

Upper Dublin Township Community Broadband Steering Committee

Update & Recommendation on Community Broadband Network

June 2008



Agenda

- Review from July 2007 CBBSC Commissioner Meeting Presentation
- Review of Action Items from last meeting
- Current State of Municipal Broadband
- RFP Results
- Community Broadband Network
 - Design
 - Network & Customer Equipment
 - Benefits
 - Offers
- Financial Highlights
- Recommendation

Committee Members and Support Staff

- Current Members
 - Peter Blood, Hugh Martin, John McGowan, Ed McVeigh, Robert Pressman, Shellie Straub
- Former Members
 - Stephen Daly, Jack Freeston, Rob McRobbie
- Chair
 - Ira S. Tackel
- Staff and Consultants
 - Paul A. Leonard, Deb Ritter, John Sullivan, Howard Woods, and Chris Pizzirani

2005 – Community Broadband Pilot Program

- Developed and implemented pilot program with 7 “friendly customers”:
Peter Blood, Dick Dresher, Sue Kovalchik,
David Lindorff, Ed McVeigh, Paul Ruppel, Ira Tackel
 - Equipment installed 12/05
 - CPE
 - Tower installations
 - WiMAX (unlicensed spectrum)
 - Support and Billing (PA Act 30)

2006 – Sensoria Report

- Feasibility analysis of WiFi mesh network
 - Sensoria Corporation engineering analysis
 - Applications
 - Public Safety
 - City Services
 - School District
 - Consumer Access
 - Design Requirements
 - Service area
 - Throughput
 - User coverage
 - VoIP, QoS

2006 Sensoria Report (cont.)

- Final report completed December
 - Network architecture, user capacity, RF plan, equipment, operational support, coverage maps, etc...

- WiFi Mesh Implementation proposed requirements:
 - Install 613 mesh nodes
 - Construct additional 11 poles/towers
 - Access 28 different fiber points
 - 88% coverage of the township

Analysis of Sensoria report – January/February

- Analysis completed in February
- Summary of Township analysis
 - Sensoria deliverables
 - Significant issues identified
 - Throughput
 - Equipment requirements
 - Fiber access
 - User performance
 - Life span
 - Cost

2007 – Analysis of Sensoria report – January/February (cont.)

- Conclusions
 - WiFi mesh not viable long term solution
 - Slow throughput
 - Significant construction and equipment costs
 - Short life span of WiFi mesh
 - Alternatives (Back-to-the-future)
 - WiMax (licensed spectrum)

Evaluation of Licensed Spectrum WiMax–March/April

- Consultant hired February
 - Overview WiMax Licensed Spectrum
 - Township topography
 - Licensed spectrum holders
 - Radio network plan
 - Cost estimate
- Findings presented to CBBSC in March 2007

Evaluation of WiMax – March/April (cont..)

- Summary of findings
 - WiMax technology
 - Licensed spectrum benefits
 - Preliminary design
 - CPE
 - Mobility
 - WiFi compatibility
 - Estimated cost

Licensed Spectrum – April/May

- Evaluation
 - Who owns what
 - Band transitioning
 - Ongoing negotiations with license owners
 - NextWave (Temple U)
 - Saint Joseph's U
 - Clearwire

Review of Action Items from last meeting

- Broadband Trial Expansion – July/August 2007
 - Expansion studies were completed in July
 - Network expansion too costly due to requirement for line of sight
 - Alternative selected – Free Wi-Fi added North Hills Community Center
- WiMax license spectrum assessment – July/August 2007
 - Assessment completed in August
 - Recommendation–Township should own equipment & lease spectrum
- RFP – September 2007
 - RFP released in November 2007
 - 2 Responses received in December 2007
 - Responses evaluated in January 2008
 - Discussions & meetings with one vendor January – June 2008

Current State of Municipal Broadband

- **Why Municipal Broadband Networks fail**
 - Business models are flawed
 - No anchor tenant
 - Private company expected to provide free services to the Township, low income, etc.
 - Wi-Fi architecture too expensive to build a network with robust coverage (unlicensed)
 - Poor throughput and high customer dissatisfaction
 - Examples - City of Philadelphia
- **Successful Municipal Broadband Networks**
 - Municipality makes a financial commitment (either through investment or by becoming the anchor tenant)
 - Focus is on improving services to the community – police, fire, etc.
 - Networks are built to cover >90% of the municipality
 - Commercial offerings provide robust throughput at a reasonable price
 - Example – Gillette, WY

RFP Results

Two Vendor Responses Received – Conxx & NextWave

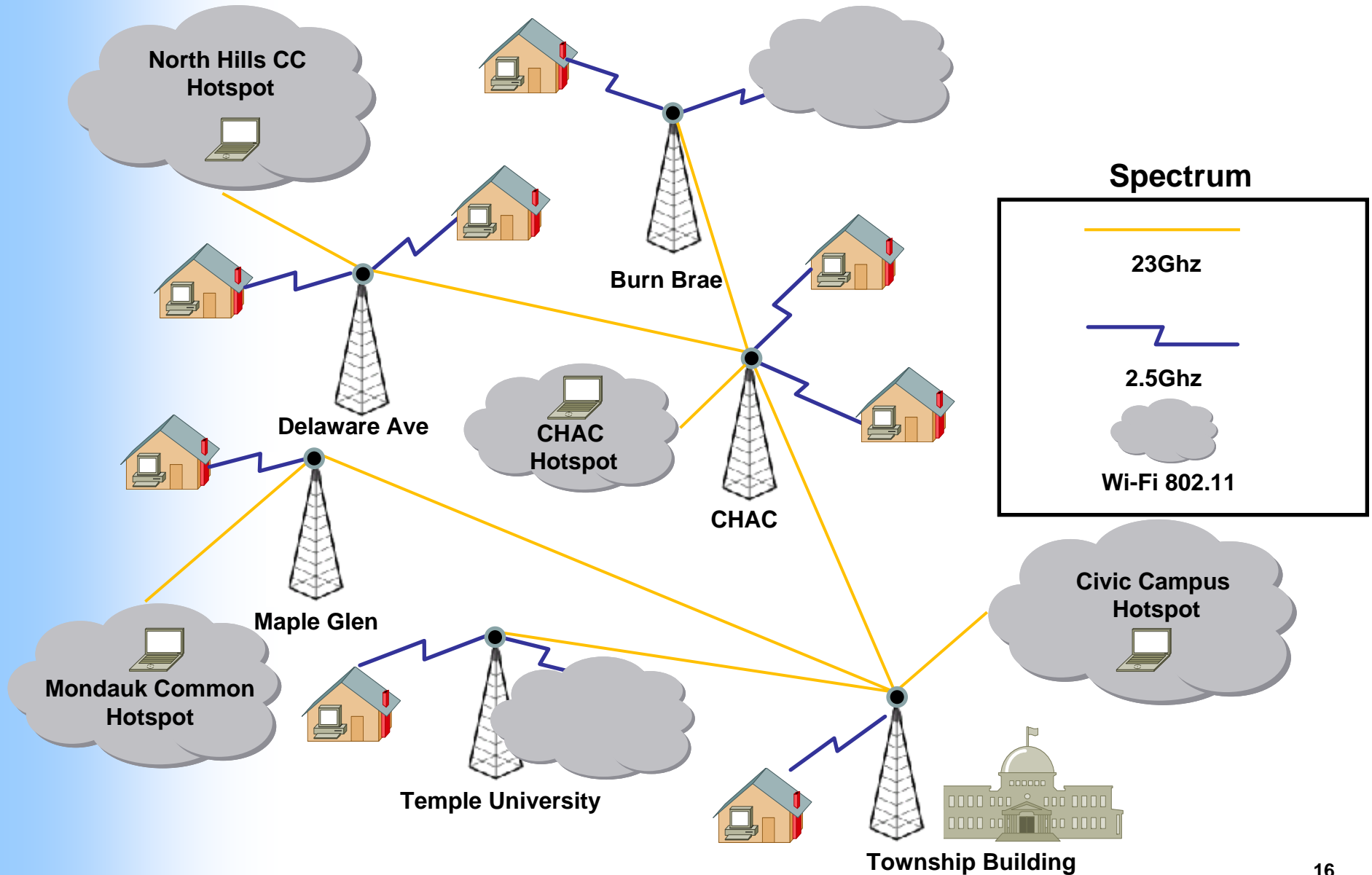
- Conxx Proposal
 - Similar architecture to current trial network
 - No licensed spectrum
 - Focus on business applications
- NextWave Proposal
 - Third Generation Wireless Broadband architecture - easy upgrade path to WiMax or LTE
 - 90% Coverage
 - Licensed spectrum available for lease
 - All network hardware and customer equipment is manufactured and maintained by NextWave

RFP Results (cont.)

Conclusion

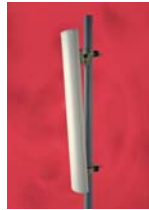
- Conxx Proposal not feasible due to dense foliage in the township & experience with pilot network
- NextWave's proposal met all key criteria
 - licensed spectrum
 - high throughput (**bandwidth @ 2MIPS up and down, what does this mean, and how does it compare????**)
 - easy upgrade path to next generation wireless network (WiMax or LTE)
 - No construction of new towers required
 - No need to use utility poles
- Move to next phase with NextWave
 - Started detailed discussions with NextWave
 - Finalized network design
 - Completed business case

Community Broadband Network - Design



Community Broadband Network – Network

Wireless Antenna



- Weight – 18lbs
- Wind rated – 150mph
- Dimensions (l ,w, h) - 56 in x 8 in x 2.75 in

Base Station



- Supports international 3GPP TD-CDMA standard
- Future upgradeability to WiMAX and 3GPP LTE
- Designed for wide-area coverage

Integrated Network Controller



- Supports international 3GPP TD-CDMA standard
- Aggregates Radio Access Network (RAN) data and management traffic

Network Management Software



- Advanced SNMPv3-based element management system

Community Broadband Network – Customer

Desktop Modem



- Works indoors or outdoors
- USB or Ethernet connection
- Works with a customer's existing router

Mobile Broadband PC card



- Works indoors or outdoors
- PCMCIA interface
- Works with a customer's existing laptop

Mobile Broadcast Receiver (Aug '08)



- Portable Receiver that connects to CDMA network
- Broadcasts Wi-Fi
- Allows Wi-Fi enabled devices to connect to the CDMA network where Wi-Fi does not exist

Community Broadband Network - Benefits

- **Public Safety & EMS** – police officers will have data connectivity in the entire township (66% today) and video monitoring will be available
- **Improved Efficiency** – new mobile applications for township services can be built to take advantage of the network coverage in the township
- **Underserved Communities** – network is designed to cover the underserved communities in the township (estimated to be 25%)
- **Redundant Access** – internet access at the township building will provide diverse route/backup access for the county and schools
- **Value** –
 - Low priced
 - Locally controlled
 - Completely mobile broadband access within the township
 - Free Hotspot access to high traffic areas
 - Best in class up stream speeds

Community Broadband Network - Offers

- Township owns all network equipment
- Township has complete control on products, pricing, marketing, support, etc
- Two potential service offerings:

\$24.99 – Standard Broadband Offering

- 2Mbps Down/2Mbps Up Unlimited Broadband Access
- Unlimited access to Wi-Fi Hotspots in the township
- Free Wireless Modem

\$34.99 – Premium Broadband Offering

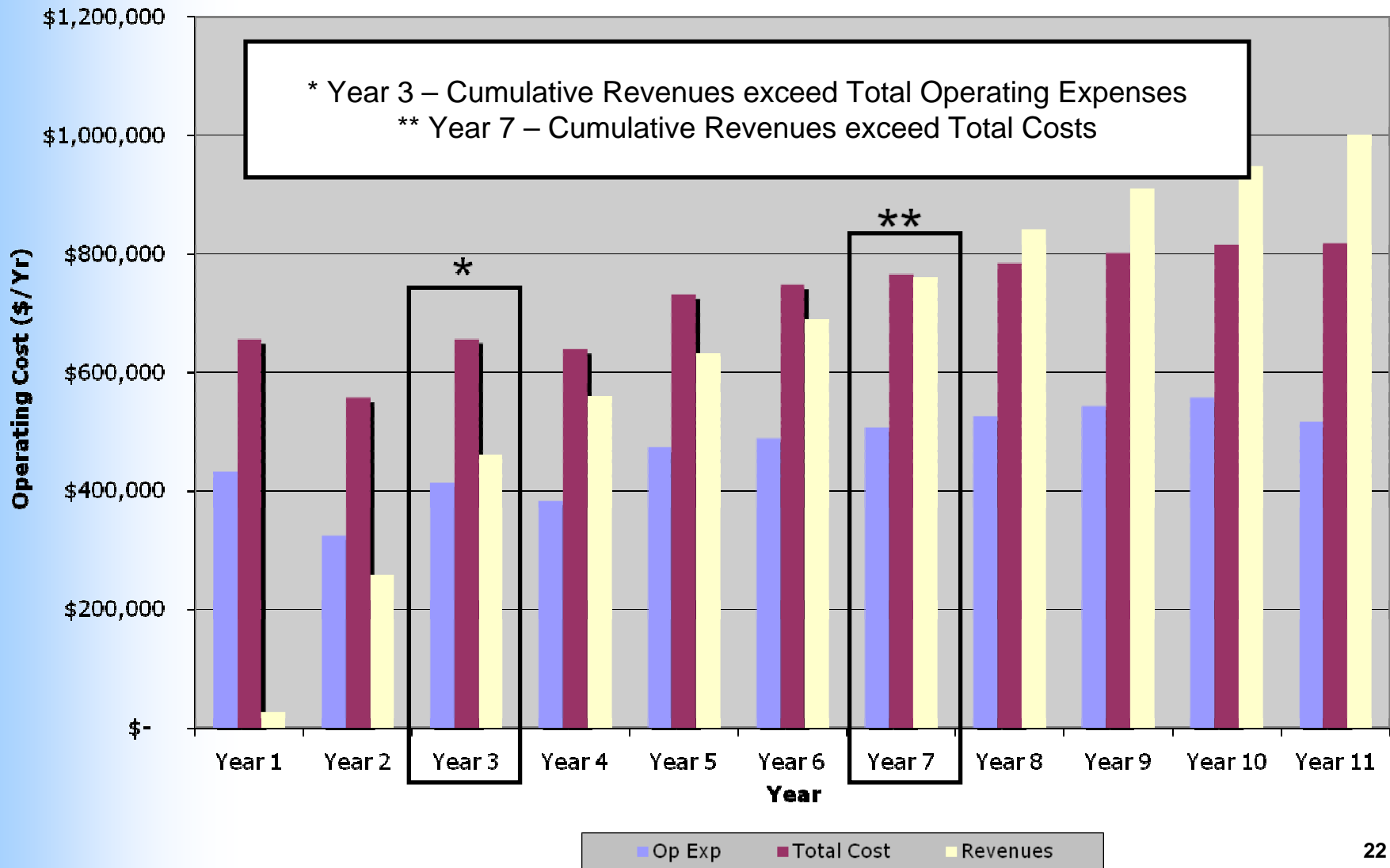
- 4Mbps Down/4Mbps Up Unlimited Broadband Access
- Unlimited access to Wi-Fi Hotspots in the township
- Free Wireless Modem

Financial Highlights

- Year 1 Expenditures
 - Transfer \$4.5M from Community Reinvestment Fund to Community Broadband Project (amount avoids the requirement for annual appropriations)
 - Network Capital = \$2.5M (includes customer equipment)
 - Operating Expenses = \$432K (includes 3 yr prepayment for SW Maintenance @ a 10% discount)
 - Debt service = \$224K
- 20% Penetration of Township households over 10 years (no business customers were included in the penetration numbers)
- Upgrade to next generation network (WiMAX or LTE) in Year 4 = \$100K
- Revenues cover Operating Expenses = Year 3
- Breakeven = Year 7, including debt service

Financial Highlights

Total Annual System Cost & Operating Expenses vs. Revenues (Adjusted Rates)



Possible Objections to a CBBSC Initiative

- **Community Broadband Networks are failing all over the Country, why do we believe the Township implementation will be successful?**
- **Why build a Broadband network when the private sector is meeting the Broadband needs of Upper Dublin Township?**
- **These networks cost millions of dollars and the Township will never get the return on investment!**
- **Running a Broadband Network is complicated and the Township has no experience!**
- **This network will be obsolete in a couple of years and the Township will be stuck with an antiquated network that will not be able to compete with the cable companies or the telcos!**

Possible Objections to a CBBSC Initiative (cont.)

- **Public Safety is already being addressed through the commercial wireless network!**
- **Taxes will have to be raised to fund this network, and I won't be using it!**
- **The network equipment is an “eye sore” and will ruin the aesthetics of the Township!**
- **Wireless network coverage in my Home is inadequate; won't the Township network have the same problem?**
- **Wireless networks seem complicated, it will be very difficult to get up and running!**

Recommendations

- Commissioners consider resolution to move forward with Community Broadband offering (June 10th)
- Negotiate contract terms with NextWave (June)
- Present contract terms to Commissioners for approval (July 8th)
- Target Community Broadband Network launch (October '08)

Questions and Discussion