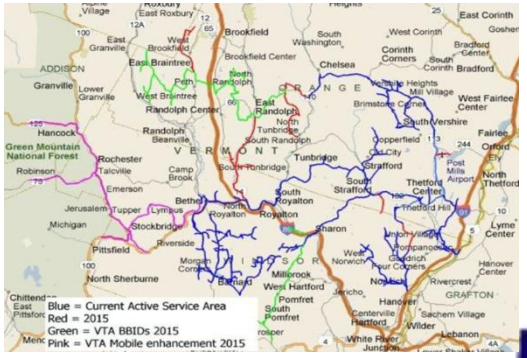
RMLUI – DU

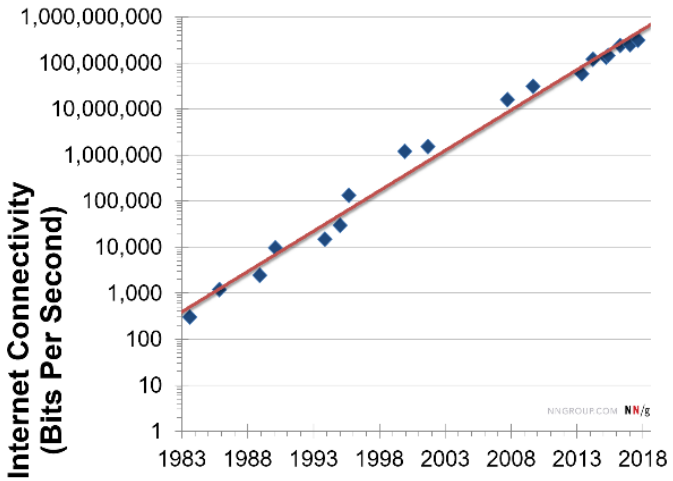
East Central Vermont Community Fiber to the Home
A Case Study



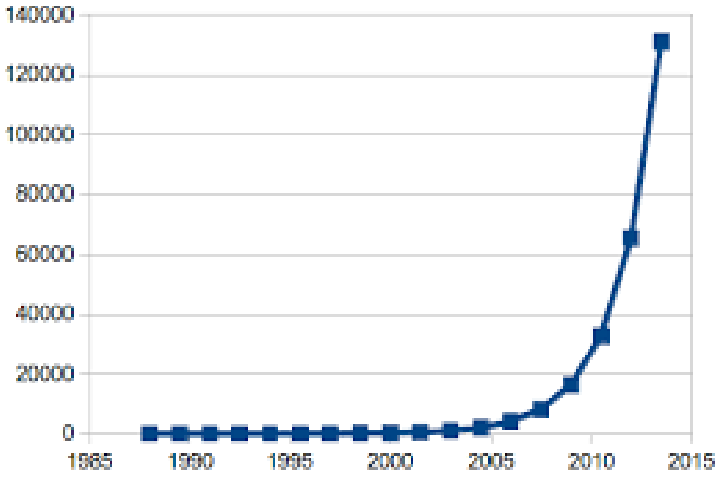
ECFiber.Net
East-Central Vermont Community Fiber-Optic Network

Disruptive Technology / Innovation

Bandwidth: Nielson's Law



Processing: Moore's Law



Economic – Production, Direct Jobs, Indirect Jobs, higher labor income

National Policy - Out of Date (driven by Telecom and Cable), CO is unique

Social Changes - Increase of better paying jobs (skilled labor), decrease unemployment (job searching), online careers, increase Quality of Life

Digital Convergence through Applications

Entertainment

Education

Government – Smart City

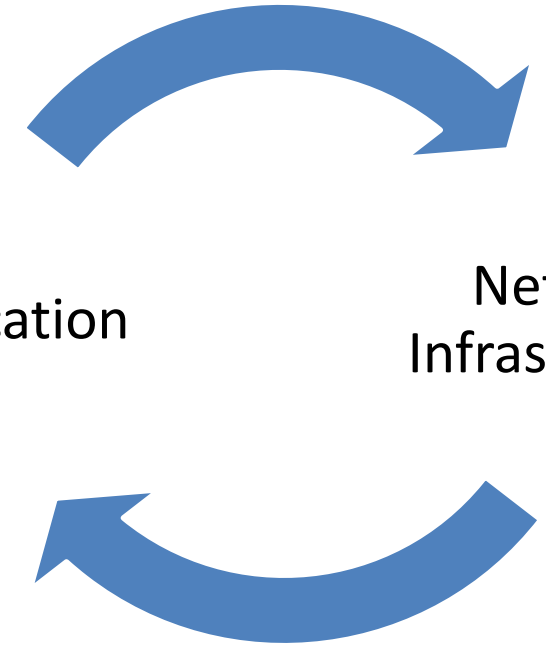
Utilities

Healthcare / EMS

Real Estate

Energy

Transportation



Wireless – PCS 5G

Telecom - xDSL

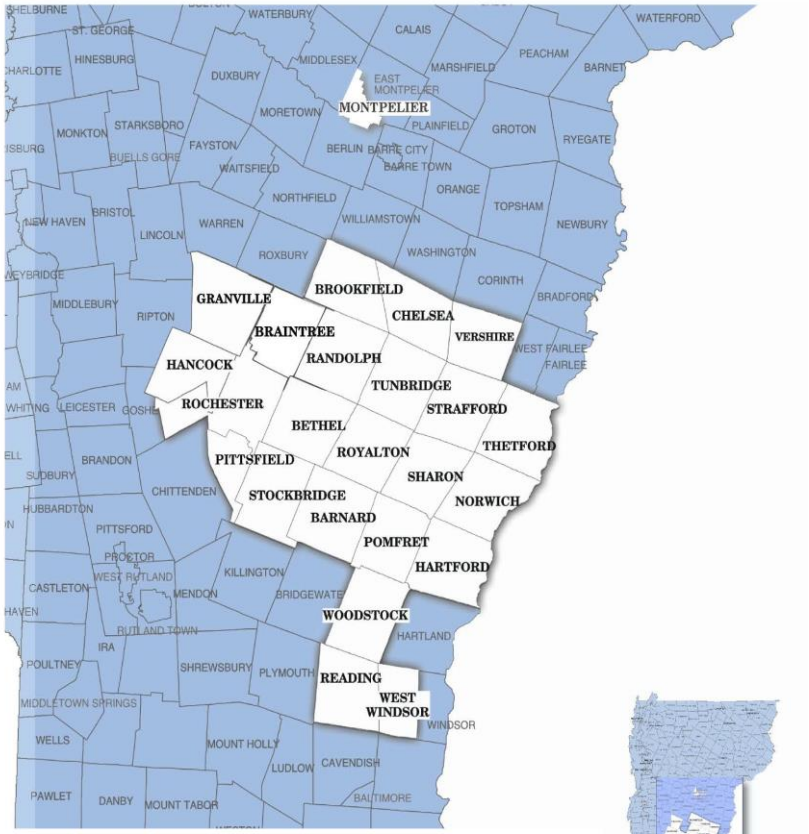
Cable – Docsis3

Satellite – GEO 12 GHz

Project Market (Unserved/Underserved)

Town	2010 Pop	2010 Premises	Road Miles	Premises Per Mile	Median Household Income
Barnard	947	746	68	11.0	$71,429
Bethel	2,030	1,063	83	12.8	$51,000
Braintree	1,246	665	51	13.0	$42,105
Brookfield	1,292	716	85	8.5	$61,641
Chelsea	1,238	731	71	10.3	$47,841
Granville	298	255	29	8.9	$53,125
Hancock	323	222	18	12.3	$35,313
Hartford	9,952	6,198	175	35.3	$52,445
Montpelier	7,855	4,724	56	84.6	$57,648
Norwich	3,414	1,668	94	17.7	$87,833
Pittsfield	546	440	20	22.4	$62,125
Pomfret	904	559	64	8.8	$64,844
Randolph	4,778	2,268	120	18.9	$48,091
Reading	666	465	47	9.9	$59,625
Rochester	1,139	887	68	13.0	$45,385
Royalton	2,773	1,539	94	16.4	$35,395
Sharon	1,502	769	64	12.0	$52,727
Stockbridge	736	568	50	11.3	$46,458
Strafford	1,098	604	68	8.9	$52,457
Thetford	2,588	1,325	89	14.8	$71,329
Tunbridge	1,284	785	79	10.0	$54,231
Vershire	730	452	39	11.4	$42,438
West Windsor	1,099	845	52	16.2	$76,250
Woodstock	3,048	2,130	98	21.8	$77,863
Totals all Towns	**51,486**	**30,624**	**1,680**	**18.2**	**$57,366**
Vermont average					**$54,166**

Source: U.S. Census Bureau and the Vermont Agency of Transportation.



ECFiber Towns and Cities

State of Vermont

Why?

- Rural Areas ignored by Incumbents

- Incompetent “Regulators” – especially Federal
  - Regulatory Capture from incumbents
  - Define Broadband Downward
  - Example: in 2009, Fairpoint (incumbent) received $66MM for 10/1 Mbps!

Project Metrics

Basics:

- Long-Term Business Model (began in 2008)
- In 2016, State legislature allowed Towns to form "**TUDs" – (Telecommunications Union Districts) -** (*Title 30, Public Service (VSA 3051))*
- **499** miles of fiber built to date, total build out in 2023 of **1,430** miles
- **Scalable:** 1 G/home to 10 G/home with little CAPEX miles of fiber.
- Debt is paid **ONLY from revenues**. ECF is the ONLY system in the Country funded this way.
- Additional 13 Towns are voting to form an adjacent TUD this week.

Costs:

- Total Project build out Cost: **~$40,000,000**
- Cost per connection: **~$5,000**
- 5 connections per mile with a current market **penetration at 32%** during construction, pre-subscriber interest levels determine deployment markets.
- Lion share of CAPEX goes to physical plant

Project Metrics (cont.)

Funding:

- Grants / Local contribution
- $7,000,000 through Crowd Funding and local investors (Tax-exempt investments. High Yield @ 11%)
- Zero Coupons / Capital Appreciation Notes (20 years)
- Trustee Structure:
  - Maintenance Reserve Accounts
  - Contingency Accounts
  - Debt/Service Coverages
- Limit Debt to Cash Flow Analysis – Coverage Ratios
- Build out markets depending on pre-sales via website.

Fundraising History (000s)

- 2008-10 - $500 (Valley Net)
- 2010 - $900 Crowd Finance
- 2011 - $400 “
- 2012 - $1,700 “
- 2013 - $1,700 “
- 2014 - $1,500 “
- 2015 - $850 “
- 2016 - $9,000 MCM (institutional)
- 2017 - $14,500 MCM (institutional)

Use of Cash Surplus

- When revenues exceeded expenses, the "excess revenues" can be used for:
    - First extending the network to other locations, and only then* distributing back to the Towns

*Governing Board is committed to using **ALL excess revenues for network expansion** until every citizen within market has service.

Result

- Customers in rural Vermont are receiving Fiber to their Home
  - *(better than Denver or other technology hubs across the United States)*
- Schools / Community Services pay same as residential customers.
- Lower Interest Rates and Cheaper cost of capital versus Incumbents
- High Operating Margins
- Churn on Network **- .13%**
  - *3 customers dropped service in 2017 (2 were home sales that flipped to new customers)*
- At 1/3 build out (10,000 customers) project will generate $3,400,000 in additional annual cash flow after OPEX and Debt.
- Achieve an investment grade rating via Moody's and/or S&P using a combination of a Utility Fee and Revenue based methodology.

Can this work in other markets?

Financial Model does work in underserved/unserved but **need to be run like a business**…

- i.e. paying back investors is as important as social goals

Requirements:

- Lead/Local Investors – no town risk
- Angry and Determined Communities
- State – Regulatory/Grants/ (Dark Fiber Availability)
- Need a willing Service Provider (Valley Net) and Operations Company
- Dedicated Volunteers
  - Governance, Marketing/Sales/PR, Vendors
- PATIENCE

Thanks!

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