



UC2B Business and Strategic Plan

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NEO Fiber

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This Business and Strategic Plan, along with the Financial Models is for UC2B's use only, and is Proprietary and not to be distributed.





Urbana-
Champaign
Big Broadband

UC2B Business and Strategic Plan

UC2B Introduction
and Executive
Summary

Introduction and History of UC2B



The American Recovery and Reinvestment Act (ARRA) provided a total of \$7.2 billion to the National Telecommunications and Information Administration (NTIA) and the Department of Agriculture’s Rural Utilities Service (RUS) to fund projects that would expand access to and adoption of broadband services across the United States.

NTIA utilized \$4.7 billion of that funding for grants to deploy broadband infrastructure in the U.S., expand public computer center capacity, and encourage sustainable adoption of broadband service.

The Urbana-Champaign Big Broadband (UC2B) is an intergovernmental consortium of the University of Illinois and the cities of Urbana and Champaign dedicated to building and operating an open-access fiber-optic broadband network throughout the Champaign-Urbana area. UC2B applied for and was awarded a NTIA grant of \$22.5 Million. The State of Illinois provided a \$3.5 Million grant, and local matching funds added an additional \$3.4 Million to fund the project.

The Grantee, the University of Illinois Champaign-Urbana, has 22 years experience in the design, implementation, and operation of 591 miles of networks for the campus, region, and community. The University and the cities of Champaign and Urbana collaborated to create the Urbana-Champaign Big Broadband intergovernmental consortium to support the project. The University’s Campus Information Technologies and Educational Services, acting as the lead to carry out construction of the network, has a full-time staff of 280, a budget of \$42 million, and a strong record of working with the cities and social organizations to share the benefits of connectivity with the community.

The foundation of the UC2B network will be the fiber-optic “backbone” infrastructure that is being constructed with the grant money. During the time the Business Plan was written, UC2B was and has been in the process of constructing a backbone network that will serve the needs of 200 anchor institutions such as schools, the university, government agencies, the medical community, non-profit and social service organizations, as well as (11) census block areas within the Urbana-Champaign area representing approximately 4,650 households passed. The grant also will provide “fiber-to-the-premises” (FTTP) connectivity directly to 200 Community Anchor Institutions and businesses throughout Champaign, Urbana, and Savoy and up to 2,500 households in several underserved neighborhoods in Champaign and Urbana. The grant includes covering the capital costs to install FTTP to these 2,700 locations.

As the network build is currently underway, UC2B, through this Business and Strategic Plan, is looking at possible options of expanding the network, as well as best practices for operating the network and its associated services.

The UC2B network will serve as an integral part of the community to bridge the gap between accelerating demand for bandwidth and access to an all fiber network. The UC2B network will enable improved access and support to health care, educational and recreational institutions, public safety and government agencies, and social service and religious organizations, as well as increased access to public computing centers. Training, entertainment, and social networking opportunities will also be enhanced.

Planning Process and Background Information

The UC2B Policy Board approved a scope of work to develop a business plan, which included providing recommendations for developing service tiers and pricing for both retail and wholesale customers; identifying and evaluating opportunities for expansion; and identifying and evaluating options for UC2B's organizational model and governance structure.

In September, 2011, the UC2B Policy Board endorsed a scope of work that was incorporated into a Request for Proposal and distributed to industry experts with the intent of identifying a qualified firm able to assist UC2B in the development of a business plan and financial model analysis. Staff from each of the UC2B member agencies reviewed responses, interviewed firms, and collectively made a recommendation to the Policy Board.

In October, 2011, the Policy Board recommended that the City of Champaign, as lead agency for operations, contract with NEO Fiber, LLC for such services. NEO Fiber, LLC was selected as the best qualified firm for the identified scope of work, particularly because of its familiarity with similarly situated and federally funded projects and its experience owning and operating its own fiber to the premise networks.

Under City staff supervision, Diane Kruse, NEO Fiber's CEO and the NEO Fiber team began work immediately on a preliminary and time-sensitive scope of work in November. The Champaign City Council approved Council Bill No. 2011-244 in December.

Kruse and her team visited the community in January, 2012 meeting with member agencies, stakeholders and potential subscribers, gathering their input on the future of UC2B.

NEO provided an early recommendation for the introductory residential service tier and pricing for "20 mbps for \$20". This



was approved in January and incorporated into UC2B's marketing and outreach materials and customer acquisition activities.

Over the next several weeks, NEO Fiber prepared a report titled "NEO Fiber Evaluation and Recommendations for Pricing and Positioning Strategies, Best Practices for Retail Service Offerings, Residential and Business Services" which coupled the stakeholder and community input received in January with their industry expertise. They also prepared and provided preliminary financial models and feasibility objectives. The UC2B Policy Board officially endorsed both the Report and its recommendations - with a few revisions related to residential pricing and the feasibility objectives at its March 22, 2012 meeting. Decisions relating to business pricing were made on April 11 and 18.

Based upon these decisions and direction, NEO then began its work more broadly providing guidance and expertise in business planning, organizational structure and governance, market analysis, pricing and positioning, financial modeling, operational considerations and financing options. These items are addressed in this Business and Strategic Plan. All of the Policy Board decisions made to date have been incorporated herein.

About the Business and Strategic Plan



The purpose of this Business and Strategic Plan is to provide guidance to UC2B as it goes about the business of being an infrastructure and services provider. This business plan is a working document to be updated, referenced, and to be used as a guide to facilitate decisions.

Additionally, the plan is to be used as a tool to identify possibilities for expansion. Various expansion options are provided within this document with key assumptions made and possible circumstances in which the expansion could be feasible. If UC2B decides to expand its existing infrastructure to other areas in addition to the (11) census block areas, the plan discusses ways in which this could be done.

As the various financials were run, assumptions were made for capital and operating expenses. A detailed design and engineering of the network and its possible expansion scenarios was outside the scope of work for this project and therefore was not conducted. The projections within this document need to be further verified with actual design and engineering work.

The plan provides documentation of decisions that have been made and their financial impact to the consortium, and the plan can be used as a guide to what is possible, whereby UC2B should investigate more. This is a working tool to help facilitate and guide the organization.

Among the questions examined in this document are: Can the grant-funded asset be leveraged and expanded to serve the broader Urbana-Champaign area? And if so, how should the network best be expanded: Fiber-to-the-Business? Fiber-to-the-Home? How should UC2B structure its internal line-of-business operations and customer service offering? What areas of operations can be outsourced? What operational structure is best suited for UC2B? Should UC2B expand using a wholesale model; an open access network; vendor-neutral; and/or transport only?

What services can the UC2B network support and what is feasible? Can additional services such as wireless access be overlaid onto the network to support government and public safety applications?

This Business and Strategic Plan examines these issues and provides analysis and guidance to assist UC2B in determining the best course suited for meeting internal fiscal requirements and to serve the larger community needs.

Financial Scenarios Examined in this Plan

“Maintain the Grant Funded Program Only”

Explores the implications of maintaining and operating the current Fiber to the Premise network for the (11) census block areas plus the anchor institutions funded by the grant program.

“Fiber to the Business”

Explores the implications of extending last mile connections to a critical mass of government, business, industry and citizen services institutions.

“Fiber to the Home”

Explores the implications of extending last mile connections to a critical mass of residential units within the Urbana-Champaign areas.

“Wholesale Models”

Explores the opportunity to partner with local service providers to use the UC2B network to provide services, such as television services, to the community.

“Wireless for Public Safety Applications”

Looks into the capital costs for expanding the existing network funded by the grant program to support a wireless/Wi-Max network for government and public safety use only.

Executive Summary



The Opportunity. It is clear that the U.S. lags far behind many other countries and their investments in broadband infrastructures. Currently, upload and download speeds in the Champaign-Urbana area are much slower than U.S. averages and even as much as 10 times slower than those reported in leading global metropolitan areas. Customers are utilizing greater amounts of bandwidth, with more intensive bandwidth applications such as downloading and uploading picture-rich and video-based content. Additionally, with the growing use of cloud computing, more businesses are demanding faster symmetrical upload and download speeds in order to compete effectively in the global marketplace. This increasing need for more bandwidth is expanding faster than the construction of high bandwidth networks in the U.S.

With the addition of this new fiber-based broadband network, Champaign-Urbana has the opportunity to leap ahead and attract/retain business and industry, create jobs and provide an improved quality of life for all of its residents.

Fiber optic networks are capital intensive; this being the main reason why more fiber networks are not being built. The impact of receiving the grant to pay for a robust and future-proof fiber optic network will have an enormous effect on the community. With the grant funding the construction of this network, UC2B will not have the massive amounts of debt that is typically associated with community fiber networks. The backbone infrastructure will be an asset that can be expanded to further bridge the digital divide, providing very high bandwidth at very little cost to the community.

There currently are no providers in the Champaign-Urbana area offering services via Fiber to the Premises service which is a huge advantage for UC2B. Current providers do not provide symmetric upload and download speeds, and customers do not always receive the speeds they are buying from other providers. The pricing structure and service tiers established by the UC2B Policy Board are much better than the incumbents' overall. UC2B will be one of a small handful of communities that are offering Gigabit speeds within the community, setting the Champaign-Urbana area apart from other communities.

The UC2B Policy Board spent a significant amount of time working on the Guiding Principles of the organization to provide value statements that recognize both the social mission of UC2B and the need for business and technology independence. Much effort was spent acknowledging that the guiding principles provide a sound basis for the current and future status of the organization. In particular, there are references to openness and transparency, along with maintenance of the open access structure and level playing field for service providers.

Current Environment. The primary purpose of this Business and Strategic Plan is to provide financial modeling for further expansion of this network asset. These findings and recommendations contained in this plan are supported by the financial modeling workbook/tool also provided by NEO. If UC2B maintains the grant funded area only and does not expand the network further, the system will operate at breakeven, only as long as the University subsidizes the backhaul costs of internet service, i.e. purchases bandwidth on the internet. This scenario improves with the addition of revenue received from offering dark fiber leases during that period, but not to a level that is sustainable long term. The UI subsidy is provided via agreement only for the first 5 years of operation for UC2B, so the need exists to grow the customer base and expand the system, unless further public subsidy is going to be provided.

Executive Summary, cont'd



Triple Play or Internet Only? Many retail providers have relied upon triple play services to create a sustainable business plan. The telecommunications and entertainment industries have changed dramatically in the past five years, and this strategy of offering triple play services as a retail provider is no longer the only way to create a sustainable business plan. In fact, investing in a video headend and in VoIP equipment now may be a less desirable approach.

VoIP. With enhancements being made to cellular phones and the increasing mobility needs of customers today, more customers are opting for cell phone services over their landline phones. The number of adult Americans with a smartphone rose from 35% in April 2011 to 46% in February 2012. Smartphones have more advanced computing ability and connectivity than landline phones. Smartphones are now cameras, media players, video cameras, GPS navigation units, web browsers, and personal digital assistants.

Landline phone service is a product in decline. According to an April 2012 news report by RTT News, Financial Services, the telecommunications industry estimates about 1/3 of Americans have replaced their landline phone service in their homes with cell phones. The number of households in the United States that have only wireless phone service has jumped from about 18% in 2008 to almost 35% in 2011. It is predicted that only 30% of homes will retain their landline phones in another three years.

The FCC is recommending changing the Universal Service Fund, which helped subsidize the installation of networks to build landline phones, to subsidizing broadband services. The Universal Service Fund would no longer subsidize landline phone service, but would instead subsidize broadband or Internet services. **As it is projected that only 30% of the American population will have a landline phone by 2015; NEO is not recommending that UC2B invest in infrastructure to provide VoIP services.**

IPTV: Video and cable TV usage is dramatically changing too. The top 12 cable companies have all seen a dramatic decline in cable TV subscribers in the past twenty-four months. Former pay-TV subscribers are opting for lower-priced Internet streaming solutions, such as Netflix, Hulu and Amazon. The big three

channels (ABC, NBC and CBS), as well as most cable TV content is now offered online at no or very low cost depending upon the programming. As customers are becoming more Internet-savvy, more content is now offered online for free, and given the current context of the tough economic climate, when given a choice, customers are discontinuing their cable TV subscriptions in favor of Internet entertainment options.

The customer's experience in the world of TV is well established and expectations are deep-seated. Customers do not want to experience channel delay or service disruptions, which have been typical in most IPTV service roll-outs. Initiating an IPTV service must meet or exceed previous customer experience from cable or satellite companies. Market research shows that if these experiences are not impeccable, the customer is already predisposed to changing services should their expectations (or anybody else's in the household, for that matter) not be met.

Offering IPTV services is challenging and complex. Even for existing service providers or other utility providers that already have an operational team and systems in place, launching IPTV service is unlike providing any other service offering in the past. The complexity of the last-mile network infrastructure, i.e. the fiber from the curb to the premise, the Customer Premise Equipment configurations, the difficulties in establishing programming and distribution rights, competition among Fortune 500 companies, the complexity of the service offerings, coupled with the customer's established TV viewing expectations make offering IPTV services difficult at best.

Executive Summary, cont'd



It could take several years for UC2B to overcome or build up to the operational challenges of offering IPTV services. In several years, the number of subscribers choosing pay-TV services will be even lower than it is today. Given the decline in pay-TV subscriptions, the availability of content on the Internet for free and the fact that landline phone services is dramatically declining, the expected revenues from offering IPTV services is in flux. As the initial capital costs of IPTV services are extensive, NEO believes the best strategic plan involves partnering with existing IPTV and phone service providers.

Therefore, NEO is not recommending that UC2B offers IPTV or service on a retail basis, but rather; partner with, or lease access to, service providers that are already offering IPTV and VoIP services. The service providers would use the UC2B network to provide their services.

The initial grant includes construction for approximately 2,500 residential and 200 business customers. It does not make sense to build out a capital-intensive video headend for offering IPTV or video services for the grant-funded area. This would add an additional \$4.4 Million in initial capital expenses and \$850 in additional capital expense to light up a new IPTV customer. Operating expenses would also be significantly higher with IPTV services. This provides an environment where the UC2B network would not reach financial sustainability.

Several models for providing IPTV services and VoIP phone services are provided within the Business Plan. None of the models for directly providing retail IPTV and retail VoIP improve the financial viability of the project.

This creates a difficult challenge. How can UC2B expand the network without the recurring revenue of triple play services? Challenging as it may be, it can be done. NEO recommends offering Internet services on a retail and wholesale basis, and partnering with existing service providers for cable TV/IPTV and phone services.

Models for Expansion. NEO has provided several financial models where expansion of the network can create a more sustainable financial environment, and Gigabit Intranet and ultra-fast Internet services can be offered to the larger community. Expanding to the business and commercial community is logical. National studies show the number one criteria for a business re-location is the availability of ultra-fast broadband services. The expansion to the business community meets all of the financial feasibility objectives.


Expansion to the residential areas alone is difficult. Again, Fiber to the Premise networks are capital intensive. If UC2B can mitigate the risk of covering debt service by closely tying the outlay of capital to receiving revenues, the numbers can work. Other suggestions for improving the viability include having UC2B expand to the business community first, pre-sell subscriptions prior to construction, or have some of the construction costs absorbed through installation charges, or can reduce the initial capital outlay.

Offering wholesale services alone can also be difficult. However, offering wholesale services along with a retail strategy does work. The pricing models for wholesale services can be supportive of a financially stable plan.

The business plan and financial models provide insight into how and where expansion of the network can be financially sustainable and feasible.


Again, it should be noted, this plan is a "working" tool that is designed to assist UC2B and its member agencies in their decision-making capacities in the future. The plan includes a proprietary and working financial model that is based upon a set of key assumptions that should be considered when exploring expansion options.

Maintain the Grant Funded Area Only




Congratulations to UC2B for winning the grant. Having capital costs funded by the grant allows UC2B to offer extremely competitive pricing to the 11 census block areas; build out a robust fiber optic backbone network that can be leveraged for expansion; and offer Gigabit Intranet services to anchor institutions, businesses and residents. As the capital costs are funded by the grant, there is no high debt that needs to be serviced.

Fiber to the Business



This is logical. The business and financial model works well to further expand the grant funded network to businesses and commercial areas within Urbana -Champaign.


Fiber to the Residential Areas



Proceed cautiously. If UC2B decides to expand the existing grant-funded network to other residential areas, the business plan can work if UC2B charges monthly rates that are in the \$40-\$55 range, and/or if some of the capital costs may be re-captured by installation charges. The business plan works even better when UC2B pre-sells within a targeted area prior to building out. Once a pre-sell take rate of 40-50% is reached, then UC2B could begin construction of the network. This is a more efficient use of capital, tying receipt of revenue to outlay of capital.

Most successful FTTH networks are offering more services than Internet; and are bundling voice and cable/video services with high speed Internet. As the entry costs are extensive to build a video headend, and the manner in which cable TV use is changing, NEO does not recommend directly providing and offering cable TV services, but rather offer these services by partnering with existing service providers for IPTV and VoIP service offerings.

Wholesale Models




Again, be careful. There are many methods of offering wholesale services to service providers. Most FTTH Networks that are offering Layer 2 and 3 wholesale services; **only**; i.e. receiving a revenue share for voice, Internet and cable TV/video services, are not thriving. It would seem that the operational costs of offering wholesale versus retail services would be lower; however, this is not always the case.

Although serving the grant-funded area with Layer 2 and 3 wholesale services works because there is no debt to be serviced, expanding the network with this type of wholesale strategy should be done with caution. Operational costs are high; debt service is high and revenue capture is low. This is risky.

However, offering dark fiber leases and long term IRUs (Layer 1) is a great strategy and will minimize operational expenses. **Coupling wholesale services with retail services can work.** UC2B could pursue this strategy, as revenue capture is good, and operating expenses are not increased.

Wireless Overlay for Public Safety Applications



The existing network could be further used for wireless services for public safety applications. Although there is not much revenue capture for this application, the benefits of providing the wireless network to allow for fire, police and emergency services has great intrinsic value. There are tremendous grant opportunities available now and will be in the coming months to build out these networks.

SWOT Analysis: UC2B

Strengths

- ✓ Grant covers capital costs - No debt to service
- ✓ Community Anchor Tenant Institutions support this project
- ✓ Excellent investor partners
- ✓ Good potential partnership with Champaign Telephone to offer other services
- ✓ Good base of recurring revenue from long-term fiber IRUs, Maintenance Agreements
- ✓ Excellent fiber backbone footprint provides avenue for expansion
- ✓ Pent-up demand for services, (11) census block areas want and need high speed Internet services
- ✓ Reputation as a positive force and progressive entity within the community
- ✓ A GIGABIT NETWORK; no other competitor has this network capacity
- ✓ Gigabit connectivity for within the community (intranet)

Opportunities

- ✓ Expansion of Existing Fiber Footprint to Businesses: Expand to Businesses within the Champaign-Urbana area to increase revenue and provide an economic development engine to the community
- ✓ Expansion of Existing Fiber Footprint to Other Residential Areas: The existing network can be expanded to other residential areas if done properly. Pre-sell geographic service areas for efficient use of capital.
- ✓ Gig U: Possibility to use existing network to expand to other areas of the community and outsource operational issues to experienced network providers.
- ✓ Wireless Overlay for Public Safety: Possibility to use existing fiber network for a wireless overlay to be used for public safety purposes.

Weaknesses

- X No sales force to drive customer acquisition
- X Time is short on the grant period, need to sign up as many customers as possible. Time period put pressure on UC2B to get customers signed up and installed prior to formal processes in place.
- X Need to build customer care, support and billing from ground up (this could be a weakness and a strength)
- X Not yet run as an formal business unit with associated expectations and managed approaches to CAPX and OPX investment decisions
- X Current Operational Structure may be limiting for running and expanding the business

Threats

- X Competitive marketplace, Established single/double/triple play providers
- X Declining price trends regionally and nationally for fiber IRUs, dark fiber leases, Retail rates for both residential and business customer
- X Pressure to comply with existing ISPs needs and wants as it relates to UC2B
- X Operating at breakeven, no cash from operations to expand

U.S. and Global Industry Trends



- The U.S. has fallen behind in the global broadband speed race, and is currently ranked #30 behind a host of Asian and European countries. Average advertised U.S. download speed is 14.7 Mbps, but actual delivered speeds are typically less.
- Governments across the world are investing heavily in broadband infrastructure to enhance their ability to compete in the global marketplace and provide enhanced citizen services and public safety solutions. Although their investment has moved the U.S. from 1st to 30th in less than a 7-year period, investments by the U.S. federal government through the ARRA BTOP and BIP programs as well as strong FTTP efforts across the country by Verizon, AT&T and municipal/utility companies is allowing us to begin closing the gap and enhance the global competitiveness of our communities.
- Investment disparity, however, remains significant. To put it in perspective, the Australian Government dedicated \$43 billion for its national FTTP infrastructure (NBN) population in its drive to make Australia the new IT capital of the East. The U.S. government allocated \$7 billion for its infrastructure backbone upgrade (primarily middle mile transport) for a population over 10x the size of that in Australia.
- South Korea, France and Japan all offer between 50 Mbps to 100 Mbps to over 80% of the population. Metropolitan areas in the Netherlands, France, South Korea, Japan, China, Switzerland, Singapore and Germany offer 100 Mbps FTTP to large segments of the population, with businesses enjoying synchronous or symmetrical 100 Mbps to 10 Gbps services.
- The Urbana -Champaign area is far below U.S. averages (and 10x slower than leading global metro areas) for both download and upload speeds, with nearly 80% of the commercial establishments and residences having download speeds of less than 10 Mbps, and 90% having upload speeds of less than 2 Mbps.
- Both commercial and residential bandwidth consumption are doubling every year, as video, cloud computing, advanced storage solutions, telemedicine, telecommuting, video conferencing, etc., and there is no entity investing in replacing the aging greater Urbana -Champaign infrastructure with fiber except UC2B.
- **Deployment of an FTTP infrastructure presents the opportunity for the Champaign and Urbana to leapfrog competing communities across the country and cash in on the recent economic development opportunity to attract further corporate investment, jobs and quality of life for its citizenry.**

U.S. and Global Industry Trends, cont'd



Rapid growth in FTTP adoption for non-traditional providers (Non-ILEC/MSO)

- 35 % Take rates common among ILECs/MSOs
- 50% Take rates for non-traditional providers (municipalities, co-ops)
- 70% and greater take rates for Utility companies within 6 to 8 years of operations providing triple play
- Significant early penetration for broadband - 4.5% to 8% in first 6 months
- Long-term trends show video services necessary for early adoption and higher take rates, but the issue of HOW to deliver video services is in question
- Traditional cable TV delivery of video is becoming antiquated

Increased demand for network services and transparency

- Greater access to low cost physical and logical transport services
- Needs for more than physical transport
- Network services - enterprise WAN and access to cloud services
- Reliable and redundant Ethernet Services
- Reliable and redundant IP Transport and Services (Growing Needs for Value Added Networked IP Services)

Reliable, resilient, scalable and affordable Internet

- Big broadband is a significant difference
- Access to high quality voice and video delivery services
- Access to content service providers and cloud services
- Wireless mobility through IP based services

Residential growth

- Still driven by video content, roughly 70% of broadband adopters also buy video services from their broadband providers
- Over the top trends having some impact on video, but not yet ready for 'prime time'
- Voice service trends towards VoIP
- Integration of home area network and wireless services

Commercial growth

- Driven by available bandwidth/cost
- Availability of value added network services
- Connection to community and network assets
- Connection to alternative providers/services

Commercial Provider Trends

- Incumbents and MSOs are:
 - reliant on aging infrastructure that has slowed down investment in FTTP in most areas
 - trending towards higher cost for services to alternative providers and resellers
 - unwilling to overbuild other FTTP networks
- Alternative providers and resellers:
 - need reliable Ethernet and IP transport services
 - require advanced MPLS/QoS service delivery
 - require multi-carrier/facilities/service access
 - need local IP Service Exchange
 - reduced time to market

FTTP/B Infrastructure Trends

- Fiber to the curb deployments
- Preference for underground solutions even if at higher cost
- Fiber management solutions in the field
- Active electronics closer to the distribution centers
- Hybrid architecture (WDM/GPON/AE)
- Ethernet to the edge and IP transport at the head-end
- Carrier neutral Ethernet interconnection
- Internet head-end for ISPs/wireless providers
- Integration of Home Area Network solutions into service offering

FTTP/B Business Model Trends

- Movement away from wholesale infrastructure separation in small, mid-size and rural markets
- Movement towards hybrid (e.g., ISP – Internet/VoIP/Cloud Services) business services and partnerships
- Full vertical integration in small to mid-size market
- Hybrid wholesale/retail service offerings (e.g., Creating Friendly Competition)
- Taking more participative role in the sale/marketing of services (even with partners)

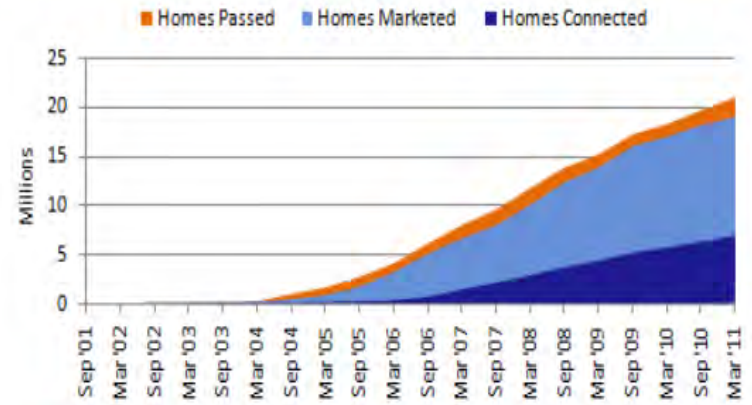
U.S. Fiber-to-the-Home (FTTP) Trends in Focus

As the figures on this page illustrate, the fiber-to-the-home market is one of the fastest growing trends in technology today here in the United States. Globally, the U.S. currently ranks 11th in terms of market penetration for FTTP, and has deployments occurring across the country in an effort to catch market leaders South Korea, Japan, Hong Kong, China and a host of European nations.

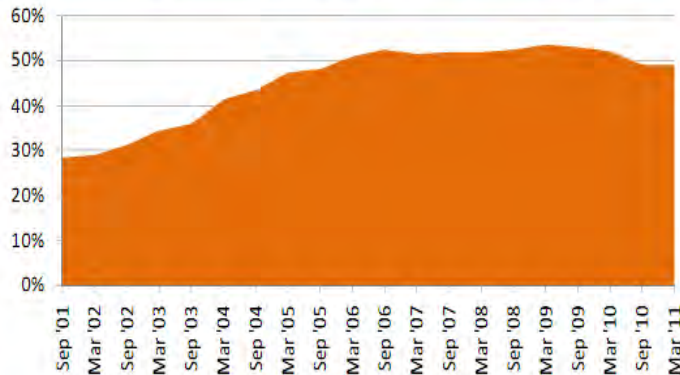
In the past 10 years the number of homes passed with fiber has grown from 19,000 in 2001 to nearly 20.9 million as of March 30, 2011. There is typically a lag between the time networks are constructed and when the actual marketing to consumers begins, and this is reflected in the gap between homes connected and homes passed. Take rates for non-Regional Bell Operating Companies (RBOC) for FTTP deployments have remained steady at nearly 50%, with the cumulative total homes connected (fully lit and using the service) passing 7 million as of March 30, 2011.

The U.S. has reached an important milestone with just over 18% of all homes passed of which 6% are connected. The market forecast for homes connected projects a doubling of that figure within 18 months as marketing efforts and markets deployed mature.

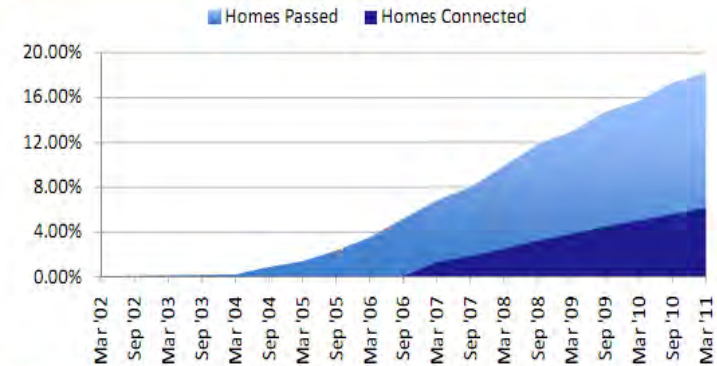
North American FTTH Homes Cumulative



FTTH Non RBOC Take Rates Homes Connected vs. Homes Marketed



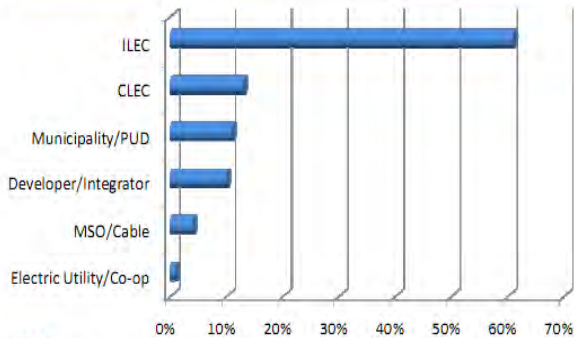
FTTH Penetration Cumulative – United States



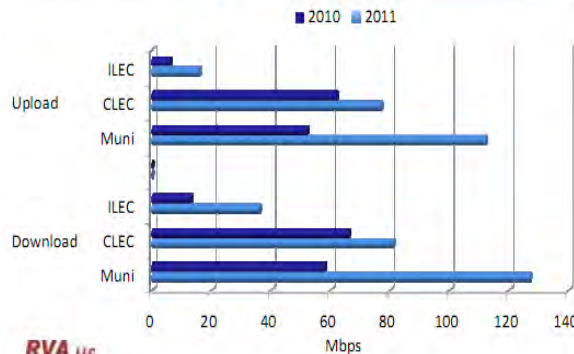
U.S. Fiber-to-the-Home Trends in Focus



FTTH Non RBOC Deployments by Provider Type



Highest Average Internet Speeds Offered by Non RBOC Provider Type

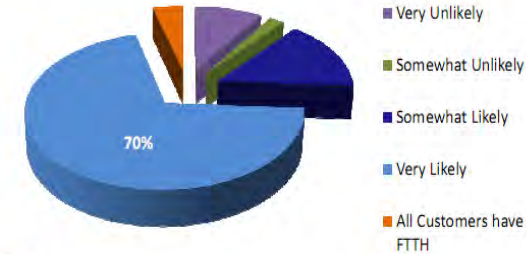


Although Verizon is the clear market leader in terms of FTTP deployments by a large margin, municipalities, public utility districts, electric utilities and local Competitive Local Exchange Carriers (CLECs) have been a major force in fiber deployments across the country, recently far outstripping the FTTP investments of cable companies. A survey of hundreds of non-Regional Bell Operating Companies (RBOC) across the nation revealed that this trend is likely to continue, with 70% indicating that investment in FTTP connectivity was very likely in the near future.

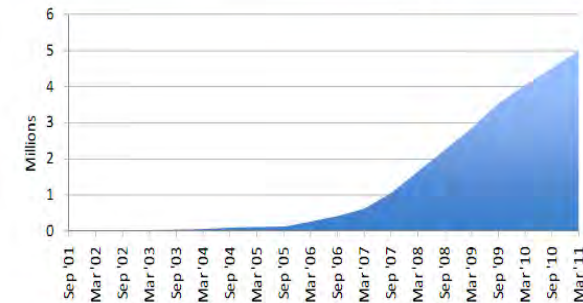
Non-RBOC providers are also among the most aggressive in terms of services offered. Double, Triple and Quadruple Plays (Internet, VoIP, Video, Energy Management) are the rule, with customer Internet connectivity speeds averaging 100 MB per second (upload and download) for municipalities and utilities.

Take rates for video are in sync with the take rates for Internet and VoIP services, with roughly 5 million of the 7 million homes lit by fiber receiving video services today. The vast majority of the remaining 2 million are being provided services by companies that are not offering video services currently. The bundling of packages, similar to that which occurs in the cable industry, is the dominant trend at this time. For video, HD and 3D channels are in high demand, and most providers offer 80 to 250 channels including premium channels and movies on-demand.

Likelihood of Adding FTTH Lines by Current Non RBOC FTTH Providers



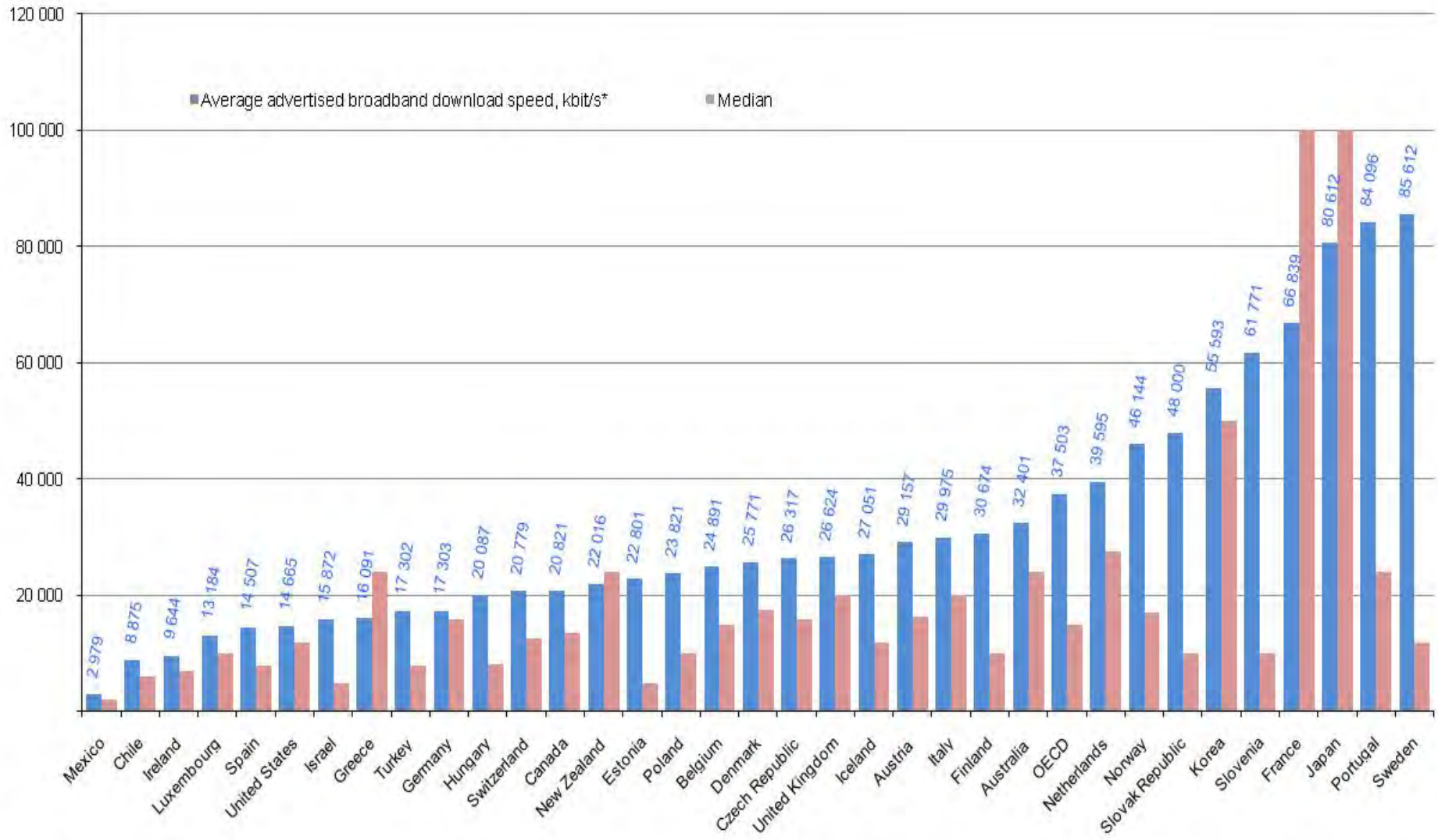
North American FTTH Video Homes Cumulative



NORTH AMERICAN FTTH STATUS (AS OF THE END OF THE FIRST QUARTER OF EACH YEAR)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Homes passed	35,700	110,000	189,000	1,619,500	4,089,000	8,003,000	11,763,000	15,170,900	18,249,900	20,914,500
Homes marketed	35,700	110,000	189,000	829,700	3,218,600	6,643,000	10,082,000	13,875,600	16,992,600	19,344,700
Homes connected	10,350	38,000	78,000	213,000	671,000	1,478,600	2,912,500	4,422,000	5,804,800	7,094,800

Global Trends in Focus



Bandwidth Trends, Conventional Models are under Pressure

tal	70 to 100 Mbps		12.5 to 354 Mbps +	4 to 84 Mbps +

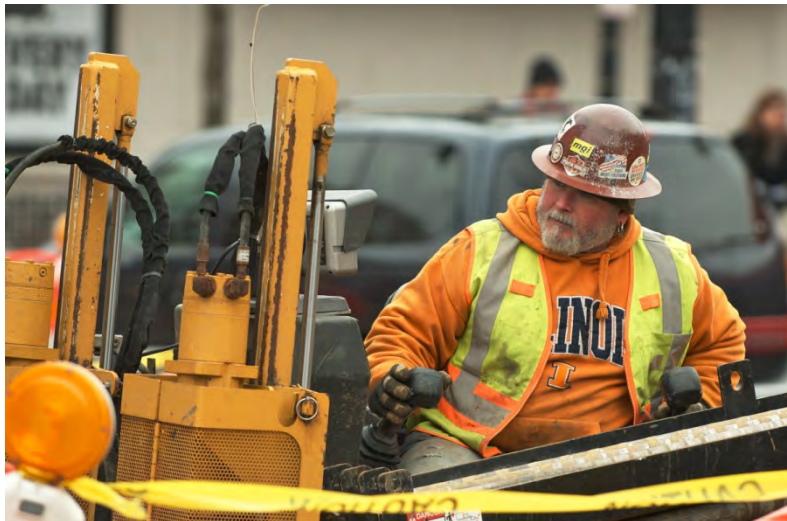


The Need for All Fiber Networks

There is a significant emergence of advanced, bandwidth-intensive applications that not only require large availability for download speeds, but also upload speeds as well. Customers are creating videos, pictures, and CAD files that need to be uploaded, requiring large bandwidth upload speeds.

In addition, over-the-top (OTT) TV applications, gaming and cloud-based services are driving up the need for available capacity and the move towards expanded two-way communications. These over-the-top frameworks are also increasing the need for attaching and sharing home/business access creating the need for greater two-way service access.

The Fiber to the Home Council, a non-profit organization whose mission is to promote and educate about the need for more Fiber to the Home connections, cites research concluding that consumer demand for symmetrical bandwidth, with the increasing use of applications such as cloud computing and a host of essential services in the areas of education and healthcare will "easily exceed 25 Mbps within just five years."





Urbana-
Champaign
Big Broadband

UC2B Business and Strategic Plan

Guiding
Principles

Guiding Principles

Creating the Core Value Proposition in Terms of Return on Investment (ROI)

UC2B is a community that has:

- A committed, cross-sector group of leaders that facilitate **sustainability** and **local ownership**
- A “digital climate” – an environment rich in **access options** and **awareness**
- Broad community **adoption** – citizens have the means and will to access broadband (training, devices, and motivation)
- Community **impact** – where broadband applications directly benefit the community
- A sense of place where **community assets** can help provide for the future economic success of our constituents.
- Long term **vision** with short term needs that must be met if it is to grow



Creating an Innovative Business Model

Guiding Principles



Work to develop an ***open carrier neutral and multi-stakeholder community network that aggregates and leverages community investments*** to increase availability, capacity, and value added services. This ***lowers overall total cost of ownership (TCO) while increasing the social value of the communities' investment***. In addition, the UC2B network approach can provide additional value to both the public and private sector by:

- **Improving Government Services** and **improving Health and Education** services;
- Helping communities leverage high speed broadband to prompt **economic development**;
- **Aggregating demand** across stakeholders and industries for **sharp collective cost reductions**;
- Leveraging the sharing of public and private assets and competencies (including phone, cable and utility) **to facilitate the delivery of the highest capacities and lower capital and operating costs**, while helping attract additional investment;
- **Providing an “Open” facilities based “Neutral Network”** that serves as a level playing field for all network and service providers for both physical and logical network services;
- Using and leveraging strong existing partnerships and agreements with key local, state and national providers **to rapidly deliver high capacity, best of breed solutions, for sharply lower costs**;
- **Leveraging the capital creation ability** of shared infrastructure and aggregating services to invest and advance the needs for broadband infrastructure throughout the region;
- Creating a community presence and civic social network via a community portal to **promote digital inclusion** for low income and other underserved populations.
- **Investing in the highest quality infrastructure available for community use.**

Creating an Innovative Business Model, cont'd

Guiding Principles



Leverage Public and Private Investment

Collaborative public and private investment will:

- necessitate a role for the government and community non-profit partnerships in part because benefits often accrue to society as a whole, while they are not an active part of the investment strategy of publicly-traded broadband providers;
- create community-driven strategies that invest in broadband infrastructure to meet the needs of the underserved micro-urban communities through collaborative multi-stakeholder investment;
- have the potential to contribute to long-term community broadband projects that impact economic growth based on cost savings and other benefits accrued to government, education, health and workforce programs;
- invest in the future of the community to attract and retain its youth and intellectual capital; and
- raise the standard of living and quality of life of all Champaign-Urbana citizens if the policies that promote adverse market inefficiencies are offset, and if efforts are made to expand infrastructure access.

Guiding Principles

The UC2B guiding principles are designed to help make technology accessible and invisible, removing all the barriers and providing support to our community and its stakeholders as needed.

UC2B's community objectives focus on scale, impact, and sustainability.



UC2B Guiding Principals – Social Mission

Open Network

- Capability to deliver technology and services based on articulated community need that creates equal opportunities between the community’s supply & demand
- Network design that interconnects and leverages local carriers, Internet service providers and cable companies, creating a level playing field for participation.
- Open and neutral exchange with open access to all community facilities and service providers
- UC2B will maintain a level playing field, and consistent with that, UC2B will charge the same fees to third party providers on the network that it charges to services that it provides, including retail FTTP services, unless it adopts a policy to do otherwise consistent with its guiding principles.
- Enable physical and virtual network operating partnerships to provide shared facilities, services and applications
- Co-Marketing Service Delivery
- Transparency in maintaining an open and neutral exchange requires that UC2B assess the financial position of each of its major market segments, and to facilitate that assessment, prepare profit and loss statements for its major market segments.
- Actively solicit and consider public input
- Provide transparency in operations, decisions, and documents to the full extent possible within sound business practices

Low Operating Cost

- Aligned as open solutions provider between stakeholders and network service providers to address social priorities and provide community driven solutions.

Trusted Advisory Services

- Capability to deliver technology and services based on articulated community need that translates into a Social Return on Investment
- Network to optimize economic development opportunities and provide revenues for the use of the Community Benefit Fund.
- Promote open transparency and community involvement and input when appropriate

Social Mission – Proven Community Partner

UC2B Guiding Principals – Social Mission

Social Mission – Proven Community Partner

Non-Traditional ROI

- Aligned as neutral partner between stakeholders and network service providers.
- Maximize Security for multi-use network
- Promotes digital inclusion for low income and underserved populations

- Represents the community
- Promotes public input
- Provides transparency except when required for sound business purposes

No Profit Motive

- Able to leverage donated and stakeholder investments to aggregate infrastructure and services for lower cost.
- Invest in Infrastructure that reduces long term operational expenses
- Maximize public interest, government, education, health care large institutional base for greater savings

Preservation of Invested Capital

- Ability to maximize, leverage and preserve stakeholder investment for the good of the community and individual stakeholder needs.
- Tiered technology solution that incorporates layered service and low cost upgrade of Dark Fiber, Dim Fiber/Wave services, Metro Ethernet Services and Fiber/Wireless Access Services
- Leverage existing community assets such as vertical structures, duct and conduit systems, rights-of-way, building collocations and licenses
- Design that reduces the cost of the last mile, provides multiple low cost approaches for end user access and leverages carrier interconnect for end user access
- Routes network infrastructure to emphasizes shared facilities, equipment and supports multi-use programs and applications

UC2B Guiding Principals – Business & Technology Independence



UC2B Guiding Principals – Business & Technology Independence	
<p>Infrastructure Diversity</p>	<ul style="list-style-type: none"> Ability to attract non-traditional investment, grants and loans through partnerships and traditional investment for community broadband development
<p>Redundancy & Reliability</p>	<ul style="list-style-type: none"> Community ownership and governance of shared network infrastructure Neutral third party aggregation partner capable of initiating, negotiating, and developing master service agreements directly with vendors and partners Independent vendor management
<p>Life Cycle Management</p>	<ul style="list-style-type: none"> Pre-sales, plan, design, provision, implement, asset management, monitor and manage, help desk, day-8 support Bandwidth scalability from small Business/Consumer Access (20-200 Mbps minimum service availability) to Commercial/Institutional Access (1 Gbps to greater than 10 Gbps service availability). Industry Standards/Protocols applied to a Consistent Physical Layer and Network Architecture Construction Standards
<p>Contract & Vendor Management</p>	<ul style="list-style-type: none"> Carrier Class engineering and service deployment with redundant/failover architecture that complements common carrier and cable provider networks to provide redundancy and survivability
<p>Alternative Forms of Capitalization</p>	<ul style="list-style-type: none"> Customized solutions across multiple technology, provider and service partners, emphasizing carrier and upstream diversity

Business & Technology Independence



Urbana-
Champaign
Big Broadband

UC2B Business and Strategic Plan

**Grant Funded
Fiber Network**

Summary of Findings, Grant-Funded Fiber Network

If UC2B maintains the grant funded area only, and does not expand the network further, the financial model shows that UC2B will operate at breakeven. In year 5 (2017), after the University no longer subsidizes the backhaul costs of Internet services, the financial models show UC2B operating at a loss.

NEO ran various financial models of the existing grant funded areas with assumptions of 20%, 30%, 40% and 50% take rates. As Gigabit fiber networks are capital intensive, the biggest risk that most fiber infrastructure organizations face is not having enough revenue, or high enough take rate percentages of customers passed, to service the debt and cover operating expenses.

In UC2B's case, the grant is paying for all capital costs, and this minimizes the risk to UC2B if the 50% take rate is not achieved. The revenues for the network will obviously be impacted, but much of UC2B's operating expenses are variable and depend upon the number of customers using the network.

The grant money will only fund the capital costs of the network build during the grant period. With this in mind, UC2B will need to continue to be aggressive in its marketing, sales, and customer installations to take full advantage of the NTIA funds, aiming for full achievement of the projected take rates.

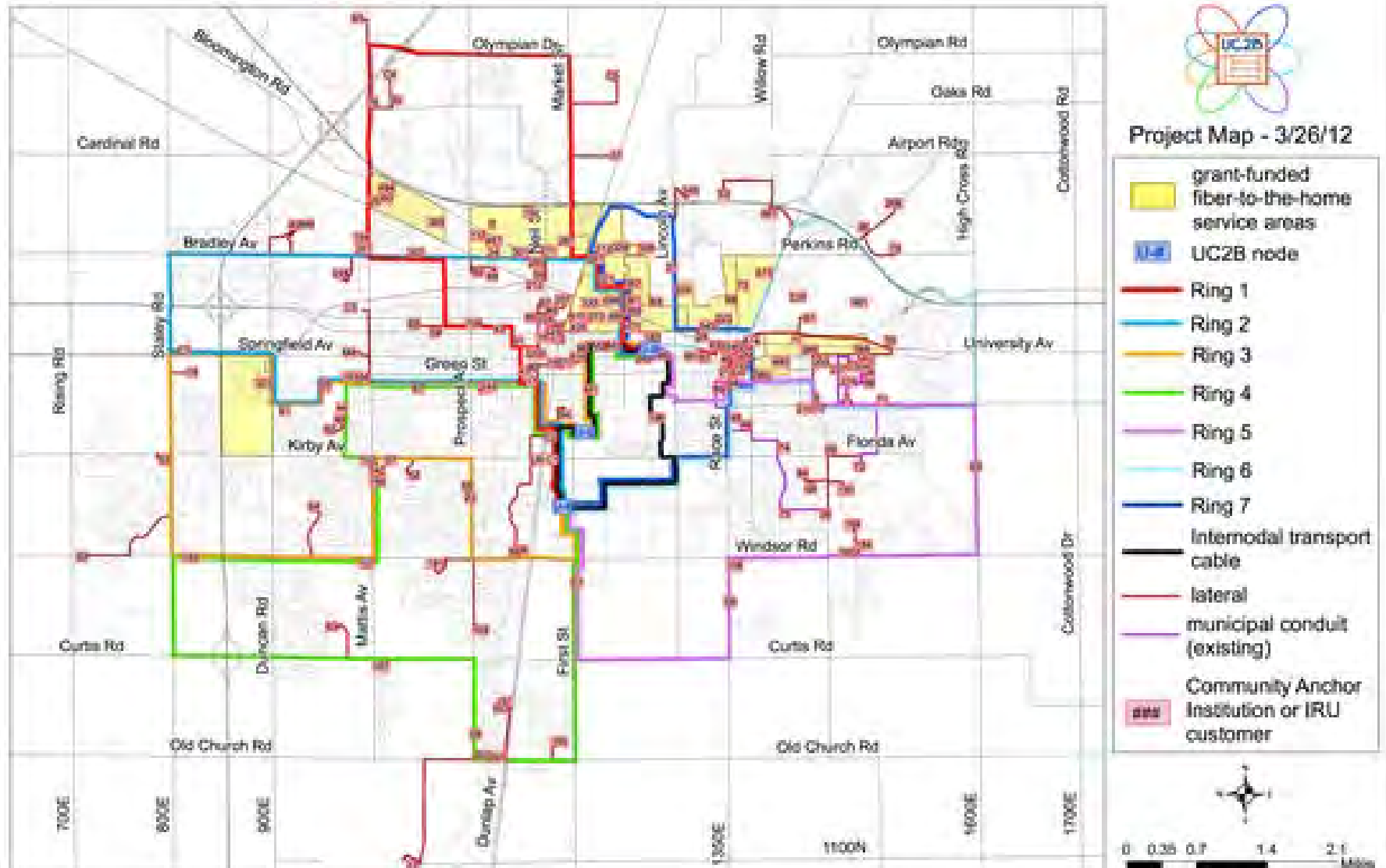
The financial model for the grant area could be improved dramatically by offering dark fiber leases to Internet Service Providers, businesses and Over-the-top (OTT) Service Providers. Based upon initial conversations with the local Internet Service Providers, this seems to be a product that UC2B could offer and they would want to buy.

The financial model for the grant-funded network was run with adding dark fiber leases and the results are contained within this Section.



Description of the Grant-Funded Project Area

Below is a map of the network including the fiber backbone rings and the grant-funded Fiber to the Premise service areas.



Objectives and Methodology



NEO Fiber was asked by UC2B to run various financial scenarios to determine the following:

1. What should the UC2B pricing for business/commercial, anchor, non-profit and residential customers be for the grant-funded FTTP areas and to Anchor Institutions in the entire community?
2. Verify whether or not the pricing proposed is financially feasible for the grant-funded FTTP areas and to the Anchor Institutions. Verify the assumptions originally submitted by UC2B during the Due Diligence process are realistic.
3. Could UC2B extend the network beyond the grant-funded FTTP neighborhoods and businesses, and how? NEO was asked to provide financial models for extending the network for residential areas, business and commercial subscribers and to look into various Wholesale Models.
4. What would it cost to use the network to support public sector wireless applications?

UC2B had a fairly sophisticated financial model that was created and submitted to NTIA for the Due Diligence process. Rather than recreate the proverbial “wheel,” NEO Fiber took this model and stripped away future and projected installation, revenue and capital costs occurring after the grant period. This created a Base Model from which to build upon various financial scenarios on how to further expand the UC2B’s grant-funded FTTP network. NEO also expanded each spreadsheet to include projections for ten years, as the initial model only included financial projections for the first five years.

An additional worksheet was added to the Base Model to include one page with all of the Key Assumptions. This allowed NEO to make changes to the model easily to see what outcomes would occur. All of the existing spreadsheets were linked to the Key Assumptions page.

The Base Model assumptions were also verified and updated based upon the network topology and system design, the current competitive environment for pricing, and the projected operating and capital expenses made. Requests for Proposals were received for Outsourcing the Customer Service Call Center and for Billing and Collection services. Actual costs quoted are reflected in the financial model.

For the financial models that project various scenarios for expansion, an additional worksheet named “Financing and Feasibility” was created with tools to assist UC2B in the decision to expand and whether or not certain feasibility metrics could be achieved.

Residential Revenue Assumptions, Grant-Funded Fiber Network

Key revenue assumptions that were made for this financial scenario are the following:

Residential and Anchor Institution Pricing	
UC2B 20/20Internet CNS	\$19.99
UC2B 30/30Internet CNS	\$29.99
UC2B 40/40Internet CNS	\$39.79
Service #4	\$0.00
Service #5	\$0.00
Installation Fee	\$0.00

Residential Revenue "Mix"	Percentage of Customers taking that service
20/20	98%
30/30	1%
40/40	1%
Service #4	0%
Service #5	0%
	100%

Customers Passed and Take Rate Percentages	
Total Customers Passed	4650
Total Customers Passed, Grant Funded	4650
New Customers Passed, Non-Grant, Year 3	0
Take Rate after 1 year	0%
Take Rate after 2 years	0%
Take Rate after 3 years	52%
Take Rate after 4 years	52%
Take Rate after 5 years	52%
Annual Growth Rate Years 6 through 10	0%

		Year Three, 2012			
		Q1	Q2	Q3	Q4
New Customers, Take Rate Projections for Residential		1/1/12 thru 3/31/12	4/1/12 thru 6/30/12	7/1/12 thru 9/30/12	10/1/12 thru 12/31/12
	Total New Customers	0	0	1440	960
	Total Cumulative Customers	0	0	1440	2400
	Take Rate Percentage	0	0%	31%	52%

Business Revenue Assumptions, Grant-Funded Fiber Network

No additional revenue is assumed for new business customers after the end of 2012. No additional revenue is assumed for wholesale customers, other than the IRUs that were committed for the original investors in UC2B.

Business/Commercial Pricing		Business and Commercial Revenue "Mix"	Percentage of Customers taking that service
UC2B 20/20Internet CNS	\$54.99	UC2B 20/20Internet CNS	50%
UC2B 40/40Internet CNS	\$94.99	UC2B 40/40Internet CNS	25%
UC2B 60/60Internet CNS	\$133.99	UC2B 60/60Internet CNS	1%
UC2B 80/80Internet CNS	\$172.99	UC2B 80/80Internet CNS	1%
UC2B 100/100Internet CNS	\$212.99	UC2B 100/100Internet CNS	
Private VLAN 10 Mbps	\$100.00	Private VLAN 10 Mbps	20%
Private VLAN 100 Mbps	\$400.00	Private VLAN 100 Mbps	3%
Private VLAN 1 Gbps	\$1,200.00	Private VLAN 1 Gbps	0%
Installation Fee	\$0.00		100%

Business Customers Passed and Take Rate Percentages	
Total Customers Passed	200
Total Customers Passed, Grant Funded	200
New Customers Passed, Non-Grant, Year 3	0
Take Rate after 1 year	0%
Take Rate after 2 years	53%
Take Rate after 3 years	53%
Take Rate after 4 years	53%
Take Rate after 5 years	53%
Annual Growth Rate Years 6 through 10	0%

		Year Three, 2012			
		Q1	Q2	Q3	Q4
New Customers, Take Rate Projections for Business and Commercial		1/1/12 thru 3/31/12	4/1/12 thru 6/30/12	7/1/12 thru 9/30/12	10/1/12 thru 12/31/12
	Total New Customers	0	25	40	40
	Total Cumulative Customers	0	25	65	105
	Take Rate	0%	13%	33%	53%

Operating Revenue and Expense Assumptions, Grant-Funded Fiber Network

The following operating assumptions were used for the financial model:

Other Revenue Assumptions

- Internet services only
- No additional revenue for voice, cable TV or wholesale services, Universal Service Fund, Long Distance Voice services
- No installation service revenue. Installation costs of equipment and labor is provided for by the grant.
- Tax Revenue of 6%
- UI subsidizes the cost of the 1 Gbps Internet Connection and an in-kind contribution of 1 Gbps Internet Transport Fees
- Uncollectable Revenues of 2% of Gross Sales



Operating Expense Assumptions

- While the UI is subsidizing the cost of the 1 Gbps Internet Connection and the 1 Gbps Internet Transport fees, additional backhaul costs will be incurred as more subscribers are on the network.
- JULIE fiber locates for the fiber ring costs of \$75,000 for Year 3 and \$150,000 for years after
- JULIE fiber locates of block groups of \$35,000 for Year 2, \$80,000 for Year 3, and \$90,000 for years after
- JULIE Locates and Network Maintenance account for approximately 35% of the operating expenses
- A Director or General Manager is hired in early 2013; (2) Network Engineers will be hired in last quarter of 2012. A 3% increase in salary and benefits is realized each year for both positions.
- The University will pay for the Network Engineers salaries and benefits from 2012 through 2014.
- UC2B outsources its customer service; a competitive bid process resulted in costs per customer varying from \$3 per customer to \$8 per customer. This varies based upon the number of calls received by the Outsourced Customer Service Center, the length of calls and the nature of the calls. As UC2B is a new entity with no statistics on call volumes or history of length of calls, etc. it is difficult to pinpoint what the actual costs will be. For purposes of the financial plan, a \$5 per customer cost is assumed.
- UIUC Telecommunication Node Power cost of \$15,000 - \$21,000 annually.
- Rental space cost of \$12,000 annually.
- Churn rate of 5%.
- Billing cost assumption was \$.50 per month per customer. UC2B will email invoices to customers; as there is no cost for postage, this seems to be a conservative cost assumption.
- Tax expense of 6% of gross sales. This is a pass-through expense.
- Community benefit fund expense of 5% of gross sales.

Capital Cost Assumptions, Grant-Funded Fiber Network

NTIA's program is very stringent upon how and when the grant money is spent. The capital costs assumptions were based upon what was submitted to NTIA for the grant process.

20 Year Depreciation	1	2	3
Outside Plant	\$ 144,944	\$ 2,610,570	\$ 19,476,682
			\$ -
Other Upfront Costs			
Staff Resources	\$ 8,993	\$ -	\$ 14,207
Land, structures, right-of-ways	\$ -	\$ -	\$ 23,200
Architectural and engineering fees	\$ -	\$ 1,000,000	\$ 802,479
Other Architectural and Engineering Fees	\$ -	\$ 402,981	\$ 339,490
Project inspection fees	\$ -	\$ -	\$ 783,992
Site work	\$ -	\$ 33,500	\$ -
Demolition and removal	\$ -	\$ 74,880	\$ -
Miscellaneous	\$ -	\$ 76,999	\$ 1,116
Discount (ENTER AS A NEGATIVE NUMBER)			\$ -
Sub-Total	\$ 153,937	\$ 4,198,930	\$ 21,441,166

5 Year Depreciation capital costs of approximately \$3.5 Million including the costs for Network and Access Equipment (Switching, Routing, Transport and Access Equipment), BSS and OSS Systems, Design and Application Consulting Services, permits, CPE Equipment and Routers, In-Building Wiring and ONTs.

Grant-Funded Area: 50% Take Rate, Retail Internet Services

Income Statement										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues										
Network Services Revenues:										
Local Voice Service	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Broadband Data	-	-	290,400	705,200	705,200	705,400	705,400	705,400	705,400	705,400
Video Services	-	-	-	-	-	-	-	-	-	-
Network Access Service Revenues	-	-	73,200	146,400	146,400	146,400	146,400	146,400	146,400	146,400
Universal Service Fund	-	-	-	-	-	-	-	-	-	-
Toll Service/Long Distance Voice	-	-	-	-	-	-	-	-	-	-
Installation Revenues	-	-	-	-	-	-	-	-	-	-
Other Operating Revenues	-	-	-	-	-	-	-	-	-	-
BTOP Grant	101,259	2,452,559	19,980,958	-	-	-	-	-	-	-
Matching Contributions	52,678	1,891,315	4,908,156	-	-	-	-	-	-	-
Tax Revenue	-	-	21,800	51,100	51,100	51,100	51,100	51,100	51,100	51,100
Donation from UI (cash and in-kind)	-	-	51,000	102,000	102,000	102,000	102,000	51,000	-	-
Donation from UI (salary)	-	-	85,000	175,100	180,400	-	-	-	-	-
Uncollectible Revenues	-	-	(7,300)	(17,000)	(17,000)	(17,000)	(17,000)	(17,000)	(17,000)	(17,000)
Total Revenues	\$ 153,937	\$ 4,343,874	\$ 25,403,214	\$ 1,162,800	\$ 1,168,100	\$ 987,900	\$ 987,900	\$ 936,900	\$ 885,900	\$ 885,900
Expenses										
Backhaul	\$ -	\$ -	\$ 82,500	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000
Network Maintenance/Monitoring	\$ -	\$ 35,000	\$ 240,000	\$ 415,100	\$ 420,400	\$ 425,800	\$ 431,400	\$ 437,100	\$ 443,000	\$ 449,100
Utilities	\$ -	\$ 12,000	\$ 15,000	\$ 18,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000
Leasing	\$ -	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000
Sales/Marketing	\$ -	\$ -	\$ 7,300	\$ 17,000	\$ 17,000	\$ 17,000	\$ 17,000	\$ 17,000	\$ 17,000	\$ 17,000
Customer Care	\$ -	\$ -	\$ 60,800	\$ 150,900	\$ 150,900	\$ 150,900	\$ 150,900	\$ 150,900	\$ 150,900	\$ 150,900
Billing	\$ -	\$ -	\$ 6,100	\$ 15,100	\$ 15,100	\$ 15,100	\$ 15,100	\$ 15,100	\$ 15,100	\$ 15,100
Corporate G&A	\$ -	\$ -	\$ 37,200	\$ 117,400	\$ 120,500	\$ 123,700	\$ 127,000	\$ 130,400	\$ 133,900	\$ 137,500
ROW Access Fees	\$ -	\$ -	\$ 21,800	\$ 51,100	\$ 51,100	\$ 51,100	\$ 51,100	\$ 51,100	\$ 51,100	\$ 51,100
Community Benefit Fund	\$ -	\$ -	\$ 17,815	\$ 41,730	\$ 41,730	\$ 41,740	\$ 41,740	\$ 41,740	\$ 41,740	\$ 41,740
Total	\$ -	\$ 59,000	\$ 500,515	\$ 1,024,330	\$ 1,035,730	\$ 1,044,340	\$ 1,053,240	\$ 1,062,340	\$ 1,071,740	\$ 1,081,440
EBITDA	\$ 153,937	\$ 4,284,874	\$ 24,902,699	\$ 138,470	\$ 132,370	\$ (56,440)	\$ (65,340)	\$ (125,440)	\$ (185,840)	\$ (195,540)

Improve the Financial Projections with Dark Fiber Leases

As stated previously, the financial model for the grant area could be improved dramatically by offering dark fiber leases to Internet Service Providers, businesses and Over-the-top (OTT) Service Providers. Based upon initial conversations with the local Internet Service Providers, this seems to be a product that UC2B could offer and they would want to buy. NEO made very conservative projections, assuming (2) providers signed up for (7) rings each of dark fiber leases in the last quarter of 2012.

For simplicity, it was assumed that the average fiber ring monthly price was \$550. The approved pricing range for the various fiber rings are between \$300 - \$792. The mileage for each of the backbone rings varies slightly, and therefore, the pricing will also vary slightly.

Backbone			With the \$25 Maintenance Fee Included with the \$9.90 Usage Charge		
Rings	Route Miles	\$9.90	Rings	Route Miles	\$34.90
1	16.41	\$162	1	16.41	\$573
1A	7.08	\$70	1A	7.08	\$247
1B	14.06	\$139	1B	14.06	\$491
2	16.82	\$167	2	16.82	\$587
3	19.97	\$198	3	19.97	\$697
3A	8.60	\$85	3A	8.60	\$300
4	22.70	\$225	4	22.70	\$792
5	15.98	\$158	5	15.98	\$558
6	15.29	\$151	6	15.29	\$534
6A	15.98	\$158	6A	15.98	\$558
7	11.57	\$115	7	11.57	\$404
7A	14.95	\$148	7A	14.95	\$522
Total for All Rings		\$1,776	Total for All Rings		\$6,261

In all likelihood, most Internet Service Providers or OTT providers would want to offer their product to the entire community, and therefore, all of backbone rings would be leased.

Offering Dark Fiber Monthly Leases dramatically improves the financial projections.

Grant-Funded Area: Improve the Plan with Dark Fiber Leases

Income Statement										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues										
Network Services Revenues:										
Local Voice Service	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Broadband Data	-	-	313,500	797,600	890,000	962,800	962,800	962,800	962,800	1,009,000
Video Services	-	-	-	-	-	-	-	-	-	-
Network Access Service Revenues	-	-	73,200	146,400	146,400	146,400	146,400	146,400	146,400	146,400
Universal Service Fund	-	-	-	-	-	-	-	-	-	-
Toll Service/Long Distance Voice	-	-	-	-	-	-	-	-	-	-
Installation Revenues	-	-	1,000	-	1,000	2,500	-	-	-	500
Other Operating Revenues	-	-	-	-	-	-	-	-	-	-
BTOP Grant	101,259	2,452,559	19,980,958	-	-	-	-	-	-	-
Matching Contributions	52,678	1,891,315	4,908,156	-	-	-	-	-	-	-
Tax Revenue	-	-	23,200	56,600	62,200	66,600	66,600	66,600	66,600	69,300
Donation from UI (cash and in-kind)	-	-	51,000	102,000	102,000	102,000	102,000	51,000	-	-
Donation from UI (salary)	-	-	85,000	175,100	180,400	-	-	-	-	-
Uncollectible Revenues	-	-	(7,700)	(18,900)	(20,700)	(22,200)	(22,200)	(22,200)	(22,200)	(23,100)
Total Revenues	\$ 153,937	\$ 4,343,874	\$ 25,428,314	\$ 1,258,800	\$ 1,361,300	\$ 1,258,100	\$ 1,255,600	\$ 1,204,600	\$ 1,153,600	\$ 1,202,100
Expenses										
Backhaul	\$ -	\$ -	\$ 82,500	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000
Network Maintenance/Monitoring	\$ -	\$ 35,000	\$ 240,000	\$ 415,100	\$ 420,400	\$ 425,800	\$ 431,400	\$ 437,100	\$ 443,000	\$ 449,100
Utilities	\$ -	\$ 12,000	\$ 15,000	\$ 18,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000
Leasing	\$ -	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000
Sales/Marketing	\$ -	\$ -	\$ 7,700	\$ 18,900	\$ 20,700	\$ 22,200	\$ 22,200	\$ 22,200	\$ 22,200	\$ 23,100
Customer Care	\$ -	\$ -	\$ 60,900	\$ 151,000	\$ 151,100	\$ 151,400	\$ 151,400	\$ 151,400	\$ 151,400	\$ 151,500
Billing	\$ -	\$ -	\$ 6,100	\$ 15,100	\$ 15,100	\$ 15,100	\$ 15,100	\$ 15,100	\$ 15,100	\$ 15,200
Corporate G&A	\$ -	\$ -	\$ 37,200	\$ 117,400	\$ 120,500	\$ 123,700	\$ 127,000	\$ 130,400	\$ 133,900	\$ 137,500
ROW Access Fees	\$ -	\$ -	\$ 23,200	\$ 56,600	\$ 62,200	\$ 66,600	\$ 66,600	\$ 66,600	\$ 66,600	\$ 69,300
Community Benefit Fund	\$ -	\$ -	\$ 19,000	\$ 46,255	\$ 50,835	\$ 54,475	\$ 54,350	\$ 54,350	\$ 54,350	\$ 56,640
Total	\$ -	\$ 59,000	\$ 503,600	\$ 1,036,355	\$ 1,059,835	\$ 1,078,275	\$ 1,087,050	\$ 1,096,150	\$ 1,105,550	\$ 1,121,340
EBITDA	\$ 153,937	\$ 4,284,874	\$ 24,924,714	\$ 222,445	\$ 301,465	\$ 179,825	\$ 168,550	\$ 108,450	\$ 48,050	\$ 80,760



Urbana-
Champaign
Big Broadband

UC2B Business and Strategic Plan

Expansion of Fiber
Network

Business

Summary of Findings, Fiber to the Businesses

NEO has provided several financial models where expansion of the network can create a more sustainable financial environment and Gigabit Intranet and ultra-fast Internet services can be offered to the larger community.

Expanding to the business and commercial community seems to be logical. National studies show the number one criteria for a business re-location is the availability of ultra-fast broadband services. The expansion to the business community meets all of the financial feasibility objectives.

Two scenarios were run with expanding to the business areas. The first assumes the pricing that was approved by the Policy Board during the grant construction. The second scenario makes the assumption that the pricing for businesses would be increased.

The financials for offering pricing to businesses at the higher price are more favorable. For both scenarios, NEO assumed a 40% take rate percentage under both models occurring in year 4, and then an additional 5% take rate in year 5, and 3% growth from years 6 through 10.

In the model where the existing business pricing that is being used for the grant funded areas are further provided (meaning the pricing stays the same as it is today), there is positive EBITDA (Earnings before Interest, Taxes, Depreciation and Amortization), and there is enough EBITDA to cover the interest on the new debt. There is negative Net Income with the Depreciation and Amortization expense in 2013, 2014, 2015 and 2016. IRR is 42%, which is a very healthy return on investment.

The model to expand to businesses and increase the pricing to what is comparable in the marketplace from other providers, was also run. The second scenarios showing the increase in pricing resulted in an even stronger financial picture. IRR is 114% (up 66% from previous model), a very healthy return on investment and all financial feasibility objectives were met.

Expansion Models, Feasibility Objectives

Every entity, whether it is a business, or a non-profit organization, or a government agency, will have a different set of financial objectives for defining what is “feasible” in order to assist the organization in making financial decisions. These decisions may be to seek financing to further expand the network, to roll out new products, etc. For example, a typical business may need to see an unleveraged IRR of 30% or greater in order to obtain financing to further extend the FTTP network. Without an IRR of 30% or greater, the business may have trouble getting financing approved by a banking institution or an investor. Being a governmental consortium, in order to meet its goals, UC2B may not need to see an IRR of 30%; but rather simply a positive IRR.

UC2B’s set of financial objectives to meet the “feasibility test” may be vastly different than a private sector business. During its engagement with UC2B, NEO recommended various feasibility objectives to be considered that were typical for an entity to use as decision tools to expand or further invest in infrastructure. The Policy Board gave NEO the direction of the following feasibility objectives to be considered:

- 1. Debt Service Constant on Outstanding Debt.** The Debt Service Constant calculates the factor that, multiplied by the original loan principal, yields the annual debt service payment (principal plus interest) required to amortize a loan. NEO provided a Debt Service Constant on Outstanding Debt with Net Operating Cash flows that ask the questions, “Can Net Operating Cash flows cover the payment of principal plus interest on the outstanding debt? And what percentage of Net Operating Cash flows can service the debt?” When this formula is over 200 percent, there is a likely opportunity to refinance; or use the collateral of the network and the collateral of the Net Operating Cash flows to further expand the network. As a litmus test, it is desirable to see if the network is “financeable” with this Debt Service Constant on Outstanding Debt calculation of greater than 200 percent within the first 4-5 years.
- 2. Cumulative Cash flows of the Network over 10 years are greater than the Debt Service.** This objective provides that UC2B will be able to cover its Debt Service by the operating cash flows generated from the network, if UC2B decides to expand the network beyond the grant coverage area.
- 3. Positive Income.** Income from operations covers interest and taxes. As depreciation and amortization are not subject to cashflow, NEO left these out of the assumptions. This objective allows UC2B to seek debt financing, if it decides to expand the network beyond the grant coverage areas, and have operating income cover interest and tax expenses. This objective meets UC2B’s goal of expanding the network without public financial support.
- 4. Positive IRR.** UC2B may simply need to see a positive return on the investment.

Expansion Models, Assumptions

Under all of the expansion models, it was assumed that a subsidy would be in place; whereby the (11) residential census block areas that were funded by the grant activities, would continue to receive the \$19.99 pricing.

It was also assumed that UC2B would improve the grant-funded model by offering Dark Fiber Leases.

From this, various expansion models and scenarios were run. The models have been built to allow UC2B to continue to work with various assumptions on pricing, take rates, number of customers passed, as well as all operating and capital cost assumptions. The financial models are meant to be a tool that UC2B will continue to use.

For purposes of this report, most of the capital costs contemplated under various expansion models are assumed to occur in year 2014; and it is assumed that 100% of the expansion build would take place within that year. In reality, UC2B may want to expand more gradually, building out neighborhoods or areas at a time. Capital costs of \$1,000 for the outside plant per business passed and \$635 per customer in access, routing, transport and switching expenses and \$250 in design and consulting fees per business passed were assumed. Capital costs of \$250 for in-building wiring, \$750 in engineering and construction of the drop cable and materials, and \$389 per ONT for each business lit. These are conservative assumptions.



Scenario 2, Expand Fiber to the Business

According to the 2010 Census, there are approximately 7,678 businesses in the Champaign-Urbana area. NEO assumed that 200 of these businesses were passed with the construction activities from the grant, leaving 7,478 businesses to be addressed. Most of the businesses in the grant-funded area would be eligible to receive the residential pricing. Two scenarios were run with expanding to the business areas. The first assumes the pricing that was approved by the Policy Board during the grant construction. The second scenario makes the assumption that the pricing for businesses would be increased.

	Business Pricing	Business Pricing for the Grant	Business Pricing
	UC2B 20/20Internet CNS	\$ 54.99	\$114.80
	UC2B 40/40Internet CNS	\$ 94.99	\$213.80
	UC2B 60/60Internet CNS	\$ 133.99	\$312.60
	UC2B 80/80Internet CNS	\$ 172.99	\$411.00
	UC2B 100/100Internet CNS	\$ 212.99	\$509.00
	Private VLAN 10 Mbps	\$ 100.00	\$100.00
	Private VLAN 100 Mbps	\$ 400.00	\$400.00
	Private VLAN 1 Gbps	\$ 1,200.00	\$1,200.00
	Installation Fee	\$ -	\$ -

The financials for offering pricing to businesses at the higher price are more favorable. NEO assumed a 40% take rate percentage under both models occurring in year 4, and then an additional 5% take rate in year 5, and 3% growth from years 6 through 10.

Expansion Model, starting in Year 4, Additional Business Customers Pass and Take Rate Percentages	
Total Customers Passed in Expansion Area Only	7478
Take Rate, Expansion Area, Year 4	40%
Take Rate Expansion Area, Year 5	45%
Annual Growth Rate Years 6 through 10	3%

Expansion Model: Income Statement, Fiber to the Business, Grant-Funded Pricing

Income Statement										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues										
Network Services Revenues:										
Local Voice Service	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Broadband Data	-	-	601,300	3,466,800	4,977,100	5,364,000	5,602,200	5,840,400	6,078,600	6,316,700
Video Services	-	-	-	-	-	-	-	-	-	-
Network Access Service Revenues	-	-	73,200	146,400	146,400	146,400	146,400	146,400	146,400	146,400
Universal Service Fund	-	-	-	-	-	-	-	-	-	-
Toll Service/Long Distance Voice	-	-	-	-	-	-	-	-	-	-
Installation Revenues	-	-	361,800	-	1,000	-	-	-	-	-
Other Operating Revenues	-	-	-	-	-	-	-	-	-	-
BTOP Grant	101,259	2,452,559	19,980,958	-	-	-	-	-	-	-
Matching Contributions	52,678	1,891,315	4,908,156	-	-	-	-	-	-	-
Tax Revenue	-	-	40,500	216,800	307,400	330,600	344,900	359,200	373,500	387,800
Donation from UI (cash and in-kind)	-	-	51,000	102,000	102,000	102,000	102,000	51,000	-	-
Donation from UI (salary)	-	-	85,000	175,100	180,400	-	-	-	-	-
Uncollectible Revenues	-	-	(13,500)	(72,300)	(102,500)	(110,200)	(115,000)	(119,700)	(124,500)	(129,300)
Total Revenues	\$ 153,937	\$ 4,343,874	\$ 26,088,414	\$ 4,034,800	\$ 5,611,800	\$ 5,832,800	\$ 6,080,500	\$ 6,277,300	\$ 6,474,000	\$ 6,721,600
Expenses										
Backhaul	\$ -	\$ -	\$ 82,500	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000
Network Maintenance/Monitoring	\$ -	\$ 35,000	\$ 240,000	\$ 415,100	\$ 420,400	\$ 425,800	\$ 431,400	\$ 437,100	\$ 443,000	\$ 449,100
Utilities	\$ 6,000	\$ 12,000	\$ 15,000	\$ 18,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000
Leasing	\$ 6,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000
Sales/Marketing	\$ -	\$ -	\$ 13,500	\$ 72,300	\$ 102,500	\$ 110,200	\$ 115,000	\$ 119,700	\$ 124,500	\$ 129,300
Customer Care	\$ -	\$ -	\$ 60,900	\$ 263,600	\$ 345,500	\$ 367,700	\$ 381,400	\$ 395,100	\$ 408,800	\$ 422,500
Billing	\$ -	\$ -	\$ 6,100	\$ 26,400	\$ 34,600	\$ 36,800	\$ 38,100	\$ 39,500	\$ 40,900	\$ 42,200
Corporate G&A	\$ -	\$ -	\$ 37,200	\$ 117,400	\$ 120,500	\$ 123,700	\$ 127,000	\$ 130,400	\$ 133,900	\$ 137,500
ROW Access Fees	\$ -	\$ -	\$ 40,500	\$ 216,800	\$ 307,400	\$ 330,600	\$ 344,900	\$ 359,200	\$ 373,500	\$ 387,800
Subsidy of Grant Area (Pricing stays at \$20)	\$ -	\$ -	\$ -	\$ 467,712	\$ 467,712	\$ 467,712	\$ 467,712	\$ 467,712	\$ 467,712	\$ 467,712
Community Benefit Fund	\$ -	\$ -	\$ 33,100	\$ 177,045	\$ 251,100	\$ 270,010	\$ 281,680	\$ 293,355	\$ 305,025	\$ 316,690
Total	\$ 12,000	\$ 59,000	\$ 540,800	\$ 1,972,357	\$ 2,268,712	\$ 2,351,522	\$ 2,406,192	\$ 2,461,067	\$ 2,516,337	\$ 2,571,802
EBITDA	\$ 141,937	\$ 4,284,874	\$ 25,547,614	\$ 2,062,443	\$ 3,343,088	\$ 3,481,278	\$ 3,674,308	\$ 3,816,233	\$ 3,957,663	\$ 4,149,798

Expansion Model: Income Statement, Fiber to the Business, Grant-Funded Pricing

EBITDA	\$ 141,937	\$ 4,284,874	\$ 25,547,614	\$ 2,062,443	\$ 3,343,088	\$ 3,481,278	\$ 3,674,308	\$ 3,816,233	\$ 3,957,663	\$ 4,149,798
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Depreciation	\$ 7,697	\$ 217,643	\$ 2,008,280	\$ 3,289,443	\$ 3,410,283	\$ 3,410,283	\$ 3,410,283	\$ 2,691,704	\$ 1,606,839	\$ 1,485,999
Amortization	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Earnings Before Interest and Taxes	\$ 134,240	\$ 4,067,231	\$ 23,608,609	\$ (961,690)	\$ 112,995	\$ 252,135	\$ 445,065	\$ 1,305,769	\$ 2,532,064	\$ 2,845,134
Interest Expense - New Debt	\$ -	\$ -	\$ -	\$ 532,966	\$ 567,586	\$ 588,250	\$ 608,914	\$ 629,577	\$ 650,241	\$ 670,905
Interest Expense - Existing Debt	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Interest Expense - Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Income Before Taxes	\$ 134,240	\$ 4,067,231	\$ 23,608,609	\$ (1,494,655)	\$ (454,410)	\$ (335,933)	\$ (163,667)	\$ 676,373	\$ 1,882,004	\$ 2,174,411
Property Tax	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Income Taxes	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Income	\$ 134,240	\$ 4,067,231	\$ 23,608,609	\$ (1,494,655)	\$ (454,410)	\$ (335,933)	\$ (163,667)	\$ 676,373	\$ 1,882,004	\$ 2,174,411

There is positive EBITDA (Earnings before Interest, Taxes, Depreciation and Amortization), and there is enough EBITDA to cover the interest on the new debt. There is negative Net Income with the Depreciation and Amortization expense in 2013, 2014, 2015 and 2016.

Expansion Model: Fiber to the Business, Grant-Funded Pricing, Feasibility Objectives

1. Debt service constant on outstanding debt; target over 200% after Year 5.											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	
	1	2	3	4	5	6	7	8	9	10	
OPERATIONS											
Net Cash Flow from Operations	\$ (12,000)	\$ (59,000)	\$ 658,500	\$ 2,062,443	\$ 3,343,088	\$ 3,481,278	\$ 3,674,308	\$ 3,816,233	\$ 3,957,663	\$ 4,149,798	
Debt Service											
Interest	\$ -	\$ -	\$ -	\$ 532,966	\$ 567,586	\$ 588,250	\$ 608,914	\$ 629,577	\$ 650,241	\$ 670,905	
Principal			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Net Cash Flow	\$ (12,000)	\$ (59,000)	\$ 658,500	\$ 1,529,477	\$ 2,775,502	\$ 2,893,028	\$ 3,065,394	\$ 3,186,656	\$ 3,307,422	\$ 3,478,893	
Cumulative Cash Flow	\$ (12,000)	\$ (71,000)	\$ 587,500	\$ 2,116,977	\$ 4,892,479	\$ 7,785,507	\$ 10,850,901	\$ 14,037,557	\$ 17,344,979	\$ 20,823,873	
Debt Service Constant on Outstanding Debt		#DIV/0!	#DIV/0!	270%	411%	413%	421%				

The target for Debt service constant on outstanding debt is over 200% after Year 5. This feasibility objective is met.

	YEAR
	10
OPERATIONS	
Net Cash Flow from Operations	\$ 4,149,798
Cumulative Cash Flow from Operations	\$ 25,072,311
CAPITAL EXPENDITURES	
Capital Expenditures	\$ 362,520
EQUITY	5% \$ 18,126
Debt Service	
Required Draws	\$ 344,394
Total Outstanding Debt	\$ 11,181,742
Interest	\$ 670,905

Cumulative Cashflows from Operations in Year 10 (\$25,072,311) are greater than the Outstanding Debt (\$11,181,742)

Expansion Model: Fiber to the Business, Grant-Funded Pricing, Feasibility Objectives

3. Positive EBITDA?											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR
	1	2	3	4	5	6	7	8	9	10	
EBITDA	\$ 141,937	\$ 4,284,874	\$ 25,547,614	\$ 2,062,443	\$ 3,343,088	\$ 3,481,278	\$ 3,674,308	\$ 3,816,233	\$ 3,957,663	\$ 4,149,798	
Less Interest Expense	\$ -	\$ -	\$ -	\$ 532,966	\$ 567,586	\$ 588,250	\$ 608,914	\$ 629,577	\$ 650,241	\$ 670,905	
Earning after Interest Expense	\$ 141,937	\$ 4,284,874	\$ 25,547,614	\$ 1,529,477	\$ 2,775,502	\$ 2,893,028	\$ 3,065,394	\$ 3,186,656	\$ 3,307,422	\$ 3,478,893	

EBITDA is positive and Earnings cover the Interest Expense.

4. Positive IRR?											
RETURN ON INVESTMENT											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR
	1	2	3	4	5	6	7	8	9	10	
Cash Flow from Operations	\$ (12,000)	\$ (59,000)	\$ 658,500	\$ 2,062,443	\$ 3,343,088	\$ 3,481,278	\$ 3,674,308	\$ 3,816,233	\$ 3,957,663	\$ 4,149,798	
Capital Expenditures	\$ -	\$ -	\$ -	\$ 9,350,275	\$ 607,380	\$ 362,520	\$ 362,520	\$ 362,520	\$ 362,520	\$ 362,520	\$ 362,520
Net Cash Flow	\$ (12,000)	\$ (59,000)	\$ 658,500	\$ (7,287,832)	\$ 2,735,708	\$ 3,118,758	\$ 3,311,788	\$ 3,453,713	\$ 3,595,143	\$ 3,787,278	
IRR	42%									Terminal Value	\$ 13,302,056
MIRR	16%	Finance Rate	5%	Reinvestment Rate		6%		Capitalization Rate			10%

IRR is 42%, a very healthy return on investment.

Expansion Model: Income Statement, Fiber to the Business, Higher Pricing

Income Statement										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues										
Network Services Revenues:										
Local Voice Service	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Broadband Data	-	-	645,000	4,996,000	7,551,200	8,224,900	8,640,300	9,056,000	9,471,500	9,887,000
Video Services	-	-	-	-	-	-	-	-	-	-
Network Access Service Revenues	-	-	73,200	146,400	146,400	146,400	146,400	146,400	146,400	146,400
Universal Service Fund	-	-	-	-	-	-	-	-	-	-
Toll Service/Long Distance Voice	-	-	-	-	-	-	-	-	-	-
Installation Revenues	-	-	361,800	-	1,000	-	-	-	-	-
Other Operating Revenues	-	-	-	-	-	-	-	-	-	-
BTOP Grant	101,259	2,452,559	19,980,958	-	-	-	-	-	-	-
Matching Contributions	52,678	1,891,315	4,908,156	-	-	-	-	-	-	-
Tax Revenue	-	-	43,100	308,500	461,900	502,300	527,200	552,100	577,100	602,000
Donation from UI (cash and in-kind)	-	-	51,000	102,000	102,000	102,000	102,000	51,000	-	-
Donation from UI (salary)	-	-	85,000	175,100	180,400	-	-	-	-	-
Uncollectible Revenues	-	-	(14,400)	(102,800)	(154,000)	(167,400)	(175,700)	(184,000)	(192,400)	(200,700)
Total Revenues	\$ 153,937	\$ 4,343,874	\$ 26,133,814	\$ 5,625,200	\$ 8,288,900	\$ 8,808,200	\$ 9,240,200	\$ 9,621,500	\$ 10,002,600	\$ 10,434,700
Expenses										
Backhaul	\$ -	\$ -	\$ 82,500	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000	\$ 186,000
Network Maintenance/Monitoring	\$ -	\$ 35,000	\$ 240,000	\$ 415,100	\$ 420,400	\$ 425,800	\$ 431,400	\$ 437,100	\$ 443,000	\$ 449,100
Utilities	\$ 6,000	\$ 12,000	\$ 15,000	\$ 18,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000
Leasing	\$ 6,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000
Sales/Marketing	\$ -	\$ -	\$ 14,400	\$ 102,800	\$ 154,000	\$ 167,400	\$ 175,700	\$ 184,000	\$ 192,400	\$ 200,700
Customer Care	\$ -	\$ -	\$ 60,900	\$ 263,600	\$ 345,500	\$ 367,700	\$ 381,400	\$ 395,100	\$ 408,800	\$ 422,500
Billing	\$ -	\$ -	\$ 6,100	\$ 26,400	\$ 34,600	\$ 36,800	\$ 38,100	\$ 39,500	\$ 40,900	\$ 42,200
Corporate G&A	\$ -	\$ -	\$ 37,200	\$ 117,400	\$ 120,500	\$ 123,700	\$ 127,000	\$ 130,400	\$ 133,900	\$ 137,500
ROW Access Fees	\$ -	\$ -	\$ 43,100	\$ 308,500	\$ 461,900	\$ 502,300	\$ 527,200	\$ 552,100	\$ 577,100	\$ 602,000
Subsidy of Grant Area (Pricing stays at \$20)	\$ -	\$ -	\$ -	\$ 467,712	\$ 467,712	\$ 467,712	\$ 467,712	\$ 467,712	\$ 467,712	\$ 467,712
Community Benefit Fund	\$ -	\$ -	\$ 35,240	\$ 251,980	\$ 377,230	\$ 410,195	\$ 430,550	\$ 450,920	\$ 471,275	\$ 491,635
Total	\$ 12,000	\$ 59,000	\$ 546,440	\$ 2,169,492	\$ 2,600,842	\$ 2,720,607	\$ 2,798,062	\$ 2,875,832	\$ 2,954,087	\$ 3,032,347
EBITDA	\$ 141,937	\$ 4,284,874	\$ 25,587,374	\$ 3,455,708	\$ 5,688,058	\$ 6,087,593	\$ 6,442,138	\$ 6,745,668	\$ 7,048,513	\$ 7,402,353

Expansion Model: Income Statement, Fiber to the Business, Higher Pricing

EBITDA	\$ 141,937	\$ 4,284,874	\$ 25,587,374	\$ 3,455,708	\$ 5,688,058	\$ 6,087,593	\$ 6,442,138	\$ 6,745,668	\$ 7,048,513	\$ 7,402,353
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Depreciation	\$ 7,697	\$ 217,643	\$ 2,008,280	\$ 3,289,443	\$ 3,410,283	\$ 3,410,283	\$ 3,410,283	\$ 2,691,704	\$ 1,606,839	\$ 1,485,999
Amortization	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Earnings Before Interest and Taxes	\$ 134,240	\$ 4,067,231	\$ 23,648,369	\$ 431,380	\$ 2,458,160	\$ 2,858,450	\$ 3,212,895	\$ 4,235,204	\$ 5,623,109	\$ 6,097,494
Interest Expense - New Debt	\$ -	\$ -	\$ -	\$ 532,966	\$ 567,586	\$ 588,250	\$ 608,914	\$ 629,577	\$ 650,241	\$ 670,905
Interest Expense - Existing Debt	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Interest Expense - Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Income Before Taxes	\$ 134,240	\$ 4,067,231	\$ 23,648,369	\$ (101,585)	\$ 1,890,755	\$ 2,270,382	\$ 2,604,163	\$ 3,605,808	\$ 4,973,049	\$ 5,426,771
Property Tax	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Income Taxes	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Income	\$ 134,240	\$ 4,067,231	\$ 23,648,369	\$ (101,585)	\$ 1,890,755	\$ 2,270,382	\$ 2,604,163	\$ 3,605,808	\$ 4,973,049	\$ 5,426,771

There is positive EBITDA (Earnings before Interest, Taxes, Depreciation and Amortization), and there is enough EBITDA to cover the interest on the new debt. There is negative Net Income with the Depreciation and Amortization expense for 2013.

Expansion Model: Fiber to the Business, Higher Pricing, Feasibility Objectives

1. Debt service constant on outstanding debt; target over 200% after Year 5.

	2010 YEAR 1	2011 YEAR 2	2012 YEAR 3	2013 YEAR 4	2014 YEAR 5	2015 YEAR 6	2016 YEAR 7	2017 YEAR 8	2018 YEAR 9	2019 YEAR 10
OPERATIONS										
Net Cash Flow from Operations	\$ (12,000)	\$ (59,000)	\$ 698,260	\$ 3,455,708	\$ 5,688,058	\$ 6,087,593	\$ 6,442,138	\$ 6,745,668	\$ 7,048,513	\$ 7,402,353
Debt Service										
Interest	\$ -	\$ -	\$ -	\$ 532,966	\$ 567,586	\$ 588,250	\$ 608,914	\$ 629,577	\$ 650,241	\$ 670,905
Principal			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Cash Flow	\$ (12,000)	\$ (59,000)	\$ 698,260	\$ 2,922,742	\$ 5,120,472	\$ 5,499,343	\$ 5,833,224	\$ 6,116,091	\$ 6,398,272	\$ 6,731,448
Cumulative Cash Flow	\$ (12,000)	\$ (71,000)	\$ 627,260	\$ 3,550,002	\$ 8,670,474	\$ 14,169,817	\$ 20,003,041	\$ 26,119,132	\$ 32,517,404	\$ 39,248,853
Debt Service Constant on Outstanding Debt		#DIV/0!	#DIV/0!	453%	699%	722%	738%			

The target for Debt service constant on outstanding debt is over 200% after Year 5. This feasibility objective is met.

	YEAR 10
OPERATIONS	
Net Cash Flow from Operations	\$ 7,402,353
Cumulative Cash Flow from Operations	\$ 43,497,291
CAPITAL EXPENDITURES	
Capital Expenditures	\$ 362,520
EQUITY	5% \$ 18,126
Debt Service	
Required Draws	\$ 344,394
Total Outstanding Debt	\$ 11,181,742
Interest	\$ 670,905

Cumulative Cashflow from Operations in Year 10 (\$43,497,291, which is \$18M greater than previous model) are greater then the Outstanding Debt (\$11,181,742)

Expansion Model: Fiber to the Business, Higher Pricing, Feasibility Objectives

3. Positive EBITDA?											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR
	1	2	3	4	5	6	7	8	9	10	
EBITDA	\$ 141,937	\$ 4,284,874	\$ 25,587,374	\$ 3,455,708	\$ 5,688,058	\$ 6,087,593	\$ 6,442,138	\$ 6,745,668	\$ 7,048,513	\$ 7,402,353	
Less Interest Expense	\$ -	\$ -	\$ -	\$ 532,966	\$ 567,586	\$ 588,250	\$ 608,914	\$ 629,577	\$ 650,241	\$ 670,905	
Earning after Interest Expense	\$ 141,937	\$ 4,284,874	\$ 25,587,374	\$ 2,922,742	\$ 5,120,472	\$ 5,499,343	\$ 5,833,224	\$ 6,116,091	\$ 6,398,272	\$ 6,731,448	

EBITDA is positive and Earnings cover the Interest Expense.

4. Positive IRR?											
RETURN ON INVESTMENT											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR
	1	2	3	4	5	6	7	8	9	10	
Cash Flow from Operations	\$ (12,000)	\$ (59,000)	\$ 698,260	\$ 3,455,708	\$ 5,688,058	\$ 6,087,593	\$ 6,442,138	\$ 6,745,668	\$ 7,048,513	\$ 7,402,353	
Capital Expenditures	\$ -	\$ -	\$ -	\$ 9,350,275	\$ 607,380	\$ 362,520	\$ 362,520	\$ 362,520	\$ 362,520	\$ 362,520	\$ 362,520
Net Cash Flow	\$ (12,000)	\$ (59,000)	\$ 698,260	\$ (5,894,567)	\$ 5,080,678	\$ 5,725,073	\$ 6,079,618	\$ 6,383,148	\$ 6,685,993	\$ 7,039,833	
IRR	114%								Terminal Value		\$ 31,727,036
MIRR	27%	Finance Rate	5%	Reinvestment Rate		6%		Capitalization Rate			10%

IRR is 114% (up from 66% from previous model), a very healthy return on investment.



Urbana-
Champaign
Big Broadband

UC2B Business and Strategic Plan

Expansion of Fiber
Network

Residential

Scenario 3, Expand Fiber to the Other Residential Areas

According to the 2010 Census, there are approximately 53,524 residential units in the Champaign-Urbana area. 42.3% of these housing units in Champaign are in multi-dwelling units (apartments, duplexes), and 55.7% of the total housing unit in Urbana are multi-dwelling units. NEO assumed that 4,650 of these residential units were passed with the construction activities from the grant, leaving 48,874 residences to be addressed.

Many scenarios were run. NEO ran the financial model assuming that the pricing approved during the grant period (\$19.99) was extended to the residential expansion areas. Under this scenario, none of the financial objectives were met. Offering this pricing to the (11) census blocks covered by the grant is feasible because the grant paid for the capital costs of the network. The University is also subsidizing the 1 Gbps of Internet and transport services through mid-2017.

NEO also assumed increasing the monthly pricing to between \$45 (96% of residential customer would choose this tier) and \$75 for Internet services and various take rate percentages of 20%, 30% and 40% were applied. The feasibility objectives came close to being met with higher pricing of \$45 per subscriber and 40% take rates. And finally, the financial model was run to expand to both the businesses and residential areas. This model works and the financial feasibility objectives are met.

Most of the successful FTTP networks to date are offering triple play services (voice, Internet and cable TV) via a retail model. As UC2B is providing Internet services only, there is a substantial amount of revenue that is not being generated per customer. However, that being said, without offering video or cable TV services, UC2B is not paying massive video content expenses or head-end construction debt service expenses either. With the exception of a handful of FTTP networks that have been installed by other communities, most of the FTTP networks have NOT deployed Gigabit services. As video and phone services are in decline, and as most service providers have deployed IPTV services as a defensive strategy to retain customers, the question is this – What incents a customer to change? Is it ultra-high speed, Gigabit Intranet and Internet services, or does offering IPTV services provide the incentive to change? NEO believes that high speed Internet services is the “secret sauce” to entice a customer to make a change, and given the difficulty in operating an IPTV service, the risks of not doing it right are high. A detailed discussion and financial analysis of triple play services is provided after this section.

Expansion could be feasible with pre-selling various areas prior to construction. When a 40% take rate is pre-sold, construction activities can begin. Expansion could also be feasible if some of the capital costs per customer are absorbed through installation fees. Expanding to the multi-dwelling units reduces capital costs because the drop cable is extended once to the building (approximately ½ of the total capital costs per customer). The expansion could be done; however, it is recommended to do so cautiously; with the idea of outlaying capital efficiently by tying revenues to when capital costs are incurred. Again, the model works even better when the business community is addressed first and then the network is built out to the residential areas.

Scenario 3, Expand Fiber to the Other Residential Areas

	Take Rates		
	20%	30%	40%, with \$500 install
Cumulative Cashflow from Operations	\$ 44,969,811	\$ 58,079,181	\$ 87,067,716
Debt after 10 years	\$ 58,020,191	\$ 65,397,473	\$ 72,774,755
Delta	\$ (13,050,380)	\$ (7,318,292)	\$ 14,292,961
IRR	-11%	-6%	6%

Take rate assumptions are critical; if UC2B is not able to effectively compete against the existing providers, then UC2B would not be able to cover its debt service.

The model is upside-down with extending the \$19.99 pricing to the residential expansion area.

	Monthly Pricing	
	\$19.99	\$45.00 monthly, \$500 install
Cumulative Cashflow from Operations	\$ 17,706,226	\$ 87,067,716
Debt after 10 years	\$ 65,397,473	\$ 72,774,755
Delta	\$ (47,691,247)	\$ 14,292,961

Scenario 3, Expand Fiber to the Other Residential Areas

On the following pages, the model is shown where it makes sense, but barely. Here are the assumptions of the following financial outcomes:

- * 40% Take rate
- * \$500 Installation Fee
- * 96% of customers take a service that has \$45 per month

The model can be improved by first offering services to the business community and then expand to the residential homes. The models showing residential build-out only are provided followed by addition of the business community.



Expansion Model: Income Statement, Fiber to the Residential Units, 40% Take Rate

Income Statement										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues										
Network Services Revenues:										
Local Voice Service	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Broadband Data	-	-	601,300	8,115,900	12,997,800	14,288,800	15,081,500	15,874,200	16,666,900	17,459,600
Video Services	-	-	-	-	-	-	-	-	-	-
Network Access Service Revenues	-	-	73,200	146,400	146,400	146,400	146,400	146,400	146,400	146,400
Universal Service Fund	-	-	-	-	-	-	-	-	-	-
Toll Service/Long Distance Voice	-	-	-	-	-	-	-	-	-	-
Installation Revenues	-	-	-	9,776,000	1,231,000	734,000	734,000	734,000	734,000	734,000
Other Operating Revenues	-	-	-	-	-	-	-	-	-	-
BTOP Grant	101,259	2,452,559	19,980,958	-	-	-	-	-	-	-
Matching Contributions	52,678	1,891,315	4,908,156	-	-	-	-	-	-	-
Tax Revenue	-	-	40,500	495,700	788,700	866,100	913,700	961,200	1,008,800	1,056,400
Donation from UI (cash and in-kind)	-	-	51,000	102,000	102,000	102,000	102,000	51,000	-	-
Donation from UI (salary)	-	-	85,000	175,100	180,400	-	-	-	-	-
Uncollectible Revenues	-	-	(13,500)	(165,200)	(262,900)	(288,700)	(304,600)	(320,400)	(336,300)	(352,100)
Total Revenues	\$ 153,937	\$ 4,343,874	\$ 25,726,614	\$ 18,645,900	\$ 15,183,400	\$ 15,848,600	\$ 16,673,000	\$ 17,446,400	\$ 18,219,800	\$ 19,044,300
Expenses										
Backhaul	\$ -	\$ -	\$ 82,500	\$ 427,500	\$ 616,500	\$ 627,000	\$ 648,000	\$ 679,500	\$ 711,000	\$ 742,500
Network Maintenance/Monitoring	\$ -	\$ 35,000	\$ 240,000	\$ 415,100	\$ 420,400	\$ 425,800	\$ 431,400	\$ 437,100	\$ 443,000	\$ 449,100
Utilities	\$ 6,000	\$ 12,000	\$ 15,000	\$ 18,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000	\$ 21,000
Leasing	\$ 6,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000
Sales/Marketing	\$ -	\$ -	\$ 13,500	\$ 165,200	\$ 262,900	\$ 288,700	\$ 304,600	\$ 320,400	\$ 336,300	\$ 352,100
Customer Care	\$ -	\$ -	\$ 60,900	\$ 884,300	\$ 1,416,600	\$ 1,560,100	\$ 1,648,100	\$ 1,736,200	\$ 1,824,300	\$ 1,912,400
Billing	\$ -	\$ -	\$ 6,100	\$ 88,400	\$ 141,700	\$ 156,000	\$ 164,800	\$ 173,600	\$ 182,400	\$ 191,200
Corporate G&A	\$ -	\$ -	\$ 37,200	\$ 117,400	\$ 120,500	\$ 123,700	\$ 127,000	\$ 130,400	\$ 133,900	\$ 137,500
ROW Access Fees	\$ -	\$ -	\$ 40,500	\$ 495,700	\$ 788,700	\$ 866,100	\$ 913,700	\$ 961,200	\$ 1,008,800	\$ 1,056,400
Subsidy of Grant Area (Pricing stays at \$20)	\$ -	\$ -	\$ -	\$ 467,712	\$ 467,712	\$ 467,712	\$ 467,712	\$ 467,712	\$ 467,712	\$ 467,712
Community Benefit Fund	\$ -	\$ -	\$ 33,100	\$ 404,855	\$ 644,115	\$ 707,325	\$ 746,165	\$ 785,010	\$ 823,850	\$ 862,695
Total	\$ 12,000	\$ 59,000	\$ 540,800	\$ 3,496,167	\$ 4,912,127	\$ 5,255,437	\$ 5,484,477	\$ 5,724,122	\$ 5,964,262	\$ 6,204,607
EBITDA	\$ 141,937	\$ 4,284,874	\$ 25,185,814	\$ 15,149,733	\$ 10,271,273	\$ 10,593,163	\$ 11,188,523	\$ 11,722,278	\$ 12,255,538	\$ 12,839,693

Expansion Model: Income Statement, Fiber to the Residential Units, 40% Take Rate

EBITDA	\$ 141,937	\$ 4,284,874	\$ 25,185,814	\$ 15,149,733	\$ 10,271,273	\$ 10,593,163	\$ 11,188,523	\$ 11,722,278	\$ 12,255,538	\$ 12,839,693
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Depreciation	\$ 7,697	\$ 217,643	\$ 2,008,280	\$ 10,364,054	\$ 11,146,334	\$ 11,146,334	\$ 11,146,334	\$ 10,427,755	\$ 3,354,924	\$ 2,572,644
Amortization	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Earnings Before Interest and Taxes	\$ 134,240	\$ 4,067,231	\$ 24,514,724	\$ 5,050,694	\$ (694,871)	\$ (371,931)	\$ 223,524	\$ 1,475,663	\$ 9,081,754	\$ 10,448,189
Interest Expense - New Debt	\$ -	\$ -	\$ -	\$ 3,478,311	\$ 3,701,442	\$ 3,834,487	\$ 3,967,532	\$ 4,100,577	\$ 4,233,622	\$ 4,366,667
Interest Expense - Existing Debt	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Interest Expense - Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Income Before Taxes	\$ 134,240	\$ 4,067,231	\$ 24,514,724	\$ 1,572,383	\$ (4,396,132)	\$ (4,206,236)	\$ (3,743,826)	\$ (2,624,733)	\$ 4,848,313	\$ 6,081,704
Property Tax	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Income Taxes	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net Income	\$ 134,240	\$ 4,067,231	\$ 24,514,724	\$ 1,572,383	\$ (4,396,132)	\$ (4,206,236)	\$ (3,743,826)	\$ (2,624,733)	\$ 4,848,313	\$ 6,081,704

There is positive EBITDA (Earnings before Interest, Taxes, Depreciation and Amortization), and there is enough EBITDA to cover the interest on the new debt. There is negative Net Income with the Depreciation and Amortization expense in 2014, 2015, 2016 and 2017. Note the assumptions for this are based upon \$45 pricing, \$500 installation fee and 40% take rate.

Expansion Model: Fiber to the Residential Units, 40%, Feasibility Objectives

1. Debt service constant on outstanding debt; target over 200% after Year 5.											
	2010 YEAR 1	2011 YEAR 2	2012 YEAR 3	2013 YEAR 4	2014 YEAR 5	2015 YEAR 6	2016 YEAR 7	2017 YEAR 8	2018 YEAR 9	2019 YEAR 10	
OPERATIONS											
Net Cash Flow from Operations	\$ (12,000)	\$ (59,000)	\$ 296,700	\$ 15,149,733	\$ 10,271,273	\$ 10,593,163	\$ 11,188,523	\$ 11,722,278	\$ 12,255,538	\$ 12,839,693	
Debt Service											
Interest	\$ -	\$ -	\$ -	\$ 3,478,311	\$ 3,701,442	\$ 3,834,487	\$ 3,967,532	\$ 4,100,577	\$ 4,233,622	\$ 4,366,667	
Principal			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Net Cash Flow	\$ (12,000)	\$ (59,000)	\$ 296,700	\$ 11,671,422	\$ 6,569,831	\$ 6,758,676	\$ 7,220,991	\$ 7,621,701	\$ 8,021,916	\$ 8,473,026	
Cumulative Cash Flow	\$ (12,000)	\$ (71,000)	\$ 225,700	\$ 11,897,122	\$ 18,466,952	\$ 25,225,628	\$ 32,446,619	\$ 40,068,320	\$ 48,090,237	\$ 56,563,263	
Debt Service Constant on Outstanding Debt		#DIV/0!	#DIV/0!	304%	194%	193%	197%				

The target for Debt service constant on outstanding debt is over 200% after Year 5. This feasibility objective is NOT met, but almost met.

	YEAR 10
OPERATIONS	
Net Cash Flow from Operations	\$ 12,839,693
Cumulative Cash Flow from Operations	\$ 84,245,901
CAPITAL EXPENDITURES	
Capital Expenditures	\$ 2,334,120
EQUITY	5% \$ 116,706
Debt Service	
Required Draws	\$ 2,217,414
Total Outstanding Debt	\$ 72,777,776
Interest	\$ 4,366,667

Cumulative Cashflow from Operations in Year 10 (\$84,245,901 is greater then the Outstanding Debt (\$72,777,776)

Expansion Model: Fiber to the Residential Units, 40%, Feasibility Objectives

3. Positive EBITDA?											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR
	1	2	3	4	5	6	7	8	9	10	
EBITDA	\$ 141,937	\$ 4,284,874	\$ 25,185,814	\$ 15,149,733	\$ 10,271,273	\$ 10,593,163	\$ 11,188,523	\$ 11,722,278	\$ 12,255,538	\$ 12,839,693	
Less Interest Expense	\$ -	\$ -	\$ -	\$ 3,478,311	\$ 3,701,442	\$ 3,834,487	\$ 3,967,532	\$ 4,100,577	\$ 4,233,622	\$ 4,366,667	
Earning after Interest Expense	\$ 141,937	\$ 4,284,874	\$ 25,185,814	\$ 11,671,422	\$ 6,569,831	\$ 6,758,676	\$ 7,220,991	\$ 7,621,701	\$ 8,021,916	\$ 8,473,026	

EBITDA is positive and Earnings cover the Interest Expense.

4. Positive IRR?											
RETURN ON INVESTMENT											
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR
	1	2	3	4	5	6	7	8	9	10	
Cash Flow from Operations	\$ (12,000)	\$ (59,000)	\$ 296,700	\$ 15,149,733	\$ 10,271,273	\$ 10,593,163	\$ 11,188,523	\$ 11,722,278	\$ 12,255,538	\$ 12,839,693	
Capital Expenditures	\$ -	\$ -	\$ -	\$ 61,023,005	\$ 3,914,580	\$ 2,334,120	\$ 2,334,120	\$ 2,334,120	\$ 2,334,120	\$ 2,334,120	\$ 2,334,120
Net Cash Flow	\$ (12,000)	\$ (59,000)	\$ 296,700	\$ (45,873,272)	\$ 6,356,693	\$ 8,259,043	\$ 8,854,403	\$ 9,388,158	\$ 9,921,418	\$ 10,505,573	
IRR	4%								Terminal Value		\$ 7,637,716
MIRR	5%	Finance Rate	5%	Reinvestment Rate		6%			Capitalization Rate		10%

IRR is 4%. Proceed cautiously.

Under What Conditions Would it Work?

Not to be easily told “no,” NEO’s team put together a number of options for UC2B to consider that could possibly work for residential expansion. Here are a number of possibilities:

- 50% or greater take rates
- Pre-sell neighborhoods
- Do it gradually, tie capital costs to revenue
- Installation fees of \$500 to \$1000
- Partner with a Triple Play or Over-the-Top Provider; share in the capital costs of the network, increase the monthly revenue per customer
- Partner with the Power Utility; share in the capital costs of the network and provide utility savings with Smart-Grid applications.
- Focus initially on the Fiber to the Business and MDU market, then consider building to the Residential areas
- Raise over 30% Equity; Reduce Debt to 70% of the Capital Costs (Equity could be grants, partnerships with businesses or anchor institutions)
- Figure out how to reduce the Capital Costs per Customer (Reduced Equipment Costs? Reduced Labor Costs?)
- Build out to the Business and Commercial areas first and then expand to the Residential areas. (The financials for this follow on the next slides)



Urbana-
Champaign
Big Broadband

UC2B Business and Strategic Plan

Doing Both
Business and
Residential
Expansion

Expand to Businesses and Commercial Users, then to the Residential Users



The financial model works when the Business and Commercial users are built out first, followed by expansion to the residential user. The higher-priced businesses supplement expansion to the residential customers.

Expansion Model, starting in Year 4, Additional Residential Customers Pass and Take Rate Percentages	
Total Customers Passed in Expansion Area Only	48874
Take Rate, Expansion Area, Year 4	40%
Take Rate Expansion Area, Year 5	45%
Annual Growth Rate Years 6 through 10	3%

Expansion Model, starting in Year 4, Additional Business Customers Pass and Take Rate Percentages	
Total Customers Passed in Expansion Area Only	7478
Take Rate, Expansion Area, Year 4	40%
Take Rate Expansion Area, Year 5	45%
Annual Growth Rate Years 6 through 10	3%

Residential Pricing, Expansion Area	
UC2B 20/100Internet CNS	\$45.00
UC2B 30/100Internet CNS	\$60.00
UC2B 40/100Internet CNS	\$75.00
Service #4	\$0.00
Service #5	\$0.00
Installation Fee	\$150.00

Business Pricing	
UC2B 20/20Internet CNS	\$114.80
UC2B 40/40Internet CNS	\$213.80
UC2B 60/60Internet CNS	\$312.60
UC2B 80/80Internet CNS	\$411.00
UC2B 100/100Internet CNS	\$509.00
Private VLAN 10 Mbps	\$100.00
Private VLAN 100 Mbps	\$400.00
Private VLAN 1 Gbps	\$1,200.00
Installation Fee	\$150.00

Expand to Businesses and Commercial Users, then to the Residential Users



	YEAR
	10
OPERATIONS	
Net Cash Flow from Operations	\$ 17,625,533
Cumulative Cash Flow from Operations	\$ 101,286,946
CAPITAL EXPENDITURES	
Capital Expenditures	\$ 2,696,640
EQUITY	5% \$ 134,832
Debt Service	
Required Draws	\$ 2,561,808
Total Outstanding Debt	\$ 76,573,173
Interest	\$ 4,594,390

Cashflow from Operations is greater than the Outstanding Debt Service (left).

EBITDA is positive and covers interest expense (below) and the IRR is 9% (also below).

3. Positive EBITDA?										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR
	1	2	3	4	5	6	7	8	9	10
EBITDA	\$ 141,937	\$ 4,284,874	\$ 25,604,174	\$ 9,081,108	\$ 12,689,563	\$ 13,914,548	\$ 14,873,253	\$ 15,780,943	\$ 16,677,938	\$ 17,625,533
Less Interest Expense	\$ -	\$ -	\$ -	\$ 3,568,278	\$ 3,825,848	\$ 3,979,556	\$ 4,133,265	\$ 4,286,973	\$ 4,440,682	\$ 4,594,390
Earning after Interest Expense	\$ 141,937	\$ 4,284,874	\$ 25,604,174	\$ 5,512,830	\$ 8,863,715	\$ 9,934,992	\$ 10,739,988	\$ 11,493,970	\$ 12,237,256	\$ 13,031,143
4. Positive IRR?										
RETURN ON INVESTMENT										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR
	1	2	3	4	5	6	7	8	9	10
Cash Flow from Operations	\$ (12,000)	\$ (59,000)	\$ 715,060	\$ 9,081,108	\$ 12,689,563	\$ 13,914,548	\$ 14,873,253	\$ 15,780,943	\$ 16,677,938	\$ 17,625,533
Capital Expenditures	\$ -	\$ -	\$ -	\$ 62,601,360	\$ 4,518,780	\$ 2,696,640	\$ 2,696,640	\$ 2,696,640	\$ 2,696,640	\$ 2,696,640
Net Cash Flow	\$ (12,000)	\$ (59,000)	\$ 715,060	\$ (53,520,252)	\$ 8,170,783	\$ 11,217,908	\$ 12,176,613	\$ 13,084,303	\$ 13,981,298	\$ 14,928,893
IRR	9%							Terminal Value		\$ 20,683,606
MIRR	7%	Finance Rate	5%	Reinvestment Rate		6%		Capitalization Rate		10%



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UC2B Business and Strategic Plan

Triple Play, the
Impact of VoIP and
IPTV Services

Impact of IPTV and VoIP Services

The world of communications and entertainment options is changing as we speak.

VoIP: With enhancements being made to cellular phones and the increasing mobility needs of customers today, more customers are opting for cell phone services over their landline phones. The number of adult Americans with a smartphone rose from 35% in April 2011 to 46% in February 2012. Smartphones have more advanced computing ability and connectivity than landline phones. Smartphones are now cameras, media players, video cameras, GPS navigation units, web browsers, and personal digital assistants.

Landline phone service is a product in decline. According to an April 2012 news report by RTT News, Financial Services, the telecommunications industry estimates about 1/3 of Americans have replaced their landline phone service in their homes with cell phones. The number of households in the United States that have only wireless phone service has jumped from about 18% in 2008 to almost 35% in 2011. It is predicted that only 30% of homes will retain their landline phones in another three years.

The FCC is recommending changing the Universal Service Fund, which helped subsidize the installation of networks to build landline phones; to subsidizing BROADBAND services. The Universal Service Fund would no longer subsidize landline phone service, but would instead subsidize broadband or Internet services. **As it is projected that only 30% of the American population will have a landline phone by 2015; NEO is not recommending that UC2B invest in infrastructure to provide VoIP services.**

IPTV: Video and cable TV usage is dramatically changing too. The top 12 cable companies have all seen a dramatic decline in cable TV subscribers in the past twenty-four months. Former pay-TV subscribers are opting for lower-priced Internet streaming solutions, such as Netflix, Hulu and Amazon. The big three channels (ABC, NBC and CBS), as well as most cable TV content is now offered online at no or very low cost depending upon the programming. As customers are becoming more Internet-savvy, more content is now offered online for free, and given the current context of the tough economic climate, when given a choice, customers are discontinuing their cable TV subscriptions in favor of Internet entertainment options.

The customer's experience in the world of TV is well established and expectations are deep-seated. Customers do not want to experience channel delay or service disruptions, which have been typical in most IPTV service roll-outs. Initiating an IPTV service must meet or exceed previous customer experience from cable or satellite companies. Market research shows that if these experiences are not impeccable, the customer is already predisposed to changing services should their expectations (or anybody else's in the household, for that matter) not be met.

Offering IPTV services is challenging and complex. Even for existing service providers or other utility providers that already have an operational team and systems in place, launching IPTV service is unlike providing any other service offering in the past. The complexity of the last-mile network infrastructure, i.e. the fiber from the curb to the premise, the Customer Premise Equipment configurations, the difficulties in establishing programming and distribution rights, competition among Fortune 500 companies, the complexity of the service offerings, coupled with the customer's established TV viewing expectations make offering IPTV services difficult at best. **It could take several years for UC2B to overcome or build up to the operational challenges of offering IPTV services. In several years, the number of subscribers choosing pay-TV services will be even lower than it is today. Therefore, NEO is not recommending that UC2B offers IPTV services on a retail basis, but rather; partner with service providers that are already offering IPTV services. The IPTV service providers would use the UC2B network to provide their services.**

IPTV Assumptions

Many of the early service providers that have launched IPTV service have experienced serious operational challenges. There is a tendency to assume the primary challenges of offering IPTV services are technical in nature. However, the process-based, operational challenges are where most early IPTV service providers have failed. Operating an IPTV service is difficult, and the operating costs are significant. NEO believes service providers are offering IPTV services as a defensive strategy to reduce the churn of customers and to minimize the impact of losing revenues for phone service. NEO does not believe offering IPTV services will be the deciding factor for customers to move to UC2B. NEO strongly believes that offering Gigabit services and ultra-fast Internet connections is the winning proposition.

Nevertheless, high level financial model for IPTV services have been provided. Here are the assumptions for the financial model.

Capital Expenses:

The central headend for IPTV services includes equipment for receiving, encoding and delivering live content, encoding, storing and delivering video-on-demand (VOD) content, systems to manage the delivery of the content, and systems to monitor and maintain the network. Many of these systems do not come from one provider, and therefore, the systems integration – integrating, testing and validating the network components can be costly, time-consuming and complex. Much of these systems are still proprietary and therefore, require installation and support personnel that are highly trained with specialized experience. Equipment includes middleware, conditional access systems, VOD systems, set top boxes and Customer Premise Equipment (CPE), switches, routers, antennas, receivers, Emergency Alert Systems (EAS) and insertion systems, and content processors.

In order to attract customers, UC2B will need to provide a robust service offering. Most IPTV providers are providing over 300 channels of content and 10,000 videos to choose from for Video on Demand (VOD) content. The ability to quickly establish revenues is essential and the ability to rapidly generate take rate is paramount to the success of an IPTV rollout. UC2B will need to determine whether their IPTV services can attract new customers by simply mimicking the offering available from its competitors or whether UC2B needs to provide capabilities to deliver a completely differentiated service. An eye for the future upgrades and enhancements must also be included in the technology planning stage. In order to continue to effectively compete, UC2B will need to provide future enhanced personalized and individualized services and support future convergence of devices on the network, as well as provide core television services available today. For purposes of the financial modeling, it is assumed that UC2B would need to provide the following services:

- 150 – 300 broadcast channels (MPEG-2 and MPEG-4)
- Local off air and local content channels
- Digital music, games
- Video on Demand
- Client PVR (Personal Video Recording)
- HDTV (High Definition TV)
- Caller ID/TV, SMS (Short Message Service) Messaging
- Local digital advertising insertion

IPTV Assumptions, cont'd

It was assumed that IPTV services would support (3) TVs per home. Based upon this configuration, the initial cost of the headend would be approximately \$4.4 Million for the video headend equipment and building that would be needed to house the headend equipment. These numbers are consistent with several vendor's projections for build out of the headend (Zhone, Microsoft) and with the previous consultant's, CSG's projections. Additional capital costs per customer turned up are approximately \$850 per customer (\$445 for (3) set top boxes, \$200 for provisioning at the headend and \$250 for the installation and set up at home.) This is in addition to the Fiber to the Premise per customer passed expense of \$1,500 and the per customer lit expense of \$1,400.

For modeling purposes, NEO used the financial model of rolling out FTTP services to the business and residential community, providing dark fiber leases on a wholesale basis, and layering IPTV services on top of that .

It is not known what percentage of customers will choose an IPTV and Internet bundled service, versus a stand-alone Internet offering. In order to narrow down this assumption, a market study could be conducted. As a market study was not part of NEO's scope of work, NEO ran several financial models using the assumptions to the right:

Financial Models				
IPTV Model 1	80%	IPTV and Internet Bundled Service	20%	Internet Only Service
IPTV Model 2	60%	IPTV and Internet Bundled Service	40%	Internet Only Service
IPTV Model 3	40%	IPTV and Internet Bundled Service	60%	Internet Only Service
IPTV Model 4	20%	IPTV and Internet Bundled Service	80%	Internet Only Service

This changed the per customer equipment capital expense assumption for each of the models to:

Customer Equipment and Installation Capital Expense			
	IPTV and Internet Bundle	Internet Only	Capital Expense
IPTV Model 1	80%	20%	\$1,069
IPTV Model 2	60%	40%	\$899
IPTV Model 3	40%	60%	\$729
IPTV Model 4	20%	80%	\$559

IPTV Assumptions, cont'd

Operating Expenses: The following operating expenses would be addressed in offering IPTV services:

- **Content Acquisition Costs and Management of Content Distribution and Digital Rights.** The costs for content varies by the number of subscribers and by what will be offered to UC2B subscribers. License fees and costs for setting up and operating the delivery of content are substantial. Managing the content is significant as well. “Metadata” refers to the digital stream generated by the encoder to a multicast address, assigning network identifiers to transmit this stream of content across the network, connecting license keys that allow subscriber to access this channel and its associated programming (start time, end time and the program description), and the digital file of the actual content are all considered Metadata information.
- **OSS/BSS, Customer Care.** Maintaining the highest Quality of Service demands 24-hour support. The Internet only assumption was \$5 per customer; for adding on IPTV services, NEO used the assumption of \$9 per customer
- **Service Delivery Team:** IPTV Delivery Manager, Content Manager, Technical Staff to monitor and manage the infrastructure. NEO assumed an additional (8) people would be needed for technical staff, (1) person for IPTV Delivery Management and (2) additional staff members for content management. Average salary for each additional staff would be \$125k annually.

Other changes from the Internet only financial plans include utilities are \$63,000 annually, up from \$21,000 annually, additional backhaul Internet capacity is needed; oversubscription rate went from 40 to 10 which increases the need for more backhaul Internet capacity costs.

Revenues. IPTV services revenues include programming, content packages, rental of customer premise equipment and advertising. Industry-wide, margins for IPTV services range from 20 – 40% after costs for programming and content acquisition are added in. For financial modeling, NEO used the assumption of 30% for UC2B’s IPTV gross margin.

NEO assumed UC2B would offer an IPTV Service bundle of \$80 for IPTV service and a discounted Internet service of \$30 per month; for a monthly fee of \$110 (gross margin of \$24 for IPTV plus \$30 for Internet services). Stand-alone Internet options were priced at \$45, \$60 and \$75 for 20, 30 and 40 Mbps packages respectively. NEO ran (4) various IPTV financial models with the various assumptions for the percentage of customers selecting the IPTV Service and Internet Bundle and associated assumptions for Internet-only packages.

Results, IPTV Models

Residential Pricing, Expansion Area	
UC2B 20/100Internet CNS	\$45.00
UC2B 30/100Internet CNS	\$60.00
UC2B 40/100Internet CNS	\$75.00
IPTV Services, (Net Revenues) \$80 * 30% plus \$30 Internet	\$54.00
Service #5	\$0.00
Installation Fee	\$150.00

The percentage mix is an important assumption. If 80% of the customers that sign up take the IPTV Bundle with Internet Services, the business plan could be sustainable; with an IRR of 7%.

However, if this is not the case, and 20% of the customers that sign up take the bundled offering, the financial results do not work; a negative IRR of -1%. In the middle, where 40-60% take the bundle, the financial picture is risky with a 2-5% IRR.

The introduction of IPTV services does not improve the financial model in any of the IPTV Models. **Keep in mind, the IRR of expansion to the business and residential areas for Internet-only services with dark fiber leases (previous section) is 9%.**

Financial Results Summary				
	IPTV Model 1	IPTV Model 2	IPTV Model 3	IPTV Model 4
Mix				
Percentage of Customers that Select the IPTV and Internet Bundle	80%	60%	40%	20%
Internet Only	20%	40%	60%	80%
Feasibility Objectives				
Debt Service Constant	Yes	Yes	Yes	No
10 Year Cumulative Cashflows	\$124M	\$112M	\$100M	\$88M
Debt after 10 Years	\$99M	\$94M	\$90M	\$85M
Are Cashflows Greater than Debt?	Yes	Yes	Yes	Yes
IRR	7%	5%	2%	-1%
Does IPTV Improve the Financial Model?	No	No	No	No



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Wholesale Models

Types of Wholesale Services, Models to Consider

There are three types of wholesale services that UC2B is anticipating providing per the NTIA grant.

Layer-Two transport: The Internet Services Provider (ISP) redundantly connects to the UC2B network core and UC2B provisions a VLAN for that ISP to each of its customers. UC2B charges the ISP for the dual connections to the UC2B core network and then for each customer that the ISP “owns” on the network. UC2B-owned electronics are used to deliver the ISP’s services and each of the ISP’s customers has specific port speeds at which they can connect to the ISP. The faster those customer port speeds the more they cost.

Layer-Three service: The ISP redundantly connects to the UC2B network core, but then utilizes the UC2B Intranet and the fact that the customer has an existing IP service provider to piggyback additional services to that customer. UC2B charges the ISP the same rates for redundantly connecting to the UC2B network core, but there are no additional charges for each customer. This ISP does not “own” the end customers, who must rely on their IP services providers to be able to receive the services from the second provider. **Example:** Company Y only provides IP telephone services. Any UC2B Internet customer has an ONT that can also be used by Company Y to provide SIP-based IP telephone services. The customer pays UC2B for Internet access and Company Y for telephone services. In the fullness of time UC2B may be able to combine those billings.

Dark Fiber: Dark fiber is optical fiber infrastructure that is currently in place but is not being used. Optical fiber conveys information in the form of light pulses so the "dark" means no light pulses are being sent. To the extent that these installations are unused, they are described as dark. There are two ways UC2B can provide dark fiber – by long-term IRUs or by short-term dark fiber leases.

Our Findings

Although intuitively it may seem that the costs for customer service would be reduced with providing wholesale services, regardless of who provides the first line of customer service and trouble resolution, the customer service costs to UC2B are not dramatically less than what the costs would be to provide retail services. The customer – whether the customer is the end user or the service provider – still needs to be maintained, and UC2B needs to anticipate these costs.

UC2B's Policy Board agreed to offer retail residential pricing for the grant-subsidized areas starting at \$16.04 for 20 Mbps. The non-grant subsidized retail residential rates will need to be at a different rate in order to allow UC2B to effectively expand the network if UC2B chooses. In order to build out to other areas in the Urbana-Champaign area, UC2B would most likely need to offer a retail residential rate of at least \$45 for 20 Mbps. While NEO wants to incent service providers to use the network and provide services, NEO also wants UC2B to be able to compete effectively with the service providers if UC2B decides to expand the network.

There was much debate over the cost of providing services during several of the UC2B Policy Board meetings. The Policy Board decided to lower the offering to offering wholesale services for \$16.04 per customer. NEO believes this price may work for the grant-funded area; however, the \$16.04 price for wholesale services may be difficult under an expansion model. It may be difficult to put together a service offering that would compel the customer or end user to make a change, thus making it difficult to receive more than \$16.04 per customer. NEO has already modeled the \$19.99 per customer under the expansion scenarios; it will not cover the debt of the network. Additionally, operating costs are still assumed with this type of model and the coordination that needs to occur between UC2B as the network owner and the service provider is arduous. For these reasons, NEO would not recommend using a Layer 2 or 3 Wholesale Model Strategy solely to build out the network further. However, with that being said, the model could work if UC2B could share in the capital costs of the network with the service provider(s).

The model also works if UC2B provides dark fiber leases to services providers and it works when the strategy includes offering a combination of wholesale and retail services.

UTOPIA Example

The Utah Telecommunication Open Infrastructure Agency (UTOPIA) is perhaps the most famous example of wholesaling Layer Two and Layer Three services. Utopia burst onto the scene with much fanfare in 2004 as a consortium of (16) Utah cities joined together to provide fiber optic infrastructure under an FTTH design to their citizens and residents. Nearly \$185 million in bonds were raised for the project, along with additional state and federal monies for construction over the ensuing decade. By the end of fiscal 2010, the network had grown to over 1,700 route miles with 56,000 homes and businesses connected.

All commercial and residential subscriber sales were entirely dependent upon and driven by 3rd party channel sales partners, resulting in flat performance. To complicate issues further, the multi-municipality consortium board insisted on equal development across the 16-city footprint in tandem, leaving no room for concentration on markets with potentially high take rates to support early operations.

Additionally, UTOPIA could **only** offer wholesale services because of the regulatory environment within the state of Utah. This provided the “perfect storm” for a unstable financial environment.

This “built it and they will come” approach, utterly lacking of a financially viable and sustainable business model, found itself in serious financial difficulties by 2007, a situation that continues to this day.

By the end of Fiscal 2010, the Statement of Net Assets showed a negative balance of over \$166 million, with nearly \$260 million of debt and an operating income of only \$3 million. The anticipated wholesale value of the network was grossly over-estimated, and the unfocused nature of their build-out resulted in fewer connected potential subscribers a decade later than expected. Despite all issues, however, take rates have still been in the 20% - 30% range for those connected.

UC2B’s approach will be different. UC2B will utilize a combination of wholesale and retail strategies and will build out with an eye for tying revenues closely to the spending of capital.



Where Wholesale Models Do Work

The wholesale model has been extremely successful in European countries. The unique environment in Europe that has allowed for successful deployment of the wholesale model includes:

1. One infrastructure provider
2. Many service providers
3. Excellent services, compelling reasons to change
4. Regulatory environment

Some cities have had success complementing retail models with a wholesale component, such as Jackson, TN, Lafayette, LA, and Sho-Me Technologies in Missouri.

NEO's Recommendation

NEO recommends that UC2B **supplement its retail offering with wholesale services such as dark fiber leases**, long-term IRU agreements or leasing of wavelengths on the network. These leases do not require much from UC2B and will not increase the call center or billing costs of operating a wholesale model.

The Wholesale Model, Layer Two or Layer Three Service Works for the Grant-Funded Areas Only.

The higher layer open access concept would work under the grant-funded areas of the network, where there are no capital costs or debts to be serviced. Under this scenario, UC2B would install the drop fiber and the ONT, and UC2B would still “own” this connection to the customer and the ONT installed at the customer site. If the customer would like to use a different provider, the connection can simply be “pointed” to a different provider, no equipment would need to be replaced. **As there is no debt to be serviced, the Layer Two or Layer Three Service works only in the Grant-Funded Areas.**

Rolling this out under an expansion model needs great consideration. Maintaining the \$16.04 per customer under an expansion model cannot be sustainable. UC2B will most likely need to offer higher priced Wholesale Layer Two or Three Services in order to maintain financial viability. Other winning strategies include negotiating who pays for what capital costs of further buildout with the service providers; negotiating differentiated services such as IPTV or phone services or other over-the-top applications, and offering wholesale services in combination with retail services.



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UC2B Business and Strategic Plan

Wireless Overlay

Wireless Overlay, Estimated Costs for Public and Government Applications

And finally, NEO was asked to put together estimated costs for a wireless overlay network that would be used for public and government applications. Estimated capital costs vary based upon coverage and penetration of the wireless overlay network. On the following pages are estimated costs, the first with minimal coverage, the second with 80% coverage.



Wireless Overlay for Public Safety Applications



Outside Coverage Models (Minimal Interior Coverage)						
Public Safety	km ²	Coverage km2	WiMax Sites	Cost Per Site Deployed	Capital Cost/Installed	
Tower Design Leverages Anchor/Tower Access Near Fiber	4944	36	138	20,000	\$	2,760,000.00
Network Headend Cost					\$	350,000.00
Remote (Nomadic)			Subscriber Units	SubSubscriber Access		
			1	1,250	\$	1,250.00
Public Access	km ²	Coverage km2	WiMax Sites	Cost Per Site Deployed	Capital Cost/Installed	
Tower Design Leverages Anchor/Tower Access Near Fiber	4944	100	50	20,000	\$	1,000,000.00
Network Headend Cost					\$	200,000.00
WiFi Units			Subscriber Units	SubSubscriber Access		
			1	1250	\$	1,250.00
WiFi Commercial/Public Access	mi ²	Coverage mi2	WiFi Sites	Cost Per Site Deployed	Capital Cost/Installed	
Pervasive (High-End) Coverage	1924	0.25	7696	2,750	\$	21,164,000.00
Network Headend Cost					\$	2,308,800.00
WiFi Commercial/Public Access	mi	Coverage mi2	WiFi Sites	Cost Per Site Deployed	Capital Cost/Installed	
Commercial (Mid-Range) Coverage	187	0.19	988	2,750	\$	2,717,000.00
Network Headend Cost					\$	296,400.00
WiFi Commercial/Public Access	mi	Coverage mi2	WiFi Sites	Cost Per Site Deployed	Capital Cost/Installed	
Commercial (Best Effort- Hot Zone/Spot) Coverage	187	0.25	748	2,750	\$	2,057,000.00
Network Headend Cost					\$	224,400.00
Household/Business Wireless Access Point			Subscriber Units	SubSubscriber Access	Capital Cost/Installed	
Commercial Remote (Nomadic) 300 Mbps Wireless Access Point			1	399	\$	399.00
Residential Remote, 54 Mbps Wireless Access Point			1	199	\$	199.00
Service Options						Core Network Costs
Option 1 WiMax Public Safety Only					\$	3,110,000.00
Option 2 Wimax Public Safety & Commercial Services					\$	4,310,000.00
Option 3 Wimax Public Safety & WiFi Commerical/Public Services (Best Effort - Hot Zone/Spot)					\$	5,391,400.00

Wireless Overlay for Public Safety Applications

High Density Coverage Models (80% Interior Coverage)						
Public Safety	km ²	Coverage km2	WiMax Sites	Cost Per Site Deployed	Capital Cost/Installed	
Tower Design Leverages Anchor/Tower Access Near Fiber	4944	16	309	20,000	\$	6,180,000.00
Network Headend Cost					\$	350,000.00
			Subscriber Units	SubSciber Access		
Remote (Nomadic)				1,250	\$	-
Public Access	km ²	Coverage km2	WiMax Sites	Cost Per Site Deployed	Capital Cost/Installed	
Tower Design Leverages Anchor/Tower Access Near Fiber	4944	36	138	20,000	\$	2,760,000.00
Network Headend Cost					\$	200,000.00
			Subscriber Units	SubSciber Access		
WiFi Units			1	1250	\$	1,250.00
WiFi Commercial/Public Access	mi ²	Coverage mi2	WiFi Sites	Cost Per Site Deployed	Capital Cost/Installed	
Pervasive (High-End) Coverage	1924	0.25	7696	2,750	\$	21,164,000.00
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WiFi Commercial/Public Access	mi	Coverage mi2	WiFi Sites	Cost Per Site Deployed	Capital Cost/Installed	
Commercial (Mid-Range) Coverage	187	0.19	988	2,750	\$	2,717,000.00
Network Headend Cost					\$	296,400.00
WiFi Commercial/Public Access	mi	Coverage mi2	WiFi Sites	Cost Per Site Deployed	Capital Cost/Installed	
Commercial (Best Effort- Hot Zone/Spot) Coverage	187	0.25	748	2,750	\$	2,057,000.00
Network Headend Cost					\$	224,400.00
Household/Business Wireless Access Point			Subscriber Units	SubSciber Access	Capital Cost/Installed	
Commercial Remote (Nomadic) 300 Mbps Wireless Access Point			1	399	\$	399.00
Residential Remote, 54 Mbps Wireless Access Point			1	199	\$	199.00
Service Options						Core Network Costs
Option 1 WiMax Public Safety Only					\$	6,530,000.00
Option 2 Wimax Public Safety & Commercial Services					\$	9,490,000.00
Option 3 Wimax Public Safety & WiFi Commerical/Public Services (Best Effort - Hot Zone/Spot)					\$	8,811,400.00

Should UC2B offer a Wi-Fi Public Access Network Using the ADTRAN ONTs?

UC2B could consider offering a Wi-Fi Access Network using the ADTRAN ONT's. NEO's caution on this would be to consider doing this after the grant period so that efforts that are underway to sell, install and secure customers that will be funded through the grant are not diminished.

After UC2B has met the requirements of the grant and secured its 2,400 customers, then consideration could be given to using the ADTRAN ONTs to expand the number of users on the network. Although the capital costs to use the wireless feature for the ADTRAN ONT are minimal, it should also be taken into consideration what the additional customer service costs would be to use the wireless feature.



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UC2B Business and Strategic Plan

Operational
Structure and
Governances

Current Operating Structure

UC2B today is operating as a governmental consortium in partnership with the City of Urbana, the City of Champaign and the University of Illinois. Although there have been numerous successful endeavors that have been executed in cooperation between these agencies, and this organizational structure and governance may be more than adequate in the short term, there may be potential issues in continuing to operate an Internet and FTTP network in the long term within this current organizational structure.

The potential pitfalls may be the following:

- Procurement processes are public with open bids, open negotiation and full disclosures. Key vendors and strategic partners may see this as a barrier to do business with UC2B as they may not want to disclose all of the nuances of the relationship, pricing, cost structures, etc. to potential competitors, their customers and the public in general. Transparency requirements in business practices often cause competitive conflict.
- The open procurement process and the nature in which decisions are made, i.e. with City Council or Board approval, may create a hindrance for UC2B to remain nimble, flexible and able to make decisions in a timely manner in order to best compete in this highly-competitive marketplace.
- Long term commitment to the mission, goals and business of the business may be threatened with the change in City Council members occurring every two years, or that the mission may not be aligned with the mission of the three agencies. It is recognized that all three agencies are fully committed to the success of UC2B today; however, this may change over time as new members are brought to the City Council or to the various Boards. Long term ability to attract funding from a range of sources may be limited based upon the current organizational structure. Operating expenses will be significant and funding or revenue must be in place to cover investment and operational expenses.
- The FTTP business is a new line of business for the consortium and the ability to operate must be built, acquired or outsourced. This requires a strong management team that will oversee this process of organizational growth. Aside from a few individuals who now work for the University, UC2B does not currently have organizational experience in the utility, telecom, Internet or fiber optic business. UC2B must develop and manage marketing and sales and compete with other community network providers. This business requires a commitment to maintenance, customer service and management of an organization that is not yet in place.

Current Operating Structure, cont'd

Providing an open forum to solicit input and to share information with the public can often provide a good platform for innovation, creativity and valuable input into the processes. However, if openness and transparency affects UC2B’s ability to negotiate with vendors, and to continue to be nimble, flexible and make timely decisions, then perhaps there needs to either be a Communication Policy put in place and/or a new organizational structure may need to be established. Several service providers have expressed an interest in developing a relationship with UC2B and have expressed their desire to provide services in partnership with UC2B. However, the current Open Meetings Act laws prohibit elected or appointed decision-makers meeting in a non-public forum. The existing operational structure helps ensure UC2B’s mission; however, **the existing operational structure restricts future capitalizations, service development and expansion, and long-term stability with the private sector partners/customers.**

What is the best operational structure to be:

- Innovative
- Scalable
- Sustainable
- Nimble and Flexible
- Financeable
- Open

Scalability and sustainability will require flexibility in governance, continued innovation and deployment, and the ability to adapt to the competitive environment through partnerships, service enhancements and salable pricing model.

The current organizational structure may serve UC2B well in the short term. The question will be, “at what point does it make sense to restructure the organization?” The answer to that question will be, “when the challenges of this organizational structure limit UC2B success.”

NEO recommends a hybrid approach, a 501c(3) non-profit with for-profit LLC subsidiaries. This organizational structure that may mitigate the potential challenges of other organizational structures, while at the same time provide flexibility in gaining funding from a number of potential sources, and give the organization the ability to offer multiple types of products, services and revenue sources; and the ability to partner with MANY entities and service providers. This approach also allows innovation, scalability, sustainability and allows UC2B to be nimble and flexible.

Each type of organizational structure has its benefits and potential pitfalls. There is no bad organizational structure; each has its set of challenges. An outline of the possible organizational structures, their pros, cons and examples of other FTTP networks are shown on the following pages.

Business Model Comparison

Commonly Called	Owned By	Operated By	Pros	Cons	Examples
1. Public Utility	Municipal/Co-Op	City, Enterprise or Private Sector	<ul style="list-style-type: none"> Enterprise services with a high level of local control over network funding and priorities. Public good often overrides profit motives. User access fees; can result in savings for the public utility. Utility investment can be managed in either a wholesale model which encourages provider partners and extends community investment or through retail model which engages end-users. Dedicated retail customer (sticky). Community model creates loyalty –not just price. 	<ul style="list-style-type: none"> Often greater capital investment with no guarantees that service adoption will cover investment and operational expenses. Usually a new line of business requirements Organization must build –acquire organizational experience Public Utility must develop and manage marketing, sales and compete with other community network providers Many cities are uncomfortable with maintenance and management commitment Government fund accounting not allow certain shared revenue/cost for municipal utility Transparency requirements in business practices can cause competitive conflict. 	<p>Wholesale Models:</p> <ul style="list-style-type: none"> Chelan, WA <p>Retail Models:</p> <ul style="list-style-type: none"> St. Louis Park, MN; Chattanooga, TN Bristol, VA Chaska, MN; St. Cloud, FL Benton Public Utility District, - Kennewick, Washington Saint Louis Park, Minnesota
2. Non-profit 501(c)3 501(c)12	Typically a committed, cross-sector group of leaders that facilitate sustainability and local ownership. (Community Stakeholders, Independent Service Corporation, Institutional or Institutional Partners)	<p>Management of Non-profit with flexible governance:</p> <ul style="list-style-type: none"> Charitable Community Leaders Private and/or public sector governance Hybrid Public-Private Governance <p>Can either be a charitable or service related non-profit.</p>	<ul style="list-style-type: none"> Non-profit mission will be directed by the selected governance model and their individual mandates. Non-Profit can have a social mandate that focuses on community needs and operates network independent from other govt. business. Can aggregate demand and leverage capital assets. More funding options are available to the non-profit versus municipal led initiatives. Also provides flexible business models that can evolve to address selected community needs. 501(c)3 enables charitable giving and provides shelter for assets. 501(c)12 provides tax advantages for service organizations 	<ul style="list-style-type: none"> Usually a new line of business requirements Organization must build –acquire organizational experience Non-Profit must develop and manage marketing, sales and compete with other community network providers. Start-up structure and funding may be complex and difficult. Requires member or stakeholder buy-in Fund-raising may be difficult. Traditional financing may be more complicated by business model and ROI analysis. IRS has had increasing interest in reviewing and ensuring non-profit status and has in recent years pierced the veil when a non-profit is used as a shelter. IRS may require hybrid non-profit and for-profit corporation to manage unrelated business income. Mission often limits ability to take advantage of new opportunities 	<ul style="list-style-type: none"> OneCommunity, OH, Boston, MA; Cape Cod, MA; Rhode Island

<p>3. Publicly Owned</p> <p>Municipality</p> <p>Government Authority</p> <p>Privately Operated</p>	<p>Municipal/Government governance, non-profit, consortium of cities, public/private consortium, or private company operated</p>	<p>Management of the Non-profit governed by a municipal or government council or through operating agreement with private sector partner.</p>	<ul style="list-style-type: none"> • Can encourage build out of “middle mile” across a region and competition in local broadband market. Generally encourages private sector investment through incentives or through revenue commitments. • Easier for government to leverage assets, participate in collaborative ventures, and partner with non-profit. • Can aggregate public enterprise demand-use and leverage capital assets to reduce cost. • Can create alternative revenue streams to lower overall operating expenses. 	<ul style="list-style-type: none"> • Providers develop and invest in infrastructure based on anticipated ROI. • Varying business models make it difficult to ensure success • Competitive providers may not continue to invest in the network and may not offer services that meet community needs pushing the underserved burden and expenses onto the publicly owned asset while they cherry pick the high value customers. 	<ul style="list-style-type: none"> • Utopia, West Valley City, UT; • Windom, Minnesota • Network; Nevada, MO; • Corpus Christi, TX
<p>4. Consortium</p>	<p>Group of public partners, private partners, or public and private partners</p>	<p>Private and/or public sector</p>	<ul style="list-style-type: none"> • Buying consortia with the option to aggregate services with the benefit of volume discounts and option to co-invest in new infrastructure at a lower shared cost per individual if services are otherwise unavailable. • A Broadband buyers club for big broadband users across a region. 	<ul style="list-style-type: none"> • Usually focuses on consortia/membership and does not solve connectivity for all end users in a region. • Buyers club is subject to market conditions and rates may change based on provider market costs and willingness to sell at discounted rates. • Consortia member’s services limited to provider contracts/services. 	<ul style="list-style-type: none"> • Fredericton, NB; • Ohio Middle Mile Consortium (OMMC) • Wireless Silicon Valley
<p>5. “Public/Private” Or Franchise</p>	<p>Public/Private Investment with either public or Private leadership</p> <p>Typically a Private sector provider or reseller</p>	<p>Private sector</p>	<ul style="list-style-type: none"> • Minimizes financial, development and operational commitment by the cities/university • Provides the entity option to use services for their direct benefit without significant capital risk. 	<ul style="list-style-type: none"> • Cities/University has limited input and control; typically the entity contracts with one private sector partner for network services. • The entity has little or no impact on competition in the local broadband market. • Citizen services are driven by purely profit motive. 	<ul style="list-style-type: none"> • Philadelphia; • Umatilla county; • Rio Rancho, NM; • Tucson, AZ
<p>6. Subscriber Based Private</p>	<p>Private sector</p>	<p>Private sector</p>	<ul style="list-style-type: none"> • No financial risk for the and no control over services being delivered or made available to the community. Limited or no political risk for city. 	<ul style="list-style-type: none"> • No control over the service providers and services being offered. There is no guarantee that service provider will invest and whether they will provide services that meet the needs of community. 	<ul style="list-style-type: none"> • Common carrier, cable and third party providers. • The status quo! Any number of private networks may serve a community.

<p>7. Co-Op Model</p>	<p>Municipal/Government governance, non-profit, consortium of cities, public/private consortium, or private company operated</p>	<p>Management of the Non-profit governed by a municipal or government council or through operating agreement with private sector partner.</p>	<ul style="list-style-type: none"> • Community, locally based. Can continue to focus on the needs of the community. • Unique funding model; may use several approaches to financing: crowd funding, service providers can participate in the capital funding, individuals, and government. • Can aggregate public enterprise demand-use and leverage capital assets to reduce cost. • Can create alternative revenue streams to lower overall operating expenses. 	<ul style="list-style-type: none"> • Providers develop and invest in infrastructure based on anticipated ROI and Capital Membership • Varying business models make it difficult to ensure success • Competitive providers or individuals may not continue to invest in the network and may not offer services that meet community needs. 	<ul style="list-style-type: none"> • United Electric Cooperative (Missouri) • Paul Bunyon (Minnesota), • Camino Fiber Network Coop
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NEO's Recommendation: A Hybrid Approach

Current Status

Publicly Owned
 Government Authority
 Privately Operated

Recommendation

Consider Hybrid
 Non-Profit 501(c)3 with
 For-Profit Subsidiary Organization
 and Continued Community
 Governance

The benefits of a Hybrid Non-Profit 501c(3) organization with For-Profit Subsidiaries will combine the benefits of the Non-Profit organization (tax advantages, charitable contributions, maintaining the mission for the societal good and maintain the interest of government and the community) with the benefits of For-Profit LLCs or C-Corps (another set of funding sources, and may maximize opportunities for operational flexibility, efficiency and financial sustainability.)

This organizational structure may alleviate the potential concern of open procurement processes which may be seen by vendors, key strategic partners as a barrier to do business with UC2B. This organizational structure may also allow UC2B to make decisions more quickly and allow UC2B to be more nimble and flexible in order to best compete in the marketplace. This organizational structure may mitigate the potential concern of change in City Council members occurring every two years and may provide an environment whereby long-term commitments to the mission, goals and business of the business can be kept in place. And finally, this separate, stand-alone entity operates at arms length from the cities and UI and lessens the financial and legal risks of operating this network.

The recommendation of a hybrid structure gives UC2B the advantages of both a non-profit entity and a for-profit business.

This allows UC2B to move forward with a number of various entities in partnership (service providers, network infrastructure funders, customers, i.e. the medical community, schools, and businesses) and gives UC2B the most flexibility in maintaining the local and societal focus. Local ownership and control by the member agencies would remain in place with the appointment of representatives to the Board of Directors. The details of such an entity would need to be negotiated among the member agencies in a new intergovernmental agreement and set of organizational by-laws.

UC2B – Business Strategy & Operations

Recommended Operation, Legal and Tax Structure (Post Grant)



Mission Oriented Community Programs

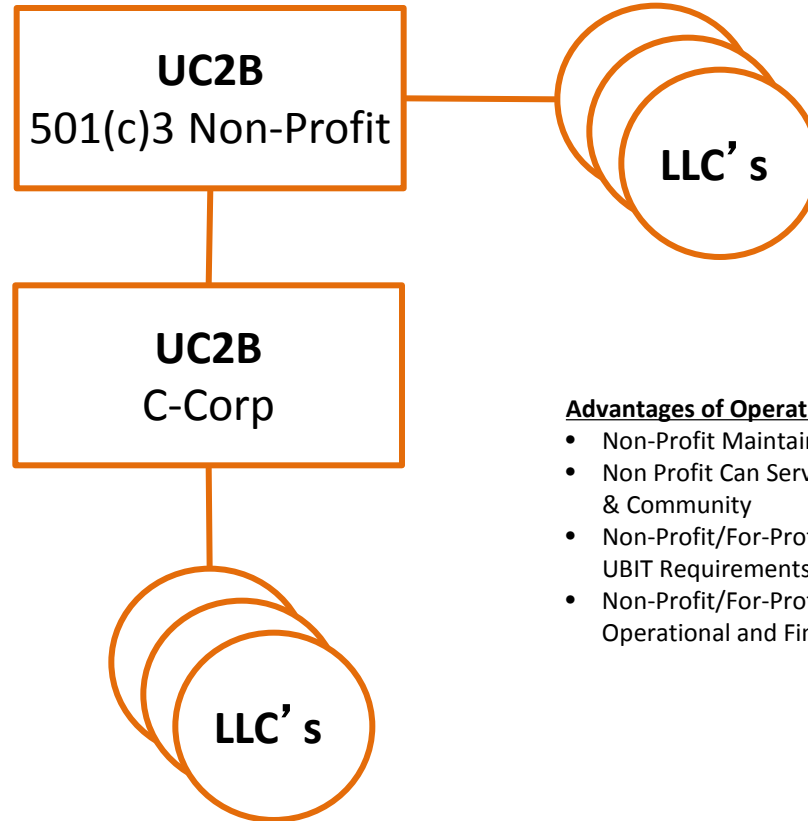
- Capital Infrastructure
 - Fiber IRUs
 - Equipment Donations
- Community Applications
 - Government Service
 - Underserved Health & Education
 - Digital Inclusion Programs

Member Programs

Maintain Target Percentage of Ownership <30%

Un-Related Business Income

Maintain Target Percentage of Ownership <30%



100% Ownership by UC2B Non-Profit

- Unrelated revenue recognition
- Royalty Use of Assets
- Target Unrelated Mission Use

Advantages of Operating Structure

- Non-Profit Maintains Mission Focus
- Non Profit Can Service the Interest of Government & Community
- Non-Profit/For-Profit Arrangement Manages IRS UBIT Requirements
- Non-Profit/For-Profit Maximize Opportunities for Operational and Financial Sustainability

Limited Liability Company

- Vendor Service Partnerships
- Network Vendor Agreements
- 100% Unrelated Income Recognition

This Structure Facilitates Multiple Funding Sources

- Grants/Loans from Charitable Foundations & Trusts
- Donations form Corporate Entities
- Bond Financing-public ownership and either G.O. Debt or Revenue Bonds
- Hybrid Bond financing using Pooled or Citizen Opt-In Bond Programs
- Private operator and private capital with Public ownership of underlying asset
- Institutional Investor (international fund)
- Potential investor/banker
- International Infrastructure Funds
- International/Sovereign wealth funds with an interest in such investments targeting education and social programs
- Hybrid public/private model using an “on behalf of entity” or alter ego entity or even create a community venture fund partnered with Private sector owner who would also manage

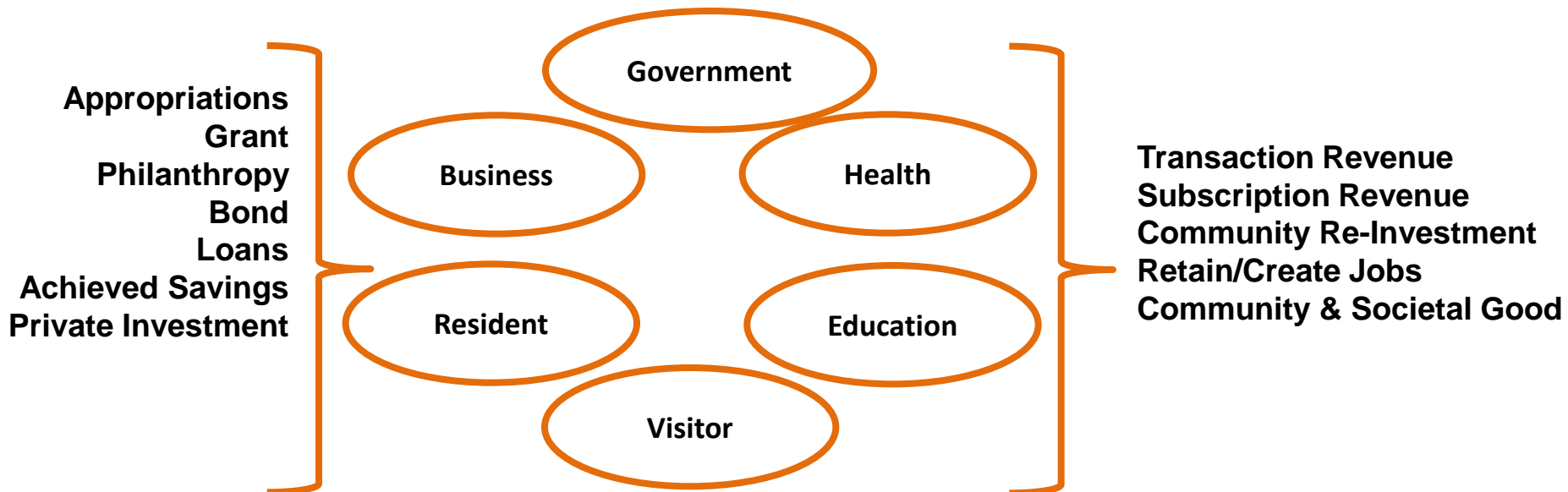
This hybrid organizational structure allows for numerous funding options, giving UC2B more flexibility and options available for funding its expansion.

This Structure Facilitates Flexibility in Sourcing Operations

- Outsourcing and Staffing Flexibility
 - Service Trades
 - Accept Donations and In-Kind Service Partnerships
 - Simplified Service Contracting
 - Broad Range of Contract Service Options

To Summarize: This Structure Would Create

- A variety of sources of funds in combination over time
- A variety of revenue and other outcomes
- A portfolio management approach





Urbana-
Champaign
Big Broadband

UC2B Business and Strategic Plan

Market Overview
Competitive
Assessment,
Pricing

Market Overview

The purpose of this section is to provide market information and analysis, data and insight into competitive service and pricing offerings in the marketplace, and to provide strategies and best practices for retail residential and business service offerings and pricing considerations for UC2B.

This report will address the following questions:

- Provide recommendations on current pricing proposals and associated bandwidths with particular attention paid to offerings in the FTTP areas.
- Provide an evaluation of and recommendations for UC2B's options for pricing retail services for business v. residential customers.
- Should UC2B consider non-profit pricing alternatives?
- Provide alternatives, advantages and disadvantages, and recommendations for UC2B to consider related to FTTP equipment deposits.
- Identify UC2B's options, the associated advantages and disadvantages, and recommendations for addressing/providing service to multi-use or multi-family structures. Should UC2B contract with landlords or the tenants? Provide draft customer service agreements if different than above.

Methodology

NEO has access to a comprehensive, broadband Internet transactions database. This database is the result of collecting and analyzing over a half a billion Internet transactions from all over the country. NEO used proprietary analytical modeling, which includes demographic information, speed tests, Internet order information, the physical addresses of subscribers and the IP addresses of subscribers. These transactions come from hundreds of sources including e-subscription services, and various other sources where the consumer submits their address information, and the database captures the consumer's IP address which the database tool then discriminates between residential carriers and business carriers.

Market Overview, cont'd

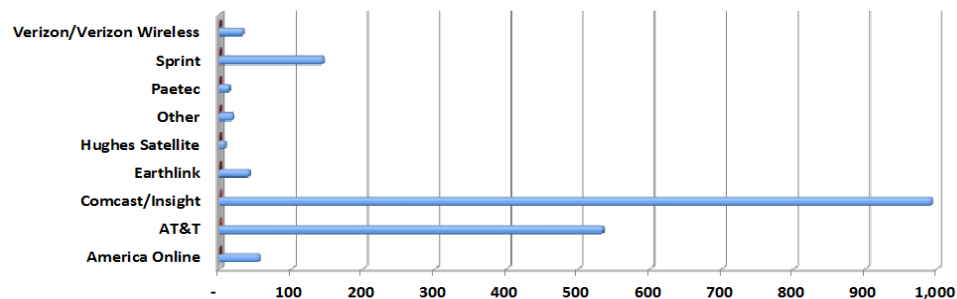
For this study, NEO analyzed database data for all of the zip codes and census tracts by block in the Champaign-Urbana area from January through September 2011. The Champaign-Urbana communities represent over 48,761 households and 1,760 businesses. The sample data was scrubbed for duplicate transactions (in other words, NEO eliminated the returning customer data records in information regarding churn rate) and then NEO analyzed 5% of the total households (1,845 discrete sample households) and 5% of the businesses (77 discrete sample businesses) to determine providers or carriers, type of services, pricing information. A slightly smaller sample (1,111 households and businesses) was analyzed to determine actual speed tests.

On this and the following pages, actual market data in the Champaign-Urbana area was captured.

Existing Providers and Market Share

Provider	Internet Provider	% of Internet Market
America Online	56	3.0%
AT&T	535	29.0%
Comcast/Insight	993	53.8%
Earthlink	42	2.3%
Hughes Satellite	8	0.4%
Other	19	1.0%
Paetec	14	0.8%
Sprint	145	7.9%
Verizon/Verizon Wireless	33	1.8%
Total	1,845	100%

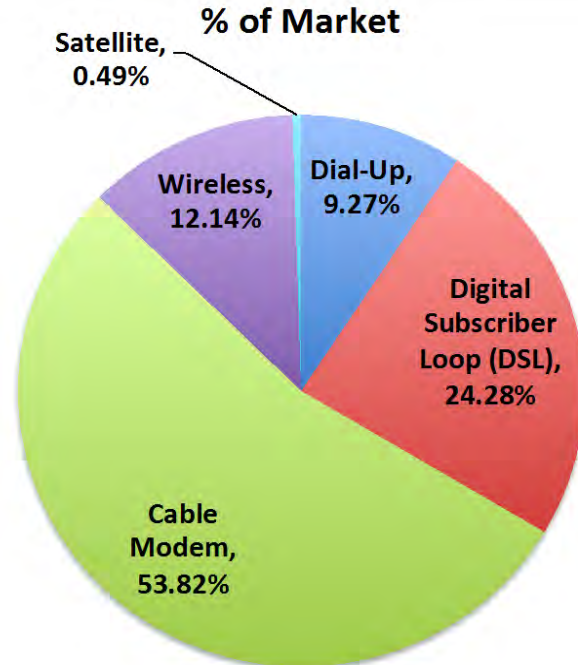
Internet Provider Market Share
Champaign-Urbana



	America Online	AT&T	Comcast/Insight	Earthlink	Hughes Satellite	Other	Paetec	Sprint	Verizon/Verizon Wireless
% of Internet Market	3.0%	29.0%	53.8%	2.3%	0.4%	1.0%	0.8%	7.9%	1.8%
Internet Provider	56	535	993	42	8	19	14	145	33

Comcast is the market leader with 53.8% of the market share. AT&T follows Comcast with 29% of the market share. Third party providers such as America Online, Volo, Juno, Earthlink and others make up over 6.4% of the market. Third party providers use DSL/Cable partners and fixed wireless to deliver network access. Approximately 1.8% currently relies on wireless as their sole Internet access service.

Type of Service Delivery, All Customers



With Comcast/Insight having 54.6% of the market share, it makes sense that a similar percentage of the service delivery is cable modem.

AT&T is offering their service via Digital Subscriber Loop (DSL) services and U-verse, which bonds two or more pairs of copper wires for faster DSL speeds. No one is currently offering services via FTTP technology.

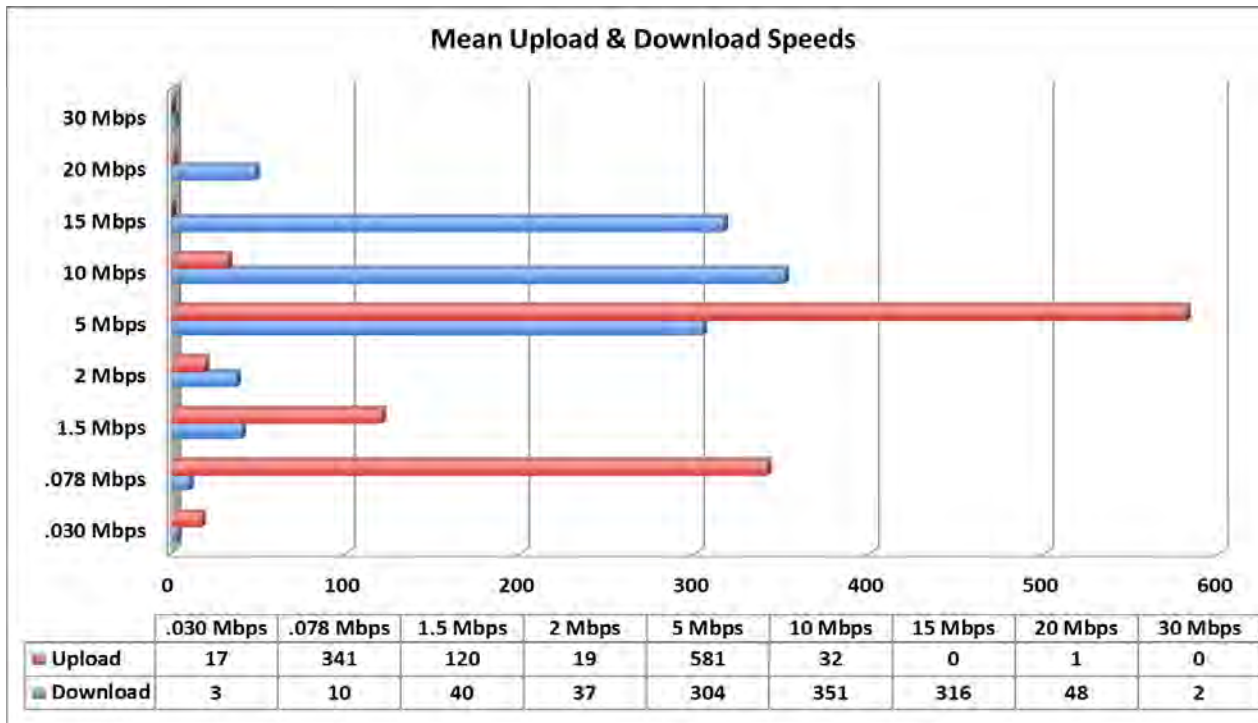
As no other company is currently offering their services using FTTP technology, UC2B should highlight this as a main selling point and advantage of its service offerings. The benefits and applications only available on FTTP are provided later in this document.

Service	Subscribers	% of Market
Dial-Up	171	9.27%
Digital Subscriber Loop (DSL)	448	24.28%
Cable Modem	993	53.82%
Wireless	224	12.14%
Satellite	9	0.49%
	1845	100%

No other provider in the Urbana-Champaign area is offering services via Fiber to the Premise technology; a huge competitive advantage for UC2B.

No Symmetrical Service Offerings are Available

Existing service offerings are asymmetrical, meaning, the download speeds are not the same as the upload speeds. The competitors are providing service offerings where the upload speeds are much slower than the download speeds. Most of the customers are subscribing to download speeds between 5 Mbps and 15 Mbps. The upload speeds that customers are subscribing to are between less than 1 Mbps up to 5 Mbps.

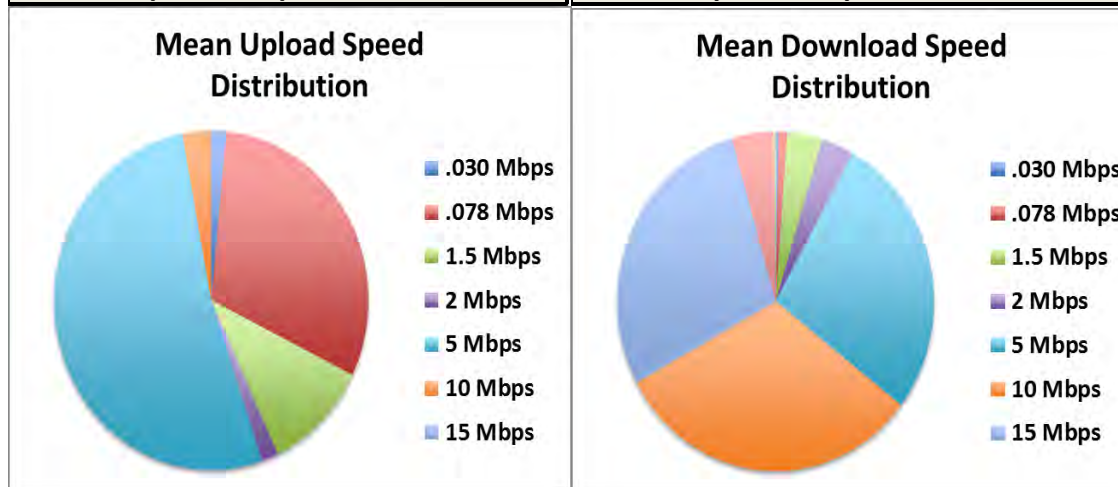


The chart on the left shows SUBSCRIPTION LEVELS, i.e. the number of customers in the sample that subscribed to a level of service; most subscribing to 5-10 Mbps download and 5 Mbps upload.

Actual Speed Tests

Mean Upload Speeds	Upload	Mean Download Speeds	Download
.030 Mbps	1.53%	.030 Mbps	0.27%
.078 Mbps	30.69%	.078 Mbps	0.90%
1.5 Mbps	10.80%	1.5 Mbps	3.60%
2 Mbps	1.71%	2 Mbps	3.33%
5 Mbps	52.30%	5 Mbps	27.36%
10 Mbps	2.88%	10 Mbps	31.59%
15 Mbps	0.00%	15 Mbps	28.44%
20 Mbps	0.09%	20 Mbps	4.32%
30 Mbps	0.00%	30 Mbps	0.18%
Subtotal Speed Samples	100%	Subtotal Speed Samples	100%

Another differentiator of FTTP networks is that more speed is available for both upload and download applications, and should be emphasized as another selling point of UC2B's service offering.



Actual speed test samples were taken by Broadband Scout in March, 2012. The actual mean upload speeds are between less than 1 Mbps and 5 Mbps, with most of the upload speeds at 5 Mbps (52.3%). The actual download speeds range between 5 Mbps (27.36%), 10 Mbps (31.59%) and 15 Mbps (28.44%).

Residential Pricing, Service Offerings



Note: These are mostly Asymmetrical Services with a cap of around 5 Mbps upstream.

Residential/SMB	AT&T	Comcast/Insight DOCSIS Cable	OneEleven Wireless	OneEleven DSL	Comcast DSL	Volo DSL/Wireless	Consolidated DSL	HughesNet Satellite
1.5 Mbps								
6 Month Introductory Price								39.99
12 Month Introductory Price								
Post Introductory Price			\$ 40.00					79.99
Bundled Price								
3-4 Mbps								
6 Month Introductory Price								
12 Month Introductory Price	\$ 19.95							
Post Introductory Price	\$ 38.00		\$ 50.00	\$ 69.95	\$ 39.95	\$ 32.00	\$ 19.95	
Bundled Price								
5-8 Mbps								
6 Month Introductory Price								
12 Month Introductory Price	\$ 24.95							
Post Introductory Price	\$ 43.00		\$ 75.00	\$ 89.95				
Bundled Price								
10-12 Mbps								
6 Month Introductory Price		\$ 19.95						
12 Month Introductory Price	\$ 29.95							
Post Introductory Price	\$ 48.00	\$ 59.95		\$ 101.95				
Bundled Price		\$ 44.95						
18 Mbps								
6 Month Introductory Price								
12 Month Introductory Price	\$ 39.95							
Post Introductory Price	\$ 53.00							
Bundled Price								
20 Mbps								
6 Month Introductory Price								
12 Month Introductory Price								
Post Introductory Price		\$ 69.95						
Bundled Price								
24 Mbps								
6 Month Introductory Price								
12 Month Introductory Price	\$ 49.95							
Post Introductory Price	\$ 63.00							
Bundled Price								

Most pricing in the market has an initial 6 month or 12 month rate that reverts to a higher rate after the initial period.





Urbana-
Champaign
Big Broadband

UC2B Business and Strategic Plan

Pricing
Residential
Services



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Residential Service for Grant-Funded Area: “20 Mbps for 20 Bucks”

UC2B is proposing to offer 20 Mbps for \$20 per month (\$19.99). UC2B’s initial proposal at the time of the grant applications was to offer 5 Mbps at the \$19.95 price. After a more diligent market analysis, it is clear that this offering 20 Mbps of bandwidth for the same price will encourage current subscribers to move to UC2B, especially when it is pointed out that the customer is not always receiving the level of bandwidth from the current providers that the customer is subscribing to. **In other words, the customer is not getting what they are paying for from the competition.**

With UC2B offering 20 Mbps for \$20 per month; the competition is offering the same amount of bandwidth for 2-3 times this price. AT&T is offering 18 Mbps for \$39.95 initially; with the price increasing to \$53 per month after 12 months. Comcast/Insight is offering 20 Mbps for \$69.95. Most of Comcast’s customers are on the 10-12 Mbps offering, for a price of \$19.95 for six months, then jumping to \$59.95 per month. Other competitors are offering 3-4 Mbps for \$19.95 to \$69.95.

Comparison of UC2B Pricing vs. the "Market"

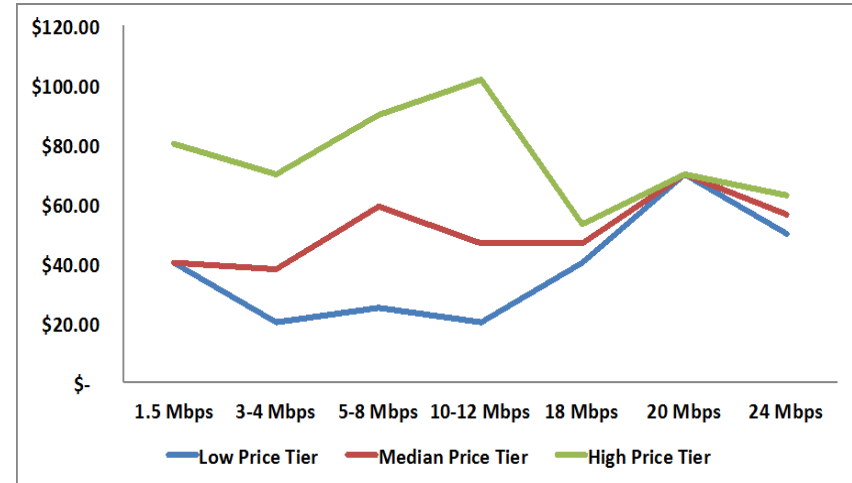
Consumer	Symmetrical	Basic Services Best Effort Upstream	Upgraded Upstream 1-2 Mbps Max	Upgraded Upstream 2 to 5 Mbps Max
Price/Service Tiers	UC2B's Initial Pricing	Low Price Tier	Median Price Tier	High Price Tier
1.5 Mbps	NA	\$ 39.99	\$ 40.00	\$ 79.99
3-4 Mbps	NA	\$ 19.95	\$ 38.00	\$ 69.95
5-8 Mbps	\$ 19.99	\$ 24.95	\$ 59.00	\$ 89.95
10-12 Mbps	\$ 19.99	\$ 19.95	\$ 46.48	\$ 101.95
18 Mbps	NA	\$ 39.95	\$ 46.48	\$ 53.00
20 Mbps	\$ 39.99	\$ 69.95	\$ 69.95	\$ 69.95
24 Mbps	NA	\$ 49.95	\$ 56.48	\$ 63.00
30 Mbps	\$ 49.99			
40 Mbps	\$ 59.99			
Upstream		<700 Kbps	1 to 2 Mbps	2 to 5 Mbps
Low		\$ 19.95	\$ 38.00	\$ 53.00
Median		\$ 39.95	\$ 46.48	\$ 69.95
Max		\$ 69.95	\$ 69.95	\$ 101.95

All of the service providers offer a “best effort” service; meaning, they will make their best effort, yet do not always deliver the level of service or the amount of bandwidth to which the customer subscribes. To receive a higher level of service and to upgrade the available bandwidth for uploading data, the existing service providers charge the customer more. This could be a differentiating feature of UC2B’s service offering. With FTTP, and the Gigabit capacity that UC2B is building, UC2B will have a much better chance of meeting the subscription levels it offers its customers.

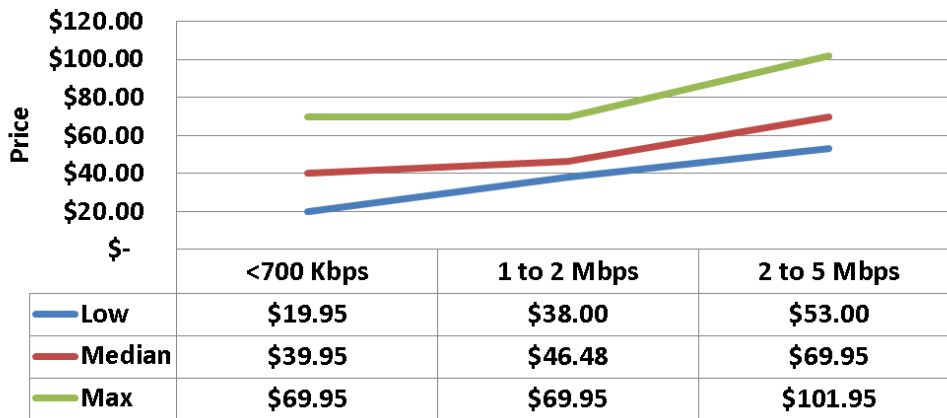
UC2B Disadvantage: No Bundled Video Services; Position as Price/Service Leader

UC2B should be aware that many of the consumers of broadband are currently purchasing bundled services from cable/DSL providers. Comcast currently offers a bundled Triple-play service at \$99 which is the predominate bundle within the underserved community. Since UC2B is competing with bundled and unbundled services it will have to consider that the bundled offerings will be tougher to compete with unless there is a VoIP/IPTV alternative. Comcast unbundled VOIP/TV will increase in price to as much as \$112 for VoIP/TV without the data component making the UC2B and Cable package more expensive for the existing consumers of these services. Comcast has already announced that it will be lowering its price for bundled services.

Existing Services Max out at 18 Mbps



Consumer Price Tiers Based on Upstream Services



What is interesting is that there are currently very few high bandwidth providers and only one above 18 Mbps. So, the convergence of low, medium and high pricing at the 20 Mbps service level around \$66 per month is based on the fact that there is no competition above 18 Mbps. In addition, there is a wide variance in pricing across the Cable, DSL and Wireless providers.

Summary of Salient Points



- ❖ Comcast/Insight is the market leader with 53.8% of the market share. AT&T follows Comcast/Insight with 29% of the market share.
 - ❖ With Comcast having approximately 54% of the market share, it makes sense that a similar percentage of the service delivery is cable modem. AT&T is offering their service via traditional Digital Subscriber Loop (DSL) services as well as U-Verse, which bonds DSL copper pairs for greater bandwidth.
 - ❖ No one is currently offering services via FTTP technology. In addition, Comcast/Insight and AT&T have not upgraded their data cable network infrastructure to support the next tier of services (100 Mbps). UC2B should market the advantages of its FTTP offering, being the only service provider using this technology.
 - ❖ 97% of the Upload Speeds are less than 5 Mbps. Over 35% of the download speed is less than 5 Mbps, now considered underserved.
 - ❖ Approximately 64% within the micro-urban setting have speeds greater than 5 Mbps, 12% lower than the national average. The actual speeds are typically 20 to 30% less than advertised and because of oversubscription, often are less than 50% of the advertised rates at peak periods.
-

- ❖ No other provider is marketing symmetrical services or any kind of service level agreement. This is an advantage for UC2B.
- ❖ Customers are paying for a service level that they are not actually receiving. All of the other service providers are offering their service as a “best effort.” In order to actually receive better bandwidth, especially for uploading data, the customer needs to pay higher rates. UC2B could offer a guarantee on service levels as a differentiator in the marketplace.
- ❖ Comcast has a 6-month introductory price of \$19.99; after that it reverts to \$59.99 or a bundled price of \$44.95 for bandwidth speeds of **10 Mbps** of download, asymmetrical of **5 Mbps** or less upload. AT&T has a 12-month introductory price of \$29.95; after that it reverts to \$48.00.
- ❖ Comcast/Insight does provide bundled services (Triple Play) that reduce the overall cost based on the uptake of the additional product offers. Both Comcast and AT&T will be able to offer bundled rates, simplifying the “triple play” decision and providing the appearance of lower rates for similar services. As UC2B does not have this capability, this is a disadvantage for UC2B. UC2B could partner with other VoIP/IPTV providers to mitigate this disadvantage. Groups like Roku, Boxee, and others are building a portfolio of Over-The-Top applications to compete with the local cable operators. UC2B will continue to negotiate with companies such as Netflix and Google as peering partners to offer movies and content on demand.



Urbana-
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UC2B Business and Strategic Plan

Pricing
Business and
Commercial
Services



The objectives and core values of the business pricing strategy for UC2B are as follows:

- Simple, straight-forward pricing
- Superior service than the competition
- Much better pricing than what is available in the market today
- Attractive pricing and packaging to meet the goals of the grant, a sustainable financial plan
- A possible financial path for further expansion of the network
- Provide novel, unique approach to UC2B’s offering

Tiers of bandwidth with flat-rate pricing

NEO recommended to have flat-rate tiers of bandwidth available. Larger data users may purchase faster tiers of service and small users may subscribe to smaller Internet bandwidth (yet much better bandwidth speed, performance and availability than what is available in the marketplace today).

The chart on the right shows Comcast’s Cable offering and Comcast’s Ethernet offering. The difference between Comcast’s Cable and Ethernet offering is their Ethernet product is delivered via fiber, their Cable offering uses their cable network. Below Comcast’s rates is what NEO initially recommended to the Policy Board for pricing for business and commercial Internet users.

Comcast Cable			
	22 Mbps/5 Mbps	\$ 106.95	
	50 Mbps/10 Mbps	\$ 196.95	
	100 Mbps/10 Mbps	\$ 376.95	
Comcast Ethernet			
		Low End	High End
	22 Mbps/5 Mbps	\$ 399.00	\$ 899.00
	50 Mbps/10 Mbps	\$ 489.00	\$ 948.00
	100 Mbps/10 Mbps	\$ 650.00	\$ 1,048.00
UC2B Ethernet, Fiber Optic, Initial Recommended Pricing			
	20 Mbps/20 Mbps	\$ 114.80	
	40 Mbps/40 Mbps	\$ 213.80	
	60 Mbps/60 Mbps	\$ 312.60	
	80 Mbps/80 Mbps	\$ 411.00	
	100 Mbps/100 Mbps	\$ 509.00	

Business and Commercial Pricing, cont'd



For the grant-funded areas only, the Policy Board approved giving businesses the “20 Mbps for \$20” pricing if the business did not require a larger bandwidth tier, and/or if the business did not need more than one IP address. For all other businesses, meaning those that needed more than one IP address and/or a higher pricing tier, the Policy Board approved the following pricing:

All Local network connections are symmetrical at 1,000 Mbps or 1 Gbps
Fiber Installation Cost – Grant-Funded
Equipment Cost – Grant-Funded

Upstream Internet Bandwidth	Downstream Internet Bandwidth	Cost per Month
20 Mbps	20 Mbps	\$ 54.99
40 Mbps	40 Mbps	\$ 94.99
60 Mbps	60 Mbps	\$ 133.99
80 Mbps	80 Mbps	\$ 172.99
100 Mbps	100 Mbps	\$ 212.99
125 Mbps	125 Mbps	\$ 261.99
150 Mbps	150 Mbps	\$ 309.99
200 Mbps	200 Mbps	\$ 406.99

This pricing is far more competitive than its equivalent in the marketplace, offering better service, reliability and pricing that is more than 50% less than Comcast’s Ethernet service. The pricing is competitively priced versus Comcast’s cable product. UC2B customers would also be able to connect to the Gigabit Intranet service at no additional charge.

Intranet service is non-Internet access services provided within the communities of Urbana-Champaign for those that are connected to the UC2B network.

The primary advantage of flat-rate pricing for customers is that they know exactly what their bill will be each month. If experience shows that a customer has purchased too much bandwidth, they may elect to go with a less-expensive, slower tier in the future. UC2B loses a little future revenue, but the customer is allowed to purchase the correct package to meet its needs.

From UC2B’s perspective, there is minimal overhead involved in operating a tiered-bandwidth system. It is certainly possible that a business customer paying for the least amount of bandwidth could actually transfer more Internet data on the network over any given period of time than a customer paying for more bandwidth. While that may seem unfair, it is actually OK for UC2B. UC2B will have the ability to increment the Internet bandwidth that UC2B has available, and stay ahead of the heavy users’ demand.

Approved Pricing for Business/Commercial Customers, Grant-Funded Areas



If experience shows that a customer has not purchased enough bandwidth, they will have two options. First, they can simply elect to move to a faster and more expensive tier for the future. However, if the customer does not want to purchase a more expensive tier, the customer may elect to stay with their current tier and monthly rate and accept the fact that for some percentage of the day, they will be constrained by their bandwidth limit. If that congestion is only 10 minutes a day, it may be acceptable to the customer. If that congestion is 10 hours a day, they may want to purchase additional bandwidth. As long as UC2B remains flexible about allowing customers to change their bandwidth packages for future months, this is absolutely the most customer-friendly, simple and straight-forward, and understandable way UC2B can sell Internet services to businesses.

A two-year service commitment is required to receive the grant-funded fiber installation and equipment. These grant-funded service rates include one public IP address. The equipment provided by UC2B will support an unlimited number of wired or wireless devices on private IP addresses. The customer will be responsible for providing an Ethernet switch if connecting more than four wired devices is desired. Should a customer require more than one public IP address or require more than 40 Mbps of Internet bandwidth, the commercial rates on this page will apply. UC2B is an open-access network. In addition to UC2B Internet service, there will also be services available from other providers over the same fiber connection and equipment.

Public IP Addresses are available in IP subnets of 5, 13, 29, 61, 125 and 253 customer usable addresses. The monthly costs for additional Public IP addresses are: 5 hosts - \$4.99, 13 hosts - \$12.99, 29 hosts - \$28.99, 61 hosts - \$60.99, 125 hosts - \$124.99 and 253 hosts - \$252.99. There are also one-time charges associated with setting up Public IP subnets: 5 hosts - \$20, 13 hosts - \$25, 29 hosts - \$30, 61 hosts - \$35, 125 hosts \$40, and 253 hosts - \$45. After the initial setup, and changes to the Domain Name Service will be charge \$20 per request. This \$20 change service charge may involve changing a single IP address or changing a series of IP addresses that are submitted at the same time.

Approved Pricing for Business/Commercial Customers, Grant-Funded Areas



VLAN Service. UC2B is also offering pricing for a direct connection or Private VLAN connection on the network. Anchor tenants or businesses would be charged this pricing for Ethernet connections to other customers on the network.

Private VLANs are used for connecting multiple locations of an organization to each other. This is sometimes referred to as "Metro Ethernet". There is no Internet connectivity or Community Network Service connectivity included in the Private VLAN Service. In this model, organizations would typically centralize Internet connectivity, and then use the Private VLAN to distribute Internet and organizational data to all remote locations.

UC2B is planning to offer the following pricing:

Business and Anchor Institutions, Private VLAN, Layer Two Service			
	Downstream Mbps	Upstream Mbps	Pricing Plan per Month
Private VLAN 10 Mbps Location	10	10	\$ 100
Private VLAN 100 Mbps Location	100	100	\$ 400
Private VLAN 1 Gbps Location	1000	1000	\$ 1,200

This pricing seems to be competitively priced as well. AT&T is offering a Private VLAN product for health and education applications of \$650 for 100 Mbps (UC2B is offering this at \$400 per month) and \$1,100 for 1Gbps.



Urbana-
Champaign
Big Broadband

UC2B Business and Strategic Plan

Pricing
Wholesale
Services: Dark
Fiber Leases, IRU
Agreements, etc.

Types of Wholesale Services, Models to Consider

There are three types of wholesale services that UC2B is anticipating providing per the NTIA grant.

- **Layer-Two transport:** VLAN
- **Layer-Three service:** Per customer
- **Indefeasible Rights of Use (IRUs) and Dark Fiber Leases:** Upfront capitalized fee (IRU) or Monthly lease (Dark Fiber Lease)

NEO will first discuss IRUs and Dark Fiber Leases and will address in detail the Layer Two and Three services later in this section.

Indefeasible Rights of Use (IRUs) and Dark Fiber Leases

An Indefeasible Right of Use (IRU) is the effective long-term lease (or often thought of as temporary ownership) of a portion of the capacity of fiber optic cable. IRUs are specified in terms of a certain number of fiber counts for a given segment of a fiber optic network. In most cases, the IRU is a 20- to 25-year agreement to use the fiber count for a segment. Payment for the IRU is typically an upfront fee based upon the fiber count miles. The fiber count miles are the number of miles of the segment times the number of fibers used.

Typically, the per route mile fee can range anywhere between \$1,500 to \$3,500 per fiber count. These numbers are based upon national statistics. In the State of Illinois, the per route mile fee has ranged anywhere between \$500 to \$6,500 per fiber count for long-haul fiber routes. For very shorter routes, the per route mile fee can be up to \$25,000 per route mile. This large range in pricing is due to a number of factors.

Pricing for rural-based and long-haul IRU's are thought to be lower than metropolitan IRU's because a metropolitan lease may bring more customers and more revenue potential. Based upon national pricing, the up-front fee for a rural, long-haul IRU may be \$1,500 - \$2,500; the pricing for a metropolitan IRU may be \$2,500 - \$3,500. However, pricing is also dependent upon supply and demand factors. For instance, if there is little fiber available for lease, the pricing will be higher. Many of the incumbent phone and cable companies will not provide IRU agreements, which create a greater demand for IRU's. Pricing for IRUs is also not regulated, and unpublished; and therefore, there is often a large fluctuation of pricing offered to various customers from providers.

IRU Pricing

An example of how the pricing for the IRU is shown below. For example, ABC Company wants a 20-year IRU agreement for a (6) count fiber cable from Location 1 to Location 2. The distance on the network between Location 1 and Location 2 is 100 miles. ABC Company will pay \$2,200 per mile.

The upfront payment would be:

$$(6) \text{ counts of fiber} * \$2,200 \text{ per mile} * 100 \text{ route miles} = \$1.32 \text{ Million}$$

Additionally, there is typically an annual maintenance fee in addition to the up-front payment. Annual maintenance fees are typically anywhere from \$200 to \$350 per mile. In some cases, the annual fee is included in the up-front payment as it is treated as a capital expense from the buyer. In other cases, the maintenance fee is paid monthly or annually for the term of the agreement. Also, in some cases, the maintenance fee is a simple monthly or annual fee per customer and the number of fiber counts is not taken into consideration.

Assuming the annual maintenance fee is \$200; the annual maintenance payment would be:

$$\$200 \text{ per mile} * 100 \text{ route miles} = \$20,000 \text{ annually}$$

In addition to the up-front payment and maintenance fees, additional revenue can be gained through leasing rack-space at UC2B's hub or equipment locations. Collocation is another term used for leasing space for placement of equipment in hub locations along UC2B's fiber network. Collocation fees are typically charged monthly by the rack, by space on the rack, or by chassis or cabinet. Additional fees are typically charged for use of power at the facility. In some cases, additional up-front fees can be charged for make ready use.

Dark Fiber Indefeasible Rights of Use (IRU) Agreements

Below is the pricing that has been approved by the UC2B Policy Board for 20-Year IRU Agreements for all customers:

Dark Fiber - Indefeasible Rights of Use Agreements (IRUs) for all customers			
IRU Element	One-Time Charge for 20-Year IRU	Recurring Annual Charge for Maintenance	Comments
IRU - Per Strand Mile - Sold in complete rings	\$1,500 per strand mile	N/A	Sold for the entire length of a UC2B ring or sub-ring
IRU - Per Lateral Connection	Actual construction costs, or pro-rated costs if shared	N/A	Lessee may purchase a single strand of fiber
Fiber and Facilities Maintenance - Charged in complete rings	N/A	\$300 per year per route mile	Not dependent on the number of strands
Maintenance - Per Lateral Connection	N/A	\$600 per year per lateral	No pro-rating if shared or subleased

Shorter-Term, Dark Fiber Leases

Dark Fiber Leases. The Policy Board approved shorter-term dark fiber lease pricing consistent with the IRU rates established. Monthly dark fiber lease pricing would be based upon amortizing the per-strand mile rate of \$1,500 over twenty years at a 5% interest rate. Dark fiber monthly rates will be based upon the following two components:

1. A maintenance charge of \$25 per mile for all miles in each pertinent ring, and
2. A usage charge of \$9.90 per strand-mile as follows:

Backbone			With the \$25 Maintenance Fee Included with the \$9.90 Usage Charge		
Rings	Route Miles	\$9.90	Rings	Route Miles	\$34.90
1	16.41	\$162	1	16.41	\$573
1A	7.08	\$70	1A	7.08	\$247
1B	14.06	\$139	1B	14.06	\$491
2	16.82	\$167	2	16.82	\$587
3	19.97	\$198	3	19.97	\$697
3A	8.60	\$85	3A	8.60	\$300
4	22.70	\$225	4	22.70	\$792
5	15.98	\$158	5	15.98	\$558
6	15.29	\$151	6	15.29	\$534
6A	15.98	\$158	6A	15.98	\$558
7	11.57	\$115	7	11.57	\$404
7A	14.95	\$148	7A	14.95	\$522
Total for All Rings		\$1,776	Total for All Rings		\$6,261

The \$25 per mile maintenance charge would be added to the \$9.90 usage charge.

The business plan for the grant-funded area can be greatly improved by offering IRU Agreements and dark fiber leases.

Layer Two and Layer Three Services

Layer-Two transport: (VLAN) The Internet Services Provider (ISP) redundantly connects to the UC2B network core and UC2B provisions a VLAN for that ISP to each of its customers. UC2B charges the ISP for the dual connections to the UC2B core network and then for each customer that the ISP “owns” on the network. UC2B-owned electronics are used to deliver the ISP’s services and each of the ISP’s customers has specific port speeds at which they can connect to the ISP. The faster those customer port speeds the more they cost.

Layer-Three service: The ISP redundantly connects to the UC2B network core, but then utilizes the UC2B Intranet and the fact that the customer has an existing IP service provider to piggyback additional services to that customer. UC2B charges the ISP the same rates for redundantly connecting to the UC2B network core, but there are no additional charges for each customer. This ISP does not “own” the end customers, who must rely on their IP services providers to be able to receive the services from the second provider. **Example:** Company Y only provides IP telephone services. Any UC2B Internet customer has an ONT that can also be used by Company Y to provide SIP-based IP telephone services. The customer pays UC2B for Internet access and Company Y for telephone services. In the fullness of time UC2B may be able to combine those billings.

In either of these two scenarios above, the service provider could be responsible for billing the customer, providing customer service and trouble resolution and would “own” the relationship with the customer. UC2B may decide to provide billing services for the service provider. This is a negotiable point. Trouble resolution and adds, moves, changes, and upgrade processes would need to be solidly created and agreed upon with the service providers. UC2B could co-market services with the provider and could include marketing information about the relationship with the service provider, the service provider’s products and services and how to order services. UC2B would bill the service provider the wholesale rates and the service provider would mark-up these rates to the end user.

Layer Two and Layer Three Pricing

The following Layer Two and Layer Three Pricing was approved by the UC2B Policy Board :

UC2B Wholesale & ISP Service Offerings



For customer sites in the grant-funded areas and Anchor Institutions

ISP and Service Provider Layer Two Transport Service Offering

Customer Connections	Locations Where Available	Symmetric Ethernet Port Speed	Monthly Pricing	Comments
Last Mile Internet Service Provider (ISP) Customer 1 Gbps Port	Any of 500 Points of Interconnection (POI) or customer locations on the UC2B network	1,000 Mbps (1 Gbps)	\$16.04 - adjusted every 6 months as appropriate	ISP/Service Provider must connect to UC2B core in one of the three ways below
Core Backbone Connections				
Last Mile Internet Service Provider (ISP) Redundant Core Connections Dual 1 Gbps Ports	Any of 500 Points of Interconnection (POI) or customer locations on the UC2B network	1,000 x 2 (1 Gbps x 2)	\$1.00 per customer up to a maximum of \$100 per month	No CIR/VLAN charge. (Any UC2B fiber needed is an additional charge.)
Last Mile Internet Service Provider (ISP) Redundant Core Connections Dual 2 Gbps Ports (2 bridged 1 Gbps Ports)	Any of 500 Points of Interconnection (POI) or customer locations on the UC2B network	2,000 x 2 (2 Gbps x 2)	\$2.00 per customer up to a maximum of \$200 per month	No CIR/VLAN charge. (Any UC2B fiber needed is an additional charge.)
Last Mile Internet Service Provider (ISP) Redundant Core Connections Dual 10 Gbps Ports	Any of 500 Points of Interconnection (POI) or customer locations on the UC2B network	10,000 x 2 (10 Gbps x 2)	\$4.00 per customer up to a maximum of \$400 per month	No CIR/VLAN charge. (Any UC2B fiber needed is an additional charge.)

Note # 1 - All core elements of the network are non-blocking and are interconnected at 10 Gbps.

Note # 2 - All ring fiber necessary to connect Provider is an additional cost at UC2B's established lease rates.

Note # 3 - Customer-end electronics are provided by UC2B.

Layer Two and Layer Three Pricing, cont'd

Below is a summary of the ramp-up pricing for Wholesale UC2B Core Connections:

Ramp-Up Pricing for Wholesale UC2B Core Connections			
These charges are for Layer Two providers in addition to per customer site charges of:			
\$16.04 per month per customer connection			
Layer Two Providers - Dual 1 Gbps Connections			
Provider pays cross-connect / port charge of \$1.00 per customer per month up to a maximum of \$100 per month plus standard fiber lease rates (if needed)			
Layer Two Providers - Dual 2 Gbps Connections			
Provider pays cross-connect / port charge of \$2.00 per customer per month up to a maximum of \$200 per month plus standard fiber lease rates (if needed)			
Layer Two Providers - Dual 10 Gbps Connections			
Provider pays cross-connect / port charge of \$4.00 per customer per month up to a maximum of \$400 per month plus standard fiber lease rates (if needed)			
Layer Three Providers			
Layer Three Providers simply pay the \$100, \$200 or \$400 core connection rate each month regardless of their number of customers, which UC2B cannot easily verify. Layer Three providers also pay to lease any UC2B fiber they use to connect to the UC2B core in addition to these core connection rates.			

“Yes” to Dark Fiber Leases

NEO’s Recommendation

NEO recommends that UC2B supplement its retail offering with wholesale services such as dark fiber leases, long-term IRU agreements or leasing of wavelengths on the network. These leases do not require much from UC2B and will not increase the call center or billing costs of operating a wholesale model.

The Wholesale Model, Layer Two or Layer Three Service Works for the Grant-Funded Areas Only.

The higher layer open access concept would work under the grant-funded areas of the network, where there are no capital costs or debts to be serviced. Under this scenario, UC2B would install the drop fiber and the ONT, and UC2B would still “own” this connection to the customer and the ONT installed at the customer site. If the customer would like to use a different provider, the connection can simply be “pointed” to a different provider, no equipment would need to be replaced.

In NEO’s modeling, it has also been provided for UC2B to bill the ISP at \$16.04. This pricing can work for the grant-funded areas only. This pricing does NOT work for expansion of the network.





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UC2B Business and Strategic Plan

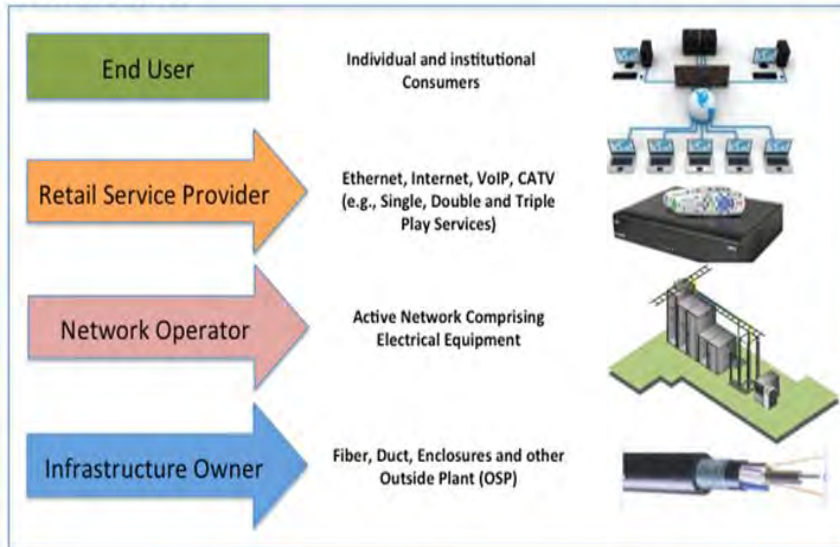
Operating
Models
Outsourcing and
Staffing

Fiber Network Overview: Network Layers

A FTTH network can be considered to have four layers: the passive infrastructure comprising the fiber, duct, enclosures and other outside plant; the active network comprising the electrical equipment; retail services, which provides connectivity to the services (e.g., Ethernet, internet, VoIP, IPTV, Sensors); and of course the end-users. Some people also visualize an additional layer, the content layer, lying above the retail services layer, which may also be exploited commercially.

This technological structure has implications for the way that a FTTH network is organized and operated.

Network Layers



Clarity in the overall business model and service offering guides resource and equipment investment decisions, as well as marketing, sales and support activities. The three primary technology structures are:

Passive infrastructure - Physical Network

The passive infrastructure layer comprises all the physical elements needed to build the fiber network. This includes physical objects such as the optical fiber, the trenches, ducts and poles on which it is deployed, fiber enclosures, optical distribution frames, patch panels, splicing shelves and so on. The organization in charge of this layer will normally be responsible for network route planning, right-of-way negotiations, and the civil works to install the fiber. This is the layer where the network topology is implemented.

Active Network – Electronics

The active network layer refers to the electronic network equipment needed to bring the passive infrastructure alive, as well as the operational support systems required to commercialize the fiber connectivity. The network operator in charge of this layer will design, build and operate the active equipment part of the network. This is the first layer where active services such as coarse wave or dense wave division multiplexing (C/DWDM), Gigabit Passive Optical Networking (GPON), and Ethernet (Active Ethernet) services are provided.

Retail Services –

Once the passive and active layers are in place, retail services come into play. This is the layer where the Internet, voice, video or other network service connectivity are packaged as a service for consumers and businesses. Besides enabling those services technically, the company responsible for this layer is also in charge of customer acquisition, go-to-market strategies, and customer service. The retail service provider may also decide to offer premium services from the content layer, such as IPTV.

Passive Infrastructure, Physical Network

This includes physical objects such as the optical fiber, the trenches, ducts and poles on which it is deployed, fiber enclosures, optical distribution frames, patch panels, splicing shelves. The primary functions for this layer are:

Construction Activities, Backbone Network

- **During the Grant.** UC2B has outsourced the construction of the network to various companies. As the grant has a short-term window of construction activities and UC2B did not have staff in place or experience in fiber optic construction, outsourcing the construction of the network made the most sense.
- **Post Grant.** Most entities other than the incumbent providers outsource the construction activities of their networks. If UC2B does decide to build out to other residential areas within the Champaign-Urbana area, it still makes the most sense to outsource construction activities.

Construction Activities, Drop Cable, Laterals

- **During the Grant.** The primary challenge that UC2B has right now, is the short amount of time remaining on the grant and the number of households and businesses that need to be installed. Given this short timeframe and the amount of work that needs to take place, outsourcing to several companies to install the drop cable and electronics to “light” up a customer location is the best alternative.
- **Post Grant.** After the grant period, if UC2B decides to expand the network, in the short-term (1-3 years), it most likely makes sense to continue to outsource this function. During expansion and construction, there may be a flurry of new sign-ups and installations and in most cases, this tapers off after a few years.

Monitoring of the Network. The University will do this initially, providing alarm monitoring and network management of the network.

Maintenance of the Network. An entity that has trucks, people certified and trained to splice fiber, fiber optic testing equipment and the like should be hired to maintain and repair the network. During the grant period, the companies that are currently providing construction activities for the network are also contracted to maintain and/or repair the network.

Passive Network, Physical Network

Passive Network, Physical Network	Timeframe	Funding Source	Responsible Party
Construction of the Network	Now through November 30th	Grants	Multiple Contractors
Installing Fiber Drops into Problematic or Time Sensitive Anchor and IRU Sites	Now through November 30th	Grants	Phase 1, Western & Burns
Installing Fiber Drops into Remaining Anchor and IRU Sites	July through November 30th	Grants	Phase 2, PowerUp
Installing Fiber Drops into Residential & Business FTTP Sites in the Grant-Funded Areas	August through November 30th	Grants	Phase 2, PowerUp
Activities	Timeframe	Funding Source	Responsible Party
Infrastructure Support			
Locating fiber for JULIE requests	Now through January 31, 2013	Grants	Phase 1, Western & Burns
	February 1, 2013 thru Infinity	Operations	JULIE Locates RFP Winner
Repairing Damaged Fiber	Now through January 31, 2013	Grants	Phase 1, Western & Burns
	February 1, 2013 thru Infinity	Operations	Fiber Maintenance RFP Winner
Alarm Monitoring	Now through January 31, 2013	Grants	University
	February 1, 2013 thru Infinity	Operations	Alarm Monitoring RFP Winner

Active Network

The active network layer refers to the electronic network equipment needed to bring the passive infrastructure alive, as well as the operational support systems required to commercialize the fiber connectivity. The network operator in charge of this layer will design, build and operate the active equipment part of the network. This is the first layer where active services such as coarse wave or dense wave division multiplexing (C/DWDM), Gigabit Passive Optical Networking (GPON), and Ethernet (Active Ethernet) services are provided.

The primary functions for this layer are:

Installation of the Active Equipment. An RFP hit the street in May of 2012 for the installation of the drop cable and active equipment of the network.

Maintenance of the Active Equipment. An RFP was written and published for maintenance and repair of active equipment. No timely responses were received. Alternatives are being considered.

Activities	Timeframe	Funding Source	Responsible Party
Active Network, Core Network Support - Nodes & Cabinets, Electronics			
Provisioning Customers on Network Core	Now thru January 31, 2013	Grants	CITES
	February 1, 2013 thru June 30, 2014	UIUC	CITES
	July 1, 2014 thru Infinity	Operations	To Be Determined
Configuring and Maintaining the Network Core Equipment	Now thru January 31, 2013	Grants	CITES
	February 1, 2013 thru June 30, 2014	UIUC	CITES
	July 1, 2014 thru Infinity	Operations	To Be Determined
Repair of ONTs	Now thru January 31, 2013	Grants	To Be Determined
	February 1, 2013 thru June 30, 2014	Operations	To Be Determined
	July 1, 2014 thru Infinity	Operations	To Be Determined

Retail Services

Once the passive and active layers are in place, retail services come into play. This is the layer where the Internet, voice, video or other network service connectivity are packaged as a service for consumers and businesses. Besides enabling those services technically, the company responsible for this layer is also in charge of customer acquisition, go-to-market strategies, and customer service. In this case, UC2B is the Internet Service Provider.

The primary functions for this layer are:

- Sales and Marketing
- Order Entry, Provisioning
- Customer Service
- Trouble Resolution
- Billing
- Vertical Management of Customer Groups, i.e. Wholesale Customers, Anchor Institutions, Business and Commercial Customers, Residential Customers

An RFP has been written for order entry, provisioning, customer service, trouble resolution and billing. This is an important layer to get right in terms of outsourcing or staffing because it is closely tied to the public's perception of UC2B, UC2B's ability to provide excellent customer service, and UC2B's ability to generate revenue. Proposals were received for this RFP and pricing is based upon either the number of calls or the number of minutes. The cost for outsourced Call Center operations will range between \$2 and \$6 per customer; for the financial projections, a cost of \$5 per customer was used.

The ability to truly succeed under this business model relies on strong sales channel and delivery provider partners to effectively market and manage services and customer relationships. Having the canvassers provide this function for UC2B is an excellent idea. They have already had contact through their efforts to gauge interest.

Retail Services

Activities	Timeframe	Funding Source	UIUC CITES	City of Champaign	GSLIS, Canvassers & Vendors	GSLIS Call Center	Phase One		To Be Determined	To Be Determined
							Contractor & Burns	Phase Two Call Center - PowerUp		
Customer Acquisition & Installation										
Canvassing & Signing Up Customers in UC2B CRM	Now thru January 4, 2013	Grants	**	**	**	**				
	January 5, 2013 through Forever	Operations						**		
Coordinating Grant-Funded Installations	Now thru January 31, 2013	Grants	**	**	**	**				
Installing Fiber Drops into Problematic or Time Sensitive Anchor and IRU Sites	Now through August 1st	Grants					**			
Installing Fiber Drops into Remaining Anchor and IRU Sites	June 25 through January 31, 2013	Grants						**		
Installing Fiber Drops into Residential & Business FTTP Sites in the Grant-Funded Areas	June 25 through January 31, 2013	Grants						**		
	February 1, 2013 through Forever	Operations								**
Customer Support										
Answers the UC2B Phone # and Triage - Tier 1 Customer Phone Support	Now thru January 31, 2013	Grants				**				
	February 1, 2013 through Forever	Operations						**		
Provides Tier 2 Customer Phone Support	1st 7 days after Install thru 1/31/13	Grants			**	**				
	After 7th day - July 2nd thru Forever	Operations							**	
Provides On-Site Customer Support	1st 7 days after Install thru 1/31/13	Grants					**			
	After 7th day - July 2nd thru Forever	Operations							**	
Provides Tier 3 Customer Phone Support	Day of Install thru January 31, 2013	Grants	**							
	February 1, 2013 thru June 30, 2014	UIUC	**							
	July 1, 2014 through Forever	Operations								**
Billing & Collections										
Issues Customer's First Bill for UC2B Service	30 days before Installation	Grants			**					
Issues All other Bills for UC2B Service	8 days after Installation thru Forever	Operations						**		
Provides Physical Location to Pay Bills	Now through Forever			**						
Coordination and Management										
Administer Grant and Construction	4/3/10 thru 5/1/13	Grant	**							
Manage Operations	Now through Forever	Operations		**						



Urbana-
Champaign
Big Broadband

UC2B Business and Strategic Plan

Financing
Options

Public Private Partnerships & Funding

Broadband infrastructure is a wonderful tool for the brokering of public private partnerships that can subsidize -build, last mile connectivity, on-going operational and customer acquisition costs. If UC2B takes a trans-sector approach to the planning, capitalization and implementation phases of its FTTP initiative, it has the opportunity to generate new multipliers for funding, impact, services and competitiveness. How does it work? In theory, it's really quite simple: Map the potential beneficiaries of any proposed project and join forces.

This sounds easy, but it requires methodological structure and discipline to obtain optimal results. For success in brokering public-private partnerships UC2B must:

1. Think outside its current operational structure
2. Map potential beneficiaries
3. Sell co-investment ROI
4. Establish governance
5. Manage the partnership(s)
6. Design and execute across institutional boundaries

The beautiful thing about a FTTP investment is that it crosses departmental and institutional boundaries when conceived, designed, constructed and implemented effectively. If UC2B expands its thinking regarding the broadband service offering to the same level of impact that the electrical grid or highway system has on any community, the pathways to successful partnership become clearer. Who are the beneficiaries? It turns out to be simpler to ask who isn't a beneficiary, because the list of beneficiaries crosses all sectors (is 'trans-sector') within society:

- Government
- Health Care
- Education
- Manufacturing
- Distribution
- Food and Retail
- Small Business Enterprises
- Large Business
- Financial Institutions
- Social Service Organizations
- Arts and Cultural Institutions
- National/Global Supply Chain
- National/Global Retailers
- People: Residents & Tourists

Co-Investment opportunities identified through structured trans-sector stakeholder mapping is the first step to achieving UC2B's public-private partnership goals. All too often communities and enterprises determine it wise through traditional return-on-investment analysis to settle for an Edsel, when the market, our partners, stakeholders and constituents require a Ferrari. Actively pursued and carefully managed collaboration is the key.

The challenge is understanding how to position and craft true 'win-win' value propositions that overcome the traditional ownership, control and motive issues that undermine and ultimately doom most partnering and co-investment efforts. This is not a trivial undertaking, and the stakes are high. If a partner's functional objective can be achieved for a fraction of the cost through collaboration – that's what matters. It's the basis for 'win-win' co-investment. Given the high cost of entry into the FTTP world, the value proposition for commercial, civic, state and federal partners is clear.

‘Low Hanging Fruit’

The number of public-private partnership opportunities spurred by an investment in FTTP are numerous – all of which have significant cost-avoidance, customer acquisition and/or revenue generation value. But the benefit is mutual to the organizations that partner and co-invest with UC2B: it enables an extension of their enterprise, service delivery or mission-driven objective not possible without a core investment in FTTP infrastructure that creates real-time interconnectivity with their key stakeholders.

Sample opportunities, requiring attention by UC2B in order to generate results, include:

- Healthcare

Both interviews with potential healthcare customers and the trajectory of HIPAA regulations and Medicare/Medicaid reimbursement policies indicate that primary institutions like Carle, Provena Covenant, or Community Healthcare providers are potential co-investors in a FTTP program. The extension of advanced telehealth, telemedicine and home health monitoring solutions, including those currently being subsidized at the federal level in pilot programs across the country to study the impact of the avoidance of institutionalization for the chronically infirm and elderly, make these institutions obvious partners for targeted neighborhood/institutional builds, last mile subsidies and in-home equipment costs.

- Municipal, Township and County Government, Power Companies or Other Utility Companies

FTTP solutions, if offered in conjunction with enhanced services (i.e. Triple Play) and big bandwidth, (e.g. 100 MB+, Smart-Grid) provide government and utility companies with the opportunity to create dramatic efficiencies while extending, enhancing and deepening citizen services. From public safety and intelligent surveillance solutions to advanced traffic management, video arraignment and shared platforms, the business case for co-investment and anchor tenancy is strong.

'Low Hanging Fruit'

- Medium and Large Commercial Enterprises

Information communication technologies (ICT) and business are so intertwined today as to be inseparable. From employee attraction and retention via flexible work times and telecommuting arrangements to the 24x7x365 demands of the global economy, employers are looking for ways to extend the workplace into the places where their employees are 'after hours.' The ability to create employee benefit subsidy packages for last mile connectivity, equipment and Internet/VoIP connectivity (much like bus pass and cell phone subsidies) is an obvious public-private partnership initiative.

- Higher Education, K-12 and Social Service Agencies

By definition, all three of these groups have a vested interest in their constituents being connected via high speed options. From distance learning, to advanced research and collaboration, to parent engagement and client tracking, services delivery and interaction, intercommunication is core to the missions of all three groups. This is a key opportunity for collaboration once value-added services are offered, as the direct benefits to their stakeholders are tremendous and funds largely come from state and federal sources.

- Providers and 3rd Party Operators

There is the opportunity to partner with providers and 3rd party operators for both capital and on-going operational costs associated with a FTTP deployment. IPTV and cellular operators, such as Microsoft MediaRoom, AT&T, Verizon, Sprint and others may subsidize a build if given rights and co-branding for the delivery of content over the network (a pennies on the dollar investment for them as compared to the cost of a fiber deployment) or if connecting cell towers with fiber for LTE services.

3rd party operators are also very viable potential partners for a FTTP build-out should UC2B decide to take a wholesale or active sharing approach to the commercial and/or residential sectors. If, for business, political or other reasons UC2B decides to eschew the delivery of enhanced services to either of these sectors, there may be 3rd party providers willing to directly invest CAPX and OPX capital in exchange for on-going rights to use fiber or wave IRUs for commercial purposes.

Other Funding Sources

Gig U, BTOP, RUS, State Grants, Federal Grant, Co-ops



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UC2B Business and Strategic Plan

Glossary of
Terms and
Acronyms

List of Acronyms

AE	Active Ethernet
BTOP	Broadband Technology Opportunities Program
BIP	Broadband Infrastructure Program
CAPX	Capital Expense
CLEC	Competitive Local Exchange Carrier
COGS	Cost of Goods Sold
DSL	Digital Subscriber Loop
FTTH	Fiber-to-the-Home
FTTB	Fiber-to-the-Business
FOTP	Fiber-to-the-Premise
GPON	Gigabit Optical Networking
ICT	Information Communications Technologies
IPTV	Internet Protocol Television
IP	Internet Protocol
IRU	Indefeasible Right of Use/Capital Lease
ISP	Internet Service Provider
IT	Information Technology
MB	Megabits
Mbps	Megabits Per Second
MDU	Multi-Dwelling Unit
MPLS	Multi Protocol Label Switching
NGO	Non-Governmental Organization
OPX	Operating Expenses
QoS	Quality of Services
RBOC	Regional Bell Operating Company
ROI	Return on Investment
SG&A	Sales, General and Administrative Expenses
SIP	Session Internet Protocol
VoIP	Voice over Internet Protocol
VLAN	Virtual Local Area Network

Glossary of Terms

This Glossary of terms is broken up into specific categories as they relate to fiber-to-the-home (FTTH).

Fiber-to-the-Home (FTTH)

“Fiber to the Home” is defined as a communications architecture in which the final connection to the subscriber’s premises is Optical Fiber. The fiber optic communications path is terminated on or in the premise for the purpose of carrying communications to a single subscriber.

In order to be classified as FTTH, the access fiber must cross the subscriber’s premises boundary and terminate inside the premises, or on an external wall of the subscriber’s premises, or not more than 2m from an external wall of the subscriber’s premises.

FTTH services may deliver just one application, but generally deliver several such as data, voice and video.

This FTTH definition excludes architectures where the optical fiber terminates in public or private space before reaching the premises and where the access path to the subscriber over a physical medium other than optical fiber (for example copper loops, power cables, wireless and/or coax).

Fiber-to-the-Building (FTTB)

“Fiber to the Building” is defined as a communications architecture in which the final connection to the subscriber’s premises is a communication medium other than fiber. The fiber communications path is terminated on the premises for the purpose of carrying communications for a single building with potentially multiple subscribers.

It is implicit that in order to be classified as FTTB, the fiber must at least enter the building, or terminate on an external wall of the building, or terminate no more than 2m from an external wall of the building, or enter at least one building within a cluster of buildings on the same property, or terminate on an external wall of one building within a cluster of buildings on the same property, or terminate no more than 2m from an external wall of one building within a cluster of buildings on the same property.

FTTB services may deliver just one application, but generally deliver several such as data, voice and video.

This FTTB definition excludes architectures where the optical fiber cable terminates in public space more than 2m from an external wall of one building (for example an operator’s street-side cabinet) and where the access path continues to the subscriber over a physical medium other than optical fiber (for example copper loops, power cables, wireless and/or coax).

Fiber-to-the-Node (FTTN)

There are two technologies for delivering broadband: Fiber-to-the-node (FTTN) uses fiber to bring data to a node and uses copper to bring the data into the home. Fiber-to-the-home (FTTH) brings fiber all the way into the home.

Communications Architecture Definition

The cable plant, which connects the operators' premises and subscribers' premises, can be deployed in the following different topologies:

“Point-to-Point” (P2P, Pt-Pt, or PtP) cable plant provides optical fiber paths from a communication node to single premises such that the optical paths are dedicated to traffic to and from this single location. (Uninterrupted single fiber from last communication switching equipment-point to the premises.)

“Point-to-Multipoint” (P2MP) cable plant provides branching optical fiber paths from a communication node to more than one premises such that a portion of the optical paths are shared by traffic to and from multiple premises. In generic terms this is a tree topology.

“Ring” cable plant provides a sequence of optical fiber paths in a closed loop that connects a series of more than one communication node.

Note that from these definitions it is not possible to identify the access protocol used over the cable plant.

It is possible for a network to be built so that a common cable plant can include a mix of different architectures, or be re-configured over time to support different architectures, to allow for mixed user categories, to allow access diversity for reliability, and for future flexibility and network longevity.

Premises, Subscriber “Premises” is defined as the subscriber's home or place of business. In a multi-dwelling unit each apartment is therefore counted as one premises.

“Subscriber” is a premises that is connected to an FTTH/B-network and uses at least one service on this connection under a commercial contract.

Network Size

The size of FTTH/FTTB Networks is described in the following terms:

The number of **“Homes Passed”** is the potential number of premises to which an operator has capability to connect in a service area, but the premises may or may not be connected to the network.

This definition excludes premises that cannot be connected without further installation of substantial cable plant such as feeder and distribution cables (fiber) to reach the area in which a potential new subscriber is located.

The number of **“Homes Connected”** is the number of premises that are connected to an FTTH/FTTB-network.

With respect to a particular network, either FTTH or FTTB, the following three definitions are measures of network utilization and calculated as follows:

The **“Penetration Rate”** - “Homes Connected” divided by the number of premises in a served area.

The **“Take Rate”** - “Subscribers” divided by “Homes Connected”

The **“Connect Rate”** - “Homes Connected” divided by “Homes Passed”

FTTH/B Access Protocols Definition

Access Protocols are the methods of communication used by the equipment located at the ends of the optical paths to ensure reliable and effective transmission and reception of information over the optical paths. These protocols are defined in detail by the standards organizations that have created them, and are recognized and implemented by manufacturers around the world.

The Access Protocols in use today for FTTH Networks and the optical portion of FTTB Networks are:

“Active Ethernet” uses optical Ethernet switches to distribute the signal, thus incorporating the customers' premises and the central office into one giant switched Ethernet network.

“EFM” defined as Ethernet in the First Mile in IEEE 802.3ah **“EP2P”** defined as Ethernet over P2P in IEEE 802.3ah

“EPON” defined as Ethernet PON in IEEE802.3ah (Note that the expression Gigabit EPON is synonymous with EPON.)

“BPON” defined as Broadband PON in ITU-T Recommendation G.983 **“GPON”** defined as Gigabit PON in ITU-T Recommendation G.984

“GPON” (gigabit passive optical network) standard differs from other PON standards in that it achieves higher bandwidth and higher efficiency using larger, variable-length packets. GPON offers efficient packaging of user traffic, with frame segmentation allowing higher quality of service (QoS) for delay-sensitive voice and video communications traffic.

Where a Passive Optical Network (PON) is defined as a point-to-multipoint, fiber to the premises network architecture in which unpowered optical splitters are used to enable a single optical fiber to serve multiple premises, typically 32-128. A PON consists of an Optical Line Terminal (OLT) at the service provider's central office and a number of Optical Network Terminals (ONTs) also called Optical Network Units (ONUs) at the premises.

Network Usage Definition

FTTH/FTTB Networks may be dedicated to the services of a single retail service provider, or made available to many retail service providers, who may connect to the network at the packet, wavelength or physical layer.

“Bandwidth” is the capacity of a telecom line to carry signals. The necessary bandwidth is the amount of spectrum required to transmit the signal without distortion or loss of information. FCC rules require suppression of the signal outside the band to prevent interference.

“Broadband” is a descriptive term for evolving digital technologies that provide consumers a signal switched facility offering integrated access to voice, high-speed data service, video-demand services, and interactive delivery services.

“Exclusive Access” refers to the situation where a single retail service provider (who may or may not be the network operator) has exclusive use of the FTTH network.

“Megabyte (MB)” a measure of amount of information used, for example, to quantify computer memory or storage capacity. There are (8) Megabits in a single Megabyte.

“Megabits Per Second (Mbps)” is an abbreviation for megabits per second. It refers to data transfer speeds as measured in megabits.

“Open Access (Packet)” refers to the situation where multiple retail service providers may use the FTTH Network on an equitable base by connecting at a packet layer interface and compete to offer their services to end users.

“Open Access (Wavelength)” refers to the situation where multiple retail or wholesale service providers may use the FTTH Network on an equitable base by connecting at a wavelength layer interface and compete to offer their services.

“Open Access (Fiber)” refers to the situation where multiple retail or wholesale service providers may use the infrastructure by connecting at a physical layer (“dark” fiber) interface and compete to offer their services.

“Open Access (Duct)” refers to the situation where multiple retail or wholesale service providers may share the use of infrastructure covering a substantial region by drawing or blowing their fiber cables through the shared ducts, and compete to offer their services.

Services Definitions

“Digital Subscriber Line (DSL)” DSL refers collectively to all types of digital subscriber lines, the two main categories being ADSL and SDSL. Two other types of DSL technologies are High-data-rate DSL (HDSL) and Symmetric DSL (SDSL). DSL technologies use sophisticated modulation schemes to pack data onto copper wires. They are sometimes referred to as last-mile technologies because they are used only for connections from a telephone switching station to a home or office, not between switching stations. DSL is similar to ISDN inasmuch as both operate over existing copper telephone lines (POTS) and both require the short runs to a central telephone office (usually less than 20,000 feet).

“High Definition Television (HDTV)” An improved television system that provides approximately twice the vertical and horizontal resolution of existing television standards. It also provides audio quality approaching that of compact discs.

“Interactive Video Data Service (IVDS)” A communication system, operating over a short distance that allows nearly instantaneous two-way responses by using a hand-held device at a fixed location. Viewer participation in game shows, distance learning and e-mail on computer networks are examples.

“Indefeasible right of use (IRU)” is a contractual agreement between the operators of a communications cable, such as submarine communications cable or a fiber optic network and a client.

The IRU: shall mean the exclusive, unrestricted, and indefeasible right to use the relevant capacity (including equipment, fibers or capacity) for any legal purpose.

It refers to the bandwidth purchased after the submarine cable system has sealed the Construction and Maintenance Agreement (C&MA) among the owners or after the system came into service and where the un-owned capacity is available. IRU may also be purchased from the existing owner.

The right of use is indefeasible, so as the capacity purchased is also un-returnable and maintenance cost incurred becomes payable and irrefusable. “IRU user” can unconditionally and exclusively uses the relevant capacity of the “IRU grantor’s” fiber network for the specified time period.

In some cases with an IRU, there are often restrictions imposed on the lessee by the lessor to not resell the fiber strands to other users.

“Internet” A vast computer network linking smaller computer networks worldwide (usually precede by “the”). The Internet includes commercial, educations, governmental, and other networks, all of which use the same set of communications protocols.

“Internet/Data” refers to use of the Public Internet for exchanging email, web- browsing, etc.

“Internet Protocol (IP)” pronounced as two separate letters. IP specifies the format of packets, also called data grams, and the addressing scheme. Most networks combine IP with a higher-level protocol called Transport Control Protocol (TCP), which establishes a virtual connection between a destination and a source.

Services Definitions cont'd

“Internet Protocol Television (IPTV)” is a system through which television services are delivered using the Internet Protocol Suite over a packet-switched network such as the Internet, instead of being delivered through traditional terrestrial, satellite signal, and cable television formats.

IPTV services may be classified into three main groups:

- live television, with or without interactivity related to the current TV show;
- time-shifted television: catch-up TV (replays a TV show that was broadcast hours or days ago), start-over TV (replays the current TV show from its beginning);
- video on demand (VOD): browse a catalog of videos, not related to TV programming.

IPTV is distinguished from Internet television by its on-going standardization process (e.g., European Telecommunications Standards Institute) and preferential deployment scenarios in subscriber-based telecommunications networks with high-speed access channels into end-user premises via set-top boxes or other customer-premises equipment.

“Intranet” A computer network with restricted access, as within a company, or within a city.

“Last Mile” A phrase used by the telecommunications and cable television and internet industries to refer to the final leg of the communication networks delivering communications connectivity to end customers.

“Quality of Service (QoS)” In the field of computer networking and other packet-switched telecommunication networks, the traffic engineering term quality of service (QoS) refers to resource reservation control mechanisms rather than the achieved service quality. Quality of service is the ability to provide different priority to different applications, users, or data flows, or to guarantee a certain level of performance to a data flow. For example, a required bit rate, delay, jitter, packet dropping probability and/or bit error rate may be guaranteed. Quality of service guarantees are important if the network capacity is insufficient, especially for real-time streaming multimedia applications such as voice over IP, online games and IPTV, since these often require fixed bit rate and are delay sensitive, and in networks where the capacity is a limited resource, for example in cellular data communication.

“Universal Service” The financial mechanism that helps compensate telephone companies or other communications entities for providing access to telecommunications services at reasonable and affordable rates throughout the country, including rural, insular and high costs areas, and to public institutions. Companies, not consumers, are required by law to contribute to this fund. The law does not prohibit companies from passing this charge on to customers. The Universal Service Fund, which is administered through the FCC is currently being revised. In the past, the Universal Service Fund was used to help build out telecommunications phone service to rural or underserved areas. The Universal Service Fund may be used to help build out Internet access to underserved or un-served areas.

“Middle Mile” The segment of a telecommunications network linking a network operator's core network to the local network plant, typically situated in the incumbent telephone company's central office, or a segment of a telecommunications network linking separate service providers' networks.

“Multiprotocol Label Switching (MPLS)” is a mechanism in high-performance telecommunications networks that directs and carries data from one network node to the next with the help of labels. MPLS makes it easy to create "virtual links" between distant nodes. It can encapsulate packets of various network protocols.

Services Definitions cont'd

“Session Initiation Protocol (SIP)” is an IETF-defined signaling protocol widely used for controlling communication sessions such as voice and video calls over Internet Protocol (IP). The protocol can be used for creating, modifying and terminating two-party (unicast) or multiparty (multicast) sessions. Sessions may consist of one or several media streams. Other SIP applications include video conferencing, streaming multimedia distribution, instant messaging, presence information, file transfer and online games.

“Voice” refers to the exchange of human bi-directional, real time, full-duplex conversations by use of **“IP”** or **“Other”** encoding and transport protocols. (This category does not include Voice carried over the Public Internet.)

“Voice over Internet Protocol (VoIP)” is a method of transmission of voice or fax calls over the Internet.

“Video” refers to the exchange of visual material by use of **“IP” (IPTV)**, **“RF”** (carried via a separate optical wavelength, overlay video) or **“Other”** encoding and transport protocols. (This category does not include Video carried over the Public Internet.) Applications other than those listed above are categorized as **“Other”**.

Service Provider Definitions

“Aggregator” Any person or business that, in the normal course of business, provides a public telephone for the use of patrons through an Operator Service Provider (OSP).

“Common Carrier” The term used to describe a telephone company. It is a telecommunications company that is available for hire on a nondiscriminatory basis to provide communication transmission services, such as telephone and telegraph, to the public.

“Competitive Access Providers” Common carriers who provide local service and compete against local telephone companies’ access services that connect customers to long distance companies. These carriers often use fiber optic networks.

“Enhanced Service Providers” A for-profit business that offers to transmit voice and data messages and simultaneously adds value to the messages it transmits. Examples include telephone answering services, alarm/security companies and transaction processing companies.

“Internet Service Provider (ISP)” A company that provides access to the Internet. For a monthly fee, the service provider gives you a software package, username, password and access phone number. Equipped with a modem, you can then log on to the Internet and browse the World Wide Web and USENET, and send and receive e-mail.

“Non-governmental organization, or NGO”, is a legally constituted organization created by natural or legal persons that operates independently from any government. The term originated from the United Nations (UN), and is normally used to refer to organizations that do not form part of the government and are not conventional for-profit business. In the cases in which NGOs are funded totally or partially by governments, the NGO maintains its non-governmental status by excluding government representatives from membership in the organization. The term is usually applied only to organizations that pursue some wider social aim that has political aspects, but that are not overtly political organizations such as political parties. Unlike the term "intergovernmental organization", the term "non-governmental organization" has no generally agreed legal definition. In many jurisdictions, these types of organization are called "civil society organizations" or referred to by other names.

“Regional Bell Operating Company (RBOC)” Any one of the seven local telephone companies. Created in 1984 as part of the break-up of AT&T. The (7) RBOCs or “Baby Bells” were originally Ameritech, Bell Atlantic, Bell South, NYNEX, Pacific Telesis Group, Southwestern Bell, and U S West. Pacific Telesis Group was acquired by SBC Communications in 1997. Ameritech was acquired by SBC Communications in 1999 which subsequently acquired AT&T Corporation in 2006, becoming the present-day AT&T Inc. In 1997, Bell Atlantic merged with another Regional Bell Operating Company, NYNEX, based in New York City with a footprint spanning from New York to Maine. The combined company kept the Bell Atlantic name. In 2000, Bell Atlantic acquired former independent phone company GTE, and adopted the name "Verizon" In 2006, AT&T acquired Bell South and Southwestern Bell. U S WEST merged with Qwest Communications International Inc. on June 30, 2000 and over time the US WEST brand was replaced by the Qwest brand. Qwest Communications International Inc. merged with CenturyLink on April 1, 2011 and the Qwest brand was replaced by the CenturyLink brand. The RBOCs were created to break up AT&T, and within (20) years, AT&T acquired most of them back.

“Resale Carrier or Reseller” A carrier that does not own transmission facilities, but obtains communications services from another carrier for resale to the public for a profit.

Service Provider Definitions cont'd

“Retail Service Provider” A telecommunications or cable TV provider who offers their services to end users.

“Wholesale Service Provider” A telecommunications or cable TV provider who offers their services to other service providers, leasing their network for the other service provider’s use.