

NH GRANIT GIS Clearinghouse Digital Equity Applications

Presented at the
NH Summit on Economic Inclusion and Digital Equity

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Earth Systems Research Center
University of New Hampshire

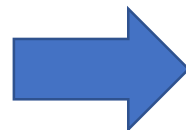


October 28, 2019

Digital Inclusion refers to the activities necessary to ensure that all individuals and communities, including the most disadvantaged, have access to and use of Information and Communication Technologies (ICTs). This includes 5 elements:

- 1) affordable, robust broadband internet service;
- 2) internet-enabled devices that meet the needs of the user;
- 3) access to digital literacy training;
- 4) quality technical support; and
- 5) applications and online content designed to enable and encourage self-sufficiency, participation and collaboration.

Digital Inclusion



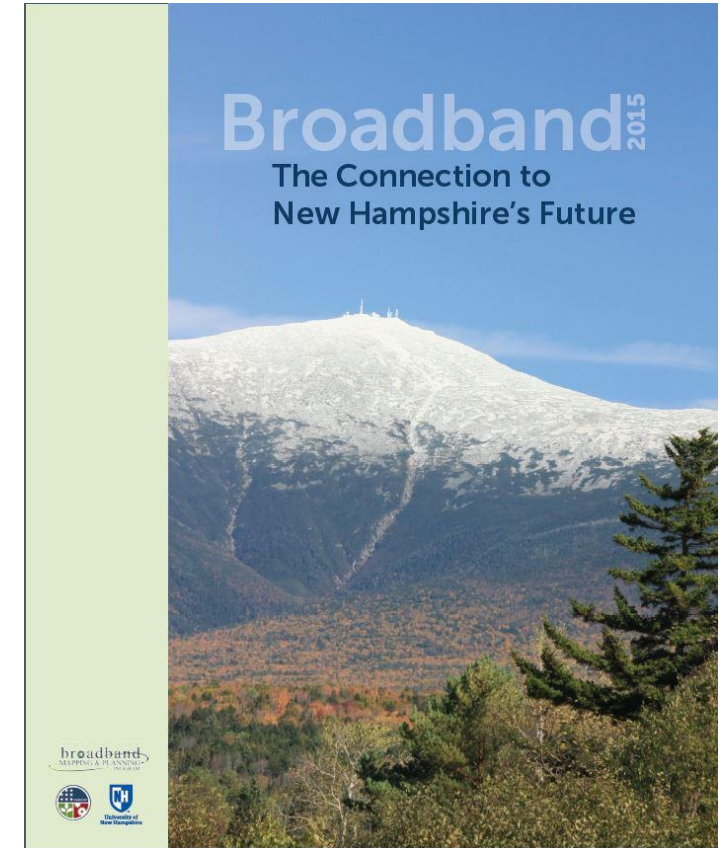
Digital Equity

Reference: www.digitalinclusion.org/definitions/



BTOP – State Broadband Initiative 5-Year Project 2010 -2015, funded by NTIA

- Mapping
- Planning
- Technical Assistance
- Capacity Building



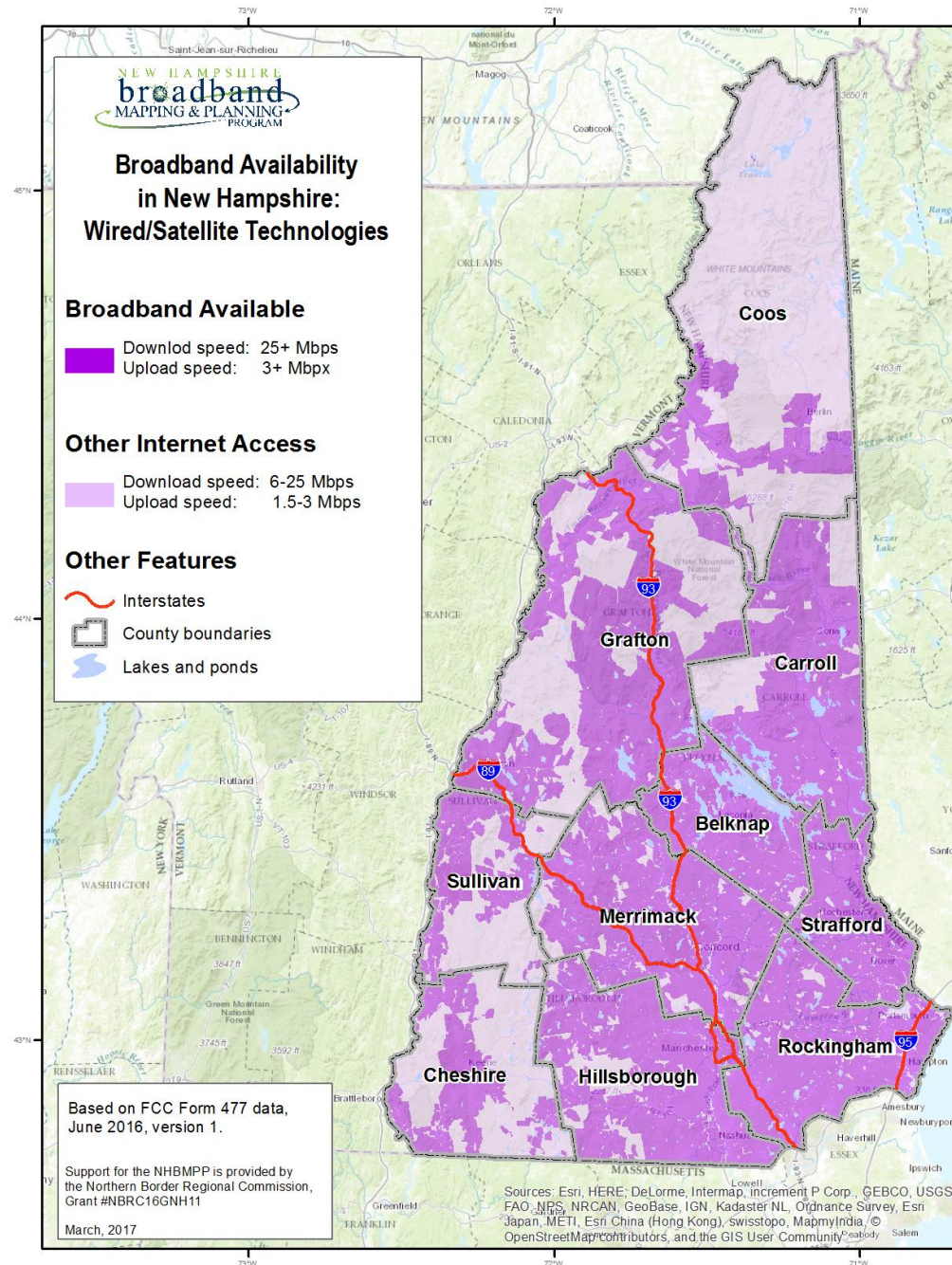


Broadband in Coos County (NBRC1), 2015-2016

Broadband in Northern NH (NBRC2)

<http://iwantbroadbandnh.org/completed-projects>

Mapping Broadband Availability



Broadband Availability – Consumer Service

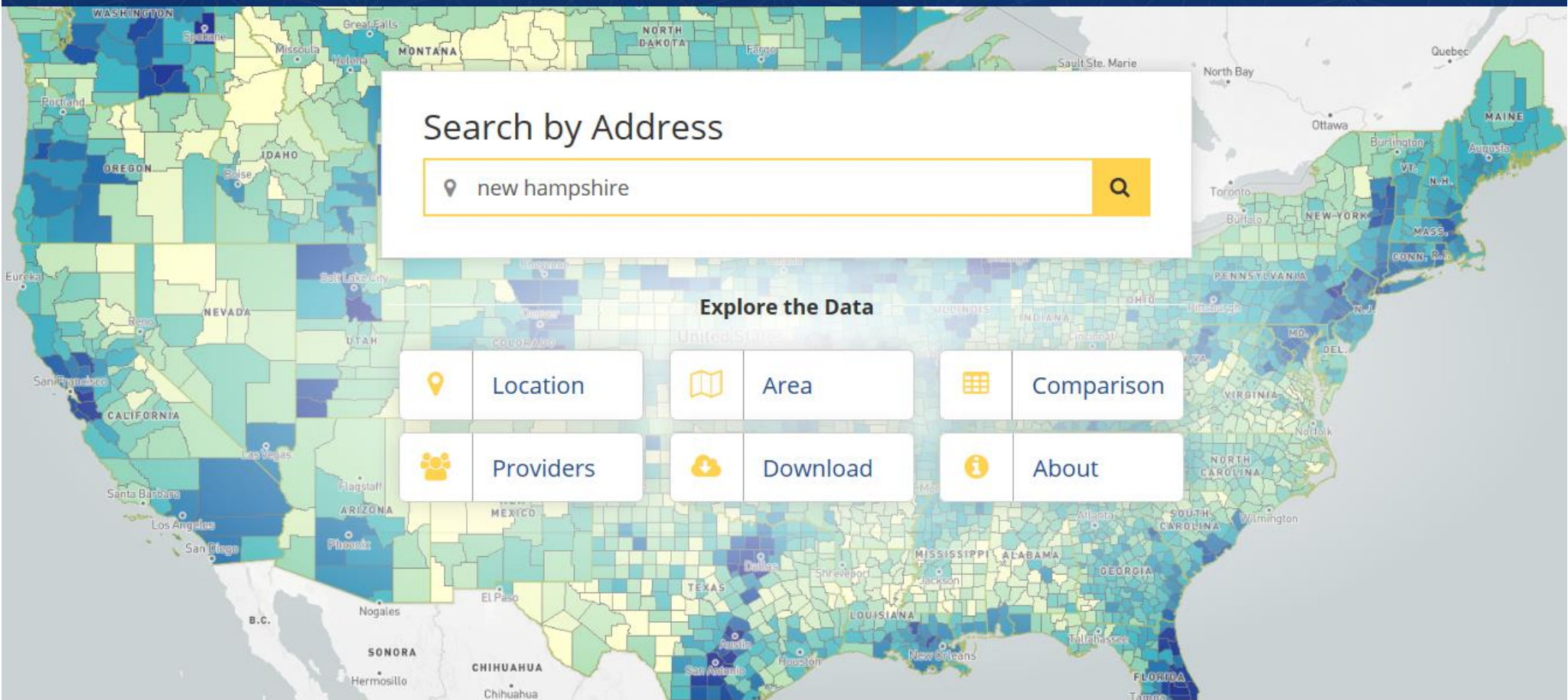
POPULATION		Served (25+ Mbps down x 3+ Mbps up)		Other Internet Access (6-25 Mbps down x 1.5-3 Mbps up)		Unserved	
County	Total Population (2010)	Population	%	Population	%	Population	%
Belknap	60,088	58,079	96.7%	2,009	3.3%	0	0.0%
Carroll	47,818	46,259	96.7%	1,559	3.3%	0	0.0%
Cheshire	77,117	61,291	79.5%	15,826	20.5%	0	0.0%
Coos	33,055	26,311	79.6%	6,744	20.4%	0	0.0%
Grafton	89,118	80,758	90.6%	8,360	9.4%	0	0.0%
Hillsborough	400,721	389,757	97.3%	10,964	2.7%	0	0.0%
Merrimack	146,445	140,152	95.7%	6,293	4.3%	0	0.0%
Rockingham	295,223	292,589	99.1%	2,634	0.9%	0	0.0%
Strafford	123,143	119,084	96.7%	4,059	3.3%	0	0.0%
Sullivan	43,742	35,198	80.5%	8,544	19.5%	0	0.0%
State of New Hampshire	1,316,470	1,249,478	94.9%	66,992	5.1%	0	0.0%

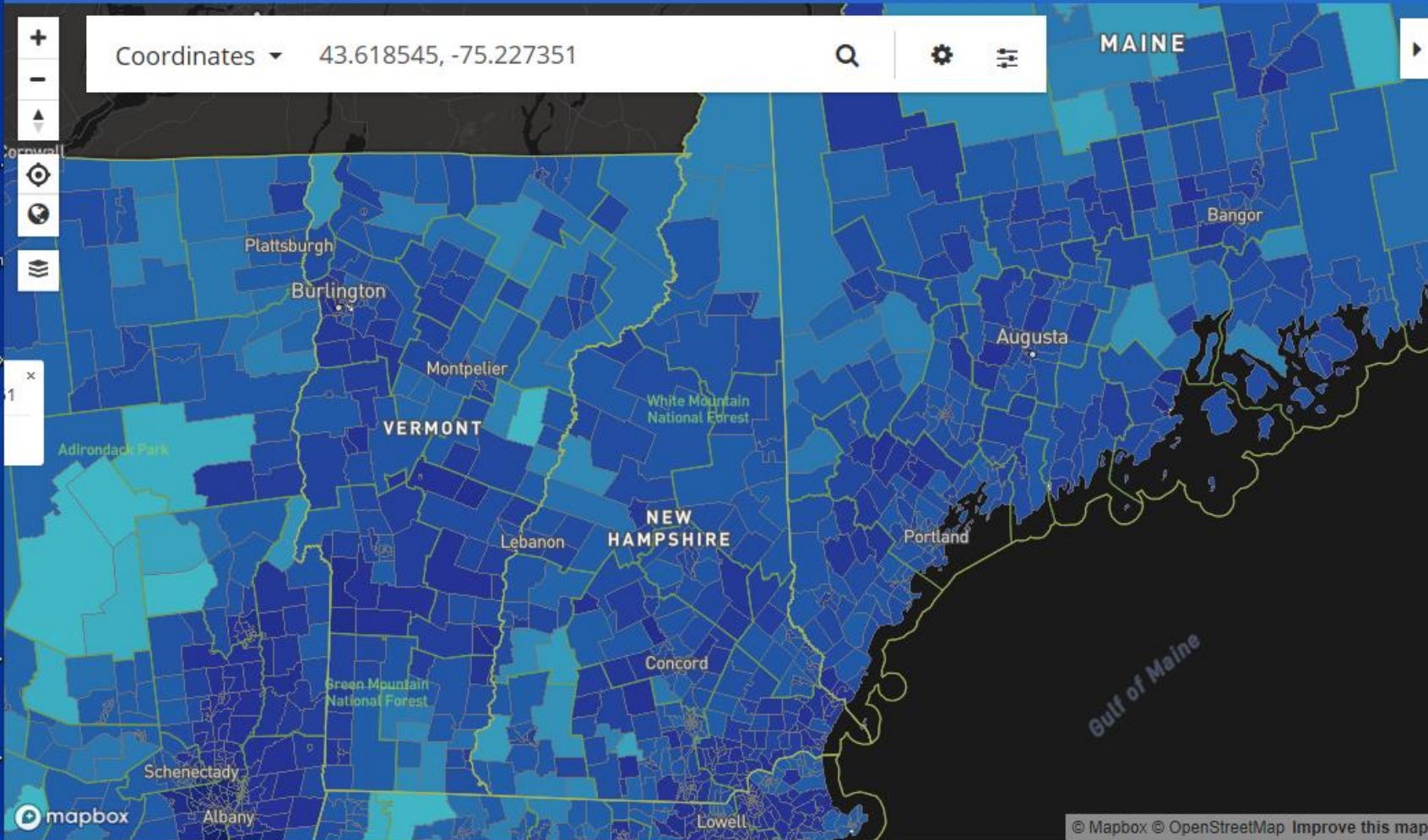
Form 477 Data Now

- Collected from providers in June/December of each year
- Describes residential, fixed broadband coverage
- Available for public access:
<https://broadbandmap.fcc.gov>



Fixed Broadband Deployment





All Providers Reporting Service

Census block ID: 360499506002175

Number of Fixed Residential Broadband Providers

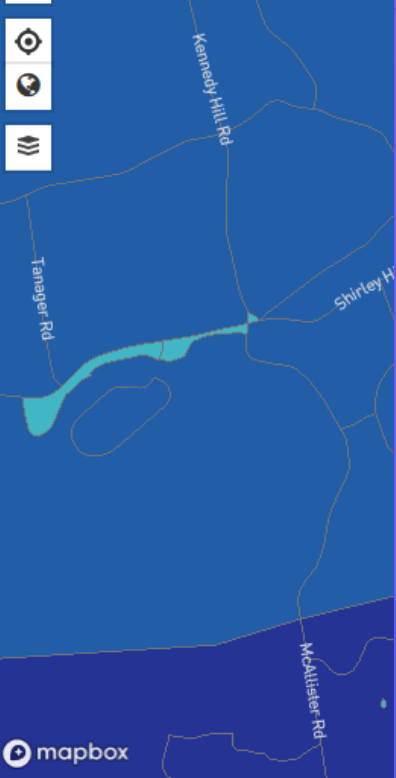


Broadband

Technology ADSL, Cable, Fiber, Fixed Wireless, Satellite, Other
Speed ≥ 25/3 Mbps
Date June 2018 (latest public release)

Provider	Tech	Down (Mbps)	Up (Mbps)
ViaSat, Inc.	Satellite	100	5
Hughes Network Systems, LLC	Satellite	25	3
VSAT Systems, LLC	Satellite	2	1.3

Coordinates 42.9



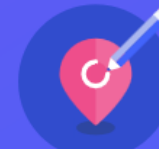
How can we improve the map?



Add a place



Fix a location



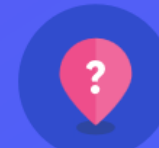
Rename a place



Fix satellite map



Remove a place



It's something else

Providers

Satellite, Other

Tech	Down (Mbps)	Up (Mbps)
Cable	987	35
Satellite	100	5
ADSL	80	20
ADSL	25	2
Satellite	25	3
Satellite	2	1.3

Search Nationwide or enter a state

Select area

Nationwide

State ▾

Compare



Broadband

Technology ADSL, Cable, Fiber, Fixed Wireless, Satellite, Other

Speed ≥ 25/3 Mbps

Date June 2018 (latest public release)

Percentage of population with broadband providers

United States (National)

Area	no providers					1 or more providers					2 or more providers					3 or more providers				
	all	urban	rural	non-tribal	tribal	all	urban	rural	non-tribal	tribal	all	urban	rural	non-tribal	tribal	all	urban	rural	non-tribal	tribal
Nationwide	0.06	0.04	0.14	0.04	1.43	99.94	99.96	99.86	99.96	98.57	99.76	99.80	99.61	99.78	97.90	93.35	97.73	75.16	93.65	68.90

State

New Hampshire

Area ▲	no providers					1 or more providers					2 or more providers					3 or more providers				
	all	urban	rural	non-tribal	tribal	all	urban	rural	non-tribal	tribal	all	urban	rural	non-tribal	tribal	all	urban	rural	non-tribal	tribal
New Hampshire	0.00	0.00	0.00	0.00	--	100.00	100.00	100.00	100.00	--	100.00	100.00	100.00	100.00	--	95.93	98.63	91.85	95.93	--

Rows per page: 200 ▾

◀ Prev 1 - 1 of 1 Next ▶

Form 477 Data Now - Currency

Home / Economics and Analytics /

Fixed Broadband Deployment Data from FCC Form 477

Wireline Competition

- Chief and Deputy Chief
- Chief Technology Officer
- Chief and Deputy Chief Economists
- Economic Analysis Division
- Auctions Division
- Data Division
- Industry Analysis Division

Who Files What?

- **All** facilities-based broadband providers are required to file data with the FCC twice a year (Form 477) on where they offer Internet access service at speeds exceeding 200 kbps in at least one direction.
- **Fixed** providers file lists of census blocks in which they can or do offer service to at least one location, with additional information about the service.*
- **Mobile** providers file maps of their coverage areas for each broadband technology (e.g., EV-DO, HSPA, LTE). See [Mobile Deployment Data](#).

Search, Filter & Visualize the Data:

- [Data as of June 30, 2018](#)
- [Data as of December 31, 2017](#)

Related Links

- [Interactive Map](#)
- [Explanation of Broadband Deployment Data](#)
- [Imputations Table for Broadband Deployment Data](#)
- [Mobile Deployment Data](#)
- [Fixed Broadband Technology Codes](#)
- [Form 477 Resources](#)
- [IAD Data and Statistical Reports](#)

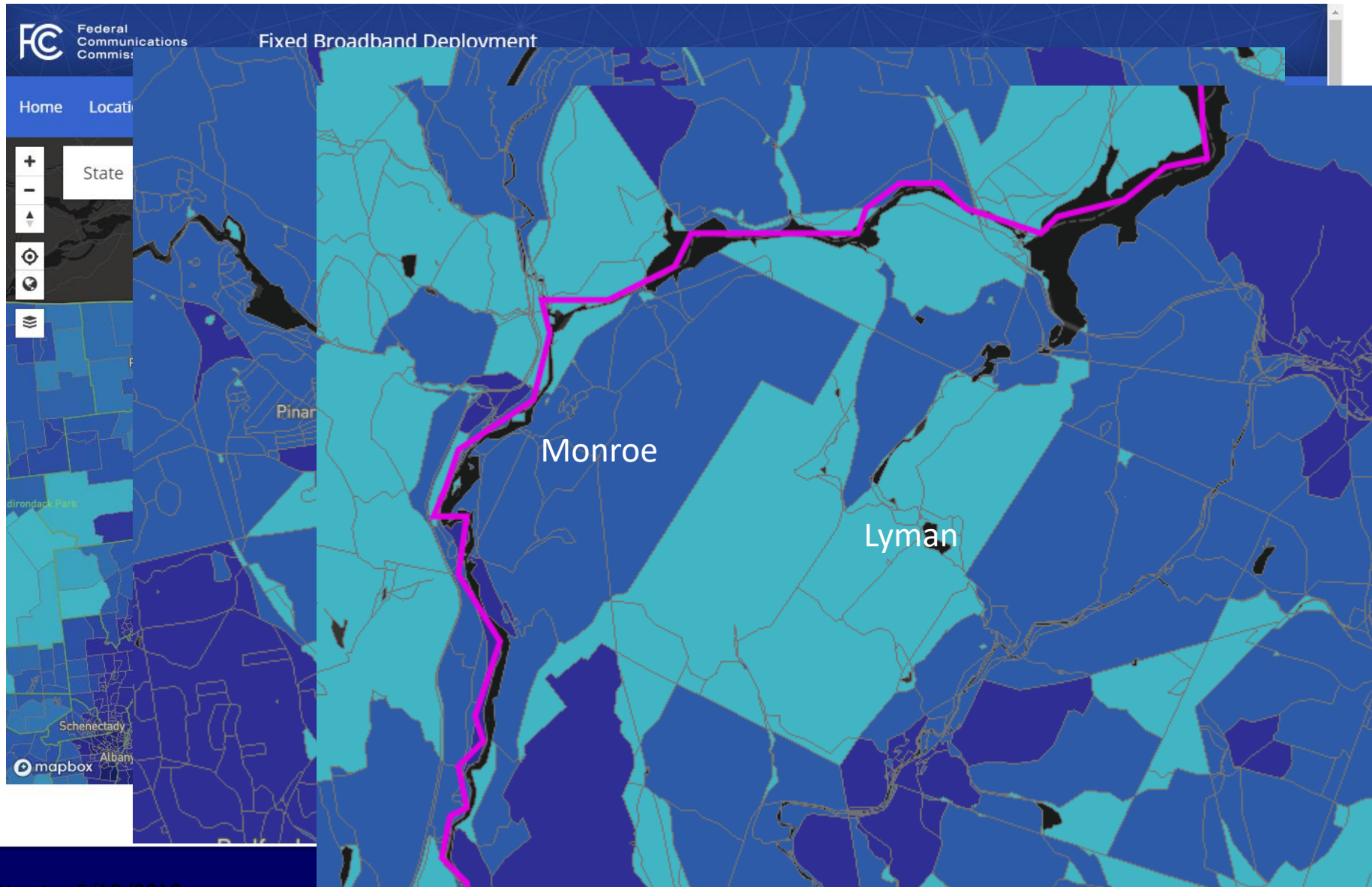
Source:

<https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>

Accessed 10/24/2019



Form 477 Data Now – Resolution

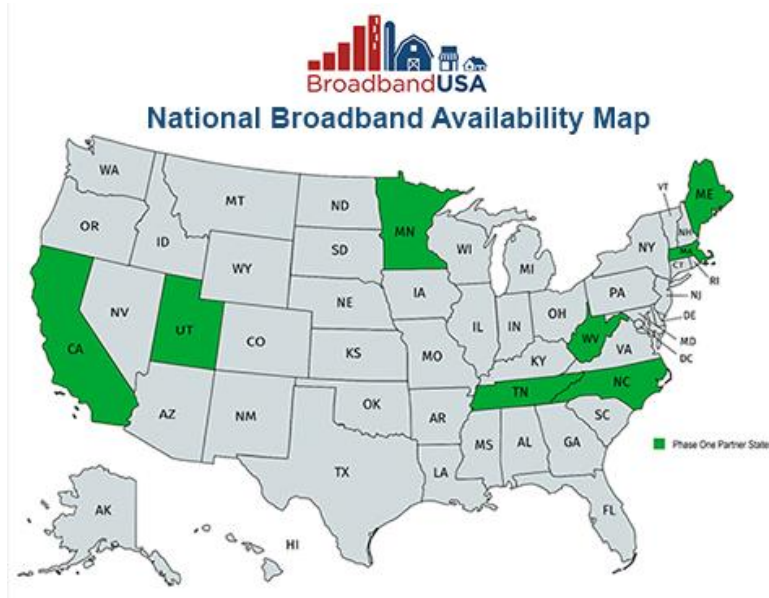


Form 477 Data Future – Modernizing the FCC Form 477 Data Program

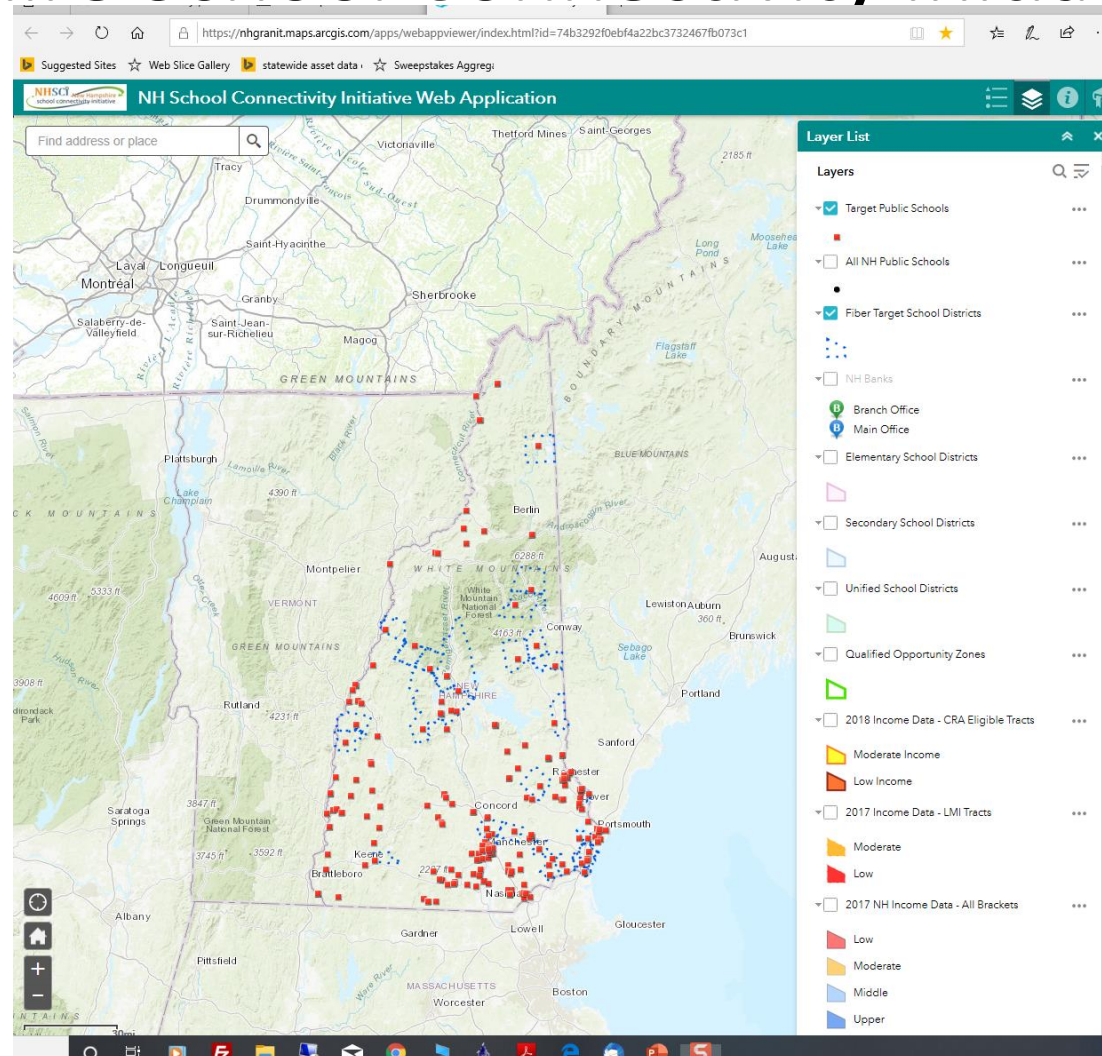
- Same collection frequency - June/December of each year
- Same objectives - describes residential, fixed broadband coverage
- Potential improvement in resolution – directs providers to submit actual service area polygons vs. lists of census blocks
- Currency – streamlined efforts to review data, including easier mechanisms for public comment. May reduce frequency to annual submission

National Broadband Availability Map

- 2018 Congressional appropriation to update the National Broadband Availability Map (NBAM)
- Incorporates data from Form 477 and available 3rd party datasets
- 6 pilot states:



Mapping Economic Inclusion Asset Providers – New Hampshire School Connectivity Initiative Web Map

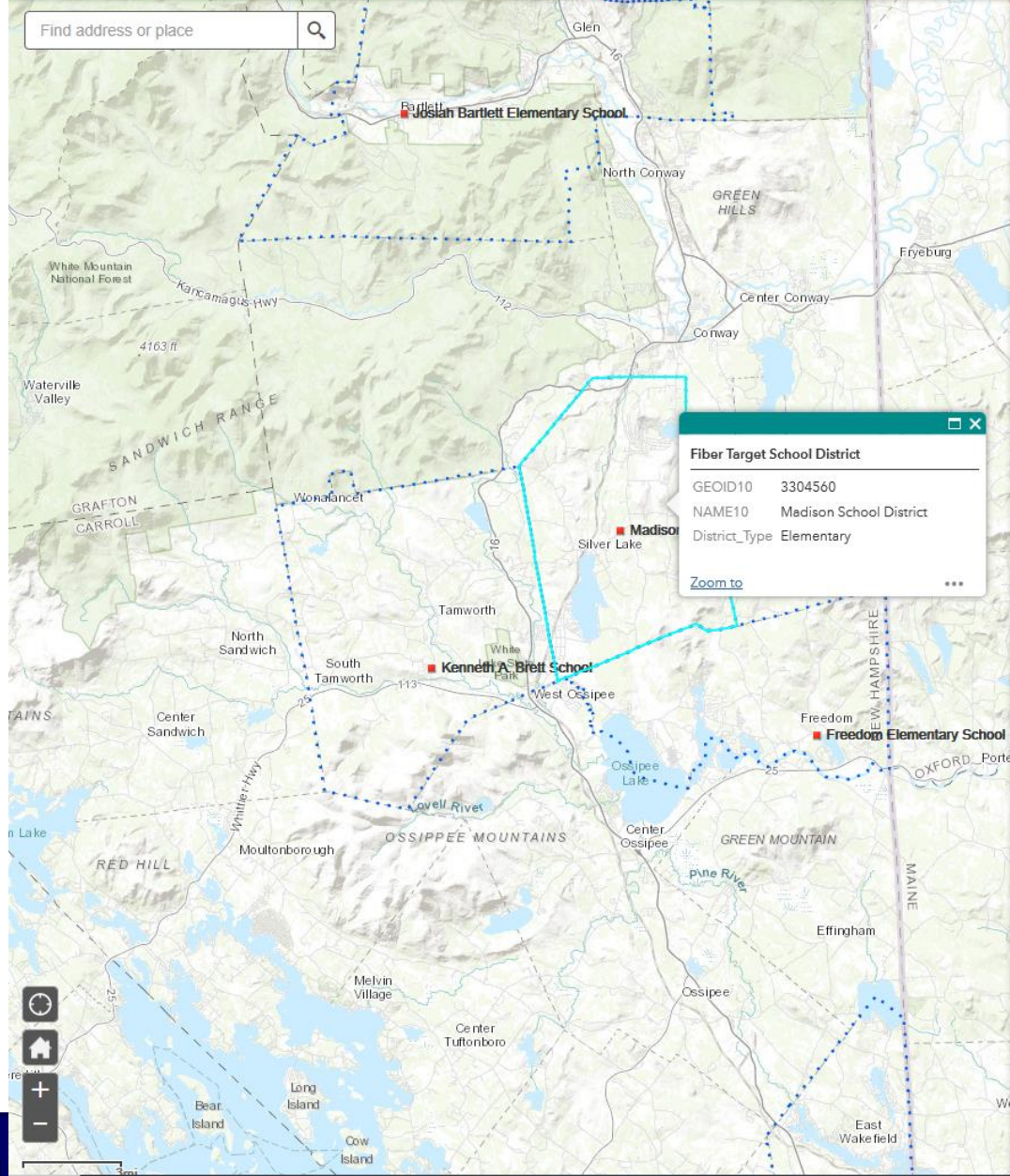




NH School Connectivity Initiative Web Application



Find address or place

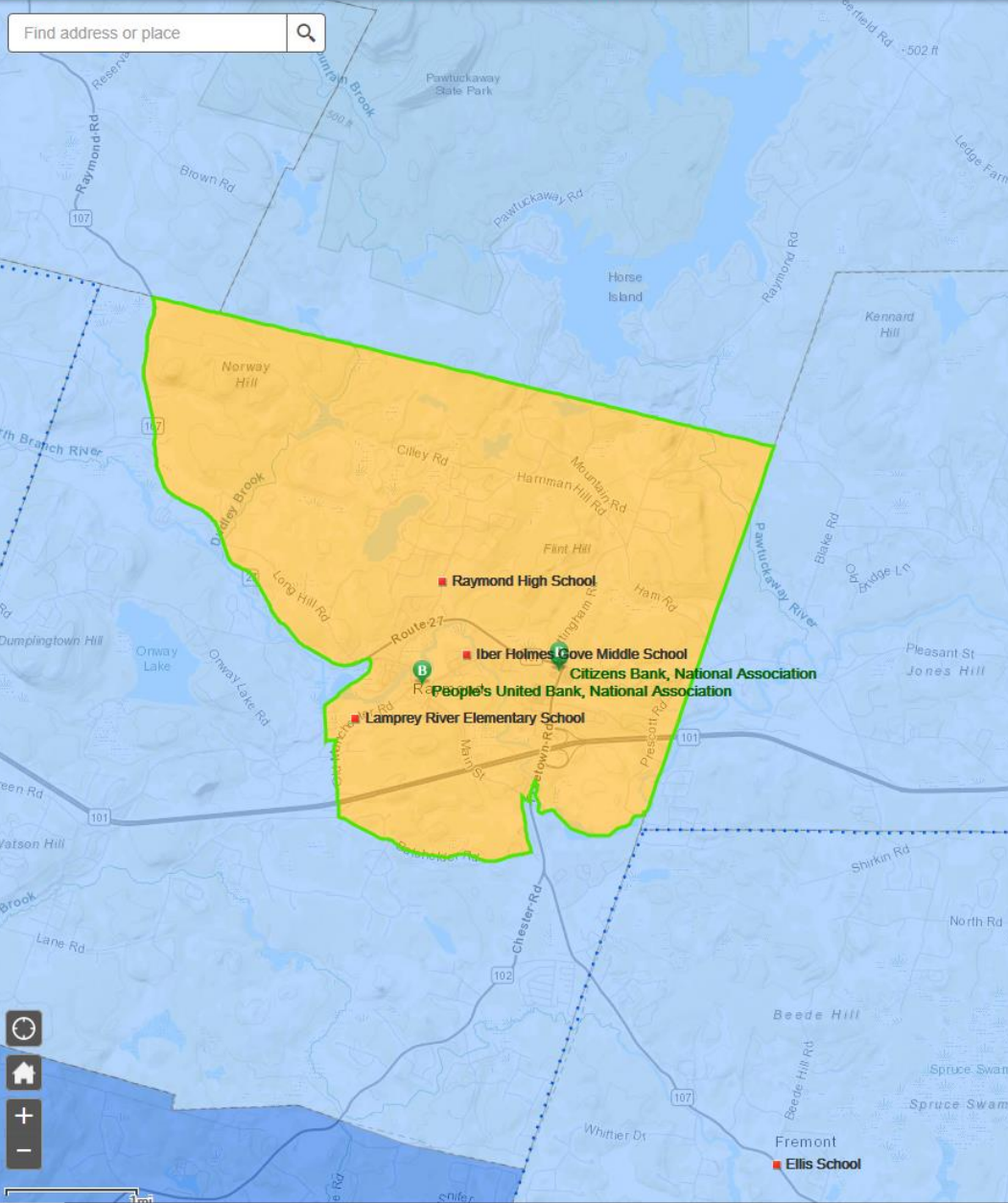


Layer List

- Target Public Schools
- All NH Public Schools
- Fiber Target School Districts
- NH Banks
- Branch Office
- Main Office
- Elementary School Districts
- Secondary School Districts
- Unified School Districts
- Qualified Opportunity Zones
- 2018 Income Data - CRA Eligible Tracts
 - Moderate Income
 - Low Income
- 2017 Income Data - LMI Tracts
 - Moderate
 - Low
- 2017 NH Income Data - All Brackets
 - Low
 - Moderate
 - Middle
 - Upper



NH School Connectivity Initiative Web Application



Layer List

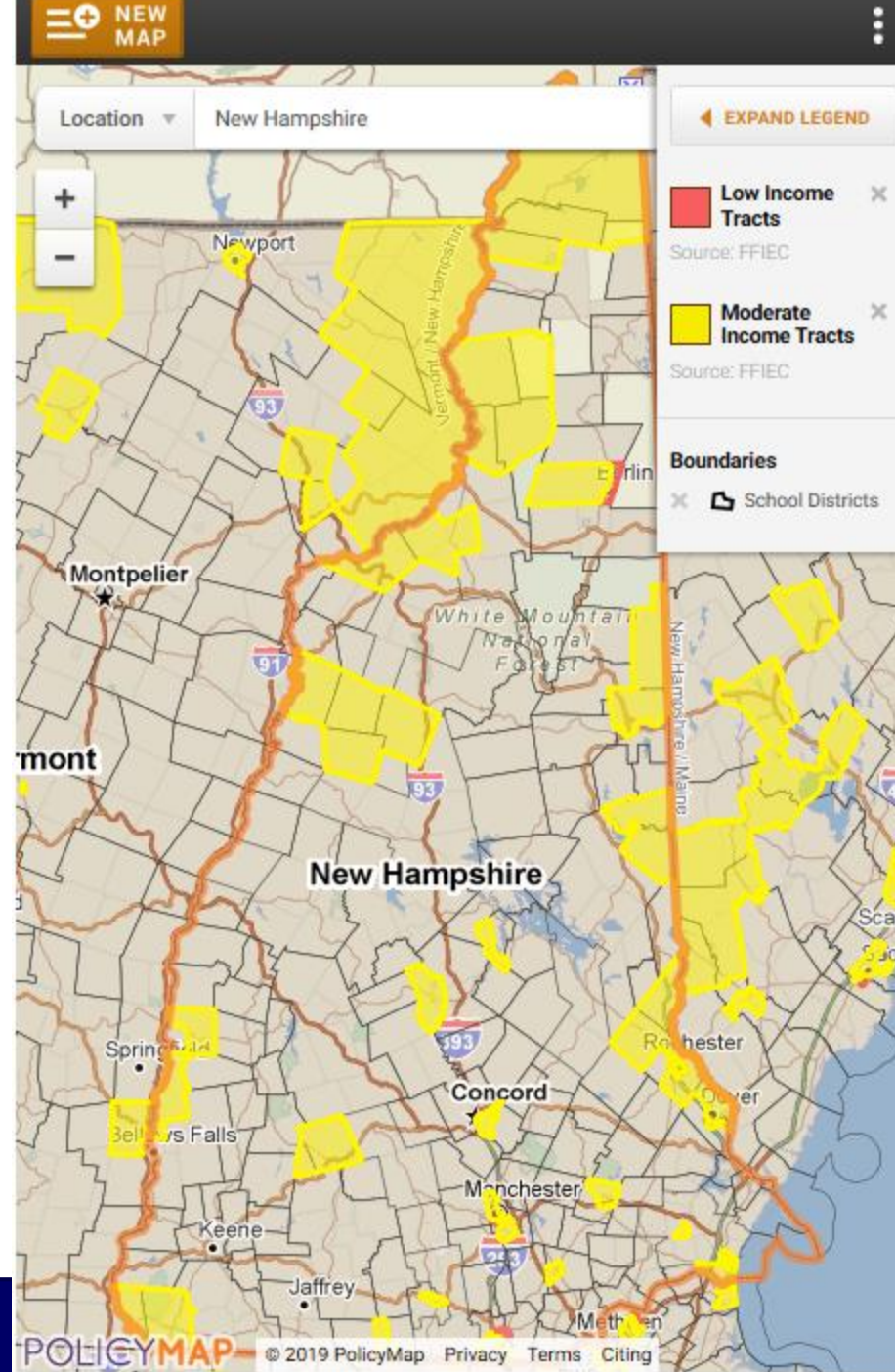
Layers

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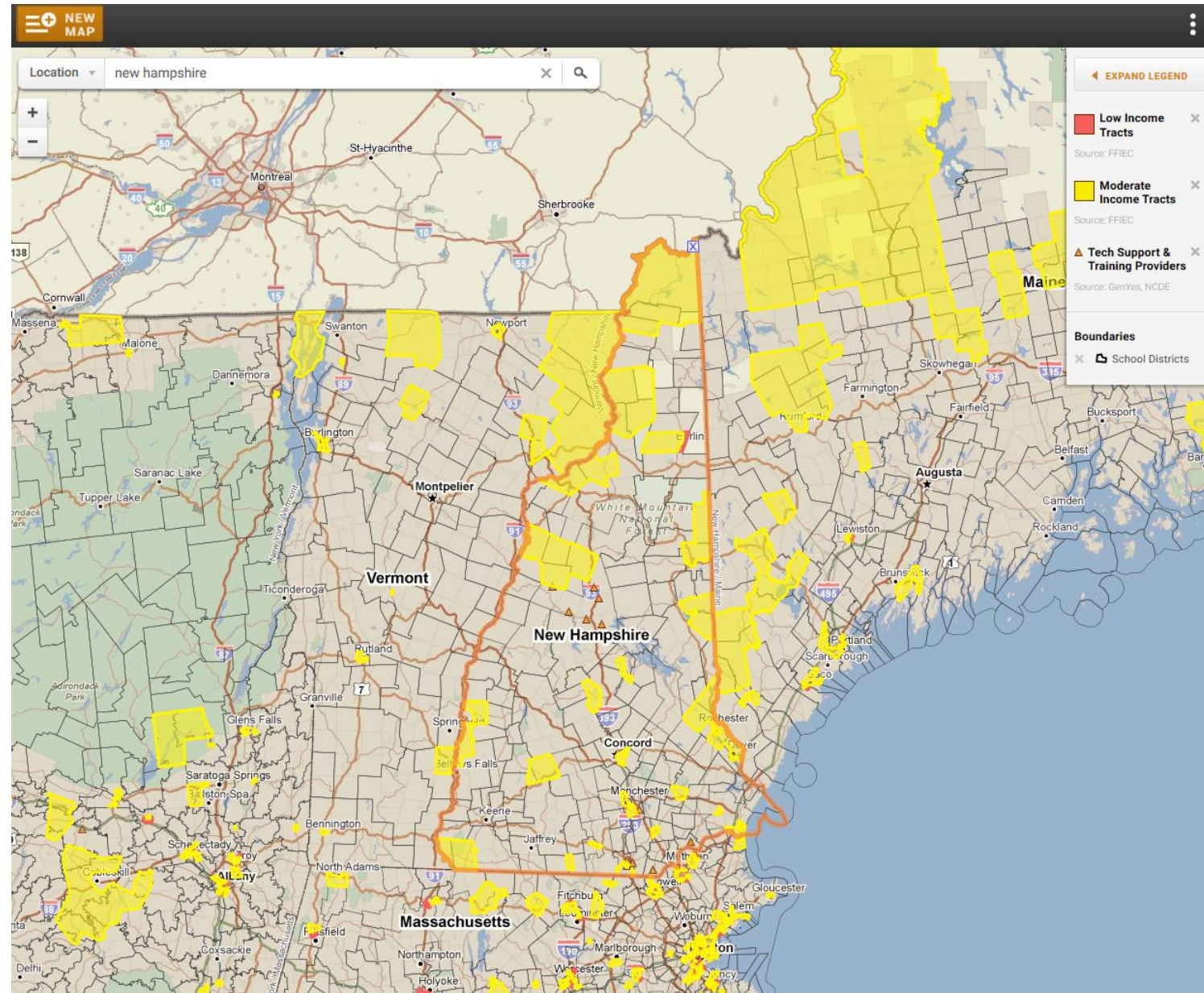
New Hampshire School Connectivity Initiative Web Map

Data Layer	Source
NH Public Schools	NH Department of Education
School Districts: Fiber Target School Districts Elementary School Districts Secondary School Districts Unified Schools Districts	US Census Bureau; E-Rate data provided by EducationSuperHighway
New Hampshire Bank Locations	FDIC tabular listing geocoded using ArcGIS World Geocode Services
Qualified Opportunity Zones	NH Department of Business and Economic Affairs
Income Data: Income Data, All Brackets LMI Tracts CRA Eligible Tracts	Downloaded from www.policymap . Income brackets are based on Census tract Median Family Income (MFI) as a percent of Metro Area MFI, as of 2017.
Census Tracts	Census Bureau, www.data.gov

National Center for Digital Equity Online Mapping Resource



National Center for Digital Equity Online Mapping Resource



Thank You



Fay Rubin

Project Director

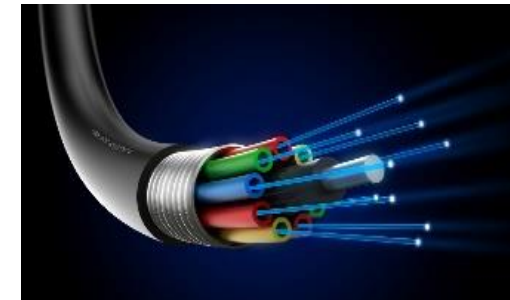
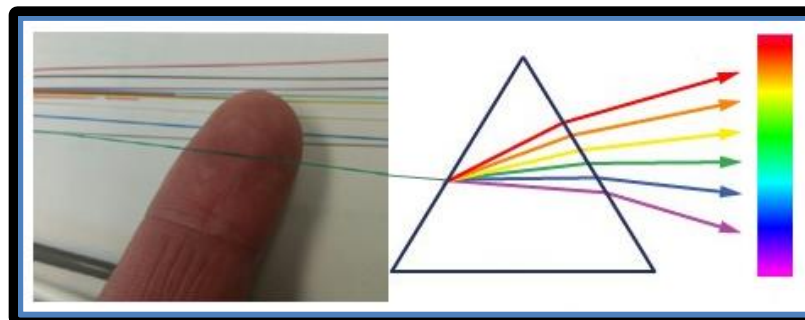
603-862-4240

fay.rubin@unh.edu

1. What data sets are most important as we explore questions about digital equity?
2. What is the most effective way to present the data?

Broadband Technology Comparison

- Dial-up
 - 56,000 bits per second (bps)
- DSL – within 18,000 feet
 - 1.5+ Million bps download (Mbps)
 - 1 Million bps upload (Mbps)
- VDSL – within 4,000 feet
 - 40+ Mbps download
 - 16 Mbps upload
- Cable
 - 10-150+ Mbps download
 - 5-20 Mbps upload
- 4G LTE Cellular and Wi-Fi
 - 10 – 20 Mbps download
 - 3+ Mbps upload
- 5G Wireless and Microcells (2020)
 - One to 10Gbps connections to end points in the field
 - One millisecond end-to-end round trip delay
 - 10 to 100x number of connected devices
 - (Perception of) 100 percent coverage and 99.999 availability
 - 90 percent reduction in network energy usage
 - Up to ten-year battery life for low power, machine-type devices
- Fiber – Best Scalability
 - Dense Wave Division Multiplexing (DWDM)
 - 88 x 100 gigabit lightwaves on a single fiber
- Broadband trend
 - Expand fiber closer to neighborhood
 - Use existing copper/wireless for last mile



New Hampshire School Connectivity Initiative

- The goals of the NHSCI are:
 - Facilitate fiber connectivity to all of our K-12 school buildings
 - Increase statewide utilization of E-Rate funds
 - Facilitate enhanced Wi-Fi deployment in schools
 - Educate and Assist with level broadband pricing options



Fiber Upgrades



10 school districts have filed for fiber upgrades

- Contoocook Valley
- Dover
- Farmington
- Grantham
- Landaff
- Lempster
- Newfound Area
- Shaker
- Timberlane
- Unity

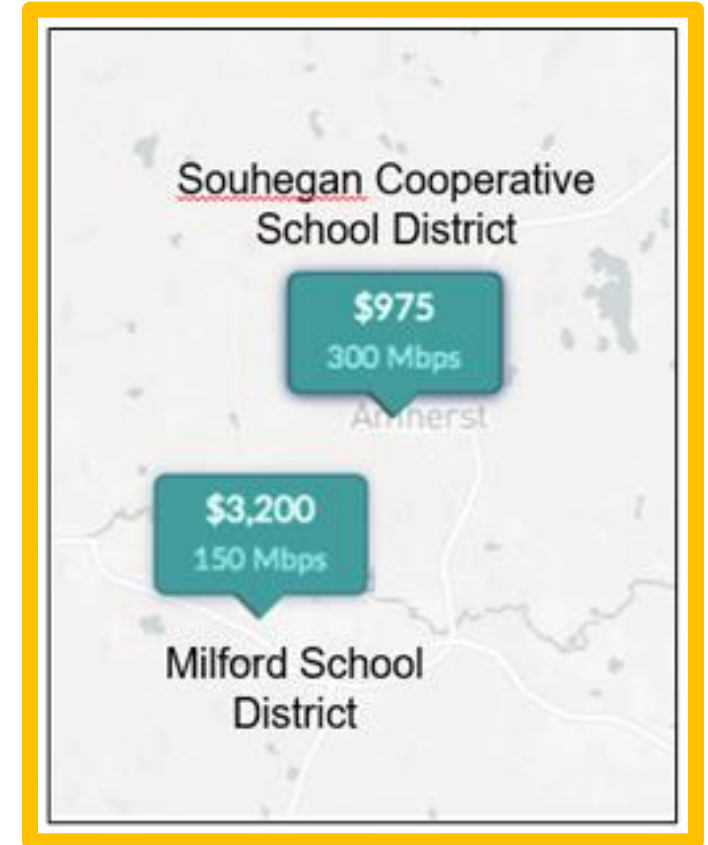
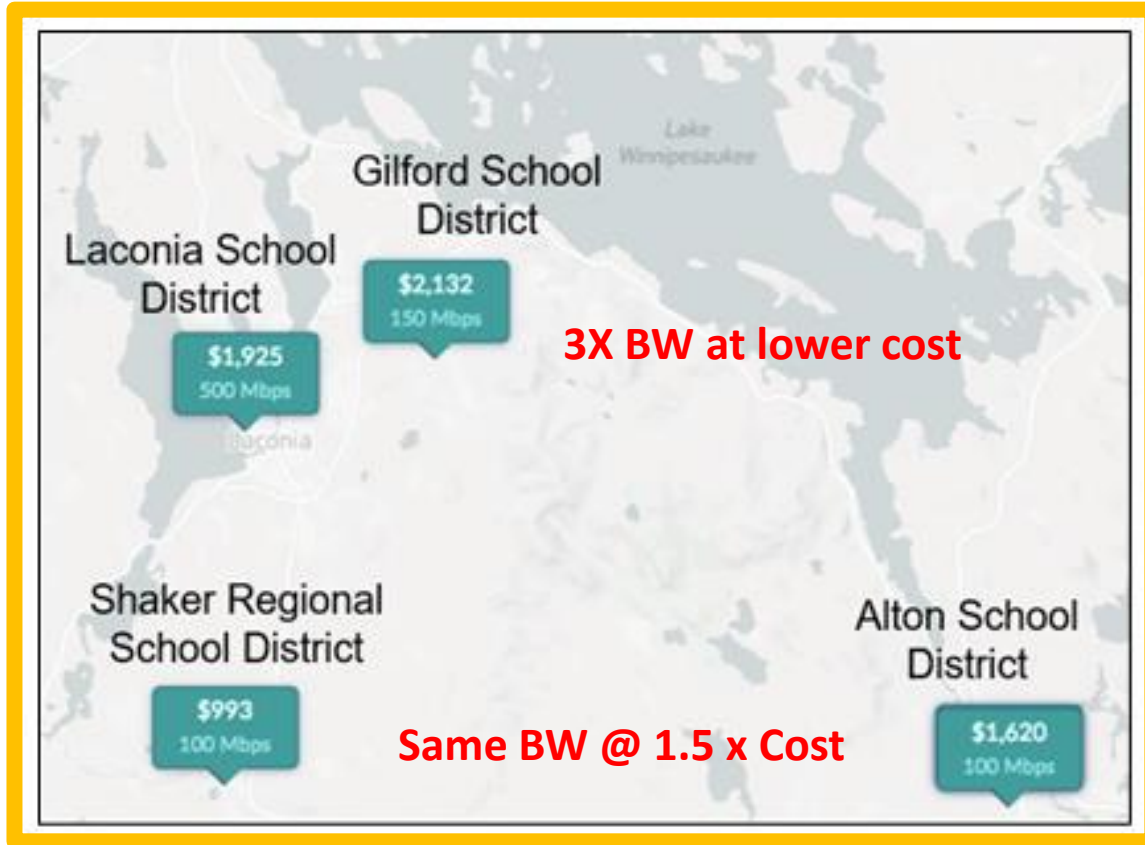
6 school districts/consortiums applied for E-rate state match money through the NH Infrastructure Fund

- Goffstown
- Mascoma
- Manchester Consortium
- Landaff
- Hampstead
- Unity

7 school districts did not file this year

- Candia
- Cornish
- Greenland
- Hooksett
- Freemont
- Sanborn
- Derry (already on fiber)

Districts in the same region pay very different costs



Double the BW at 1/3 the Cost