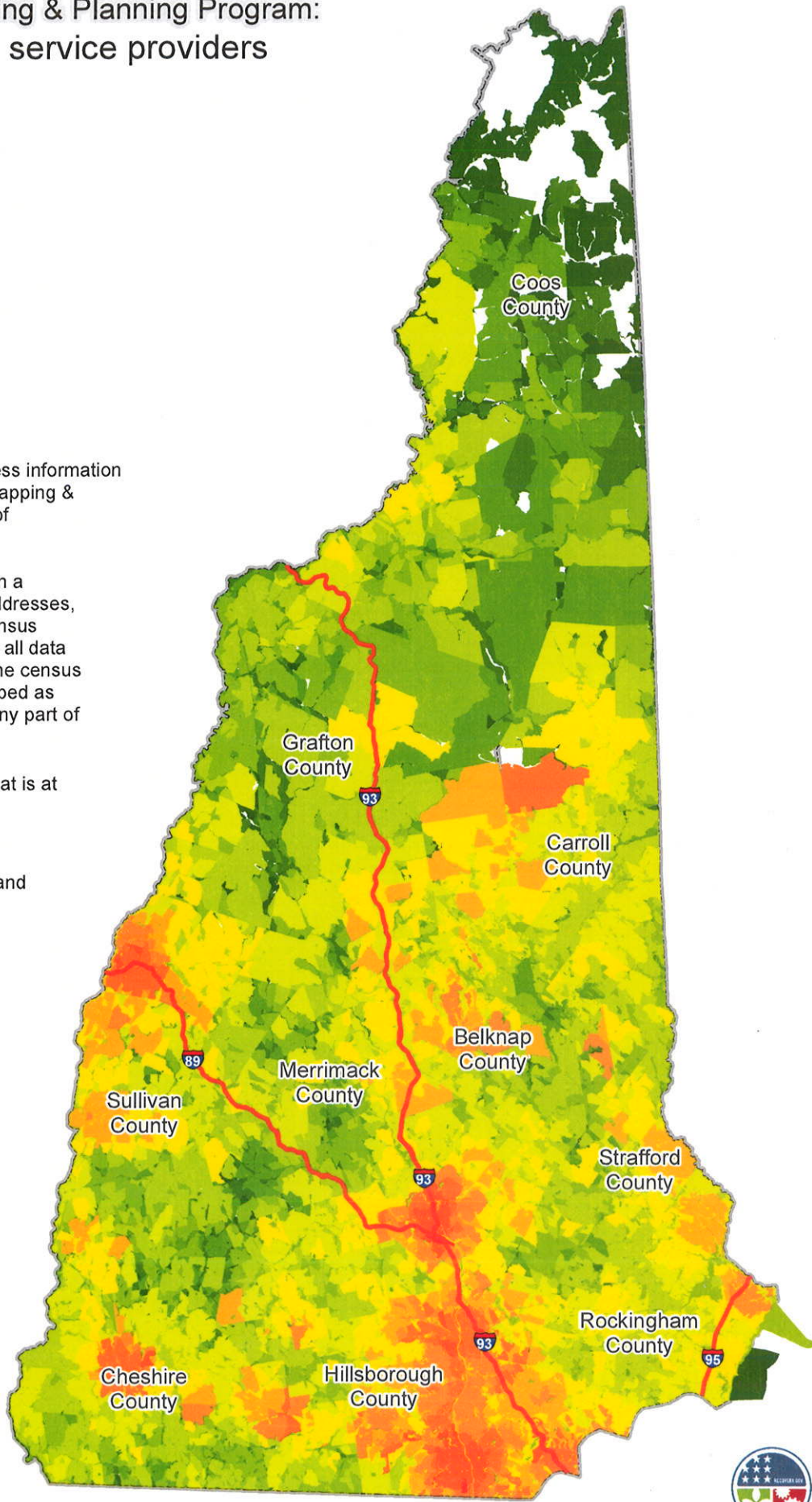
The map displays broadband access information submitted to the NH Broadband Mapping & Planning Program (NHBMPP) as of March 31, 2013.

Service providers submitted data in a range of geographies, including addresses, road segments, census blocks, census tracts, etc. For mapping purposes, all data are aggregated and displayed at the census block level. A census block is mapped as "served" if service is delivered to any part of the block.

Broadband is defined as access that is at least **768 kbps downstream** and **200 kbps upstream**.

Maximum download speed was calculated without satellite broadband service.

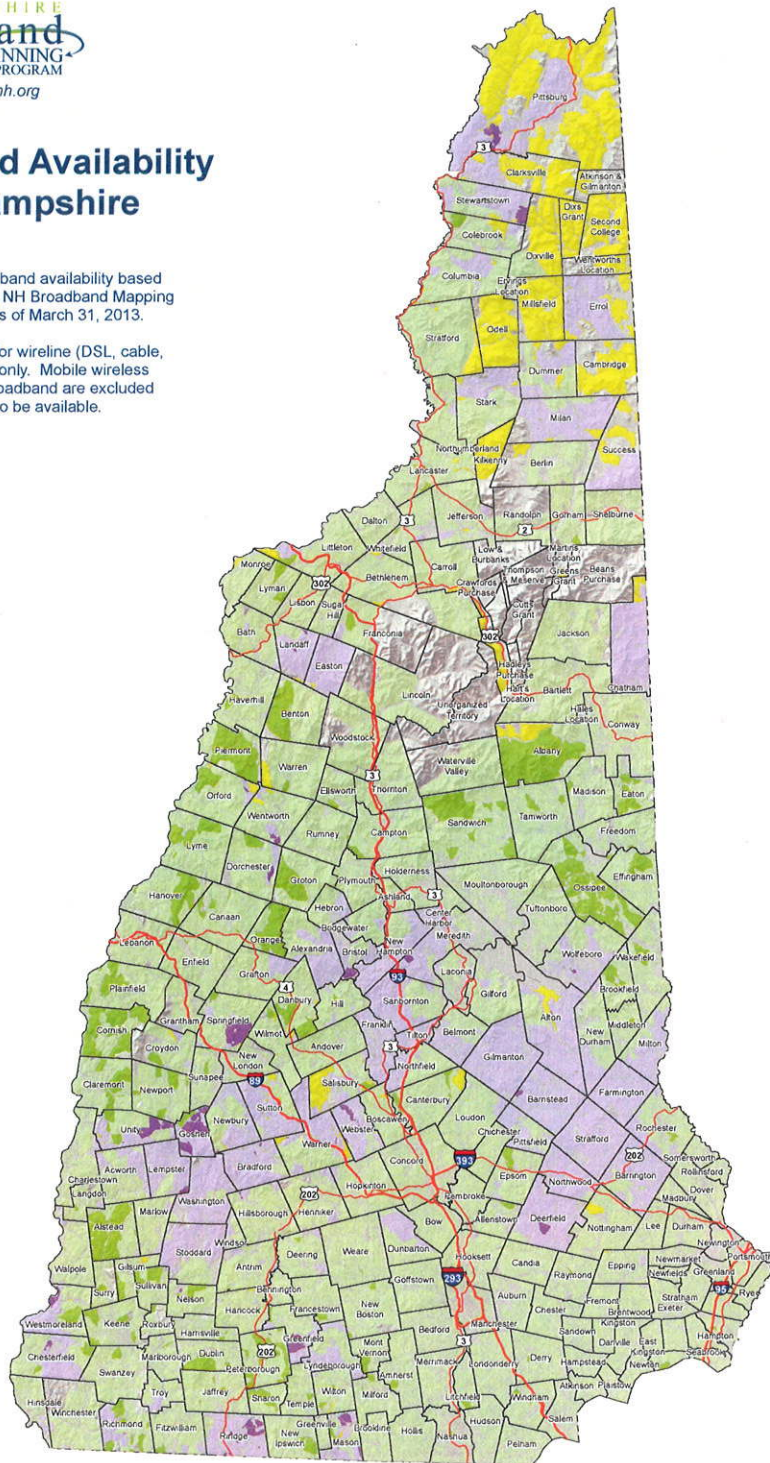
Please visit the NHBMPP web site at: iwantbroadbandnh.org



Broadband Availability in New Hampshire

This map displays broadband availability based on data submitted to the NH Broadband Mapping and Planning Program as of March 31, 2013.

Availability is displayed for wireline (DSL, cable, fiber) and fixed wireless only. Mobile wireless (cellular) and satellite broadband are excluded on this map, but may also be available.



Broadband Availability based on Provider Advertised Speeds:

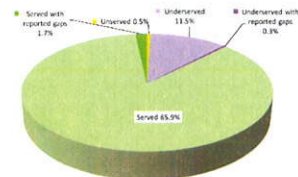
- Served
- Served with reported gaps
- Underserved
- Underserved with reported gaps
- Unserved
- Unpopulated areas

Served:
 Maximum Advertised Download Speed: 6+ Mbps
 Maximum Advertised Upload Speed: 1.5+ Mbps

Underserved:
 Maximum Advertised Download Speed: 768 kbps - 6 Mbps
 Maximum Advertised Upload Speed: 200 kbps - 1.5 Mbps

Unserved:
 Maximum Advertised Download Speed: < 768 kbps
 Maximum Advertised Upload Speed: < 200 kbps

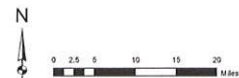
Percentage of Housing Units in NH with Broadband Service:



Map Notes:

Service providers submitted data to the NH Broadband Mapping and Planning Program (NHBMPP) in a range of geographies, including addresses, road segments, census blocks, census tracts, etc. For mapping purposes, all data are aggregated and displayed at the census block level. A census block is mapped as "served" if service is delivered to any part of the block.

The NHBMPP conducts a range of programs to verify and enhance the data. Census blocks noted as "with reported gaps" on the map are those in which the Program has recorded speed tests that indicate service levels less than those submitted by the providers).



NH GRANIT
 www.granit.unh.edu

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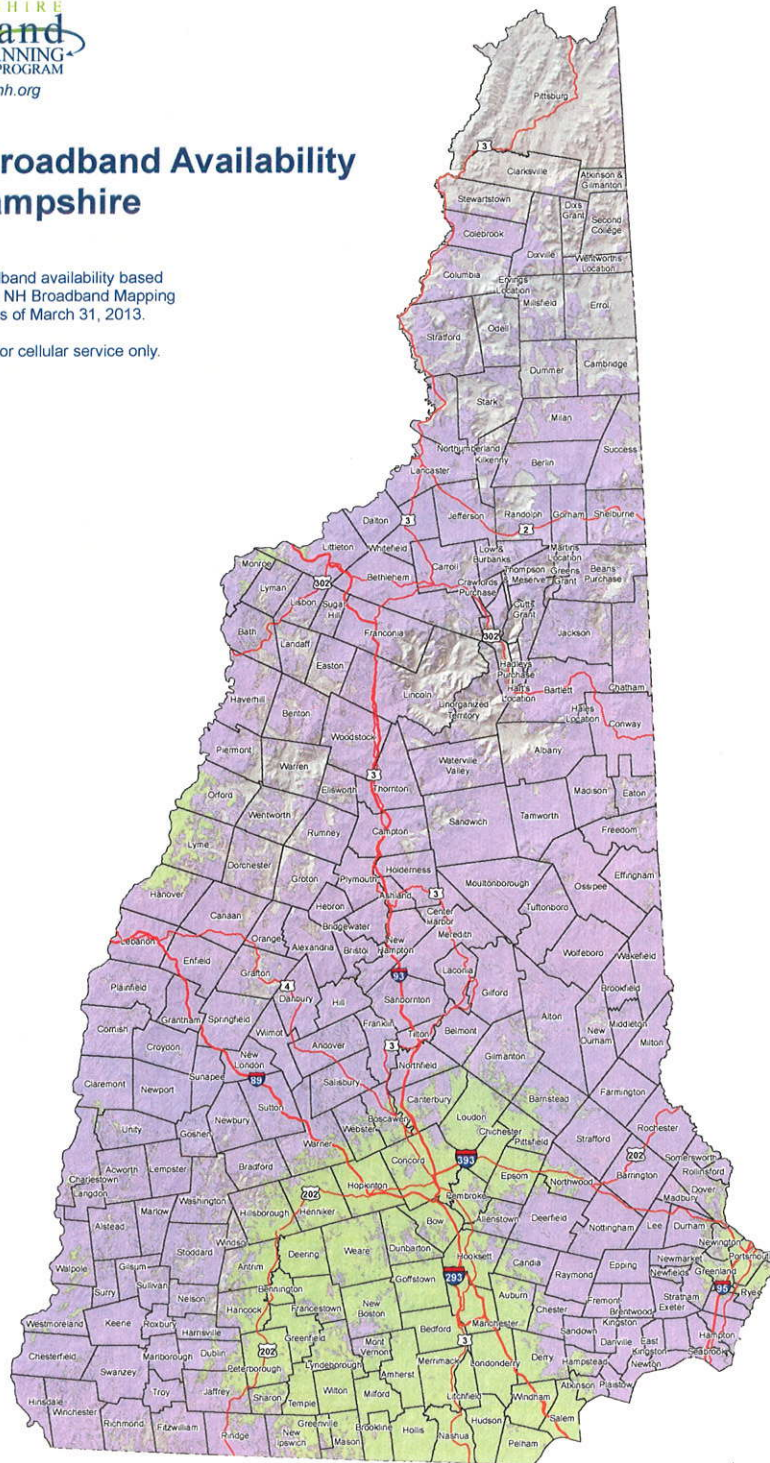
The New Hampshire Broadband Mapping and Planning Program is funded under grant #33-50-M09048 from the US Dept. of Commerce to the University of New Hampshire.



Cellular Broadband Availability in New Hampshire

This map displays broadband availability based on data submitted to the NH Broadband Mapping and Planning Program as of March 31, 2013.

Availability is displayed for cellular service only.

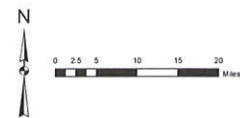


Broadband Availability based on Provider Advertised Download Speeds:

- Served
- Underserved

Served:
 Maximum Advertised Download Speed: 6+ Mbps

Underserved:
 Maximum Advertised Download Speed: 768 kbps - 6 Mbps



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The New Hampshire Broadband Mapping and Planning Program is funded under grant #33-50-M09046 from the US Dept. of Commerce to the University of New Hampshire.



Section 3

Private Industry Telecom and Cellular investments estimate since 2008 - \$493 Million (ILEC, Cable, Cell not all inclusive)

Incumbent Local Exchange Carriers (ILECs): There are 11 ILECs who serve the State of NH. ILECS are carriers of last resort providing wireline services to the customer premise in their respective territories. ILECs own and manage utility poles throughout the state either solely or jointly with the Electric Utilities. FairPoint Communications and Northland, Bretton Woods Telephone, Dunbarton Telephone, Granite State Telephone, Dixville Notch Telephone, and TDS Telecom: Hollis, Kearsarge, Merrimack, Union, and Wilton are serving Telecom Exchange Franchise Areas throughout the state. Refer to Telco Franchise Map.

FairPoint Communications is the largest ILEC in the state. Since 2008 FairPoint has invested more than \$311 million dollars in broadband infrastructure in New England to bring broadband access to areas that were not previously served – taking their broadband availability in NH from 63% when they took over the territory to 92% to date and a commitment to the state to take that number to 95% in 2013 (45,000 Homes). An additional \$3.3Million will be invested to reach NH communities over the 95% already committed by the end of 2013. Through its fast, reliable fiber network, FairPoint delivers high-quality data and voice networking communications solutions to residential, business and wholesale customers. FairPoint delivers Internet services through its resilient IP-based network in northern New England. This state-of-the-art fiber network provides carrier Ethernet connections to support the surging bandwidth and performance requirements for cloud-based applications like network storage, disaster recovery, distance learning, medical imaging, video conferencing and CAD/CAM along with traditional voice, VoIP, video and Internet access solutions. Service is competitively priced for residential and business customers.

Competitive Local Exchange Carriers (CLECs): There are 102 CLECs and 201 Authorized Toll Providers registered to do business in the State of NH. Many companies register to do business providing competitive pricing and innovated services to the business sector. Some CLECs currently do not offer service at all. Other CLECs own fiber assets and only sell to other carriers. Of the 102 CLECs there are 8 New Hampshire based companies. segTEL, Bayring Communications, G4 Communications, New Hampshire Optical Systems, and Fastroads New Hampshire employ local people around the state. Due to the nature of competition, the investments made by CLECs are not known for sure. They are often secretive about location of facilities, pricing, and expansion plans.

Cable Providers: There are 7 Cable Providers serving NH with video, voice, and internet bundles. They are not regulated at the state level but are required to negotiate and maintain franchise agreements with the individual towns in their service territory.

FiberCast Cable, Argent Communications, Comcast, Metrocast, Time Warner, Charter, and MCT serve the state. Refer to Cable Franchise Map.

Comcast is the largest cable provider passing some 450,000 homes in southern NH and provides broadband to 99% of their footprint. Top speed offering of 305Mbps is delivered by leveraging their metroE infrastructure. They provide courtesy service to schools, libraries, and non-profits in their territory with an estimated value of over ½ million dollars a year. In 2012, Comcast and NBC Universal spent over \$366.7 million in New Hampshire on capital expenditures, taxes and fees, employee investment and community investment.

In 2011 Comcast introduced Internet Essentials. The program offers discount pricing to low income families to get them connect to the internet for \$9.99 a month. The program uses the free school lunch program criteria to verify eligibility of customers for the program. Pricing levels on the residential and small business side typically range from \$29.99 for 4Mbps in the economy class to 305mbps Extreme for \$299.95. Discounts are available for triple play bundles. On the commercial side cable is offering up to 10Gbps service to business customers in some service territory.

Cellular Carriers: There are 5 Cell Carriers throughout the State of NH offering mobile services from 3G to 4G LTE technologies. Verizon-Wireless, AT&T Wireless, US Cellular, Mobile-T and Sprint are the predominant carriers. Investments and advancements in Small Cell technology will enhance coverage in rural unserved areas.

Verizon-Wireless is the largest carrier with tower facilities all over the state. US Cellular has the most coverage. Since 2009 AT&T Wireless has invested \$70 Million in infrastructure and network upgrades. They plan to invest another \$30 Million this year. They have been aggressively expanding coverage and moving closer to the North Country to enhance their position and offer service in rural areas.

There are many pockets throughout the state that still need investment. There are miles of highway without signal at the risk of public safety. Faster and more reliable mobile services are needed to meet the demand for data that has been doubling for the last 5 years representing a 20,000 increase in traffic. Cellular carriers are running out of spectrum to handle the amount of traffic generated by Smartphone users. Fiber to facility towers is required to offload traffic onto wired services to terminate calls and requests for mobile broadband services.

Newer microcell technology promises to help meet the rising demand and deployment needs in unserved areas. Pricing for service is dependent on number of phones, type of phone if it requires a data package and data throughput. Additional data throughput is sold in increments of \$15.00 a Gigabit. Average bill for a couple of phones with a data package and MY Wifi for the home network is over \$200.00 monthly.

Fixed Wireless Internet Service Providers (WISPs): There are several small wireless service providers around the state filling gaps in broadband coverage in rural communities.

WISPs providing coverage to remote pockets all over the state include SkyWire, Burgnet, CyberPine, Tamworth Wireless, CityVoice, WiValley, Radius North, Plateau Wireless, NEE Connections, Great Auk Wireless, WirelessLINC, Lakes Region Wireless, IAMNOW.Net, Spectra Access, and WaveComm. They are providing fixed-line of site or non-line of site technologies using unlicensed bands of spectrum from mountain tops to church steeples. Most are providing only data but some have started offering voice products. These companies are flexible and offer a range of pricing from \$39.99 – \$79.00 and up monthly depending upon bandwidth provisioned and the cost of acquiring backhaul to sources of internet points of presences (POPs). Investments can run from \$2,000 – \$5,000 a node depending upon choice of access point equipment. Customer premise equipment is leased, financed, bundled or bought outright by the customer.

Satellite Internet Service: The big providers include HughesNet, SkyCasters, ViaSat (formerly known as WildBlue), and Starband Communications provide service nationwide. They offer slower speeds, slow upload speeds, and data caps. In addition latency is an issue for telecommuters who need to access networks real time. Pricing ranges from \$49.00 to \$100.00 monthly for unreliable service. Customer premise equipment and installation can run an additional \$150.00 on average with a service contract time commitment.

Exede, a ViaSat brand of packaged internet is offering a download speed of 12Mbps/1.5Mbps at \$49.00 monthly.



State of New Hampshire Telecom Franchise Areas with Exchange Area Bounds

May 31, 2013

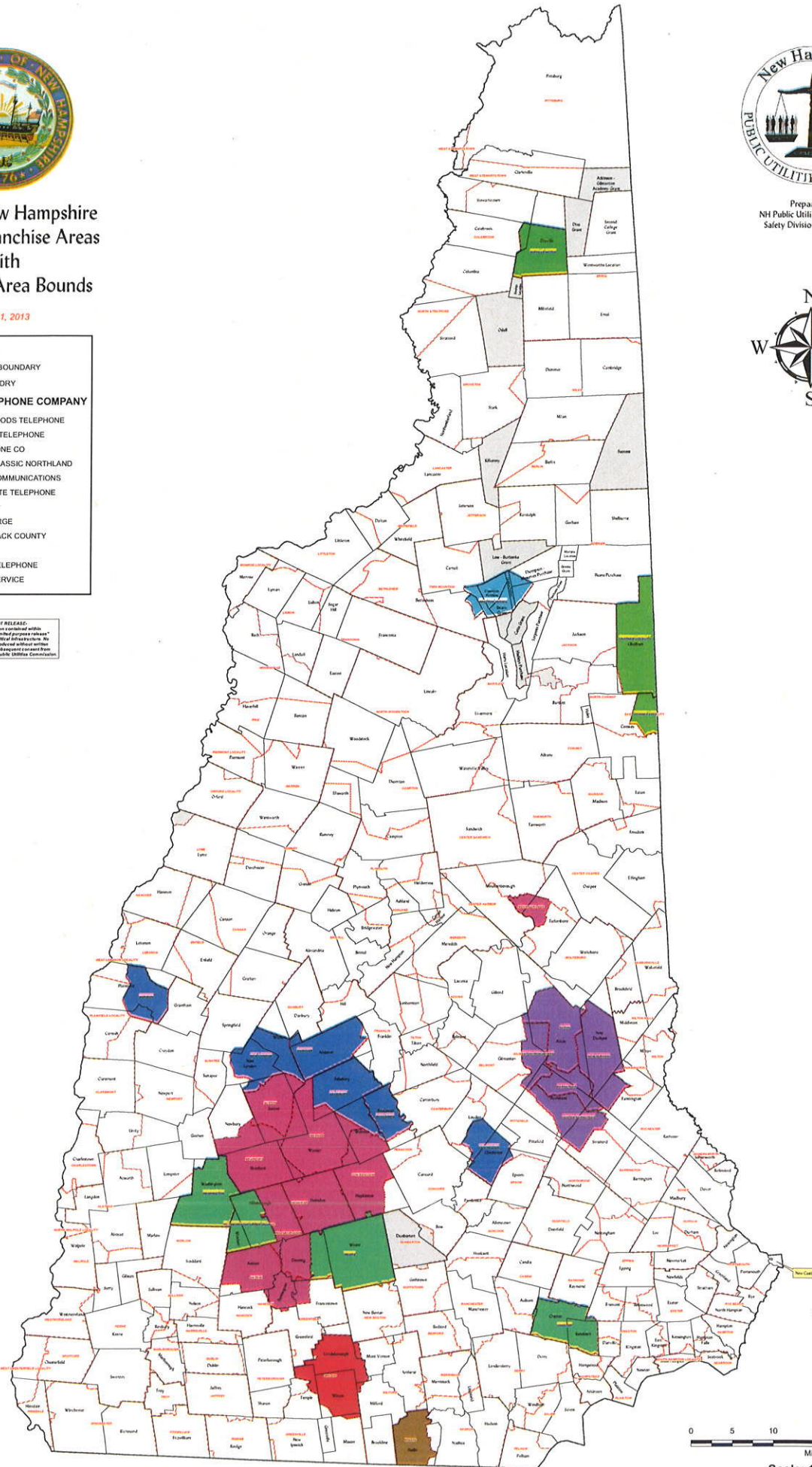
Legend

- EXCHANGE BOUNDARY
- TOWN BOUNDARY
- SERVING TELEPHONE COMPANY**
- BRETON WOODS TELEPHONE
- DUNBARTON TELEPHONE
- DIXVILLE PHONE CO
- FAIRPOINT CLASSIC NORTHLAND
- FAIRPOINT COMMUNICATIONS
- GRANITE STATE TELEPHONE
- TDS HOLLIS
- TDS KEARSARGE
- TDS MERRIMACK COUNTY
- TDS WILTON
- TDS UNION TELEPHONE
- NO PHONE SERVICE

NO COPY RELEASE.
The information contained within this map is for "limited purpose release" and releases critical infrastructure. No map may be reproduced or used without permission and consent from the New Hampshire Public Utilities Commission.



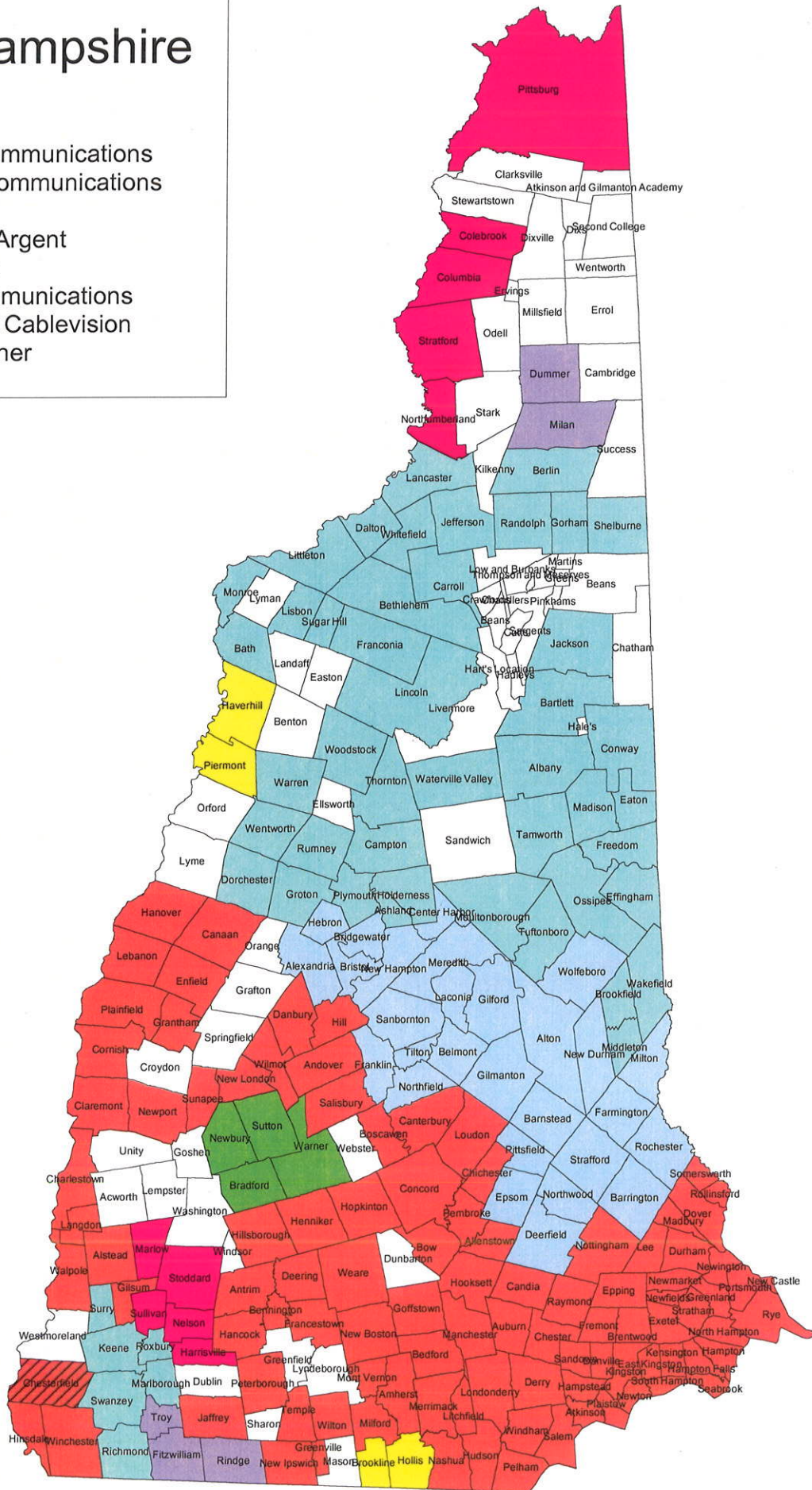
Prepared by:
NH Public Utilities Commission
Safety Division - GIS Section



Scale: 1:250000

New Hampshire MSOs

- Argent Communications
- Charter Communications
- Comcast
- Comcast\Argent
- FiberCast
- MCT Communications
- Metrocast Cablevision
- Time Warner



Section 4

Federal ARRA Investments USDA – NTIA since 2010 – close to \$70 Million (infrastructure only)

Federal NTIA and USDA Broadband Infrastructure Grant Awards in NH

- **USDA BIP Awards:**

Bretton Woods Telephone	\$985,000
TDS Telecom Kearsarge	\$372,532
TDS Telecom Merrimack	\$2,021,197
- **NTIA BTOP CCI Awards:**

Network NH Now	\$66.5 Million
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Total Broadband Infrastructure Project Awards - \$69,878,722

Network NH Now Status as of May 31, 2013

The Network New Hampshire Now is a \$44.5M federal/\$21.5M private grant project funded under the ARRA NTIA BTOP CCI program. It is comprised of five distinctly separate projects:

- **Middle Mile Fiber** - 68% of the project budget (Dark green lines on map)
 - Overview** - Construction 750 miles of open access, non-discriminatory dark fiber optic cables through all 10 counties in NH. This fiber creates the broadband “highway system” to be utilized by national and local broadband providers to serve the last mile residences and businesses. This network will be owned and operated by Nashua-based NH Optical Systems (NHOS) and administered under the NTIA BTOP rules for the life of the assets (20 years).
 - NHOS has also provided the State of NH First Right of Refusal on 16 fibers throughout the 750 mile network.
 - Current Status** - 620 miles of the 750 total miles of fiber have been constructed. The direct economic impact of the \$23.4M of federal funding provided to NHOS can be seen on page 3.
- **NH Department of Transportation Middle Mile Fiber** - 11% of the project budget (See the light green highlight on map)
 - Overview** – Construction of 20 miles of fiber within the limited access right of way along I93 between Concord and Manchester. This fiber will be utilized for DOT’s Intelligent Transportation Systems (ITS) to connect roadside cameras and signage.
 - Current Status** – Over 90% complete with full completion scheduled for June 30, 2103
- **New Hampshire FastRoads Last Mile** - Fiber is 11% of the project budget (See the yellow highlighted section on map)
 - Overview** – Construction of 86 miles of last mile fiber and leasing of 186 miles of the middle mile fiber. As a last Mile wholesale provider, NH FastRoads provides a scalable, open access ethernet network to extend broadband to other unserved and

underserved areas from Orford to Rindge. This network will be owned and operated by Keene-based New Hampshire FastRoads.

Current Status – 73% of the 86 total miles of fiber are constructed with commitments to connect fiber to the premises for 523 residences in Rindge and Enfield as well as 235 Community Anchor Institutions from Orford to Rindge.

- **NHSafeNet Public Safety Microwave Project** - 9% of the project budget (See the red lines on map)

Overview - Constructing a shared public safety microwave system constructed on 20 mountaintops in NH. The system is a collaboration between the NH Departments of Safety, Resources and Economic Development, Transportation, New Hampshire National Guard, and New Hampshire Public Television. This new network is a model for collaboration and efficiencies with each stakeholder sharing responsibility for maintenance of the shared system. The system will be owned and operated by the NH-Department of Safety.

Current Status – 18 of 20 sites are constructed with each of the agencies in testing and cutover mode. The remaining two sites are in final design and are close to beginning construction.

- **USNH Research and Education Network**

Overview – The University System of NH (USNH) is leasing 12 strand of this middle mile fiber network from NHOS to create a high-speed research and education network. This network will be owned and operated by USNH and will interconnect the campuses of USNH (University of NH, Keene State College (KSC), Plymouth State University (PSU), Granite State College (GSC), UNH School of Law, The UNH Cooperative Extension Service, as well as Dartmouth and the Community College System of NH (CCSNH). UNH is also providing a fiber backup system for the Public Safety microwave System described above. The system will further provide disaster recovery and business continuity for the educational institutions of USNH and CCSNH, as well as diverse connections regionally to commodity Internet and Internet2 points of presence.

Current Status - 90% of 35 USNH Community Anchor Institutions (CAIs) have a fiber connection and the UNH staff is deploying equipment to light this dark fiber. UNH, KSC, PSU, and Dartmouth are already interconnected with 10 gigabit connectivity as part of this BTOP grant and other National Science Foundation and National Institute of Health projects.



- **The BTOP grant also funded the State of NH Director of Broadband position for 3 years.**

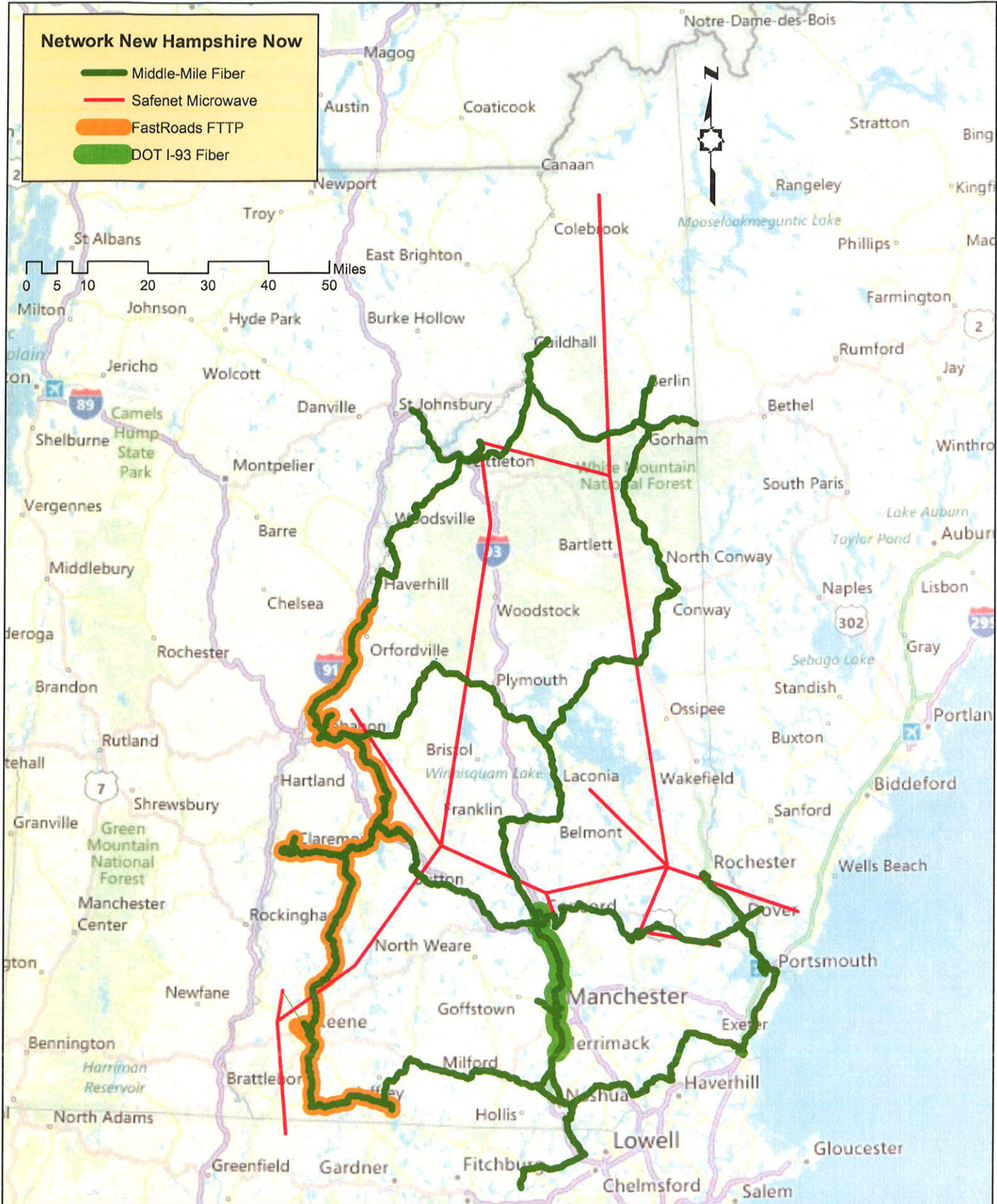
- **Challenges**

Many delays continue to block progress and litigation has been filed between a private provider and the stakeholders in the Network NH Now Project.

While over 80% of the 750 mile route is now constructed, an unintended gap in pole attachment regulations have delayed completion of the last 20%. The current pole attachments rules address the pole owner and the attacher who is seeking space on the poles but do not address conduct between existing third-party attachers and a new attacher when existing wires need to be moved to accommodate a new wire.

Network New Hampshire Now

-  Middle-Mile Fiber
-  Safenet Microwave
-  FastRoads FTTP
-  DOT I-93 Fiber

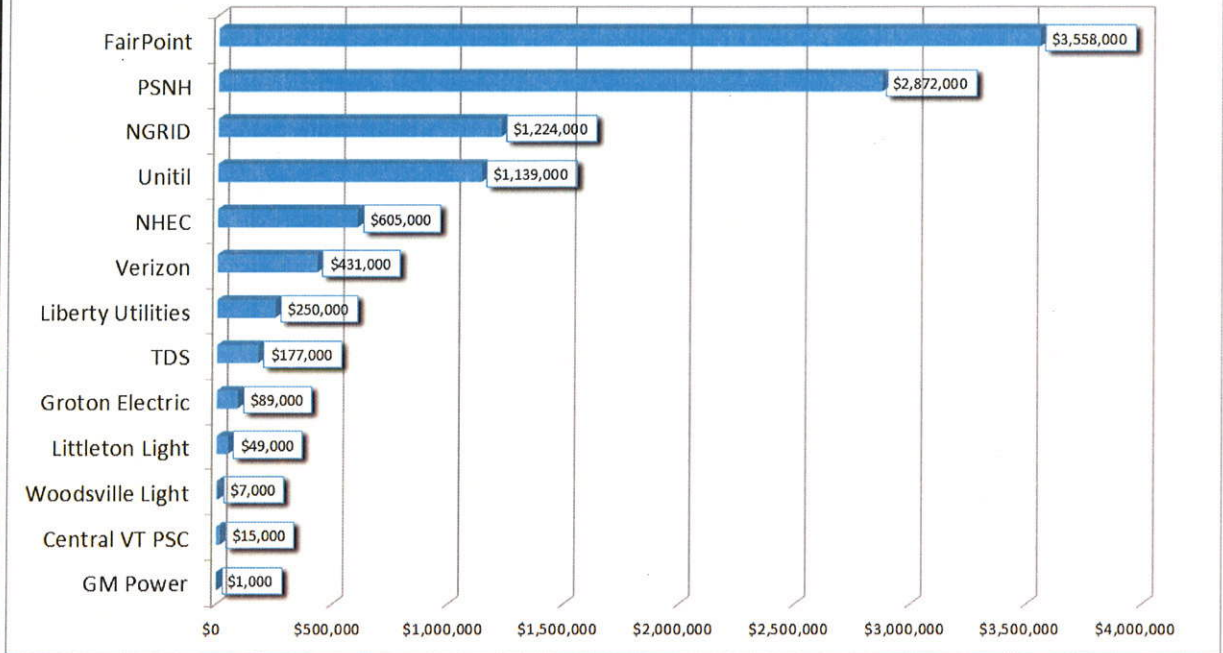


This work is partially funded under a grant from the US Dept. of Commerce # NT10BIX5570082



Doug.Green@UNH.EDU
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**BTOP FUNDS PAID DIRECTLY TO NEW HAMPSHIRE UTILITY COMPANIES
FOR LICENSING AND MAKE-READY - \$10.4 MILLION**



Police Details and Flaggers - approximately \$983,000
 Annual recurring utility pole fees - approximately \$700,000

Economic Impact to the local economy and revenue generated for NH Companies as a result of Network NH Now Project since 2010 to date - \$10.4 Million

The chart above represents costs paid directly to NH Electric Utilities, ILECs and CLECs from the licensing and make-ready construction of the fiber network. This number will increase as the network is completed at the end of June 2013. In addition police details and flaggers have been paid close to \$1 Million. Going forward reoccurring annual fees paid to pole owners will be a minimum of \$700,000 a year for the next 20 years and through the life of the federal fiber asset.

Economic Development Impact

Directly responsible for 79 new jobs and hundreds of indirect positions.

Project Update - NTIA funding since 2010 – \$6.1 Million

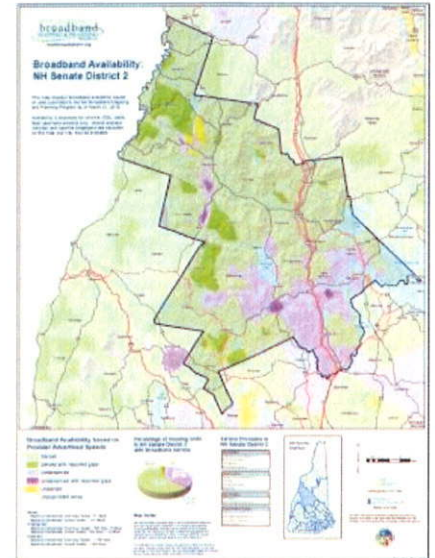
The New Hampshire Broadband Mapping and Planning Program (NHBMPP) works to improve broadband access and use in the state by assessing broadband availability, and by engaging communities and other stakeholders in conducting planning, capacity building, technical assistance, and training initiatives. We recognize that a vibrant local and state economy requires broadband infrastructure to support economic development, energy efficiency, advances in health care, public safety, improved educational opportunities, and overall quality of life.

Mapping Project Objectives/Accomplishments

The NHBMPP Mapping Project collects data from Internet Service Providers (ISPs) in New Hampshire to build the state's broadband map. It also collects data from Community Anchor Institutions (CAIs) in the state to contribute to the state's broadband map. The data is analyzed to identify areas in the state that are served, underserved, and unserved. Maps are provided to legislators, community officials, businesses, stakeholders, and residents to frame public discussions and to plan for expanded and enhanced broadband availability.

Efforts have included:

- Mapping Broadband Service Availability - collected and processed broadband data from each of the 60+ active ISPs to understand where broadband is available, the technology used to provide the service, and the maximum advertised speeds (up/down) of the available service.
- Mapping Community Anchor Institutions - collected and processed broadband availability data from ~4,000 institutions of local/regional significance, including schools, healthcare providers, libraries, public safety offices, and other municipal offices.
- Collecting Verification Data and Related Data Sets - A) Consumer Surveys - an online survey to understand where residential broadband is and is not available and/or adequate; B) Speed Tests - an online tool to record data transmission speeds; and C) Field Data - statewide mobile wireless drive tests to collect data transmission speeds.
- Analyzing Mapping Results - compiled and analyzed a full suite of data collected to characterize broadband availability in New Hampshire.
- Promoting the State Broadband Map - increased awareness of the state broadband map and how it can be effectively utilized.



Planning Project Objectives/Accomplishments

The NHBMPP Planning Project helps communities understand the importance of broadband availability and accessibility in maintaining vibrant economies and quality of life. All 9 Regional Planning Commissions have established Broadband Stakeholder Groups (BSGs) which are working to assess broadband needs within NH's regions, municipalities and sector groups. In addition, they are developing broadband plans for NH's nine regions to be integrated into a statewide broadband document

Efforts have included:

- Working with BSGs to identify regional broadband needs and barriers, as well as potential strategies to address barriers.



- Conducting the first of three public forums in each region to share an overview of the project and receive input on the current broadband needs of community members.
- Conducting assessments via focus group meetings and interviews to better understand broadband needs specific to the health, education, economic development, public safety, and local government sectors.
- Outlining the sections and format of the regional plans including common sections for all 9 reports plans.
- Funds the Director of Broadband Technologies at NH Department of Resources and Economic Development at the Division of Economic Development July 1, 2013 - June 30, 2014.

Technical Assistance and Training Project Objectives/Accomplishments

The Technical Assistance and Training Project assesses broadband training and technical assistance needs of stakeholder groups including educational institutions, municipalities, organizations, small business, and healthcare providers. It designs and develops face to face and web-based learning modules and delivers workshops, training sessions and technical assistance to broadband stakeholder groups to support increased use and adoption of broadband applications.

Efforts have included:

- Conducting needs assessments - targeted surveys, focus groups, phone surveys (Granite State Poll), and feedback sessions.
- Developing curriculum - presentations, workshops and online training resources.
- Providing targeted technical assistance upon request to enhance broadband adoption and utilization.
- Trainings and presentations made to over 200 people including business, municipal and community leaders, and the university community:
 - Presentation on ***“Putting your Community and Business on the Digital Map”*** to municipal leaders at their annual Local Government Center conference.
 - Participation in the Small Business Development Center’s
 - ***E-Commerce*** workshop in Nashua, NH.
 - Presentation to all nine Regional Planning Commission’s broadband staff on the UNH Cooperative Extension’s ***Technical Assistance and Training Program***.
 - UNH Cooperative Extension Issues and Ice Cream presentation - ***“Bridging the Digital Divide”*** - to UNH campus community.
 - Presentation before the North Country Council Broadband Stakeholder Group meeting in Berlin, NH on ***Broadband Mapping and Training and Technical Assistance***.
 - Presentations to Strafford, Rockingham and Grafton Cooperative Extension Advisory Councils.



Section 5

National Ranking and New England Comparisons:

New Hampshire Overall 14th* in the Nation according to TechNet State Broadband Index 2012

*Overall ranking based on leadership, state funding, cooperation, and planning.

Broadband Adoption – Akamai State of the Internet Report:

New Hampshire has consistently made the Top 10 States in the Akamai State of the Internet Report for Broadband Adoption. The northeast in general scores high marks as early adopters of technology. Vermont recently has made great strides to make the Top 10. Massachusetts, Rhode Island, and Connecticut all score well while Maine still has a lot of work to do.

(Each quarter, Akamai publishes its "State of the Internet" report, based on data gathered across Akamai's global server network. "State of the Internet" highlights attack traffic, connection speeds, Internet penetration, broadband adoption, and mobile usage, as well as trends seen in this data over time)

For the purpose of these next statements High Broadband is defined 10Mbps or greater and Broadband is 4Mbps or greater.

From the latest Akamai Quarterly Report on Internet Traffic as of December 2012

NH 4th in the Nation for it's average connection speed of 10.1Mbps which represents an -2.5% decrease from last quarter and an overall 25% last year in the 4th quarter of 2012.

NH 7th in the Nation for the average peak connection speed of 37.7Mbps which represents a 1.7% increase from last quarter and a 25% increase from last year.

NH 1st in the Nation for High Broadband Adoption at 34% a 4% decrease from last quarter 71% increase from last year.

NH 2nd in the Nation for Broadband Adoption at 87% a .1% decrease from last quarter and 5.9% increase over last year.

Average Connection Speed measure by State

1 Vermont	10.8	3.8%	38%
2 Delaware	10.6	-3.0%	29%
3 District Of Columbia	10.2	-5.1%	37%
4 New Hampshire	10.1	-2.5%	25%
5 Utah	9.5	4.5%	26%
6 Maryland	9.3	5.8%	44%
7 Rhode Island	9.3	2.2%	25%
8 Massachusetts	9.3	1.9%	29%
9 Connecticut	9.2	1.4%	31%
10 New Jersey	9.1	4.3%	45%

Average Peak Connection by State

1 District Of Columbia 43.1 1.7% 37%
2 Vermont 41.4 6.8% 31%
3 Delaware 40.4 3.0% 8.7%
4 New York 38.6 7.4% 34%
5 New Jersey 38.5 7.3% 40%
6 Massachusetts 38.3 6.3% 31%
7 New Hampshire 37.7 1.7% 25%
8 Maryland 37.6 7.9% 38%
9 Virginia 37.0 4.5% 23%
10 Rhode Island 36.7 6.2% 24%

High Broadband (>10Mbps) Connectivity by State

1 New Hampshire 34% -4.0% 71%
2 District Of Columbia 33% -3.2% 87%
3 New Jersey 33% 12% 203%
4 Massachusetts 32% 2.7% 89%
5 Rhode Island 32% 3.9% 102%
6 Vermont 32% -8.0% 78%
7 Delaware 32% -1.9% 95%
8 Maryland 31% 8.1% 146%
9 New York 28% 9.2% 141%
10 Connecticut 27% 2.2% 101%

Broadband (>4Mbps) Connectivity by State

1 Delaware 87% 2.6% -3.4%
2 New Hampshire 87% <0.1% 5.9%
3 Rhode Island 83% 0.6% 6.5%
4 Vermont 82% -1.8% 6.8%
5 New Jersey 80% 2.1% 16%
6 Maryland 79% 2.9% 19%
7 New York 78% 1.5% 20%
8 Connecticut 77% 0.6% 17%
9 Massachusetts 74% 2.7% 12%
10 Florida 72% 0.8% 16%