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at Dartmouth College

*The Center for Public Policy
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The Class of 1964 **Policy Research Shop**

Expanding Rural Broadband Access in Vermont

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This report was written by undergraduate students at Dartmouth College under the direction of professors in the Rockefeller Center. Policy Research Shop (PRS) students produce non-partisan policy analyses and present their findings in a non-advocacy manner. The PRS is fully endowed by the Dartmouth Class of 1964 through a class gift in celebration of its 50th Anniversary given to the Center. This endowment ensures that the Policy Research Shop will continue to produce high-quality, non-partisan policy research for policymakers in New Hampshire and Vermont.





Lack of Rural Internet Access

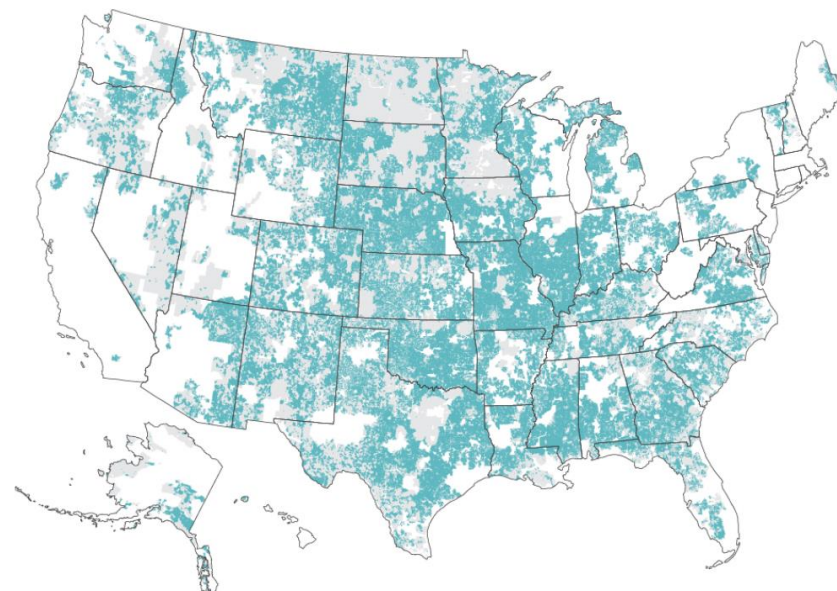
- Broadband Internet (25/3)
- Increasingly important
- Future economic and energy implications
- Vermont is largely rural (61% of its population live in rural areas)
- Over 22 percent of Vermont lacks broadband
- Concentrated in rural areas
- Only 17.5 percent of citizens conversely have access to very high-speed internet (100/100 Mbps)

SPEED TIER	NUMBER SERVED	PERCENT SERVED	NUMBER NOT SERVED	PERCENT NOT SERVED
100/100 Mbps	53,777	17.5%	254,305	82.5%
25/3 Mbps	238,183	77.3%	69,899	22.7%
4/1 Mbps	287,104	93.2%	20,978	6.8%



A Potential Solution: Electric Cooperatives

- Electric Utilities Cooperatives
 - 900 around the country
 - Already many offering internet or researching it
- Interest in ensuring broadband access for their consumers
- Cooperatives in Vermont
 - Washington Electric Cooperative
 - Vermont Electric Cooperative



- Electric co-op areas without broadband access
- Electric co-op service areas



Why Does This Convergence Matter?

- Broadband allows for efficient use which leads to energy savings
 - Costs reduced for producers and thus consumers
 - Climate benefit
- Installation cost reduction
 - One truck can service both cables
 - Reduces costs by 20-25% for broadband expansion, lowers breakeven point
- Utility providers already possess assets such as poles, electricity, etc.
- Consumers gain benefits to their electric services as well as broadband access
- Cost concerns in a heavily regulated industry
 - Lack of direct short-term benefit
- These two services are quite different in practice



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Peer States Comparisons

- Identified states by three factors
 - Large rural populations
 - Highly available broadband relative to other states
 - Presence of cooperatives
- New Hampshire
- North Dakota
- South Dakota
- Alabama



Case Study: South Dakota

- Very rural state yet has some of the highest broadband access in the nation
 - 75% of those in rural areas have broadband (61% national average)
- History of cooperation instead of competition
 - SDTA and SDN Communications
 - Regional service areas
- Impressive level of USF and Reconnect funding
 - State commitment to assisting these expensive and difficult applications
 - Letters of support from economic office
 - First-ever state broadband report
 - Many areas serviced today would not have been feasible to service without these funds
 - Able to service an area of fewer than 1/2 subscriber per mile, break-even point usually around 12 per mile
- Doubling down on the commitment to spending
 - Governor Noem's Connect South Dakota program
 - 5:1 returns on investment predicted



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Takeaways from these Case Studies

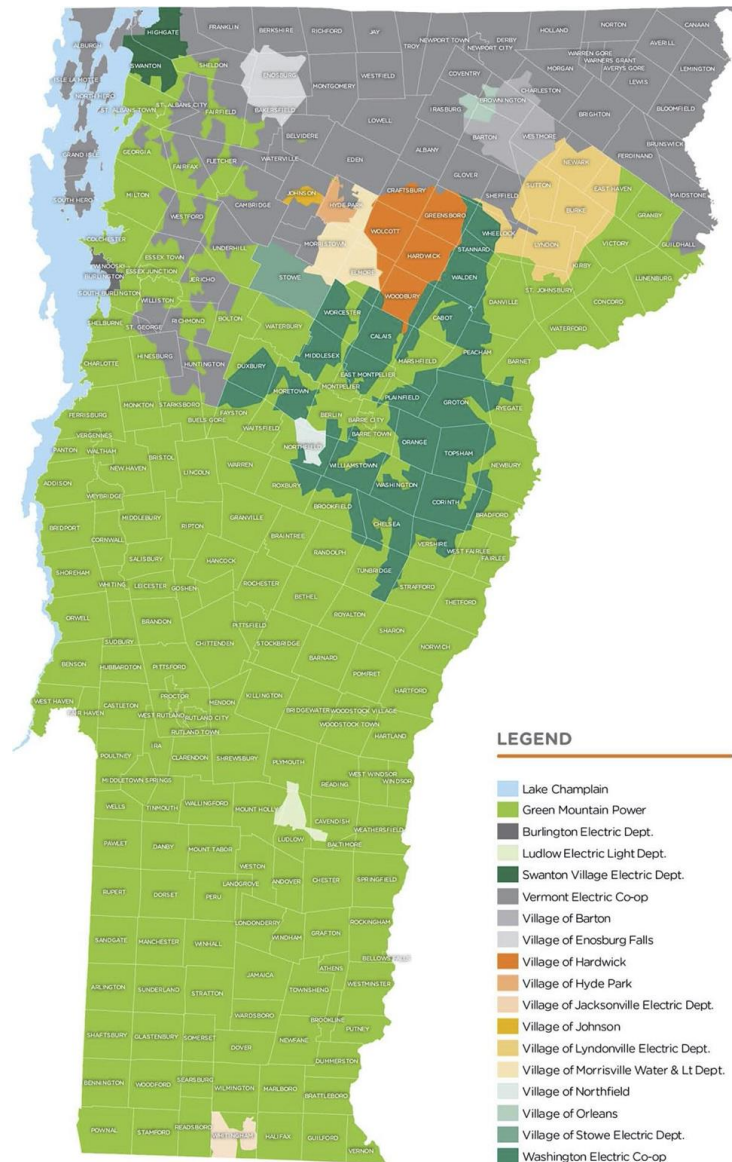
Key steps identified in our report to improving rural broadband in Vermont:

- Encouraging cross-sector collaboration
- Potential changes to the regulatory framework
- Potential means of addressing some of the fiscal challenges



Cross Section Collaboration

- Hesitancy of individual actors
 - Risk
 - Investment
- Leverage unique strengths and weaknesses of various actors
 - Green Mountain Power
 - Electric Cooperatives
 - CUDs
- Encouraging collaboration
 - Legal landscape
 - Funding pathways





Regulatory Challenges and Solutions

- Barriers against cross-subsidies for non-electric services
 - V.S.A. §3047
 - Hinder ability of cooperatives and other actors to invest in broadband
 - Potential upward rate pressure
- Right-of-way policies
 - Land ownership regulations and management concerns for telecommunications infrastructure
- Amend cooperative charters to require support for broadband expansion
 - Would create upward pressure on rates
 - Mitigate through expanded subsidies
- Allow utility providers to cover costs of make-ready improvements
 - Enables ISPs to put fiber on existing poles
 - ISPs bear the costs of installation but GMP or Cooperatives cover the upfront costs
 - Allows ISPs to build out networks in rural areas
 - GMP has petitioned the PUC for this change



Fiscal Concerns and Solutions

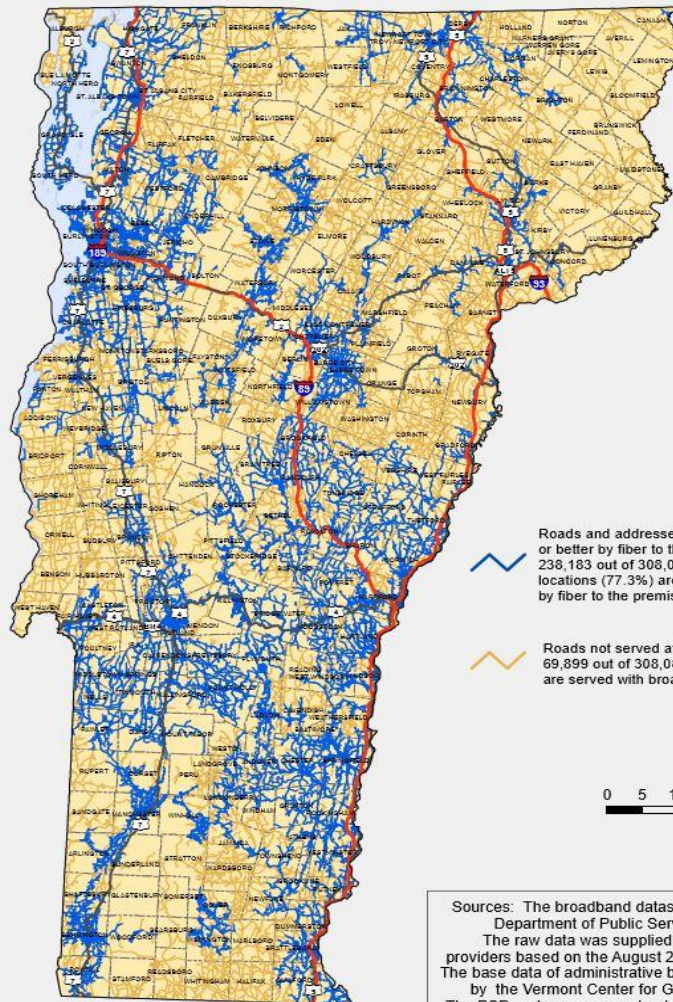
- Low profit margin for traditional ISPs
 - Non-profit advantage
 - Still limited by costs of infrastructure
 - Lack of guaranteed territory
- Large upfront investments
- New technical expertise necessary
- FCC and DOA funding
 - VTel 2010 award preventing federal funding in service area
 - Major barrier to federal funding for broadband in VT
 - Federal funding opportunities seemingly increasing in the future; important to address these concerns
- Expanding state programs like Act 79
- Cooperatives
 - Issuing bonds
 - Working with municipalities





Final Thoughts

- Overview
 - Insufficient internet connectivity
 - Realities of a convergence between electric utilities and broadband service
 - Four case studies
- Key conclusions
 - Collaboration
 - Regulatory
 - Fiscal
- Questions?

Broadband Availability by Road Segment 25 Mbps Down / 3 Mbps Up or Better



 Roads and addresses served at 25/3 Mbps or better by fiber to the premises or cable. 238,183 out of 308,082 building locations (77.3%) are servicable at 25/3 Mbps or better by fiber to the premises or cable.

 Roads not served at 25/3 Mbps or better. 69,899 out of 308,082 building locations (22.7%) are served with broadband less than 25/3.

0 5 10 20 Miles

Sources: The broadband dataset was prepared by the Vermont Department of Public Service (PSD) on 2/21/2020. The raw data was supplied by Vermont internet service providers based on the August 2019 PSD request for information. The base data of administrative boundaries and roads are supplied by the Vermont Center for Geographic Information (VCGI). The PSD makes no guarantee to the accuracy of this information.