NEW HAMPSHIRE broadband MAPPING & PLANNING PROGRAM

Program Overview and Status Report:

NH House/Senate Telecom Oversight Committee

October 4, 2012

Authority

- Federal

  American Recovery and Reinvestment Act (ARRA) through the National Telecommunications and Information Administration (NTIA)

  Broadband Technology Opportunities Program (BTOP)

- Term

  5-year grant ending December 2014

Mission

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.

Why Broadband?

- For every 10% increase in broadband penetration in a state, employment is projected to increase by 2% to 3% *(Brookings Institution, 2008)*

- For every $1 invested in broadband, the economic benefit is nearly $3 *(US Bureau of Economic Analysis)*

- US investment in broadband and related information technology has driven 1/3 or more of the productivity growth of this decade *(US Telecom Analysis)*

NHBMPP Components

Mapping

- Broadband Availability, *UNH GRANIT*
- Community Anchor Institutions, *NH RPCs & UNH GRANIT*
- Rural Addressing, *NH RPCs & UNH GRANIT*

Planning and Technical Assistance

- Broadband Technology, *NH DRED*
- Broadband Capacity Building, *NH DRED, NCIC*
- Broadband Technical Assistance Training, *UNH CE & NH OEP*
- Regional Broadband Planning, *NH RPCs & NH OEP*

NEW HAMPSHIRE broadband MAPPING & PLANNING PROGRAM

Broadband Planning

iwantbroadbandnh.org

Broadband Planning

Develop nine regional broadband plans that will be consolidated into a statewide broadband plan

- Coordinated by 9 Regional Planning Commissions
- Form Regional Broadband Stakeholder Groups
- Assess community and regional broadband needs and barriers
- Utilize data collected from stakeholders and mapping components to develop strategies for addressing broadband barriers

Broadband Planning – Status

- Regional Broadband Stakeholder Groups (BSGs) established; meet quarterly
- Identified regional broadband needs and barriers
- Developed outline of regional plan content
- Each region holding first (of three) public forums

Southwest Region Public Broadband Forum
September 27, 2012 at the Dublin Public Library

NEW HAMPSHIRE broadband MAPPING & PLANNING PROGRAM

Broadband Capacity Building

Broadband Capacity Building

Leadership Role to increase broadband adoption and deployment on a targeted community-by-community basis, collaborating to create best case practices in:

- Policy
- Management
- Financial Resources
- Advocacy for Business and Residential Broadband

NH BUSINESS RESOURCE CENTER
an office of the NH Division of Economic Development

Broadband Capacity Building

Working with Northern Communities Investment Corporation (NCIC), assist communities in their development of broadband projects by:

- Establishing Resource Teams (broadband sector experts)
- Utilizing Demand/Aggregation/Planning Tools for Municipalities
- Creating model Broadband Implementation Business Plans

NEW HAMPSHIRE broadband MAPPING & PLANNING PROGRAM

Broadband Technical Assistance & Training

iwantbroadbandnh.org

Broadband Technical Assistance & Training

- Assess broadband technical and training needs of targeted sectors
- Develop tools and learning modules relative to broadband
- Deliver technical assistance and training to targeted sectors

Targeted Sectors

EDUCATION	HEALTH	COMMUNITY SUPPORT / GOV	PUBLIC SAFETY	BUSINESS / ECON DVLPT	RESIDENTIAL
•K -12 •Higher Ed •Community / Continuing Ed •Museums •Science Centers	• Hospitals •Doctor Offices •Clinics •Nursing / Res Care Facilities •Human Service Agencies •Lab Services •Home Care Services •Adult Day Care	• Town / City Gov Admin & Services • County Gov Admin & Services •State Gov Admin & Services •Libraries •Community Centers •Land Trusts / Open Space	• Fire •Police •Emergency Management •Mutual Aid	•Chambers of Commerce •Economic Development Corporations •Travel & Tourism •Recreation •Food & Agriculture •Arts & Culture •Media •Commerical Real Estate •ISPs / Telecom •Banking / Finance •Industry	•Homeowners •Households •Residential Real Estate •Home Business

Broadband Technical Assistance & Training - Status

- Surveys completed for Education, Health, Municipal and Business sectors

- Learning modules being finalized
- Training sessions conducted including: using GIS/GPS technologies; "Putting your Business on the Digital Map"; "Leveraging Broadband for Economic Development"

NEW HAMPSHIRE broadband MAPPING & PLANNING PROGRAM

Mapping Broadband Availability

Mapping Broadband Availability – Overview

- Goal – map broadband availability by type of technology and speed, in order to identify areas served, unserved, and underserved in the state
- Broadband defined by NTIA as **768 kbps** downstream and **200 kbps** upstream
- Based on data submitted by broadband providers in the state
- Data aggregated to census block geography for analysis and display
- Multi-source data verification methodology utilized
- Data collected and processed by UNH; submitted to NTIA on a 6-month cycle (March 31, September 30) for inclusion in the National Broadband Map (http://broadbandmap.gov)

What is broadband?

NHBMPP Category	Download Speed	Upload Speed	Typical Uses (additive to level above)
Unserved	< 768 Kbps	< 200 Kbps	• Email
Underserved	768 Kbps to < 3 Mbps	200 Kbps to < 1.5 Mbps	• Web browsing and shopping • Sending/receiving medium-size files (photos, word processing) • Limited streaming content; buffering a concern • 1-3 simultaneous internet devices • Voice over IP
Served	3 Mbps +	1.5 Mbps +	• Sending/receiving large files • Streaming HD content; buffering not a concern • VPN access; where speed of operation critical to job function • 5+ simultaneous internet devices • Multi-player online gaming • HD quality videoconferencing • Teleworking • Real-time HD medical imaging and consultation • “Internet 2” connectivity and applications

Participating NH Broadband Providers (39 as of Fall, 2012)

Cable (5)

- Argent Communications, LLC (also Fixed Wireless)
- Charter Communications Inc.
- Comcast Cable Communications, LLC
- MetroCast
- Time Warner Cable

DSL (9)

- Covad Communications Company (also Other Copper Wireline, Middle Mile)
- Dunbarton Telephone Company, Inc.
- FairPoint Communications, Inc.
- G4 Communications (also Middle Mile)
- Granite State Communications (also Fiber)
- GWI (also Other Copper Wireline)
- OTT Communications (also Middle Mile)
- Sovernet Communication
- TDS Telecom (also Fiber, Middle Mile)

Fixed Wireless (9)

- Cyberpine Cooperative, Inc.
- Great Auk Wireless
- IAMNOW.net
- Lakes Region Wireless
- Spectra Access
- Tamworth Wireless Cooperative
- Wave Comm, LLC
- Wireless LINC of NH and VT
- WiValley

Mobile Wireless (5)

- AT&T Mobility, LLC
- Sprint
- T-Mobile
- U.S. Cellular
- Verizon Wireless

Fiber (2)

- Level 3 Communications (also Middle Mile)
- Topsham Communications

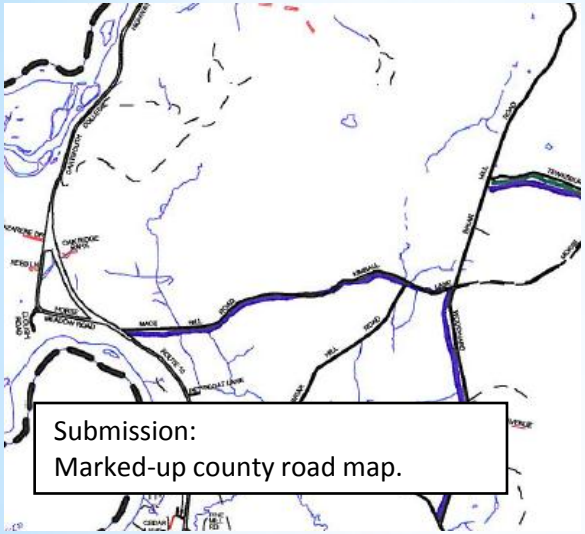
Middle Mile (5)

- DSCI Corporation
- Freedom Ring Communications
- Lightower Fiber Networks
- Oxford Networks
- Sidera Networks, LLC

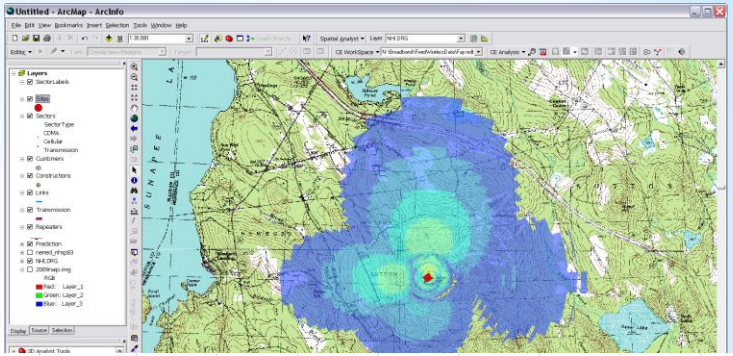
Satellite (4)

- HughesNet
- Skycasters
- StarBand Communications, Inc.
- WildBlue Communications, Inc.

Processing Provider Data

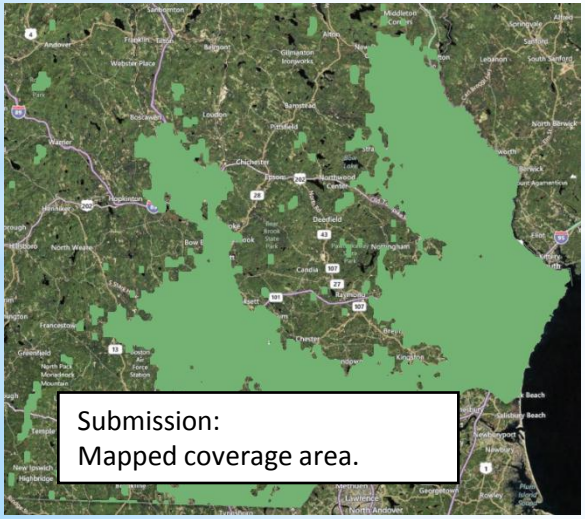


Submission:
Marked-up county road map.

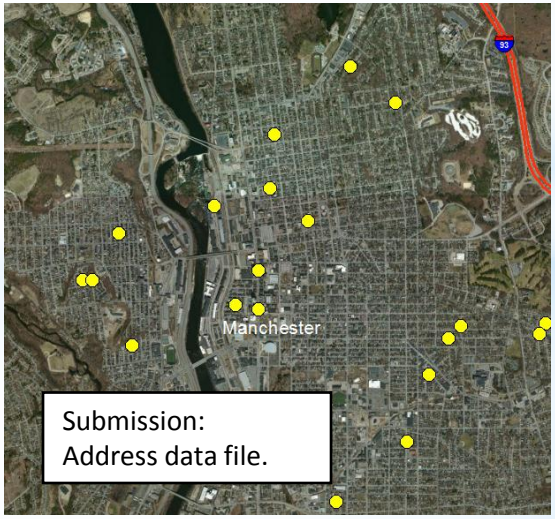


Name	Spectrum	Freq	Height AG	Ant Type	Aim (True N)	Gain db	H-BeamW	V-BeamW	Downtilt	Pwr to Ant	Modulation	Chan Widt	SystemPower
NS	2.4G	2.437G	70	120 Sectr	321	14	120	15	3	900	B' (CCK)	20M	29.54243
CC	2.4G	2.437G	70	120 Sectr	286	14	120	15	3	900	'B' (CCK)	20M	29.54243
LK	2.4G	2.437G	70	120 Sectr	206	17	120	6.5	3	900	'B' (CCK)	20M	29.54243
900NS	900M	914M	65	120 Sectr	321	13	120	15					
900OM	900M	914M	55	Omni		8	360	10					
900XR	900M	914M	60	Yagi	12	6	120	70					

Submission: Spreadsheet. Cellular Expert software (www.cellular-expert.com) predicts signal strength based on tower data. Note: Map is for display purposes only, and does not represent the coverage of any individual service provider.



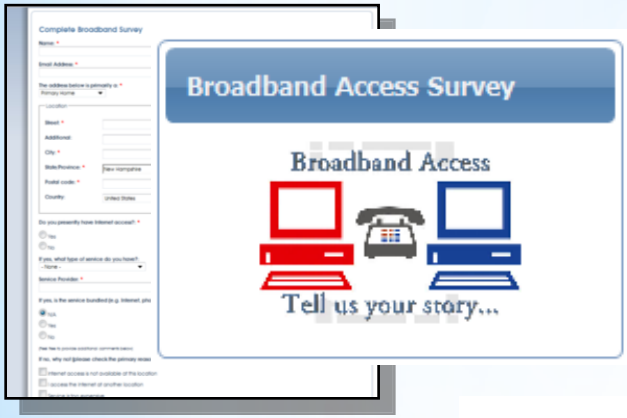
Submission:
Mapped coverage area.



Submission:
Address data file.

Broadband Availability – Data Validation

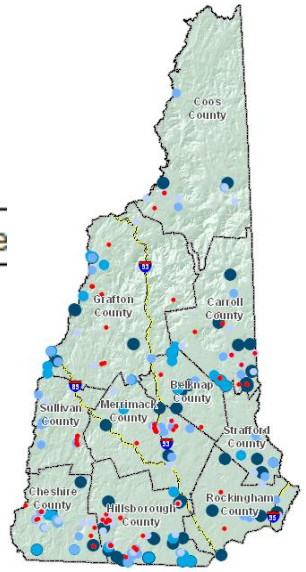
Consumer Surveys



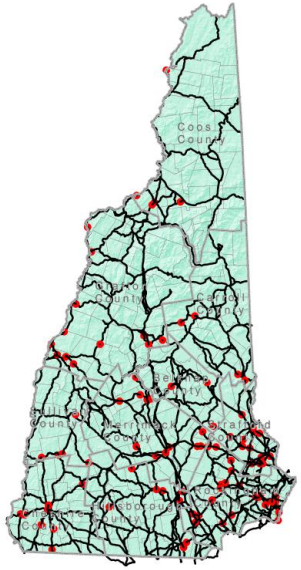
Speed Tests

Speed Test Results
(5320 results as of 9/28/2012)

Download speed	Percentage
4 Mbps or less	60%
- FCC Minimum Broadband Speed -	
4-10Mbps	34%
10-25 Mbps	5%
More than 25 Mbps	1%



Drive Tests

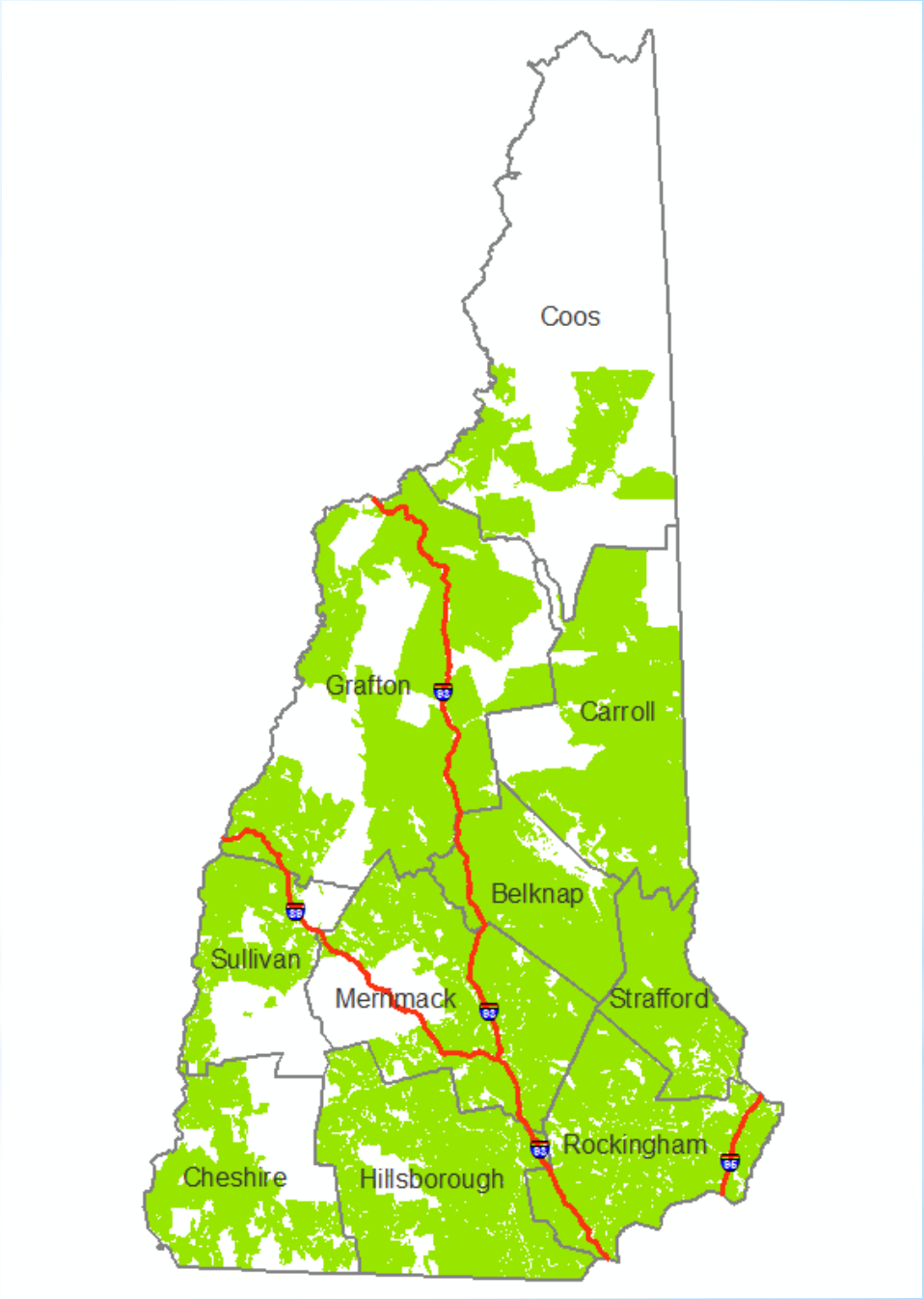


(3500+ miles of Interstates, US & State routes driven)

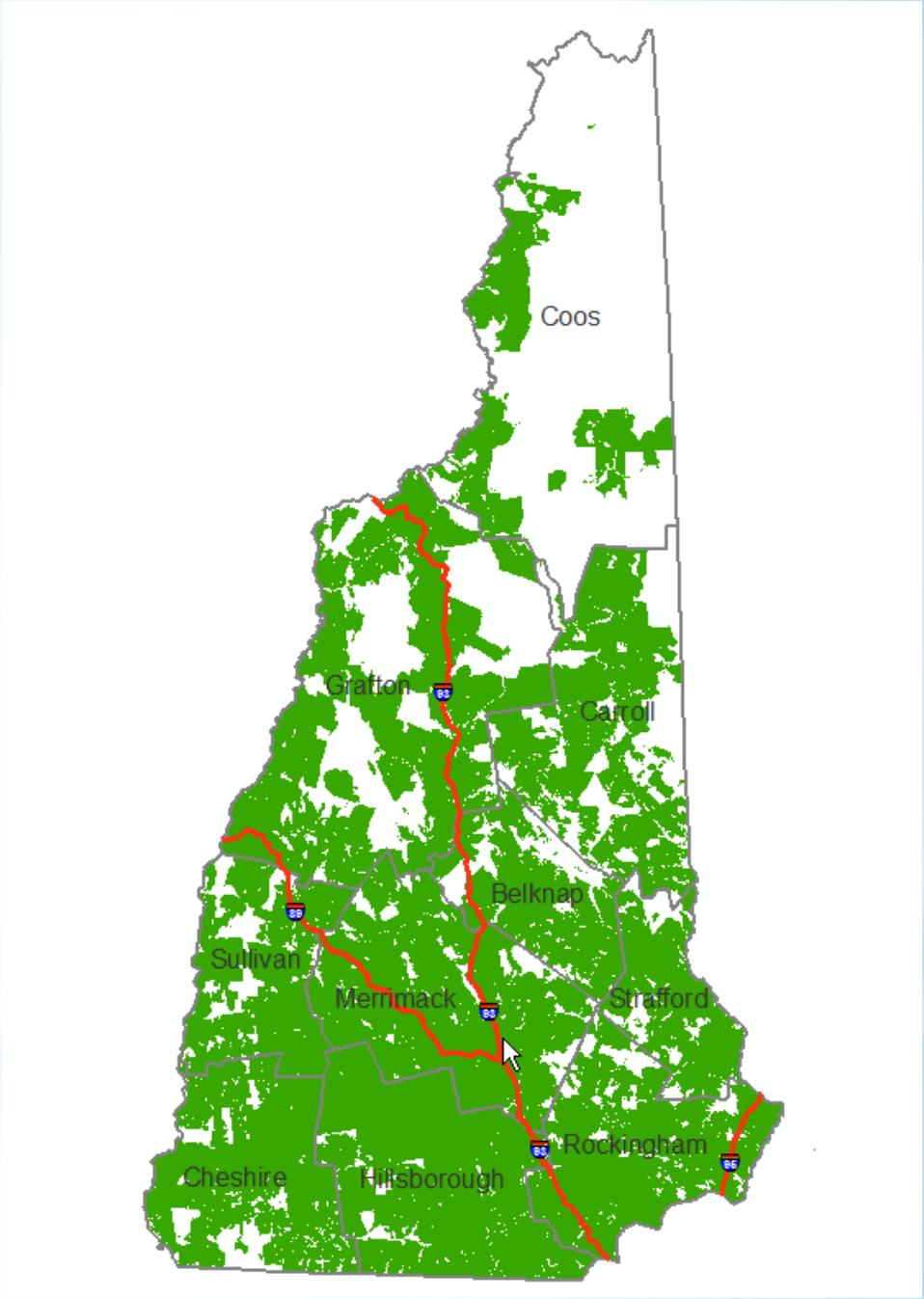
Others Data Sources

- Commercial data sets
- Data reported to FCC (477 data)
- Satellite dish inventories
- Community meetings

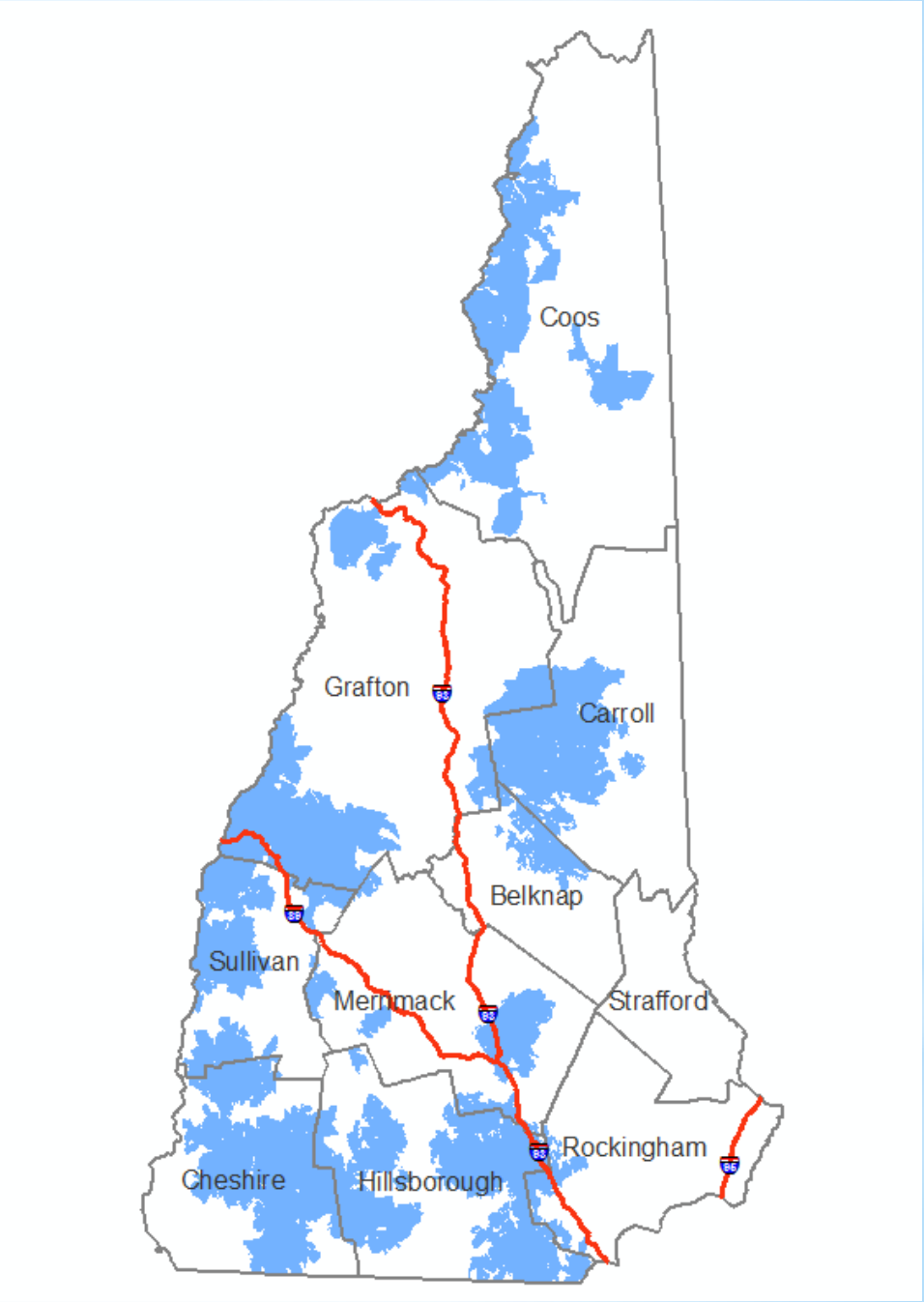
Cable Service Broadband Availability – March 2012 Results



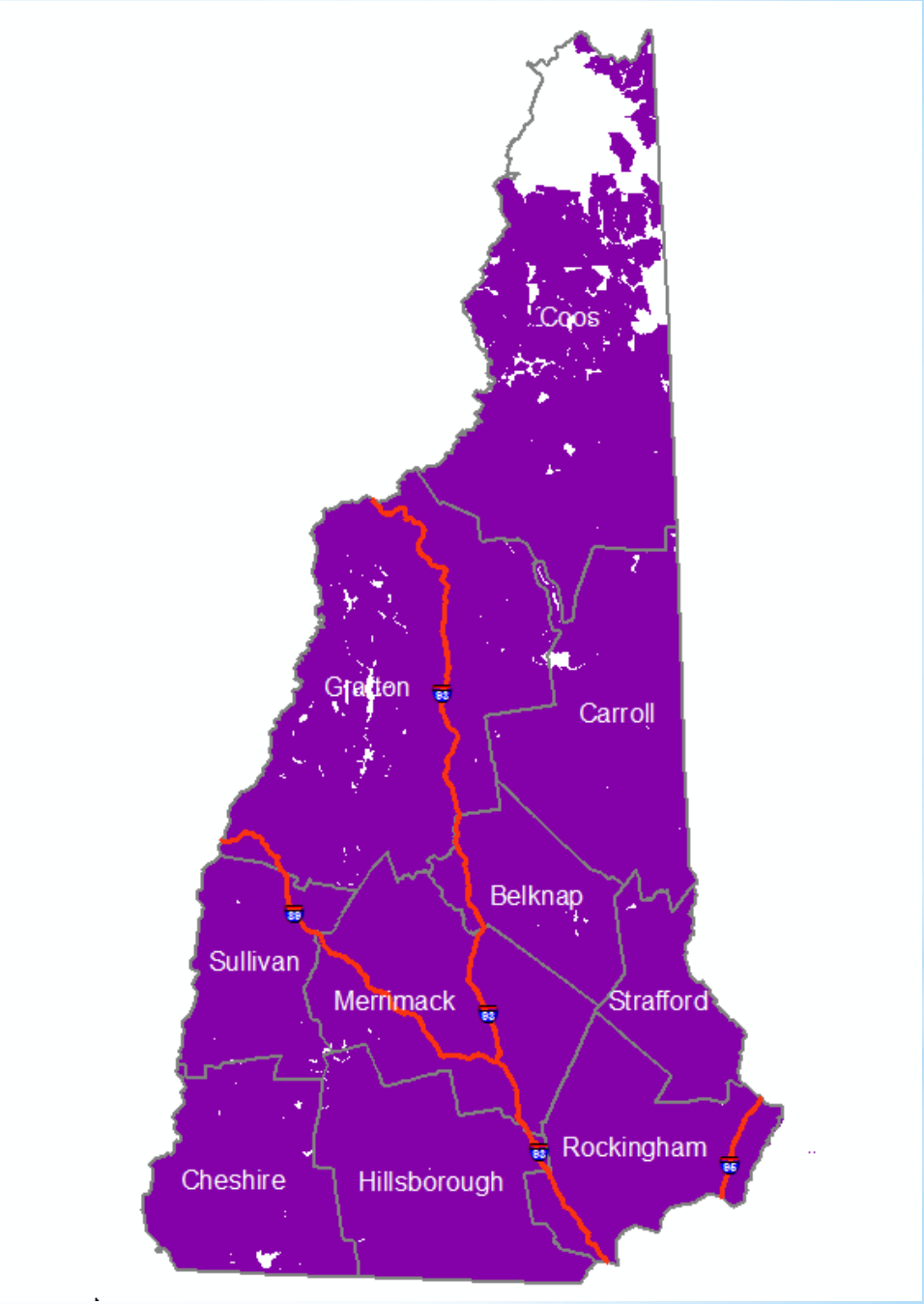
DSL Service Broadband Availability – March 2012 Results



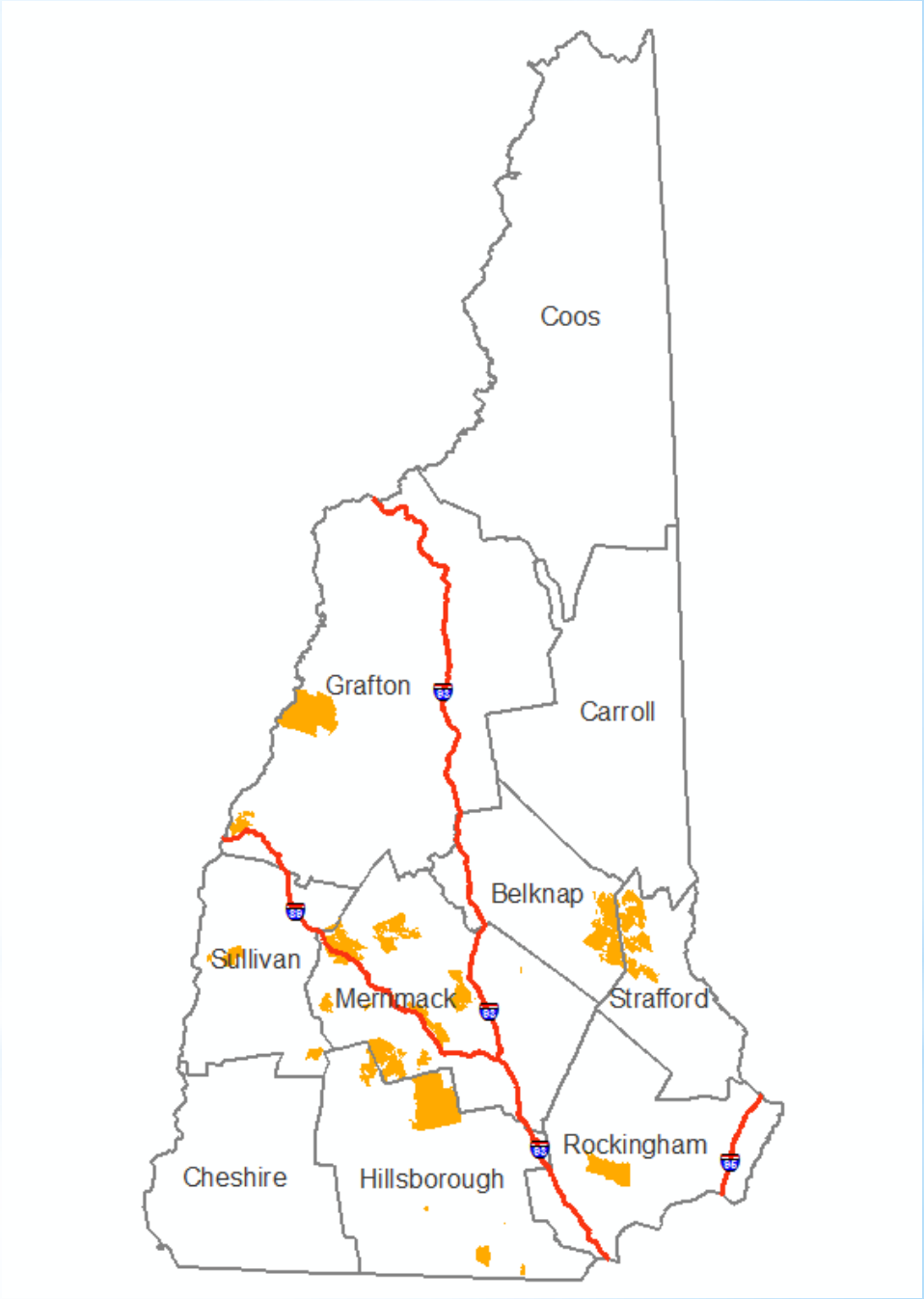
Fixed Wireless (WISP) Service Broadband Availability – March 2012 Results



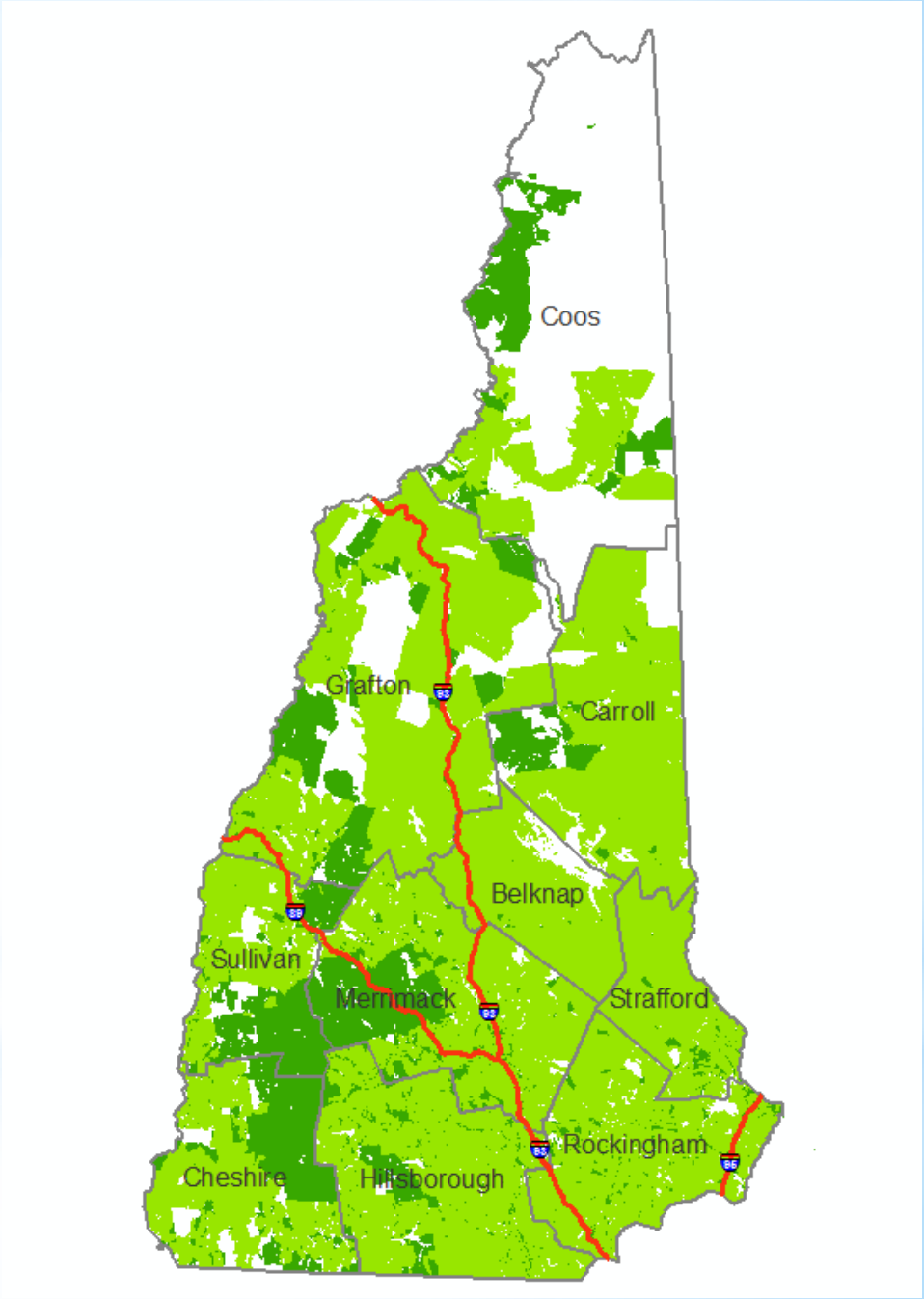
Cellular Service Broadband Availability – March 2012 Results



Optical/Fiber Service Broadband Availability – March 2012 Results



Wireline Service Broadband Availability – March 2012 Results



Broadband Availability – Download speed of 3 Mbps+ - March 2012 Results

What you can do:

- Email
- Web browsing and shopping
- Moderate social media use
- Voice over IP
- Limited VPN
- Send/receive medium-size documents

Status as of March 2012

Broadband Availability – Download speed of 25 Mbps+ - March 2012 Results

What you can do:

- High-definition videoconferencing
- High speed business to business applications
- “Smart homes” and teleworking
- High-definition audio-video streaming
- Real-time medical imaging & consultation
- Send/receive large documents

NEW HAMPSHIRE broadband MAPPING & PLANNING PROGRAM

Community Anchor Institution Inventory

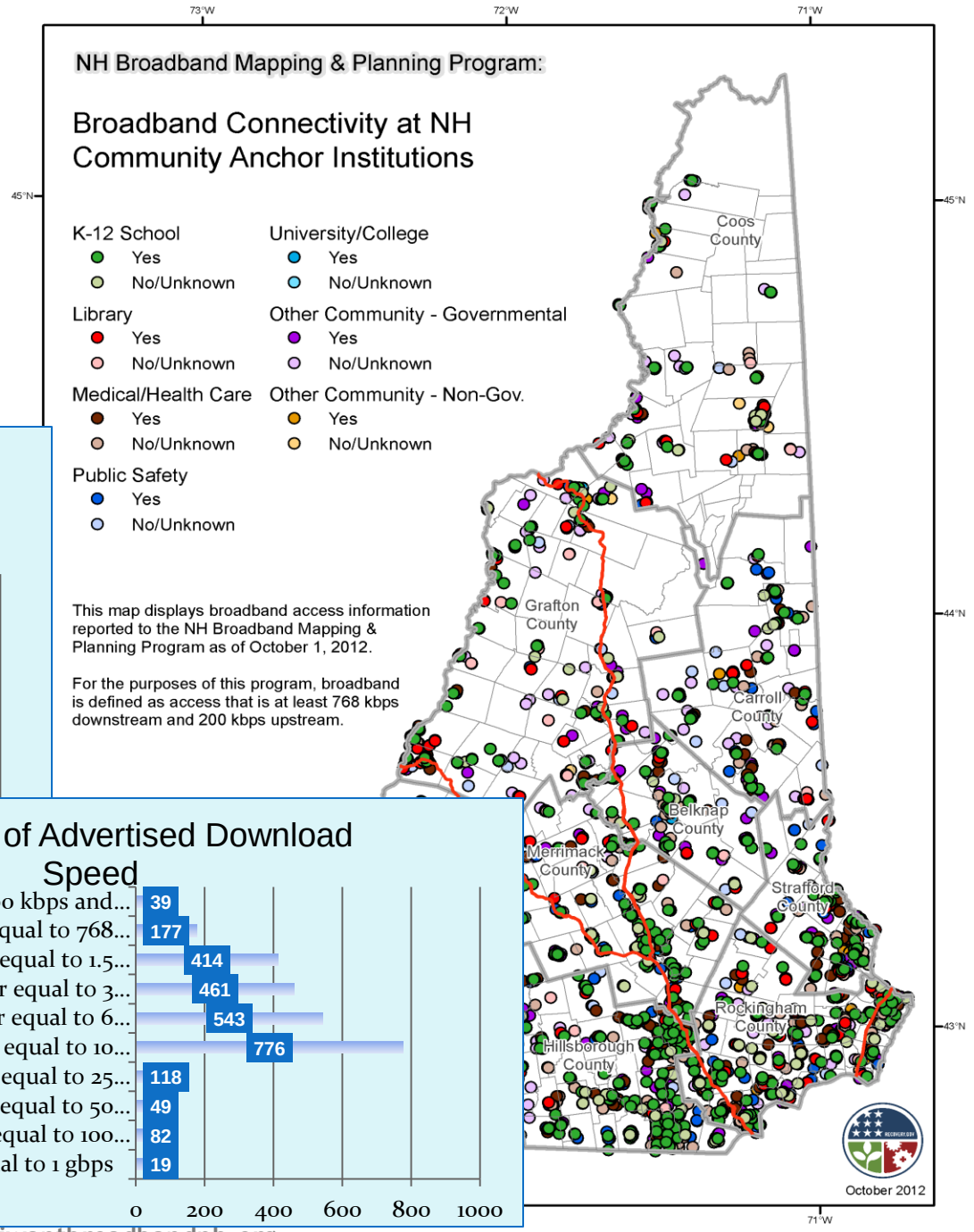
Community Anchor Institutions – Overview

- Goal – statewide layer of community anchor institutions (CAIs) with associated broadband access information
- For October 2012 submission:

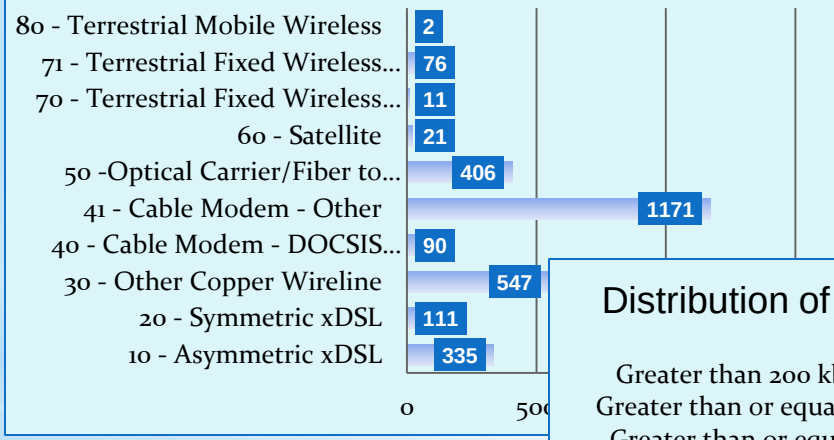
Category	No.	% of Total
1. School – K-12	762	19.5%
2. Library	766	19.6%
3. Medical/health care	808	20.7%
4. Public safety	564	14.5%
5. University, college, other post-secondary	64	1.6%
6. Other community support – government	736	18.9%
7. Other community support - non governmental	199	5.1%
TOTAL	3,899	100.0%

- Six-month update/verification cycle; continuing "gap" analysis to identify new CAIs

Community Anchor Institutions – October 2012



Distribution by Type of Technology



Distribution of Advertised Download Speed

NEW HAMPSHIRE broadband MAPPING & PLANNING PROGRAM

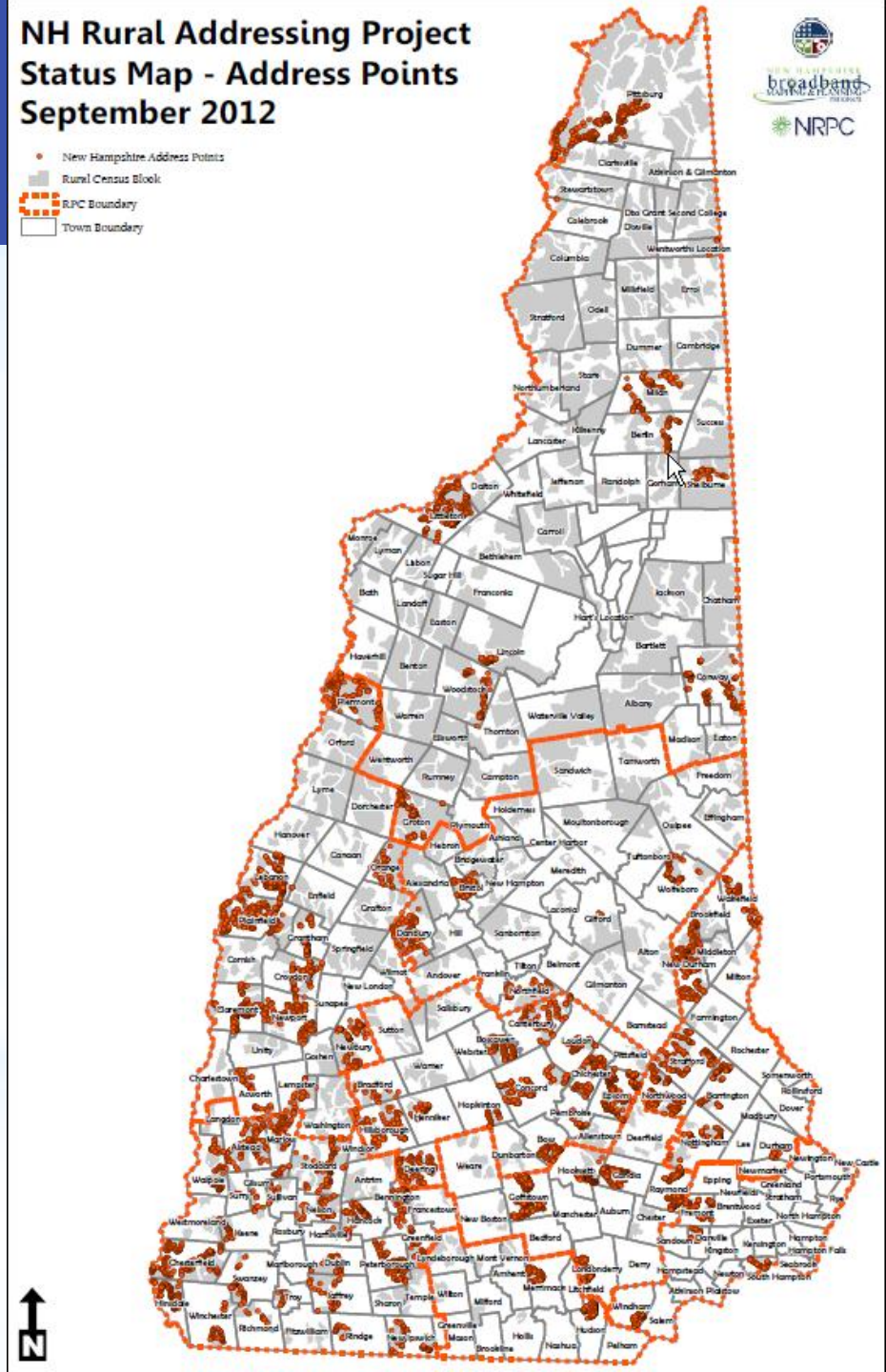
Rural Addressing Data Collection

Rural Addressing – Overview

- Goal – statewide GIS point file of addresses in NTIA-designated rural census blocks (2+ sq mi)
- ~40,000 households in rural blocks (Census 2010)
- Existing address datasets either incomplete, or unavailable to the public
- Data collected at the RPC level and coordinated by Nashua Regional Planning Commission and UNH

Rural Addressing – Status

- 14,600+ addresses collected (36.5% of total)
- 200+ volunteer hours

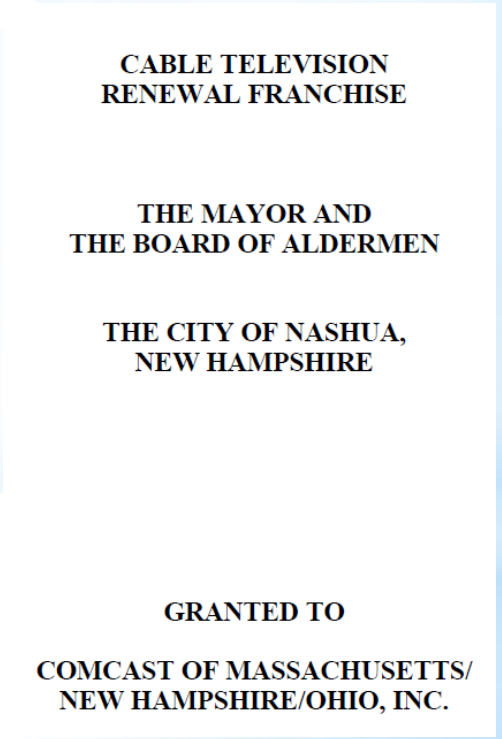


NEW HAMPSHIRE broadband MAPPING & PLANNING PROGRAM

Supplemental Mapping Activities

Broadband Availability – Supplemental Activities

- Public wi-fi location mapping
- Municipal cable franchise agreement inventory
- Enhancement of CAI data collection for additional category types
- Cell tower location updating


CABLE TELEVISION
RENEWAL FRANCHISE

THE MAYOR AND
THE BOARD OF ALDERMEN

THE CITY OF NASHUA,
NEW HAMPSHIRE

GRANTED TO

COMCAST OF MASSACHUSETTS/
NEW HAMPSHIRE/OHIO, INC.

NEW HAMPSHIRE broadband MAPPING & PLANNING PROGRAM

Broadband Data & Map Products

iwantbroadbandnh.org

Data Sets and Map Products

From GRANIT website, www.granit.unh.edu

- downloadable GIS shapefiles

From NHBMPP website, www.iwantbroadbandnh.org

- interactive map viewer
- downloadable statewide maps
- downloadable town broadband availability profiles

Aggregate datasets of all 56 state broadband initiatives can be viewed on the National Broadband Map, www.broadbandmap.gov

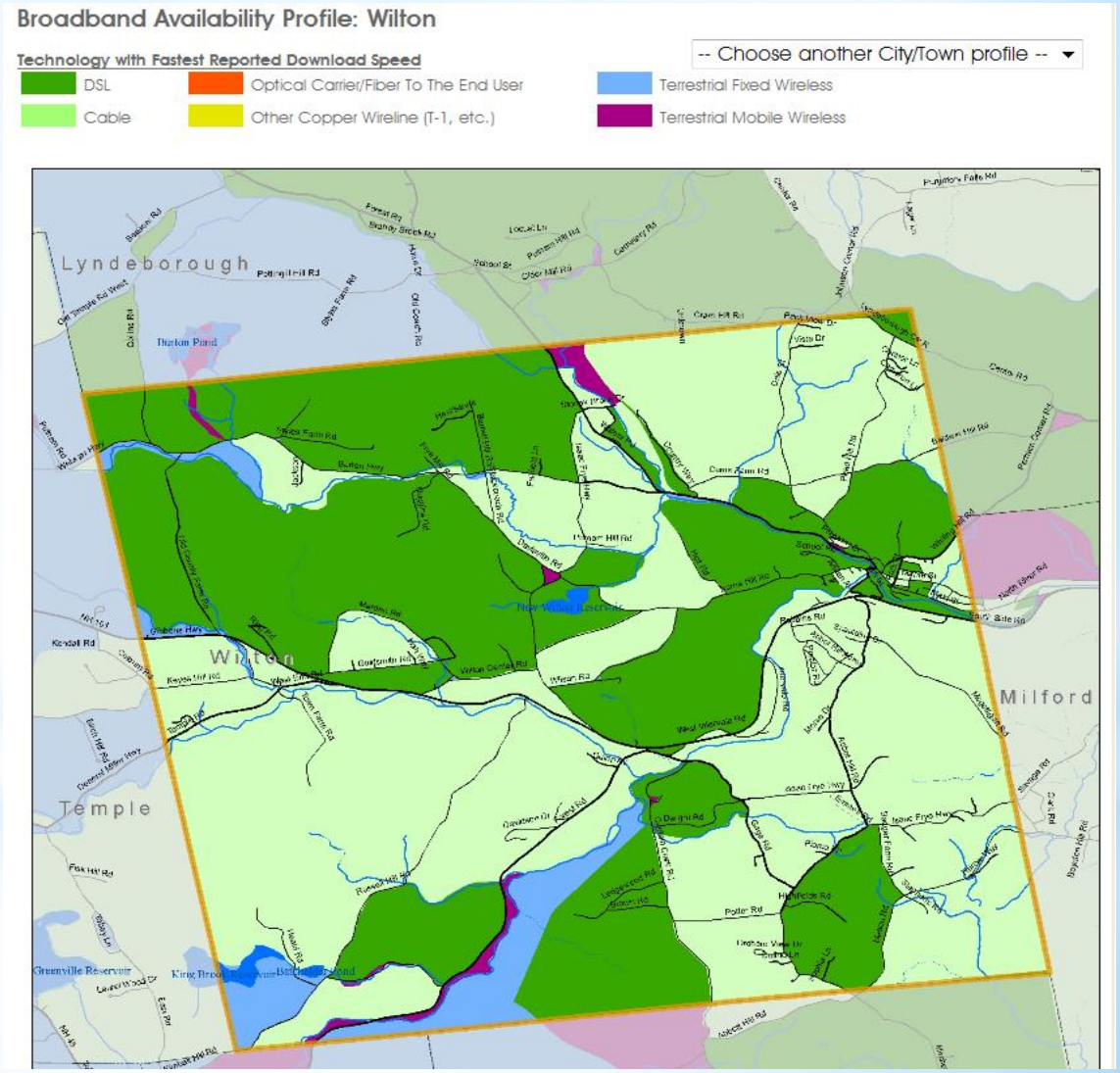
iwantbroadbandnh.org

Broadband Availability – Municipal Profiles

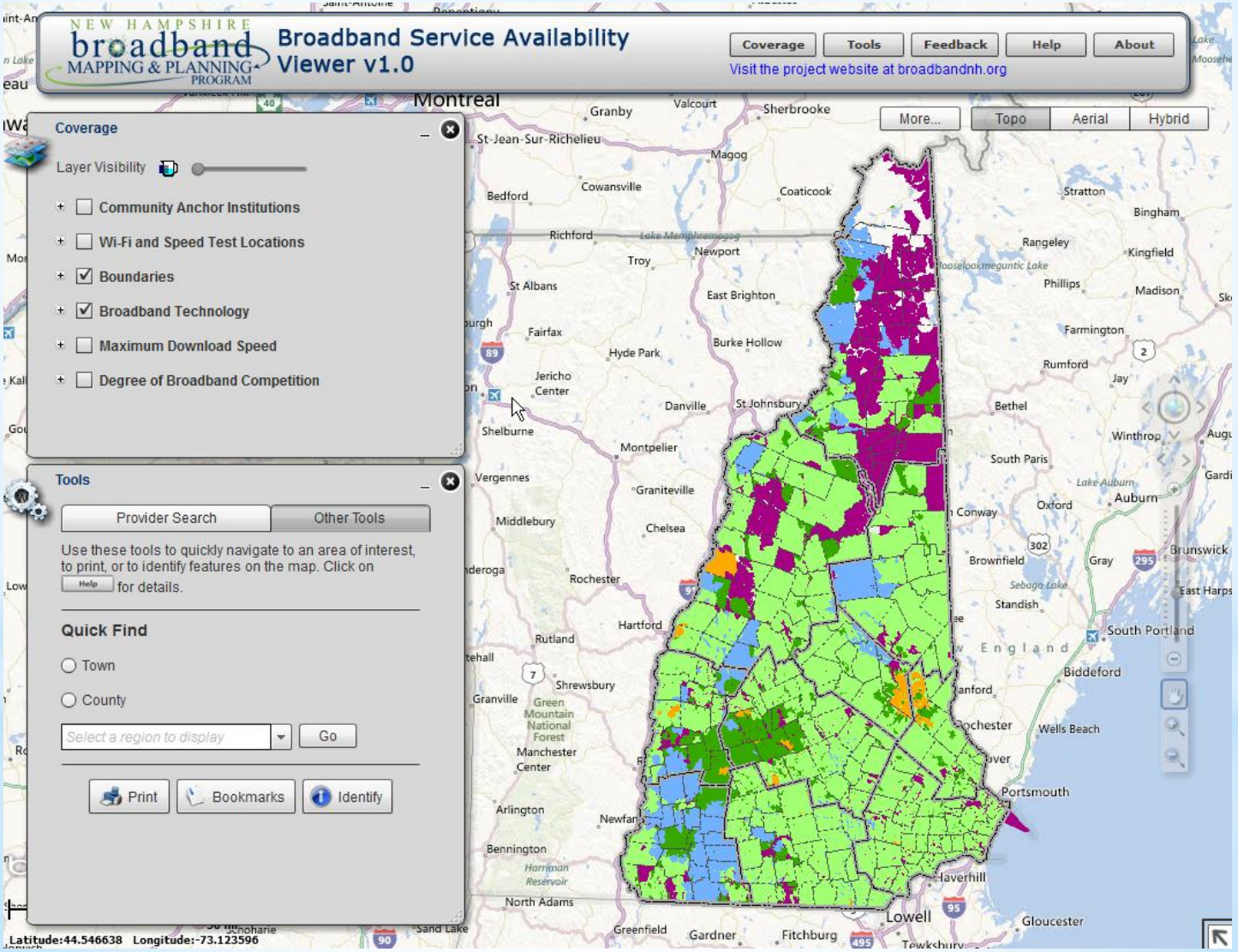
Service Providers in the Profiled Community:
Service Provider:
AT&T Mobility LLC
Comcast
FairPoint Communications, Inc.
Spectra Access
Sprint
T-Mobile
TDS Telecom
U.S. Cellular
Verizon Wireless
WiValley

Providers listed are those that submitted data indicating they offer broadband services via the technologies displayed in the profiled community. They may offer additional broadband technologies in other areas of the state.

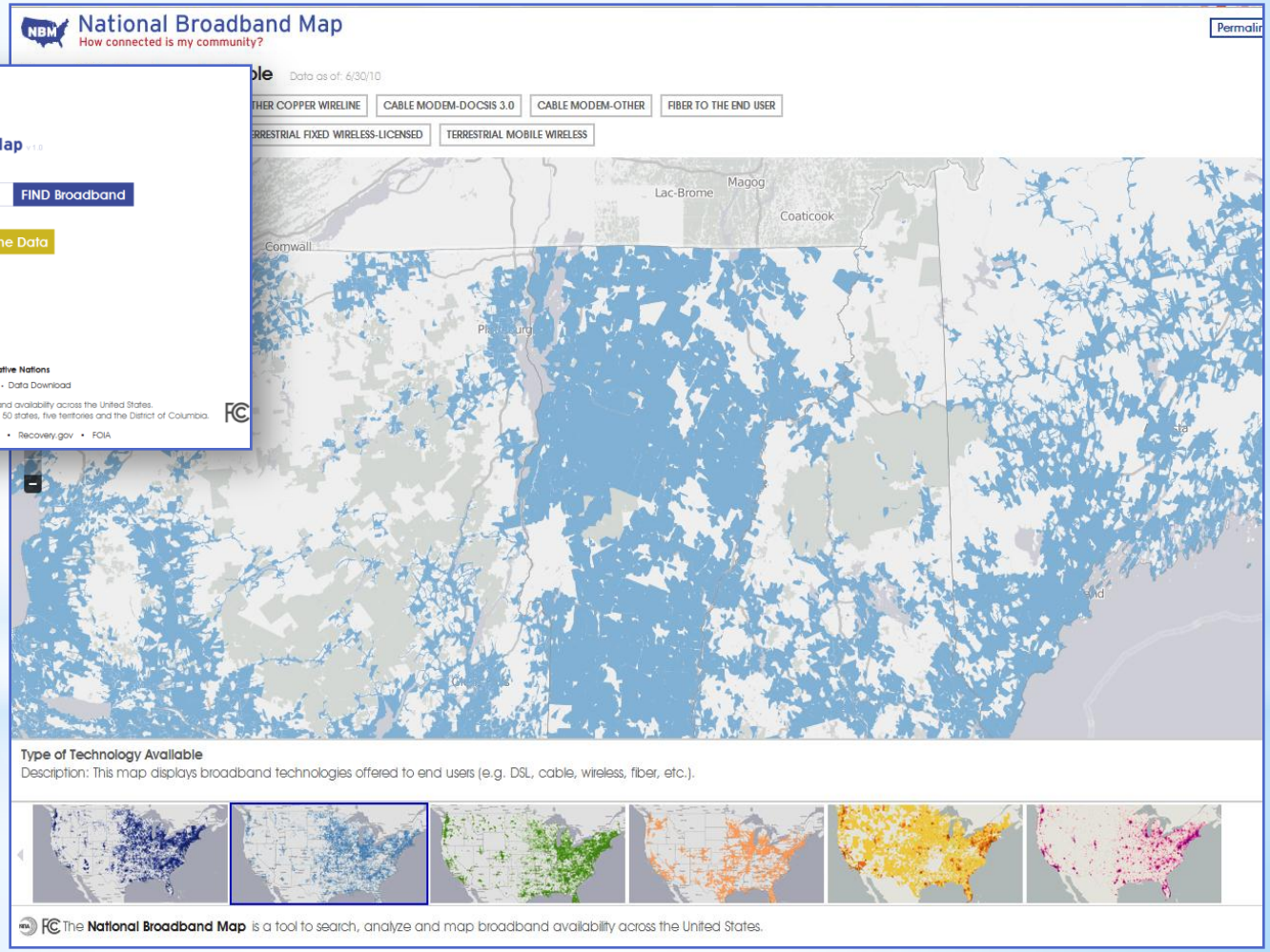
Regional Planning Commission
Nashua Regional Planning Commission



Broadband Availability – Interactive Map Viewer



Broadband Availability – National Broadband Map (www.broadbandmap.gov)



Launched February 17th, 2011 by NTIA in collaboration with the FCC, and in partnership with the 50 states, five territories and the District of Columbia broadband mapping programs

Evolution of Broadband Mapping in NH: 2008

Static

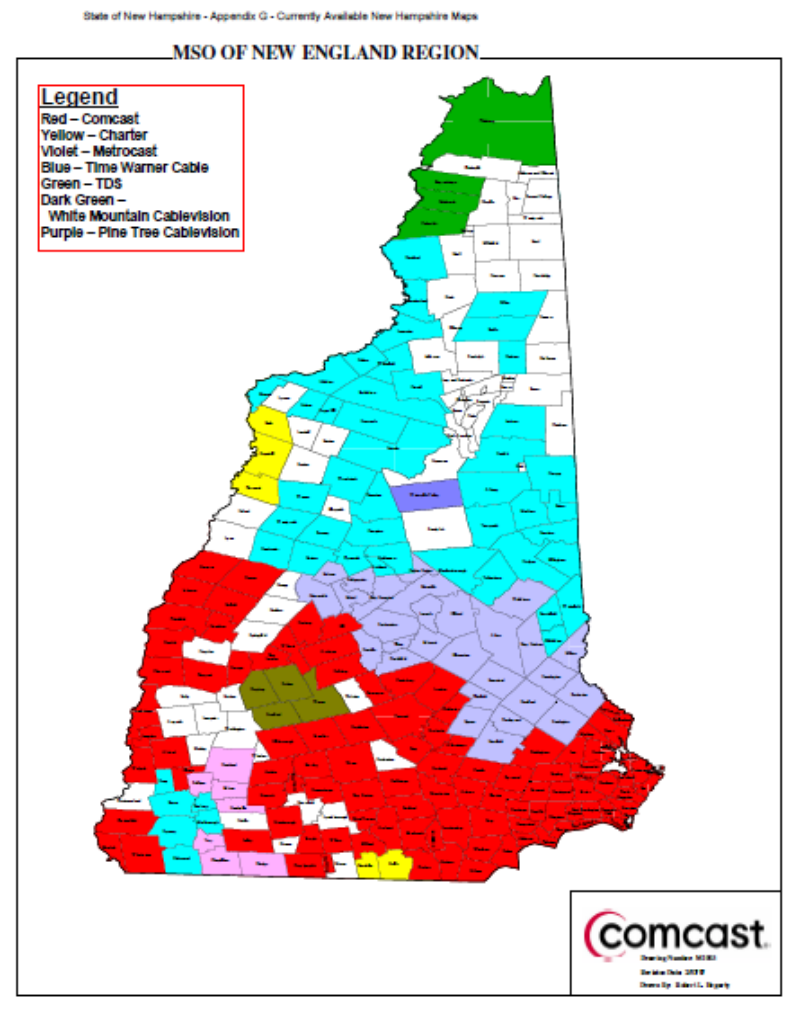
Town-based data

No planned updates

Information for selected technologies (DSL, Cable) on:

- Coverage

From "State of New Hampshire Broadband Action Plan", Department of Resources and Economic Development and the NH Telecommunications Advisory Board, June, 2008



Evolution of Broadband Mapping in NH: 2010/2011

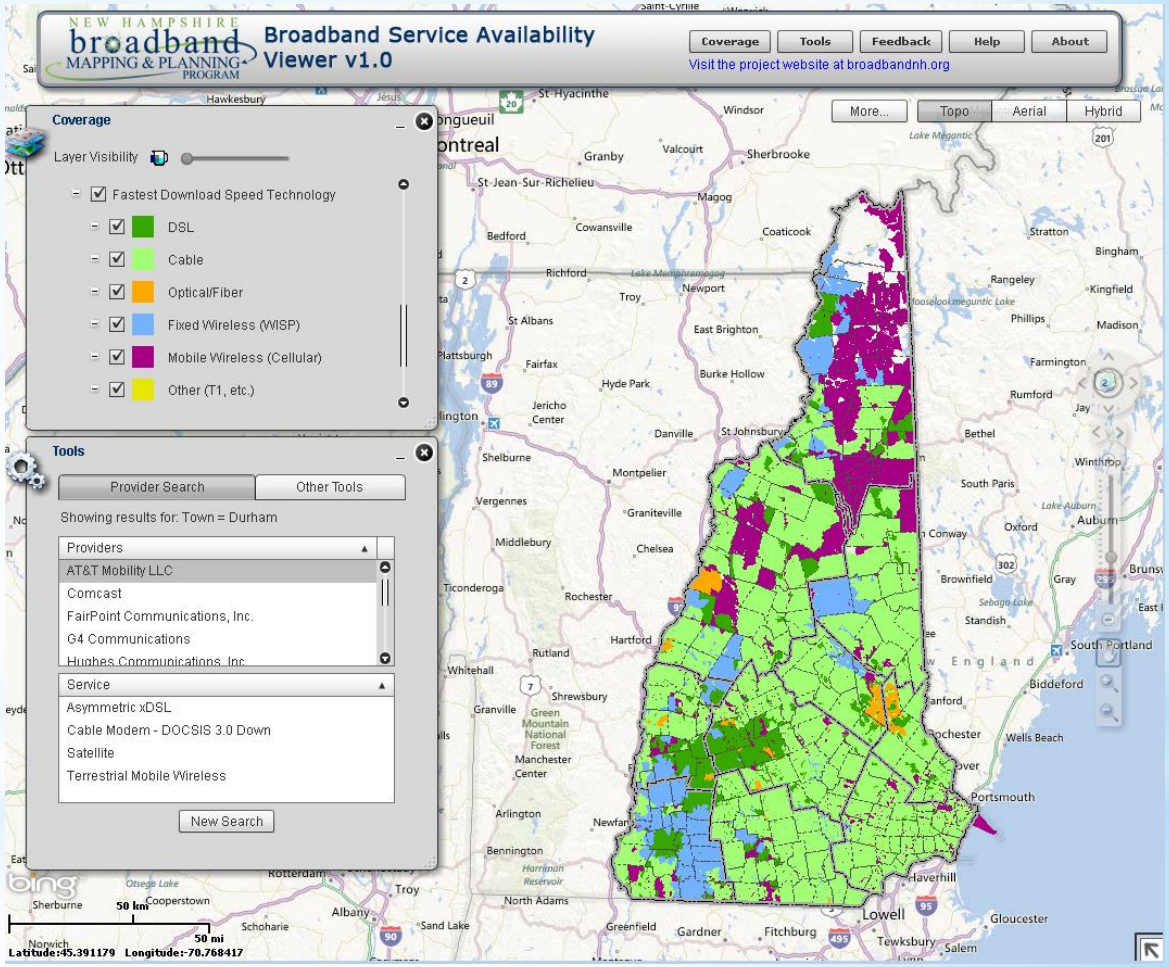
Interactive

Census block resolution

Regularly updated

Information for all technologies on:

- Coverage
- Technology
- Speed tiers
- Links to provider websites to obtain pricing data



Data as of March, 2012

Key Benefits of NHBMPP Mapping

1. Comprehensive mapping capability
   - Maintaining and verifying statewide broadband availability coverage map with speed and technology attributes, updated every 6 months
   - Exposing unserved and underserved areas of the state
   - Verifying unserved and underserved areas - user speed tests, surveys, direct emails, cellular drive testing
   - Making extensive use of GIS and web technologies to collect, process, and verify data; to conduct spatial analyses; to present results to the public
   - Developing and maintaining additional core data sets - Community Anchor Institutions, public rural address data
   - Compiling supplemental data sets - cable franchise agreements inventory, public wi-fi locations

2. Strong relationship with internet service providers
   - Returning broadband coverage maps to providers, several with limited mapping capability
   - Providing feedback on unserved and underserved areas of NH

3. Extended broadband community in NH
   - Encouraging state broadband initiatives to work collaboratively, sharing data and knowledge
   - Promoting public engagement in issues around broadband availability

Evolution of Broadband Mapping in NH: The Future?

Validation & feedback

- Every user is a potential data collector
- Customer and provider feedback loops

Better maps

- Address level mapping
- High-capacity maps for economic development
- Direct updates from providers

How you can help

- Recognize NH needs to expand broadband access and adoption in order to remain competitive with other states
- Spread the word that broadband is essential for economic development and vibrant communities
- Support NHBMPP and a state broadband authority/office, ensuring a continued capacity to deliver support to communities, businesses, schools, libraries, hospitals, etc.

How you can help

- Encourage data sharing among publically-funded data initiatives
- Incentivize provider participation in the NHBMPP and beyond
- Acquire statewide LiDAR to improve wireless signal propagation modeling capability
- Support UNH GRANIT and RPCs in providing data and technical resources

How you can help

- Encourage collaboration of public - private partners working together to enhance broadband access and adoption throughout the state
- Support legislation and policy designed to promote broadband access and adoption in NH
- Participate by attending our events; visiting our website at: iwantbroadbandnh.org
  (take the speed test and survey)

Project Contacts at UNH

Fay Rubin, Principal Investigator, NHBMPP
and NH GRANIT Project Director
fay.rubin@unh.edu

Scott Valcourt, co-Principal Investigator, NHBMPP
and Director of Strategic Technology
scott.valcourt@unh.edu

Michael Blair, Project Coordinator, NHBMPP
michael.blair@unh.edu

David Foote, Manager, Broadband Planning, NHBMPP
david.foote@unh.edu