Urban Champaign
Big Broadband
IT Pro Forum
Project Review & Update
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History

Chamber of Commerce projects - mid 1990s
- Time-Warner Cable - first cable modems
  - Good security lessons learned
- Ameritech - ISDN pilot

University Off-Campus Housing RFP - 1999
- Multiple Dwelling Units
- Fraternities, Sororities & Apartment Buildings
- McLeodUSA fiber build
  - 10 and 100 Mbps symmetrical Ethernet
- McLeodUSA full rate ADSL
  - 7 Mbps downstream, 1 Mbps upstream
I am a one-trick pony

- First raised concept in 1997 - C-Unet2000
  - Champaign Council wisely chose Tom Bruno instead
  - I joined the McLeodUSA effort

C-U Cable Commission - 2008

- Broadband Access Committee
- Plan for better broadband in community
- Advises both City Councils on broadband policy
- Became focal point for proposal development
- Sponsored 2 public broadband forums

GSLIS Broadband Forum
2009 Federal Stimulus Legislation
- Jump-started everything in January 2009
- Joanne Hovis presentation at iHotel in February 2009
- $7.2 Billion for broadband nationwide
- 20% local match required
- We competed with other broadband projects
  - Not with schools or roads

State of Illinois Broadband Program
- Funded in 2009 capital budget
- Up to a 10% match of total project
- UC2B received a $3.5 million commitment
What is UC2B?

Intergovernmental Consortium
• University of Illinois at Urbana-Champaign
• City of Champaign
• City of Urbana

Created to secure ARRA broadband funding
$29.4 million infrastructure project
• Awarded $22.5 million from NTIA in March
• Awarded $3.5 million from State of Illinois
• Raised $3.4 million in local matching funds

All-fiber overbuild of AT&T and Comcast
What was the original plan?

7 fiber rings spanning the community
- Fiber connectivity & Internet service for 143 very broadly defined “Anchor Institutions”
- Schools, Public Safety, Government, Medical, Senior Living & Activity, Youth Centers, Social Service Agencies, Public Computing Centers

Fiber-to-the-Premise (FTTP)
- To the curbs of 4,650 homes & 200 businesses
- In 11 “underserved” Census Block Groups
- Areas were determined by a statistically valid door-to-door survey and are primarily low-income
- Areas had less than 41% broadband adoption
- 2,700 projected FTTP customers
“Middle Mile” Infrastructure

7 Fiber Rings

- Cover all of the metropolitan area
- Connect 143 “Anchor Institutions”
  - All Private & Public Schools & Libraries
  - All Public Safety, and Medical facilities
  - All Senior Living and Activity Centers
  - Social Service and Youth Service Agencies
  - Public Computing Centers
  - All Urbana & Champaign city facilities
- Select Sanitary District & Mass Transit District locations
- Provide backbone for the FTTP pilot project
- Provide future backbone for FTTP everywhere
Fiber Rings & FTTP Areas

Legend:
- University Node
- Ring 1
- Ring 2
- Ring 3
- Ring 4
- Ring 5
- Ring 6 (alternate route)
- FTTP
- Land Mass FTTP Funded Service Areas (Marked as Census Block Group)

Map 1
Ring Layout
10/18/10
“Last Mile” FTTP Pilot Project

11 “Underserved” Census Block Groups
  • 6 in Champaign, 5 in Urbana

Base UC2B retail service offering:
  • 5 Mbps symmetrical connection to the Internet
  • 100 Mbps & 1 Gbps connections to local institutions
  • $19.99 a month - with grant-funded fiber installation
  • Higher Internet bandwidth tiers available

Open network - all service providers welcome
  • Only IP-based services - no traditional TV or phone
  • Layer two transport services for ISPs

One of few FTTP projects funded by NTIA
An Open Access Network

UC2B will be an Open Network

- Shared community-owned infrastructure
- Multiple service providers
  - Providers compete on price and quality of service
  - All lawful service providers are welcome
  - AT&T and Comcast are welcome

All data is treated the same

- No preference to any source or type of data

Network Neutrality is a grant requirement
Sources of UC2B Funds

- Federal Government - NTIA - $22.5 million
- State of Illinois - $3.5 million
- University of Illinois - $510,971
- City of Champaign - $498,070
- City of Urbana - $345,675
- Champaign Unit 4 Schools - $622,557
- Urbana District 116 Schools - $298,075
- C-U Mass Transit District - $339,103
- U-C Sanitary District - $120,000
- Lincoln Trail Libraries - $30,000
- Champaign Telephone Company - $587,698
Project Update

Environmental Assessment is Complete
- Finding of No Significant Impact (FONSI) issued

Engineering firm selection in complete
- Aiming for Nov 18th U of I Board of Trustees approval
- Will review the backbone design
- Will design the backbone rings and fiber to the curb

Construction will be bid in 3 packages
- Urbana (& contiguous Champaign County)
- Champaign (Savoy & contiguous Champaign County)
- University area
  - Lincoln Ave. to RR tracks, University to Windsor
Core Campus Construction Area
Interviewed for first F-T grant employee
• Will manage outreach, private easements & GIS

Second position interviews pending
• Will concentrate on outreach and easements team

Third position interviews pending
• Will concentrate on fiber construction

DCEO $3.5 M grant paperwork pending

FTTP Technology RFP is on street
• Need to select before engineer can start FTTP design

Policy Board & Tech Committee meeting
• Have approved RFP materials
Looming Issues

Organizational structure for operations
• Attorneys engaged and discussing options

IRU agreements with all entities
• Must have organizational entity first

Finalize Backbone Design
• Review is 1st order of business for Engineering firm

FTTP Technology Choice
• Needed for Engineering firm to design FTTP

Finalize Statements of Work and sub-awards
• With both cities
Looming Issues - 2

“Rural” easements
- One-time offer of UC2B services in exchange for private easements where needed for rings
- May need to move outer perimeter of backbone rings to city-owned streets in some or all areas
- Urbana Public Works is researching extend of issue

Marketing campaign
- Timing is important
  - Not too soon or too late
- Segmented approach has been suggested
  - Lots of variety in future users
Construction Timetable

Dec 2010 - March 2011 - Engineering
  • Three Bid Packages

March - April 2011 - Bid & Award Construction
  • Urbana, Champaign & University

May - November 2011
  • Build 7 Rings
  • Build fiber to many curbs
  • Connect Anchor Institutions, Homes & Businesses

March - November 2012
  • Complete construction to curbs
  • Complete remaining fiber drops
## Construction Timetable - 2

### Now - July 2012
- Create FTTP plan for the rest of the community

### August - September 2012
- Get approvals and financing for next phase

### October - November 2012
- Hire engineer for next phase

### February - March 2013
- Hire contractors for next phase

### April 2013 - November 2017
- Build FTTP to entire community
Urbana-Champaign Big Broadband

Relationship of the 7 UC2B Fiber Rings to the UIUC Nodes and to each other

Every Ring connects to both Nodes, and any fiber strand on one Ring can be connected to any strand on any other Ring in either node.
Sample Use of Middle Mile Fiber Ring to Serve Anchor Institutions

Urbana-Champaign Big Broadband
Fiber Ring #1 - Anchor Institutions
Typical use of multiple VLANs and fiber strands on Middle Mile Fiber Ring to serve various Anchor Institutions.

Urbana-Champaign Big Broadband
Fiber Ring #1 - Multiple VLANs

Public Safety sites connected to each other and the Internet on dedicated fiber strands in a redundant ring.

Unit 4 Schools connected to each other and the Internet on dedicated fiber strands in a redundant ring.

Public Computing Centers connected to the Internet via WDM-PON.

Youth Centers connected to the Internet via WDM-PON.

UIUC Node 8

UIUC Node 9
Urban-Champaign
Big Broadband

Wave Division Multiplexing - Passive Optical Networking (WDM-PON)
Fiber-To-The-Home Network Diagram

Layer 2 Transport Network:
VLAN Transport from Provider to Customer.

Local ISP Peering Hub:
Direct Layer 3 access between ISPs for high speed/low latency service to local businesses and institutions.

5/26/10
Business
Satellite Office 1
100 Mbps Layer 2 Connection

UIUC
Node 8

Business
Main Facility
Redundant 1 Gbps
Connections

UIUC
Node 8

UIUC
Node 9

UIUC
Node 9

UIUC
Node 9

Business
Satellite Office 2
100 Mbps Layer 2 Connection

WDM-PON Filter

ONT

ONT

ONT

ONT

ONT

ONT

ONT

ONT

100 Mbps

100 Mbps

1Gbps

1Gbps

WDM-PON Filter

WDM-PON Filter
How UC2B Helps Business

This is “Stimulus” money and it will stimulate

- Increased payrolls in Champaign County
- Imported workers in our motels & restaurants

Redundant fiber connections

- Rings = Redundancy = Reliability
- High-tech businesses demand redundancy

Competition for existing Internet providers

- Will restrain prices
- Will increase service levels

Enables remote data back-ups
Enables working from home
Why is the University involved?

- Reinforces our campus fiber backbone
- Redundant connections to the Research Park and the “Blue Waters” National Peta-Scale Computing Facility
- Improved connectivity to off-campus leased offices
- Improved fiber connectivity to South Farms & Willard
- Improved connectivity to off-campus student housing
  - Will enable more blended learning
- Attract and retain faculty
  - Improved home connectivity for faculty and staff
  - Improved connectivity for local schools & libraries
- Better jobs for trailing spouses
What About My House?

April 2013

- Begin FTTP construction in other areas
- Modest borrowing will fund organic growth
- Other funding options for faster growth
- Let’s have this discussion in 2011 & 2012
- Gentrification of low-income areas?
  - Probably not, but a great question
    - Question implies how desirable FTTP will be
- Different members of the UC2B consortium could expand FTTP areas in different ways
Why Fiber?

Only “future-proof” technology
- Speeds are unlimited
- Will last for generations
- No licensing required
- Cities own their rights-of-way
- New electronics
- Faster and cheaper

Who will pay for Stimulus $?
- Our children and grandchildren
- They will benefit from the fiber
Why was UC2B “special”?

- Local funding raised through the sale of fiber IRU’s
  - Did not rely on altruism
- Expansive definition of “Anchor Institution”
  - 1+ for every 1,000 citizens
  - Lots of social service organizations
- University technical support
  - NTIA believed we could make this work
- Close to bleeding edge technology choice
  - We promised a symmetric 100 Mbps connection for everyone
  - Who knew Google would promise 1 Gbps just 6 months later?
- Broad community support
  - 60 pages of supporting letters
- A valid survey to document “underserved” areas
Questions

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