

# Rethinking Investments in Rural Infrastructure and Access in a Changing World

Edyael Casaperalta, Center for Rural Strategies  
Jason Whittet, Massachusetts Broadband Institute  
Darlene R. Wong, National Consumer Law Center



John Van Alst & Jessica Hiemenz  
National Consumer Law Center

**August 1, 2012**

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## Presenter – Darlene Wong

- Staff attorney at the National Consumer Law Center focusing on low-income utility consumer issues.
- She has litigated rate and service quality cases involving issues of rate setting, consumer protection, engineering and environmental concerns relating to telecommunications, water, gas and electric companies.
- She is a co-author of NCLC's manual, Access to Utility Service, Fifth Edition, and a contributing author to Collection Actions and Unfair and Deceptive Acts and Practices 2011 Supplement.

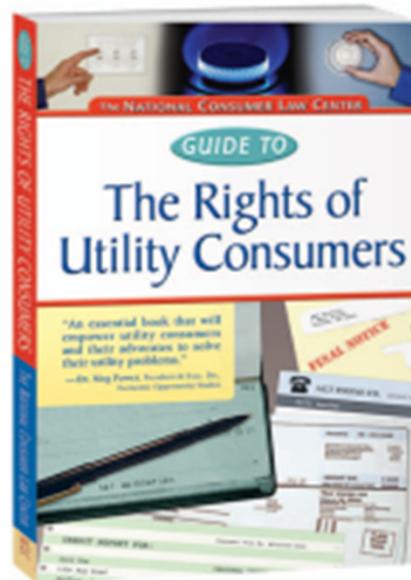
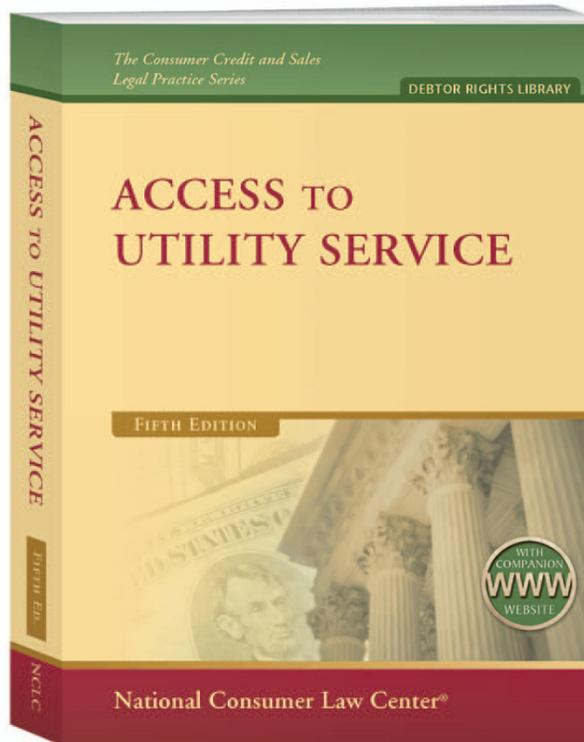
# Presenter – Edyael Casaperalta

- Joined Rural Strategies after serving as a consultant for their efforts in the Gulf Coast in the fall and winter of 2006-2007.
- Edyael's work at Rural Strategies highlights the intersections between rural communities and telecommunications policy, and advocates for policies that allow full rural participation in our nation's economy, culture, society, and democracy.
- In this capacity, she coordinates the Rural Broadband Policy Group, a national coalition of rural advocates for fast, affordable, and reliable Internet service.

## Presenter – Jason Whittet

- Since 2009, Jason Whittet has been the Deputy Director of the Massachusetts Broadband Institute, the broadband program created by MA Governor Deval Patrick.
- In his role as Deputy Director, Jason spearheads the Institute's broadband adoption and last mile efforts.
- Prior to the Institute, Jason worked in government and community relations for Comcast Cable and served as Project Director for the Office of Massachusetts State Senator Mark Montigny.
- Jason is currently on the Board of Directors of the Rural Telecom Congress.

**For More Information on the Rights of Individual and Community Access to Broadband and other Telecommunications, see these NCLC's Titles:**



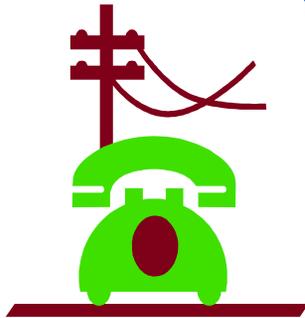
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# *Rethinking Investments in Rural Infrastructure and Access in a Changing World: What Is At Stake?*

Darlene R. Wong, Staff Attorney  
National Consumer Law Center



National Alliance for Rural Policy Network Webinar  
August 1, 2012



# Importance of Access

- **Value of the network increases to each user, with more people connected.**
- **Once, access to a canal, railroad, electricity or highway was essential to an individual's economic success.**
- **Today, individual economic success hinges on access to voice service and broadband internet.**



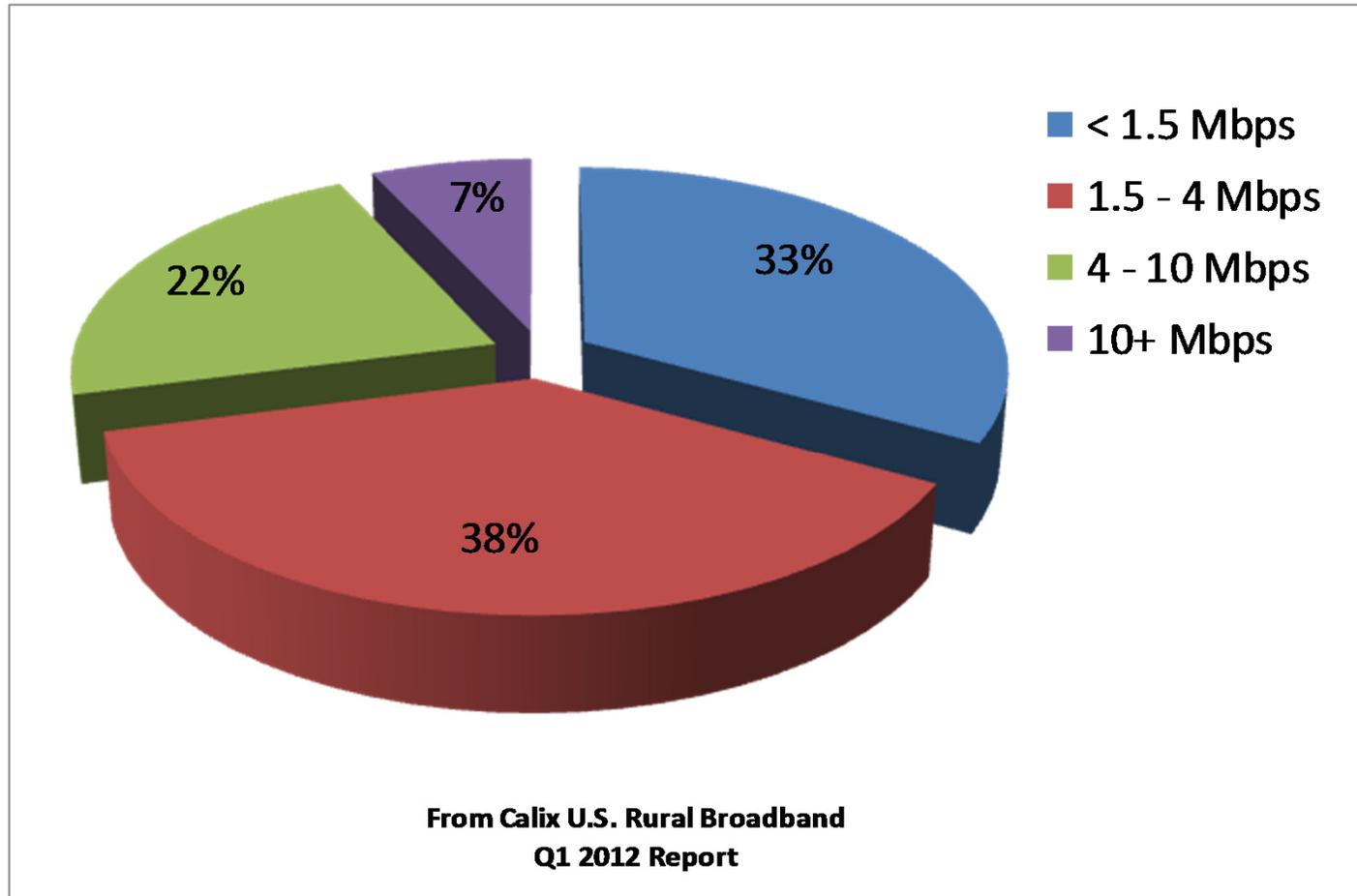
# Affordable Access: Broadband is New Essential Utility Service

- Business and social communications
  - Voice service
  - Email
- Online job applications
- Paperless government (civic engagement)
- Utility notices, bank and financial statements
- Education
- E-commerce
- Community economic development stymied in areas without BB

# Rural Broadband in Q1 of 2012: Rural Areas Starting Farther Behind

- 60% of rural BB subscribers had a **maximum** downstream BB speed of 3 Mbps or less
  - **This is one-eighth of the peak U.S. downstream speed**
- Connect America Fund – 4 Mbps downstream target; 1 Mbps upstream target
  - 71% of rural subscribers received a downstream BB speed slower than 4 Mbps
  - 90% of rural subscribers received upstream speeds slower than 1 Mbps
- Copper speeds were slower than fiber

# Peak Rural U.S. Broadband Speeds



# Broadband penetration: rural areas

- **Access** to broadband nationwide: see the National Broadband Map
  - <http://www.broadbandmap.gov/technology>
- Broadband **adoption** in rural vs. non-rural areas:
  - Rural = 50%
  - Non-rural = 68%
- Tribal lands have very low adoption rates
  - Main reason: lack of infrastructure

# Affordable Access: Landline Still Essential

- Why do consumers still subscribe to Landline?
  - **Lack of cellular service or high speed voice over internet availability**
    - **Rural areas**
  - Least Cost Option
  - Reliable and accurate 911
    - Health problems, disabilities
  - Familiarity (elders)
- But problems of degraded LL network in rural areas
- Problems of all-IP network
  - Phone outages with electric outages

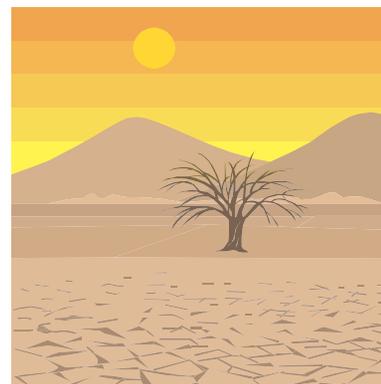


# Ensuring Access for All: State Public Utility Commissions (PUCs)

- **Carrier of Last Resort (COLR) for landline**
  - Historical commitment to ensuring everyone access to voice communications of reasonable quality and price
  - Crucial for build-out of landline to rural areas
  - This principle is needed for new telecom platforms
- **Service Quality**
  - Wrongful termination, mistakes in billing
  - Reasonable repair time for outages, dropped calls, etc.
  - Adequate notice
- **Rates, to some extent**
  - Some states retain authority to set just and reasonable rates for basic landline voice service

# Deregulation Legislation: Digital Divide is at Risk of Becoming a Digital Desert

- Landline deregulation
  - has weakened or eliminated COLR protections for Landline in some states at time when companies like Verizon announce plans to abandon landline
- High-speed Internet Access deregulation
  - Including VOIP in many states
- Problems of no COLR for BB :
  - FCC expects voluntary CAF build-out to fill the gap
    - Less success than hoped for (e.g., Verizon; AT&T; Century Link; )
  - Cable company announcements of higher speed build-outs
    - But they target already served areas
  - Verizon announcement not to expand FiOS to new areas
  - AT&T announcement not to expand U-verse to new areas
  - Impact of reduced competition



# Low-Income BB Internet Assistance Programs: Limited Service Territory

- Comcast Internet Essentials (BB internet discount)
  - <http://www.internetessentials.com>, 1-855-846-8376
- Connect to Compete (BB internet discount)
  - Eligibility: child participating in free National School Lunch program; new/non-subscriber; no arrearage
  - Discounted monthly access fee and low-cost computer
  - Training provided
  - Limited 2-3 year offer period
  - <http://connect2compete.org>

# Summary



- **BB is essential for enhancing the telecommunications network for all**
  - Necessary to keep rural populations, low-income and elder customers connected
- **State level regulations and Carrier of Last Resort provisions have been effective in ensuring all segments of society are served with adequate essential voice service**
  - But COLR generally not provided for wireless or BB/VOIP service
  - COLR and traditional consumer protections are disappearing from landline service with deregulation legislation
- **Where private companies decline to extend BB to rural and low-income communities**
  - Communities may have to act independently and seek alternatives, if possible

# Questions

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**Funding Rural Broadband:  
Programs, Challenges & Opportunities**

Edyael Casaperalta  
*Rural Broadband Policy Group Coordinator*  
Center for Rural Strategies

# Universal Service



# Universal Service Fund

Communications Act of 1936

Telecommunications Act of 1996  
FCC establishes it in 1997

- Promote the availability of quality services at just, reasonable and affordable rates for all consumers
- Increase nationwide access to advanced telecommunications services
- Advance the availability of such services to all consumers, including those in low income, rural, insular, and high cost areas at rates that are reasonably comparable to those charged in urban areas
- Increase access to telecommunications and advanced services in schools, libraries and rural health care facilities
- Provide equitable and non-discriminatory contributions from all providers of telecommunications services to the fund supporting universal service programs

**USF**  
8 billion

High Cost – supporting telecommunications companies with customers in rural, hard to serve areas

Lifeline – Providing discounts on basic, local telephone service for low income individuals

Rural Health Care – Supporting reduced rates for telecom and Internet services to rural healthcare providers

Schools & Libraries – Providing discounts on telecom services to eligible schools and libraries

Connect  
America  
Fund

# Connect America Fund

## Legacy High-Cost

- 4.5 billion
- Eligible Telecommunications Carriers
- 4mbps up, 1mbps down
- Census block
- Explicit Tribal support

## Fixed Locations

- Support/expand fixed broadband & voice
- Phase I – \$300m to unserved
- Phase II – ongoing, deploy & maintain High Cost

## Mobility Fund

- Support/deploy mobile broadband & voice
- Phase I – up to \$300m unserved, reverse auction
- \$50 Tribal Mobility Fund – Phase I
- Phase II – Up to \$500m annually ongoing support
- Up to \$100m to Tribal

<http://www.usac.org/hc/>

# Community Connect Grants

## To serve:

A single community with a population less than 20,000 which does not have Broadband Transmission Service

## Who is eligible:

- Incorporated Organizations
- Indian Tribes or Tribal Organizations, as defined in 25 U.S.C. 450b(b) and (c)
- State or local units of government
- Cooperative, private corporations or limited liability companies, organized on a for-profit or not-for-profit basis

[http://www.rurdev.usda.gov/utp\\_commconnect.html](http://www.rurdev.usda.gov/utp_commconnect.html)



# American Recovery and Reinvestment Act: BIP & BTOP Grants

- 7.2 billion (2009)
- Rural Utilities Service and National Telecommunications & Information Administration
- Broadband Initiatives Program (RUS) – 2.5b
- Broadband Technology Opportunities Program (NTIA) – 4.7b
- <http://www.broadbandusa.gov/>
- <http://www.broadbandmap.gov/>

# Challenges

- Available only to incumbent providers or Eligible Telecommunications Carriers
- The communities that need services the most, know about these resources the least, and have the least resources to be able to apply
- Technical expertise, ability to match-funds, area of coverage might not be feasible
- Areas are marked as already being served by Census Block designation
- No more than one entity funded per area - if you submit an application, and a competitor proves they serve the area.
- State bills preventing municipalities from creating their own networks

# Policy Opportunities

- ❖ USDA – “Broadband Connections for Rural Opportunities Program Act of 2012” by NY Senator Kirsten Gillibrand
- ❖ Farm Bill – Warner Amendment
- ❖ Anti- Community Network Bills
- ❖ Rural Health Care Comments – DUE Aug 23<sup>rd</sup>
- ❖ Verizon & Spectrum Co. Deal
- ❖ Telephone/Broadband Deregulation Bills
  - California – SB 1161
  - Ohio – SB 271



# Rural Broadband Policy Group



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Rural Broadband Listserv

Twitter: **@RuralBBPolicy**

<http://www.ruralassembly.org/working-groups/broadband>

Rural Broadband Tales

# Building Broadband in Rural Places

## NCLF

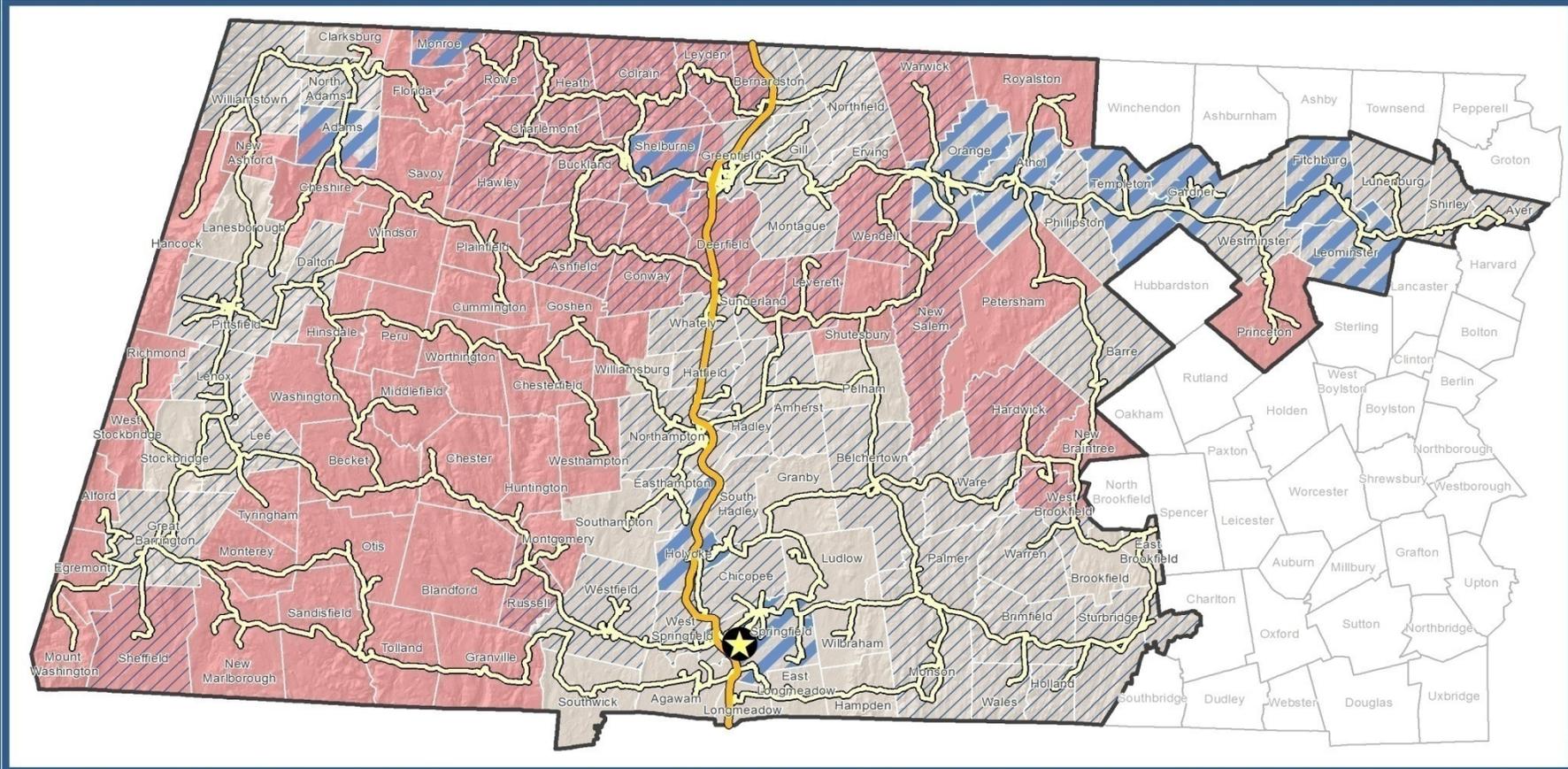
Jason Whittet  
Deputy Director  
Massachusetts Broadband Institute







# MassBroadband 123 Service Area and Network Economic and Broadband Service Status



**Mass Broadband 123 Service Area**  
Based on Federal Definitions

- Unserved or Underserved**  
Less than half of households have access to broadband and/or less than 40% of households subscribe to broadband
- Served**  
More than half of households have access to broadband and more than 40% of households subscribe to broadband

**Areas of Economic Need**

- State Designation**
  - Federal & State Designations**
- State designations meet criteria for "Economic Target Areas."  
Federal designations meet criteria for "Economically Distressed Areas."

**Broadband Network**

- MBI Existing Fiber**  
Completed I-91 Installation
- MBI Fiber to be Built**
- ★ **Internet Point of Presence**



# Rural Broadband

No service for 3.7% of US = 11 million

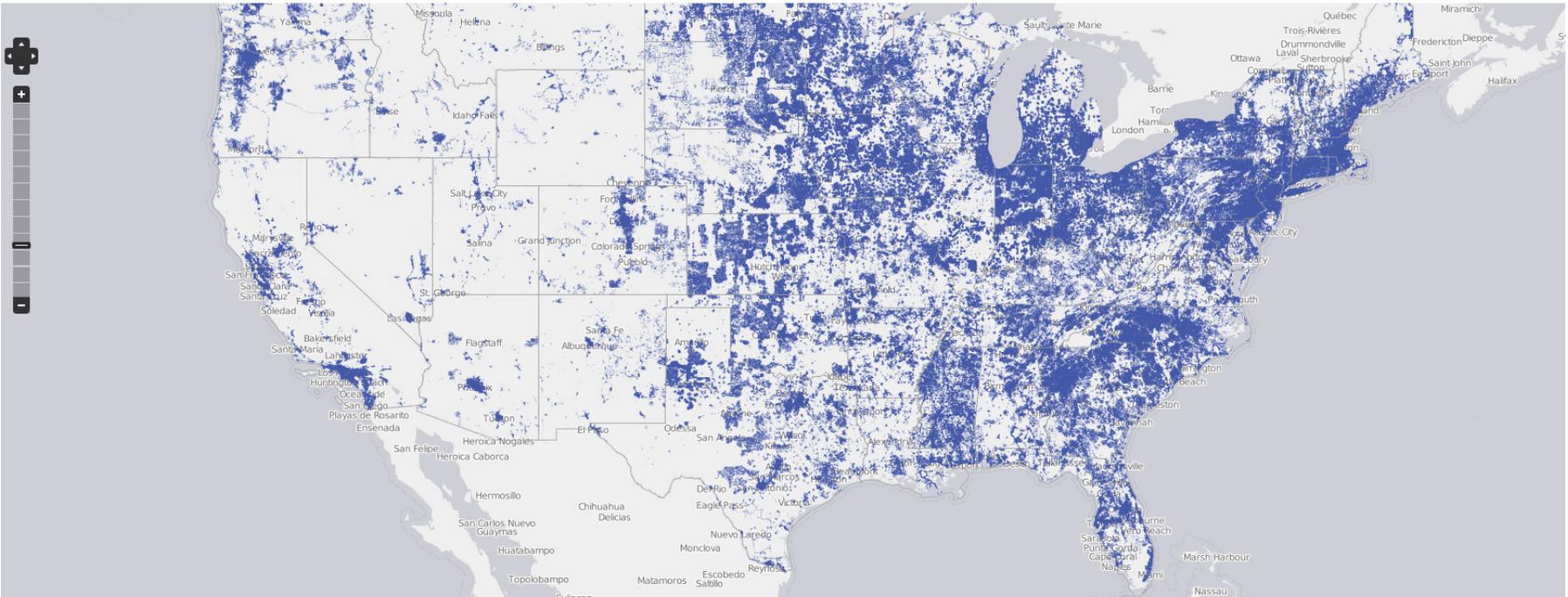
Unconnected areas are unconnected for a simple reason

Economics - it is very hard to serve rural areas and make money

Maximum Advertised Speed Available Data as of: 12/31/11

Download Speed: 3 - 6 Mbps ... 1 Gbps+

**DOWNLOAD** UPLOAD WIRELINE WIRELESS



The National Broadband Map is a tool to search, analyze and map broadband availability across the United States.

Show Footer Show Gallery

100%

# National Broadband Map

[www.broadbandmap.gov](http://www.broadbandmap.gov)

# Massachusetts

**6.5 million** people in state - 3<sup>rd</sup> most dense

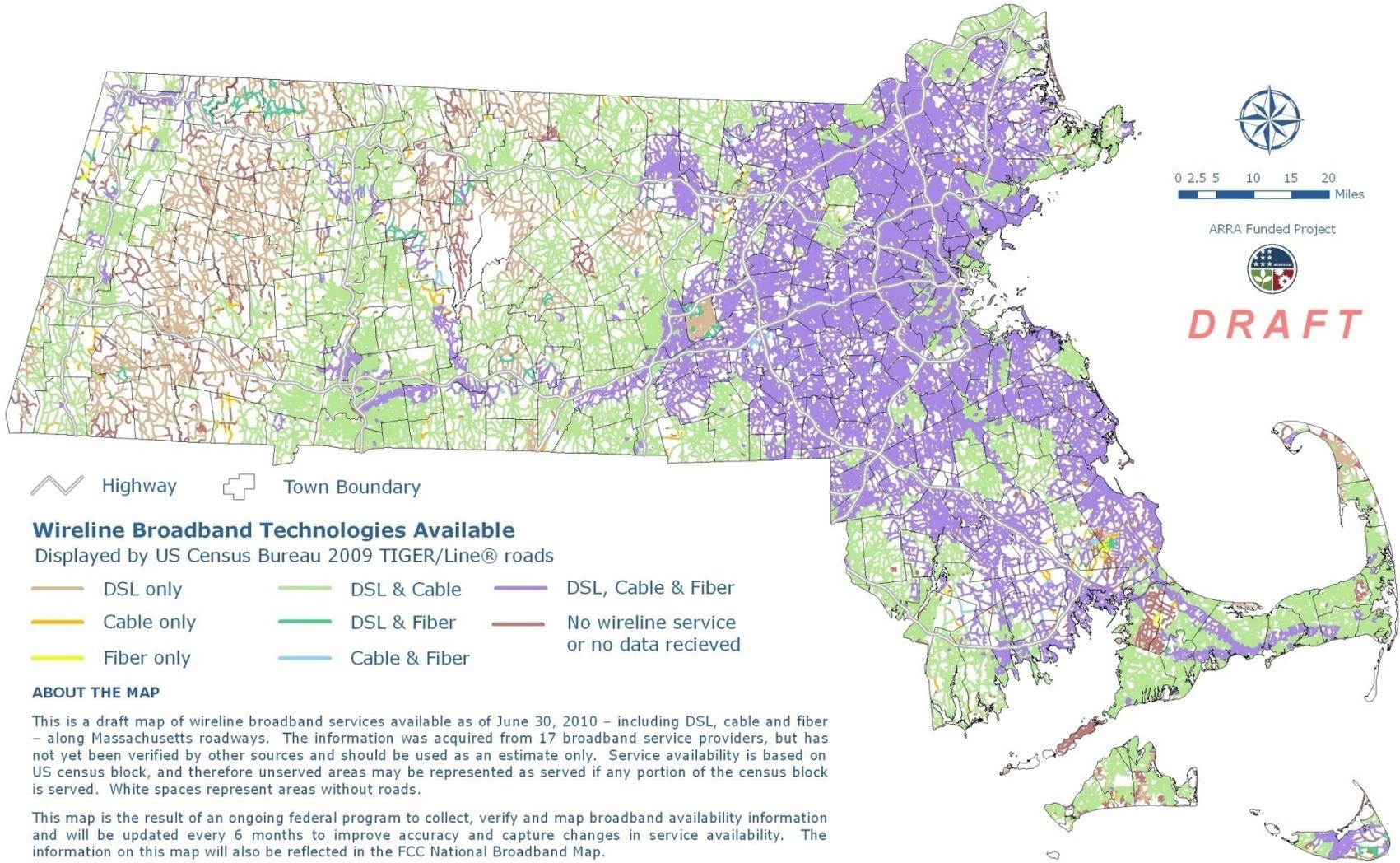
State average is **834** people per square mile

Allston has over **21,000** people per sq. mi.

Rural Mt Washington, MA has just **5.8** people per sq.  
mi.



# Wireline Broadband Availability in Massachusetts



### ABOUT THE MAP

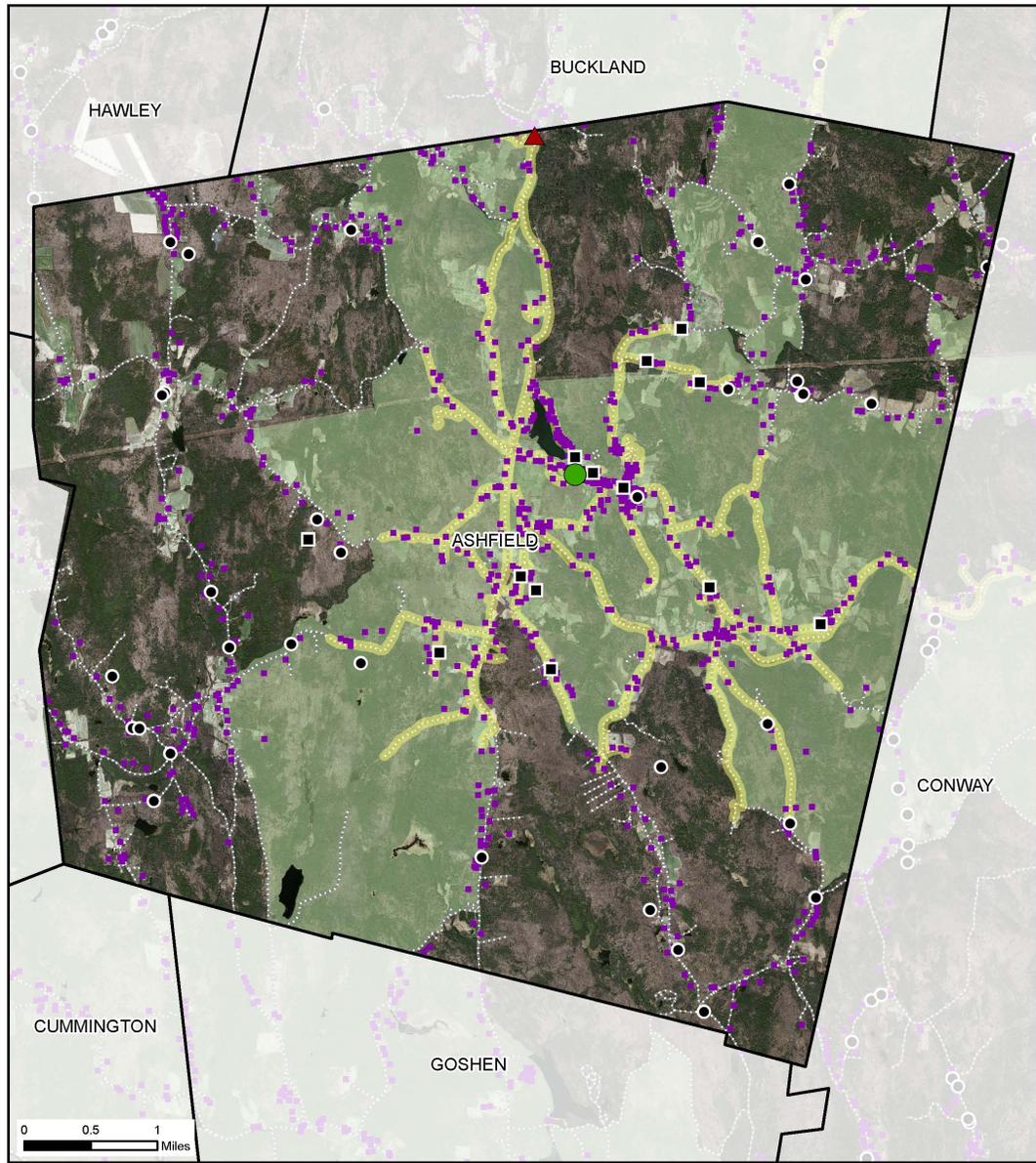
This is a draft map of wireline broadband services available as of June 30, 2010 – including DSL, cable and fiber – along Massachusetts roadways. The information was acquired from 17 broadband service providers, but has not yet been verified by other sources and should be used as an estimate only. Service availability is based on US census block, and therefore unserved areas may be represented as served if any portion of the census block is served. White spaces represent areas without roads.

This map is the result of an ongoing federal program to collect, verify and map broadband availability information and will be updated every 6 months to improve accuracy and capture changes in service availability. The information on this map will also be reflected in the FCC National Broadband Map.

This map is distributed "as-is" without warranties of any kind, express or implied, including but not limited to warranties of suitability to any particular purpose or use and is intended for use only at the published scale.

Map Date: December 21, 2010





### DSL Availability & Last Mile Review for Ashfield, MA







# Rural vs. Urban Consumers

**\$90** - in Allston for 75 Mbs service.

**\$110** - in Mt Washington for 2Mbs satellite service with a cut-off of 450 MB use.

Density promotes competition and investment

# Last Mile Technology Comparison

Fiber and cable are only viable long term, future resilient technologies available today. Satellite no longer meets FCC definition. Fixed wireless under best circumstances barely meets definition and DSL with existing copper infrastructure performs at lower end of throughput.

Technology	Fiber	Cable	DSL	Fixed Wireless	Satellite
Type	Wired	Wired	Wired	Wireless	Wireless
CPE	Optical Network Terminal	Cable Modem	VDSL Modem	External or Internal Antenna & Modem	Satellite Dish & Modem
Throughput	10 Mbps – 1+ Gbps	10 – 300+ Mbps	3 – 7 Mbps	100 Kbps – 5 Mbps (Depending on Technology)	<2.5 Mbps
Key Benefits	<ul style="list-style-type: none"> <li>• Highest Throughput</li> <li>• Unlimited bandwidth potential</li> </ul>	<ul style="list-style-type: none"> <li>• High Throughput</li> <li>• Generally upgradable</li> <li>• Nearly future proof</li> </ul>	<ul style="list-style-type: none"> <li>• Uses existing copper phone connection to homes</li> <li>• Good throughput</li> </ul>	<ul style="list-style-type: none"> <li>• Unlicensed range of technologies</li> <li>• No need for fixed infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Existing service with broad coverage in region</li> </ul>
Key Disadvantages	<ul style="list-style-type: none"> <li>• Largest Capex Investment</li> </ul>	<ul style="list-style-type: none"> <li>• Only applicable to a cable operator expanding its footprint</li> </ul>	<ul style="list-style-type: none"> <li>• Need access to copper sub-loop; therefore, only applicable to ILECs</li> </ul>	<ul style="list-style-type: none"> <li>• Frequency selection limited by available licenses or leases</li> <li>• Possible frequency interference</li> <li>• Line of Sight requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Would not leverage MB123 network</li> <li>• High cost per MB</li> <li>• Poor latency – no voip, no video conferencing</li> </ul>

# Last Mile Service Challenges

Costs – capex and opex

How to work with incumbent providers

Rights of Way and “make ready”

How to engage and structure relationships with providers

How to fund residential installation and CPE

How to treat residents equally/fairly

How to prevent “cherry-picking” of most profitable areas

# Sample Last Mile Costs

**\$50k per mile for aerial installation**

**\$300k for a new mile of underground**

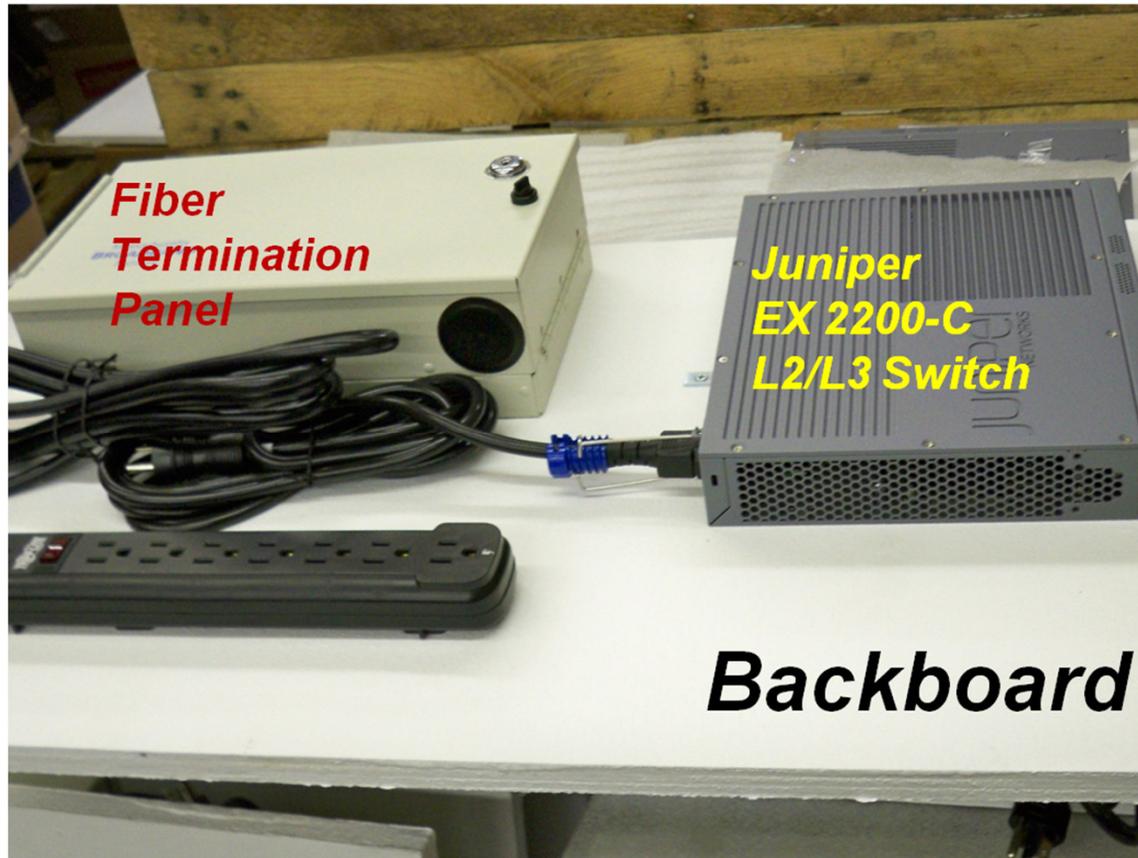
**\$500 a pole for make ready costs**

**\$1,500 for new pole sets**





**Fiber-Optic Cable**  
**\$1 per foot for the fiber and \$1.50 to install**



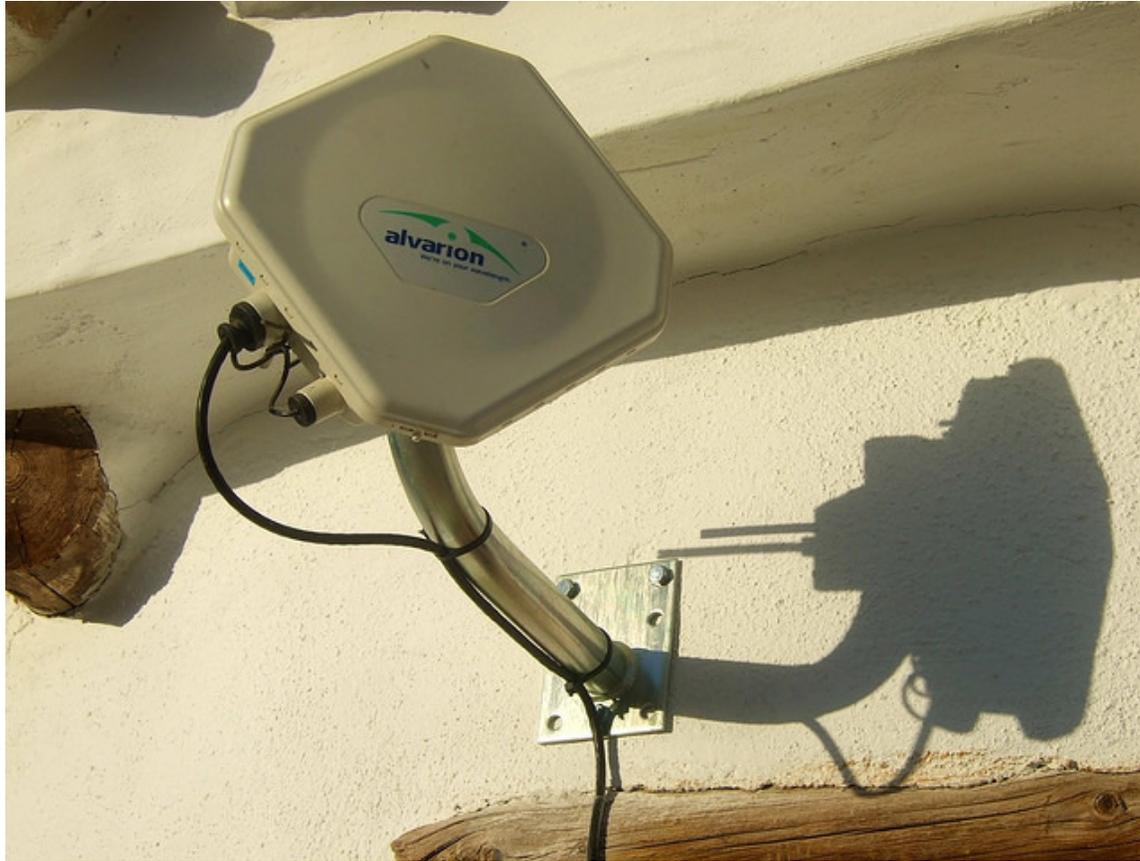
**Anchor Institution Installation  
\$1,500 to \$4,500**



**FTTH Optical Network Device  
\$100-\$300**



**75 foot Wireless Lattice Tower  
\$20k installed**



**Wireless Access Points**  
**\$500 plus**

# Direct Funding Rural Broadband

Broadband provider investment

Private Investment - business or organizations

Government appropriations, grants or loans

Connect America Fund/Lifeline

# Collaborative Funding

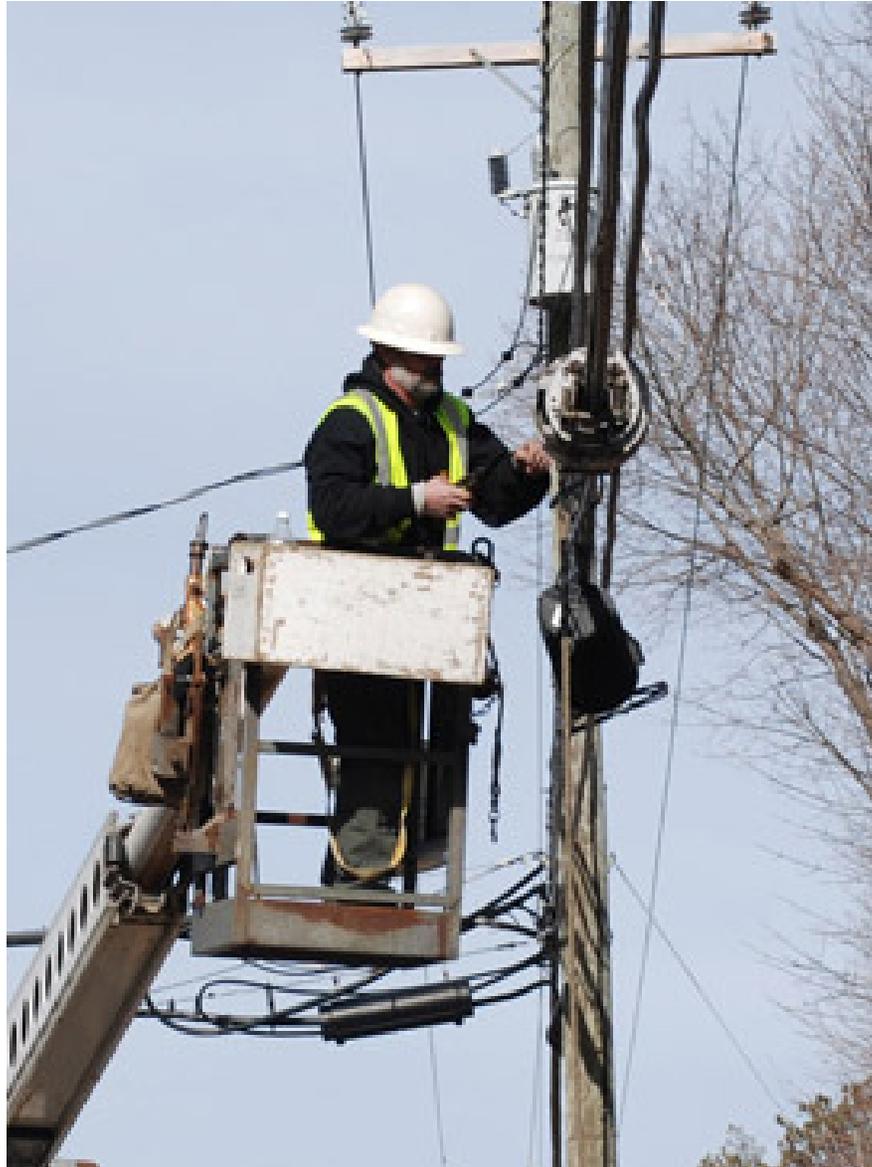
Contributions in aid of construction

Partner with Smart Grid networks

Overlap to existing fiber

Donated time, materials or assets

Non-traditional deployments



# Leveraging Policy Tools

Policy statements - broadband speed, availability

Provide access to state assets - towers, ROW

Aggregate customer demand

Provide technical assistance

Video franchising

# Broadband Network Deployment

Planning - identify/define project goals?

Build team - champions, consultants, contractors, vendors

Network design, engineering and costs

Project permits and right of way agreements

Major construction - make ready/infrastructure deployment

Testing and acceptance

Ongoing operating and maintenance

# Network Sustainability

Solid business model

Drive customer adoption and aggregation

Products, services and prices

Network maintenance and operations

Infrastructure management

# Contact

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