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
Working together to promote a vibrant rural America.

Experience Works · First Nations Development Institute · Housing Assistance Council · Indian Country Conservancy ·
National Association of Community Health Centers · National Association of Development Organizations Research Foundation ·
National Consumer Law Center · National Trust for Historic Preservation · National Rural Health Association ·
National Youth Leadership Network · NeighborWorks America · Save the Children · United Farm Workers Foundation
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.
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:

Definitive Legal Manuals and Guides from National Consumer Law Center

For details, visit the NCLC Bookstore www.nclc.org
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

From Calix U.S. Rural Broadband Q1 2012 Report
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](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](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

My contact information:

Darlene R. Wong
Staff Attorney
National Consumer Law Center
7 Winthrop Square, 4th Floor
Boston, MA 02110
617-542-8010

darlenewong@nclc.org
Funding Rural Broadband: Programs, Challenges & Opportunities

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

www.ruralstrategies.org
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

Connect America Fund

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

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
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 23rd
- Verizon & Spectrum Co. Deal
- Telephone/Broadband Deregulation Bills
  - California – SB 1161
  - Ohio – SB 271
Rural Broadband Policy Group

Edyael Casaperalta, Coordinator
edyael@ruralstrategies.org
956.457.6126

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
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
National Broadband Map
www.broadbandmap.gov
Massachusetts

6.5 million people in state - 3rd 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.
Need clearer maps

Availability by census block is still overstated
Address level mapping is needed
Supplement provider data with local outreach

Wireline Broadband Availability in Massachusetts

Wireline Broadband Technologies Available
Displayed by US Census Bureau 2009 TIGER/Line® roads
- DSL only
- Cable only
- Fiber only
- DSL & Cable
- DSL & Fiber
- Cable & Fiber
- No wireline service
- or no data received

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
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 cooper infrastructure performs at lower end of throughput.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Fiber</th>
<th>Cable</th>
<th>DSL</th>
<th>Fixed Wireless</th>
<th>Satellite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Wired</td>
<td>Wired</td>
<td>Wired</td>
<td>Wireless</td>
<td>Wireless</td>
</tr>
<tr>
<td>CPE</td>
<td>Optical Network Terminal</td>
<td>Cable Modem</td>
<td>VDSL Modem</td>
<td>External or Internal Antenna &amp; Modem</td>
<td>Satellite Dish &amp; Modem</td>
</tr>
<tr>
<td>Throughput</td>
<td>10 Mbps – 1+ Gbps</td>
<td>10 – 300+ Mbps</td>
<td>3 – 7 Mbps</td>
<td>100 Kbps – 5 Mbps (Depending on Technology)</td>
<td>&lt;2.5 Mbps</td>
</tr>
</tbody>
</table>
| Key Benefits | • Highest Throughput  
   • Unlimited bandwidth potential | • High Throughput  
   • Generally upgradable  
   • Nearly future proof | • Uses existing copper phone connection to homes  
   • Good throughput | • Unlicensed range of technologies  
   • No need for fixed infrastructure | • Existing service with broad coverage in region |
| Key Disadvantages | • Largest Capex Investment | • Only applicable to a cable operator expanding its footprint | • Need access to copper sub-loop; therefore, only applicable to ILECs | • Frequency selection limited by available licenses or leases  
   • Possible frequency interference  
   • Line of Sight requirements | • Would not leverage MB123 network  
   • High cost per MB  
   • Poor latency – no voip, no video conferencing |
<table>
<thead>
<tr>
<th>Last Mile Service Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs – capex and opex</td>
</tr>
<tr>
<td>How to work with incumbent providers</td>
</tr>
<tr>
<td>Rights of Way and “make ready”</td>
</tr>
<tr>
<td>How to engage and structure relationships with providers</td>
</tr>
<tr>
<td>How to fund residential installation and CPE</td>
</tr>
<tr>
<td>How to treat residents equally/fairly</td>
</tr>
<tr>
<td>How to prevent “cherry-picking” of most profitable areas</td>
</tr>
</tbody>
</table>
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
- Overlash 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

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>identify/define project goals?</td>
</tr>
<tr>
<td>Build team</td>
<td>champions, consultants, contractors, vendors</td>
</tr>
<tr>
<td>Network design</td>
<td>engineering and costs</td>
</tr>
<tr>
<td>Project permits</td>
<td>and right of way agreements</td>
</tr>
<tr>
<td>Major construction</td>
<td>make ready/infrastructure deployment</td>
</tr>
<tr>
<td>Testing and acceptance</td>
<td></td>
</tr>
<tr>
<td>Ongoing operating</td>
<td>and maintenance</td>
</tr>
</tbody>
</table>
Network Sustainability

- Solid business model
- Drive customer adoption and aggregation
- Products, services and prices
- Network maintenance and operations
- Infrastructure management
Contact

Jason Whittet
Deputy Director
Massachusetts Broadband Institute
whittet@masstech.org
617-378-7239
www.massbroadband.org