R&E Networks: Regional Impact from Stimulus Funding

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Now

• We serve:
  – 20 UNC System institutions
  – 24/36 independent colleges and universities
  – 115 school districts
  – 20/58 community colleges

• Providing
  – IP (commodity, peering, research)
  – Lambdas
  – Hosting and related services
  – Engineering support for K12/CC
  – Video conferencing
Goals...

• We’ve had a long-term goal of owning fiber between all our PoPs
  – Already in our strategic plan before ARRA
  – Been trying to get this fiber for years
• SPs have been unwilling to provide it to us
• We cannot sustain our network over time without owning the backbone
  – Can finally afford the first lambda
BTOP1

- $40M project ($28.2M award) - Will make us facilities-based to all of our PoPs
- Match split between MCNC and commercial partner ($4M ea)
- Eliminate leased circuits reducing cost
- Cost avoidance for future growth
BTP1 Middle Mile Build

Underserved Total:
Beaufort
Bladen
Columbus
Davie
Edgecombe
Greene
Harnett
Jackson
McDowell
Polk
Rutherford
Transylvania

Underserved Partial:
Carteret
Craven
Johnston
Onslow
Pender
Roberson
Buncombe
Catawba
Cleveland
Haywood
Iredell
Lincoln
BTOP2

- $111M project $80M award
- $24M Match provided by Golden Leaf Foundation
- REALLY reach to remote, underserved, economically distressed areas
- 179 direct connections to CAIs
- LOTS more facility to manage
- LOTS more deals to take care of
Economic Distress in North Carolina

According to 42 U.S.C. 3161, Economically Distressed Areas (EDAs) are areas where the unemployment is 1% or more above the national average or the per capita income is 80% or less than the national average. The EDA map is updated quarterly. Last Updated 02/05/10.


http://hepgis.fhwa.dot.gov/hepgis_v2/GenerallInfo/Map.aspx

Data Source: BEA and BLS

U.S. Department of Transportation
Federal Highway Administration

MCNC Route BTOP Round One
Possible MCNC Route BTOP Round Two
Round 2 Map

North Carolina Rural Broadband Initiative (NCRBI) - 1802.53 Miles In Proposed Funded Service Area
179 Community Anchor Institutions To Be Directly Connected To The North Carolina Research And Education Network (NCREN) across 69 counties (67 completely or partially underserved)

An Interconnection Point is available approximately every 5,000 feet or less as needed for all proposed fiber routes. This allows for access to fiber strands along the proposed fiber routes by Commercial Wholesale Providers, Community Anchor Institution (CAI) connectivity and the establishment of future additional NCREN optical nodes and/or PoPs as needed.
Challenges

• Well, we have to execute on construction

• Fixed costs are really fixed
  – This year had $1M budget reversion against signed contracts
  – Next year $135K in proposed Governor’s budget – (not likely to be put back in by the General Assembly!)

• Many demands to expand scope (but not so many offers of more $$)
THE END

www.mcnc.org/BTOP - Mark Johnson - MCNC
Btop2

Pulled into round2

• Stretch our backbone
  – Fill gaps
  – Prepare for really long term

• Get directly to CAIs off btop1 and btop2 backbone

• Risk the wrath of SPs
Vision

- Broadband working group
- Individual meetings
- State Technology Entities
  - Office of Economic Recovery
  - NC Office of Information Technology Services
  - eNC Authority
  - MCNC
- Golden LEAF
Strategy

• Comprehensive assessment of need
• Increase uptake where infrastructure is in place
• Expand Public Middle Mile options to rural areas
  – Service education
  – Investment from Private Sector Providers
• Local and Regional Innovation to reach the last mile
Middle Mile Process

• ITS and MCNC Backbone
  – Limited to serving Education, Government Agencies and Supporting Government Services
• Build-out fiber in rural areas with private partners
  – Providers have consistently said middle mile fiber is not available for lease in these areas
  – Gave providers 90 days to partner with MCNC – FRC/PalmettoNet did
  – Need to build middle mile to keep prices stable for education
• Private portion used for consumer/commercial services
  – Other Stimulus Projects in Energy and Healthcare
• MCNC Provided Matching Funds for Public build
Assessment of Need

• Multi-Modal Mapping
  – Web Analysis Tools
  – Boots on the Ground
    • Block by Block Census of Households
    • Predictive GIS
  – Connected Nation and eNC

• Effort led by eNC

• Received award of $2.3M in October 2009

• MCNC can attest to need after stimulus application
BTOP Timeline

- Pre-2007 – close relationship with Lt Gov on K12 connectivity initiative
- 2007: Committed to goal of acquiring dark fiber to all PoPs
- Summer 2008 - Board commitment to overhaul NCREN (matching?)
  - New design
  - New core routers
  - Completion of optical core
BTOP Timeline [2]

- Fall 2008
  - New strategic plan
    - All fiber backbone in 5 years
  - SP partnership opportunity identified
- Former Lt Gov Perdue elected Governor
- December 2008 - Stimulus white paper in circulation [a key in obtaining stakeholder support]
BTOP Timeline [3]

• March 2009 – Solicit service provider partnerships
  – Needed SP support
  – Definitely DID NOT want SP opposition
• July 2009 – NOFA released
• July 2009 – BTOP/BIP application released
• August 20 2009 – Application due
• November 12 2009 – Due Diligence begins
Update

• Application filed 8/17 (due 8/20) for first round
  – Existing mapping data was not adequate
  – Spent about $50K of MCNC funds to get better data
  – Ranked #1 by the state
  – Congressional delegation issued strong support statement

• Private partner put up equal match to MCNC
  – Opened the process to all Service Providers
  – Kept them briefed throughout

• Received 31 pages of Private Sector Objections (11/11)
  – Some just supply wireless 3G @ $60 month
  – MCNC application reduces middle mile costs
  – NTIA leaders – “Service provider objections not a sole determining factor in awards”
  – Over 80% of proposals like MCNC’s got objections
Diagram 2 of 5 - NCREN Optical Network Expansion To Undererved Areas Of North Carolina
High-Level Optical Node Perspective

Key:
- **PROPOSED** Optical Transport Node – Cisco ONS 15454 MSTP - 40 DWDM Channels.
- Existing Optical Transport Node – Cisco ONS 15454 MEOS - 40 DWDM Channels.
- **PROPOSED** N-Degree or Transporter Upgrade to Existing Optical Transport Node – Cisco ONS 15454 MEOS - 40 DWDM Channels.
- Existing Single-Mode Fiber Routes.
- **PROPOSED** Single-Mode Fiber Routes.
- Established Ring – Has Cisco 7400 Router, but may or may not have Optical Transport Node nearby.
- Proposed RFO - Does not have Router or Optical Transport Node nearby. This site does NOT exist today in any capacity.
- **PROPOSED** Co-Existing Optical Regenerator, ROADM or N-Degree.
- **SCHEDULED** Site - These sites are currently earmarked to connect.
- Optical Node In City In Undererved County.
- **MILES**

NOTE: An Interconnection Point is available approximately every 5,000 feet or less as needed for all proposed fiber routes. This allows for access to fiber strands along the proposed fiber routes by Competitive Wholesale Bandwidth Providers and the establishment of future additional NCREN critical nodes and/or RFOs as needed.

Middle Mile Span
Key Elements/Ingredients/Inputs of MCNC BTOP Mapping

- Google Earth Pro
- Enlisted assistance of e-NC Authority and Broadband Consulting Group (BBCGI)
  - Un-served/Underserved Determination
  - Rural vs. Non-rural Determination
- Exported our Fiber Routes from (true) GIS software to KMZ files
- Creativity
Mapping...Joint Techs to the rescue

Google Earth Pro can read shape files

Very interesting
Challenges

• Rules, compliance, etc
  – Start date triggers clock on EA, buildout
    • Initially set to 1/1/10. We were not informed of EA requirements until 2/13/10
  – Multiple reporting requirements
  – NTIA staff is only one step in front regarding these issues

• Capital Cost – Awardees (that’s us) responsible for overruns

• Time – must complete EA, construction and all associated contracts, IRUs and other agreements on time
Sustainability

• A lot of new op-ex, offset by reduced circuit costs
• Much less flexibility to shed cost in the wake of state budget problems
• Capital refresh
• Greater need to monitor and participate in policy and legislative activity
• More and new constituents requiring care and feeding