

Vinton Municipal Electric Utility Fiber-to-the-Premise (FTTP) Feasibility Study

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1) INTRODUCTION

Late December of 2016, Vinton Municipal Electric Utility (VMEU) engaged FARR Technologies (FARR) to develop a feasibility study that would investigate how to bring a Fiber-to-the-Premise (FTTP) network to the City of Vinton.

Various options are available that provide their own unique challenges and solutions for a city the size of Vinton. The early sections of the study cover why a fiber system is important, existing market conditions, various service offerings, while later sections address network designs, organizational structures, cost estimates and a financial analysis. The recommended project design is estimated at approximately \$8.9 M with financial details provided in **Appendix C**.

A FTTP project will be able to bring faster internet speeds, a higher level of system reliability and local customer service and support to the citizens who live and/or work in Vinton. The reality of developing a successful fiber network project will require collaboration and commitment from the City, Vinton Municipal Electric Utility (VMEU) and community to work together for the long-term benefit for the City of Vinton.

2) EXECUTIVE SUMMARY

Broadband access is arguably one of the more important aspects of any thriving community today. With broadband access our educational system, our economic development efforts, our healthcare, and our business climate are all enhanced. This broadband feasibility study examines the availability of broadband access in Vinton, Iowa, including the technical aspects and challenges of extending broadband access to residents of the City, and the feasibility of offering voice, video and data services over a FTTP (Fiber-to-the-Premise) network.

From a technical perspective (**See Appendix B**), the fiber cable network design proposes a 100% buried network and includes redundant connections to the internet backbone as well as a redundant local access network ring within the city to prevent a single cable or electronics failure from disabling the network. The proposed fiber electronics design utilizes a Gigabit Passive Optical Network (GPON) with shared 2.4 Gbps downstream and 1.2 Gbps upstream bandwidth which meets the requirements to be a Gigabit Community. Future advances in electronics can be seamlessly integrated on the existing fiber network without any need to change the cable.

The cable and electronics design capital costs were estimated to total \$8.9 million. The estimates are based on a custom layout for the cables and drops on a real-world coordinate map of Vinton to produce actual footages of each cable size, number of handholes, Multi Service Terminals (MST's), pedestals, and Optical Network Terminal's (ONT's) from the map. These units are then priced out based on 2016/17 bids for each type of cable/equipment from similar projects FARR Technologies is working on in Iowa.

Financially, the Vinton Broadband five (5) year proforma uses the following fundamental assumptions to create the Income Statement, Balance Sheet and Cash Flow statements shown in **Appendix C**.

1. Capital cost of cable, electronics, work equipment, buildings \$8.9M
2. 100% of capital cost is financed at a rate of 4.5% with a 20-year amortization.
3. 2,100 business and residential locations passed.
4. Voice service take rate of 35% in year 1 decreasing to 30% in year 5 for residential customers and 40% in year 1 – 5 for business customers.
5. Video service take rate of 35% in year 1 decreasing to 30% in year 5 for residential customers and 10% in year 1 – 5 for business customers
6. High speed data service take rate of 40% in year 1 growing to 62% in year 5 for residential and 40% in year 1 growing to 62% in year 5 for business customers.
7. Operations expenses provided by Vinton Broadband, primarily network, customer service and management, are based on a personnel and equipment model that will support the network's operation throughout the life of the network including the first 5 years in this study.

The financial results using these assumptions project the project to have positive net income in year 5, cash flow in year 4, Times Interest Earned Ratio (TIER) of 1.11 and Debt Service Coverage (DSC) 1.2 in year 3 increasing to 1.44 in year 5. **At these levels of ratios, the penetration rates included in the study are equivalent to "breakeven" rates.**

While the financials as presented are breakeven, there are several recommended next steps well worth pursuing based on this study.

1. Review and approve feasibility study
2. Seek additional marketing research / surveys to validate feasibility assumptions
3. Begin discussions with a capital investment advisor for financing
4. Send Request for Proposals (RFP's) for potential service providers for outsourced operations
5. Staking outside plant cable
6. Request for Quote (RFQ) / RFP for outside plant cable construction and electronics
7. Update pro forma with newly acquired information

3) MARKET / COMPETITION

a) Overview

Is broadband important to a small community in rural Iowa, to Vinton, Iowa? The answer is emphatically YES and that answer is supported by countless surveys and studies today which will tell you that a community cannot survive without robust broadband. These studies show that economies thrive, housing values increase, access to quality healthcare improves, business income increases, and educational experiences flourish with access to broadband. Although broadband is not the only answer for economic development and prosperity it is an extremely important factor.

The City of Vinton has multiple broadband providers today so why isn't the current broadband service good enough? One answer is streaming video. According to iGR Research the average monthly broadband usage is 190 gigabytes per month and 95% of that traffic is video related. Generally, every member of a household has their own device, whether it's a laptop, tablet, smart phone, smart TV, or 1 of many other devices, and all of them are accessing the internet. In this kind of environment DSL service or cable modem service cannot keep up with the foreseeable growth in demand for broadband.

Historically, the high cost and the lower long-term returns of delivering leading-edge communications technologies to sparsely populated areas has led many large communications companies like CenturyLink and Mediacom to invest their capital in urban and suburban areas, where more people means more profits. Many small communities ranging from 1,500 – 10,000 households are in danger of being left behind when it comes to technology. Both CenturyLink and Mediacom, who currently already provide broadband service in Vinton, have shown little or no interest in investing in new infrastructure in the City of Vinton.

While incumbent carriers have made incremental improvements to their operations to improve broadband internet speeds, they have not invested significantly in their physical plant infrastructure. Although potential internet speeds have marginally improved, reliability is still suspect due to frequent maintenance issues associated with aging, copper based and coax based infrastructure. Furthermore, no competitive carriers, wireline or wireless, have indicated any desire to complete a community wide broadband network. These factors point and lead to the conclusion that the City needs to take control of its future and build a FTTP network itself.

While this situation has clearly limited business and home-based business opportunities, K-12 educational, and public safety opportunities, there is an opportunity for the City to leverage its experience in the electric utility to create a separate communications utility, i.e. Vinton Broadband to do the job that incumbent carriers refuse to do. The new communications network will provide one of the basic needs for economic development in the City for the next 40 to 50 years. The City's experience with its electric utility will provide access to attractive financing options to fund construction of a state of the art fiber network. While this investment will not, in and of itself, guarantee economic activity, without

investment the City may be eliminated from consideration by new businesses, existing businesses looking to expand, new residents, existing residents and visitors alike. An additional incentive for the City and its citizens to build a new FTTP network is the potential for stable or increased home values. As shown in **Appendix A**, a survey by the Fiber To The Home Council in 2015 showed that high speed broadband networks showed a range of 3% to 7% in increased resale value of homes. Additional value added benefits to the community include; 1) increases in community GDP due to new economic opportunities for local businesses, 2) increased economic development opportunities to attract new businesses and industries, and 3) identification as a Gigabit Community. The availability of high speed broadband to homes and businesses makes communities an attractive option for all entities, whether a basic subscriber, subscribers with children, work-from-home employees, or main street businesses. All consumers are potential users of a FTTP network.

While some municipalities have offered wholesale services and built fiber backbone networks only (also known as Open Access Networks), these solutions do not address the public's need for services like voice, video and high-speed data that have been identified by the citizens of Vinton over the years. For that reason alone, it is the intention of this feasibility study to analyze building a true FTTP network. The electronics that will be placed into service will easily handle all current services and future bandwidth intense services. This will allow customers to have unrestricted access to the internet as well as allow them to use even more services as the demand for bandwidth continues to grow. It allows the Vinton Broadband to offer "more than needed" broadband initially, which provides a competitive advantage and a key differentiator over the existing providers' offerings. Plus, the equipment being provided for this network can easily monitor actual usage by all customers and regulate how much true demand it puts on the network connection to the worldwide network. Vinton Broadband wants to put the most bandwidth possible in the hands of the potential patrons of this network.

b) Market Approach

Communications is a capital-intensive industry and is generally best suited where economies of scale exist whereby the capital invested can be spread among more users of the system. Those economies of scale do not exist in small towns scattered throughout Iowa. Because the economies of scale are working against a new communications provider, it will be difficult if not impossible to compete with the competition on price alone. Vinton Broadband will need to consistently provide the most reliable, fastest broadband service as well as first-class customer service, and not try to match the lowest bundled price that competitors are offering. **SELL THE DIFFERENCE!** The new FTTP network will be capable of providing internet speeds 10 times as fast as currently available so it is important to **"SELL THAT DIFFERENCE"** and not try to match the same low speed tier the competitors are selling. Some suggestions on **"SELLING THE DIFFERENCE"** might include;

- Emphasize the **"DIFFERENCE"**; Vinton Broadband's FTTP network will include a reliable state of the art network, with gigabit capability, bi-directional internet speeds, local control, local service and support, and local community benefits.

- During the initial roll out of service create an “Appreciation Days” type atmosphere where potential customers are invited to learn about Vinton Broadband services, a sign-up blitz. Such an event might include demonstrations of slow (10 Mbps) versus extremely fast (1 Gbps) internet download speeds, sign up for gift drawings and hand out other free promotional items.
- Explain to customers that signing up for service during the initial construction phase will result in no cost for the fiber connection to their house or business location. After the initial construction, customers could be charged \$250 or more to have fiber brought to their residence or \$1,000 or more to have fiber brought to their business (economies of scale). Vinton Broadband can’t invest if the customer is not going to buy.
- Vinton Broadband may consider providing initial customers signing up for service with 1 Gbps service for the same price as 100 Mbps service free for the 1st month.

c) Keys to Success

- i) Deliver the fastest and most reliable broadband available in Vinton
- ii) Provide 1st class customer service
- iii) Installing a state of the art network with unlimited capacity – “Sell the Difference”
- iv) Create community excitement and enthusiasm before launching service

4) SERVICE OFFERINGS

a) Broadband

Broadband service delivered via an all fiber network infrastructure is the primary reason for the Vinton Broadband project. High speed broadband is in demand across the nation especially in areas that have been neglected by the large incumbent providers. A Fiber-to-the-Home (FTTH) network has virtually unlimited bandwidth and is only limited by the fiber electronics used to deploy service to customers.

b) Voice Service

Wireline voice services continue to be an important service offering for a competitive service provider. Vinton Broadband will have greater success attracting customers by offering a triple play (broadband, voice, & video) that includes voice service rather than offering broadband only. Many customers that currently have voice service with one of the incumbent providers will want to continue purchasing all their communications services on a single bill from a single provider. It is a fact, however, that wireline voice service is declining. With that in mind, carefully considering the cost to implement voice service is vitally important.

IP based voice services are comparable to those being offered by Mediacom today in Vinton. Residential voice service will have the same features available currently. All business-related

services such as PBX services, both customer owned and hosted services provided by the Vinton Broadband will be available within this network. Session Initiation Protocol (SIP) (internet connections for businesses and subscribers) based services will also be available. Applications which utilize SIP trunking would include Voice over Internet Protocol (VoIP) and streaming media service based on SIP in which Internet telephone service providers (ITSP's) deliver telephone services and unified communications to customers equipped with SIP-based branch exchange (IP-PBX) and Unified Communication Facilities.

FARR Technologies evaluated several options for providing voice service. The options considered are; 1) Purchasing and operating a voice switch; 2) Hosted switching arrangements; 3) Wholesale lease of facilities to voice service provider.

Purchasing and operating a voice switch requires significant capital investment, additional technical experience, and administrative burdens. The capital investment to purchase and install a voice switch would range from \$250,000 - \$350,000. Additionally, a competent technician would be necessary to monitor voice switched traffic, perform translations changes, and perform local number porting changes.

Hosted switching arrangements are becoming more common as voice service continues the transition from analog to IP. Companies that have invested in voice switches are leveraging their investment by offering hosted switching arrangements. Current voice switches often have the capacity to service many more voice connections than are typically served. A hosted switching arrangement would allow Vinton Broadband to off load much of the day to day technical operations to a contracted service provider.

Under both the previous two options, Vinton Broadband would need to file all regulatory applications, and satisfy all ongoing regulatory requirements which include, applying for numbering resources, registering with national databases, E911 requirements, local number portability, negotiate interconnection agreements with incumbent providers, etc. These requirements can be onerous and time consuming and may increase startup costs.

Another option similar to hosted switching is to contract with a voice service provider under a wholesale lease arrangement. With this model voice service provider leases a "voice path" on the newly constructed FTTH facility for each voice service purchased by residential or business customers. The voice service provider performs all regulatory filings and would be certified competitive local exchange carrier (CLEC) in Vinton. This option requires no significant capital investment but does require Vinton Communications Utility to perform all customer service and billing. It is important to note that under this model, Vinton Broadband maintains the customer relationship for sales, customer service, billing, maintenance, etc. The voice service provider provides voice switching, access to E911, Communications Assistance for Law Enforcement Act (CALEA), local number portability, and other technical functions.

The pro forma utilizes the wholesale lease option because it reduces capital investment, and reduces operational and administrative burdens to allow Vinton Broadband to focus on

customer service, however, Vinton Broadband should analyze available options for providing voice service during the final design / RFP phase of the project.

c) Video Services

Video services in rural markets are extremely competitive with profit margins that are extremely narrow if they exist at all¹. Rural video providers lack meaningful market power when negotiating for video programming. Video providers are often at the mercy of video programmers which tie or bundle undesired content with other desired channels to extract higher programming fees from video providers. In addition to the high cost of programming fees, the capital investment necessary to become a traditional video service provider is extremely cost prohibitive in rural markets with low subscriber counts.

Various national studies indicate that subscription based video services are on the decline. One study suggests that 10% of customers in urban and suburban markets have cut the video cord opting for Over the Top (OTT) video options. OTT video options are delivered over the internet as well as other video streaming content. OTT video has become extremely popular among 18-30-year-old adults and includes streaming services such as Netflix, Hulu, and YouTube. Another study conducted in 2016 of video services found that 82% of customers in rural markets continue to use subscription based video services.

Despite the challenges associated with becoming a video service provider, there are significant reasons for Vinton Broadband to develop and offer video services. It is important that Vinton Broadband offer not only an alternative, but a replacement of the incumbent providers that refuse to upgrade their services in Vinton. By offering a triple play (broadband, voice, and video) the project is further supported in achieving its customer subscription targets.

FARR Technologies evaluated three methods in which video services could be provided to residents and businesses in Vinton by the newly established communications utility. They are: 1) Build a standalone video headend; 2) Invest in an existing video headend through a sharing arrangement or partnership; or 3) Utilizing a hybrid video content delivery model through a “hosted” video headend.

A standalone video headend affords a video provider the most control over the technical aspects of video content delivery. A provider building a video headend would need to purchase land to install multiple satellite dishes used to receive video content, develop the technical expertise to manage the system, purchase middleware used to manage the content delivery to the customer, and perform all administrative functions in particular programming content negotiations. This option bears the highest capital investment and requires the most ongoing operational and administrative cost. With today’s high cost of video programming

¹ NTCA – The Rural Broadband Association, Comments filed in MB Docket No. 15-158 footnote 12; “RLECs operating as MVPDs routinely do so at or near break-even levels, if that. In these instances, video services are provided in order to meet community needs and consumer demands, in addition to countering competition from other service providers, despite the lack of a compelling business case.”

fees and over the top (OTT) alternatives for video content, there is rarely a business case for building a standalone video headend in a rural market.

Another option available to Vinton Broadband is to invest in an existing video headend through a partnership or sharing arrangement. Video headend operators are willing to provide video content to additional service providers in an effort to spread the high capital and high operational costs of operating a video headend across more users. With this option, Vinton Broadband would be responsible for becoming a member of National Cable Television Cooperative (NCTC), an organization that administers programming content agreements on behalf of its members with the various content providers such as Fox, ESPN, HBO, USA Networks, Turner Networks, etc.)

Another option is to utilize a “hybrid” video content solution through a hosted video headend provider. This option allows for the least capital investment and ensures a “moderate” gross profit margin. However, this model is relatively new and is based on SkitterTV. There have been some roll-out issues, but these are being addressed and should be more defined within the next 12-18 months. Using a managed service for video services significantly reduces startup costs as well as labor costs. SkitterTV provides content contract management, headend management and middleware management. With these time-consuming tasks being handled by SkitterTV, the operator can focus on customer service which is key to the success of the proposed fiber buildout.

Working with an existing video headend provider or utilizing a hosted service such as SkitterTV are both viable options for providing video services. The pro forma currently includes Option 3 – Hosted Video Headend as the video content delivery solution.

Summary of video delivery options available to Vinton Broadband:

	Option 1 Build a Video Headend	Option 2 Shared Video Headend	Option 3 Hosted Video Headend
Estimated Capital Cost	\$1,200,000 - \$1,750,000	\$150,000 – \$175,000	\$25,000
Estimated Annual Operating Cost	\$200,000 – \$300,000	\$30,000 – \$50,000	Included in existing operational expense (i.e. Customer Service, Repairs & Maintenance, etc.)

Option 1: Build a Video Headend

Pros: More control over content and channel line-ups, 100% control over technical delivery of video content.

Cons: Highest capital investment, highest operational cost,

Option 2: Shared Video Headend

Pros: More control over content and channel line-ups, advantage of working with local companies vested in serving rural markets.

Cons: Additional capital investment required, additional operational costs (compared to option 3).

Option 3: Hosted Video Headend

Pros: No substantial capital investment required, business model based on profit sharing, no administrative costs for programming negotiations.

Cons: No control over content, channel line-ups, or customer pricing, relatively new company.

The Video market is rapidly evolving as more non-traditional video options are becoming available. If a decision is made to move forward, it would be the expectation that Vinton Broadband evaluate all options available to determine the most cost effective, yet feature rich offering available during the design / RFP phase of the project.

5) PROPOSED NETWORK DESIGN

a) Overview

While some municipalities have offered wholesale services and built fiber backbone networks only (also known as Open Access Networks), these solutions do not address the public's need for services like voice, video and high-speed data that have been identified by the citizens of Vinton over the years. For that reason alone, it is the intention of this feasibility study to analyze building a true FTTP network. The electronics that will be placed into service will easily handle all current services and future bandwidth intense services. This will allow customers to have unrestricted access to the internet as well as allow them to use even more services as the demand for bandwidth continues to grow. It allows the Vinton Broadband to offer "more than needed" broadband initially, which provides a competitive advantage and a key differentiator over the existing providers' offerings. Plus, the equipment being provided for this network can easily monitor actual usage by all customers and regulate how much true demand it puts on the network connection to the worldwide network. Vinton Broadband wants to put the most bandwidth possible in the hands of the potential patrons of this network.

From a technical perspective (See Appendix B), the fiber cable network design proposes a 100% buried network and includes redundant connections to the internet backbone as well as a redundant local access network ring within the city to prevent a single cable or electronics failure from disabling the network. The local access network will have a 144-fiber strand cable installed in ducts connecting the five (5) splitter cabinets in the field and a single central office. From these locations, homes and businesses will connect to Multi Service Terminals (MST) using connectorized fiber cables also installed in ducts. The drops

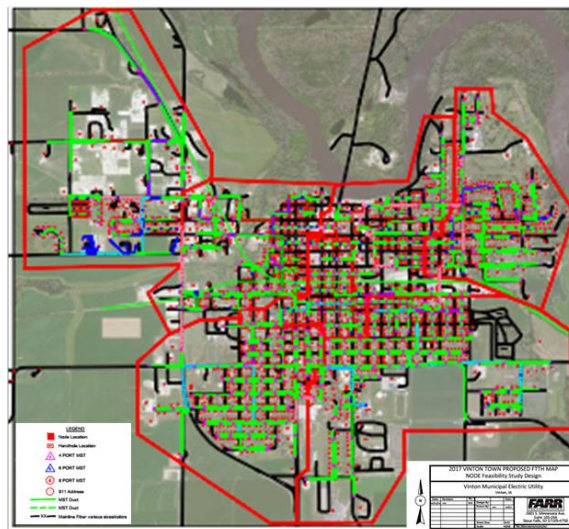
from the MST to the home or business will be direct buried with rugged connectors on each end. The connectorized ends reduce ongoing maintenance costs. The redundant fiber access to the internet uses a leased route for one connection to the internet and proposes a new buried route to complete the ring.

The proposed fiber electronics design utilizes a Gigabit Passive Optical Network (GPON) with shared 2.4 Gbps downstream and 1.2 Gbps upstream bandwidth which meets the requirements to be a Gigabit Community. Future advances in electronics can be seamlessly integrated on the existing fiber network without any need to change the cable. The NGPON2 is the next iteration of GPON electronics with download speeds of up to 10 Gbps. While it is available today, the product carries premium pricing and was not included in this study. Its availability is a testament to the ever-increasing speeds of each new generation of GPON electronics.

The cable and electronics design capital costs were estimated by developing a custom layout for the cables and drops on a real-world coordinate map of Vinton, then pulling actual footages of each cable size, number of handholes, MSTs, pedestals, and ONTs from the map and then pricing out these quantities based on 2016/17 bids for each type of cable/equipment from similar projects FARR is working on in Iowa.

b) FTTH Technical Description

The FTTH outside plant (OSP) and electronics design proposed provides Vinton Broadband a strong basis to ensure delivery of all services required by business and residents today. The proposed design utilizes a central office location and five (5) fiber splitter cabinet (FSC) nodes that allow for growth into the future by addition of field electronics to support higher data services if needed above the current capacity of the field splitter design. The central office location will have redundant fiber backbone connection routes to provide additional protection in case of a fiber cut and the five (5) FSC nodes are connected by a 144-fiber ring to allow for expansion to field electronics that can be protected in case of fiber cut as well.



i) Feeder Fiber

The feeder fiber cable system is designed in a ring configuration that originates at the Central Office (CO) location. The feeder fiber then routes to five (5) FSC Nodes in field and returns to CO. This design configuration is the most cost effective scenario when considering initial deployment but limits flexibility for the use of passive, active or combination from day one of system deployment due to creating a shortage of dedicated fibers from your CO (electronics location) to each FSC location. This shortage can eventually limit the capacity of bandwidth to each subscriber out of the nodes. The solution to this issue would be an upgrade to the existing fiber facilities from the CO to the FSC Node or the placement of FTTx electronics at the FSC Node locations. This concern has become less and less over the years as the PON electronic bandwidth continues to grow but at this point it is still a concern. There are other fiber designs that could be utilized to remove the bandwidth capacity issue, such as a centralized feeder solution that were also evaluated as part of this study (see b), i) in this section for details).



Front

Back

Fiber Splitter Cabinet (FSC)

The feeder fiber cable layout utilizes standard loose tube cable sizes from 432 to 24 fiber strand counts. The 144-fiber feeder ring cable has dedicated fiber strands to feed each splitter at each FSC Node. The number of 1x16 splitters required are based on the number of subscribers being fed from that FSC Node. There are also some spare fibers for dedicated strands to customer all the way back to CO and/or spare fiber for future electronic cabinets (if required). There are 18 spare fiber strands for this currently in the proposed 144 strand ring fiber cable.

The Feeder cable out of the FSC Nodes has a dedicated fiber strand for each Multiport service terminal (MST) cable deployed, which provides a dedicated strand for each

subscriber and spare for growth and maintenance. The FSC Nodes are sized to accommodate all feeder splitter fibers in and subscriber feeder fibers out. The FSC Node is equipped with 40% of the splitters year one and is capable of having additional splitters added as need. The Feeder cable out of each Node on average is around a 70% fill.

The network design has all feeder fiber being installed in duct, which provides additional protection from certain types of damage and if damaged occurs, it allows quicker repair of the feeder facilities over direct buried facilities. The design also includes a spare duct to be placed from the Central Office along with the Feeder routes to the North, West and South. This spare duct allows additional expansion solution for new developments and future alternate fiber connectivity solutions.

ii) Distribution Fiber

The distribution fiber design utilizes an 8 port, 6 port, and 4 port Multiport Service Terminals (MST) for cable and connectorized access for subscriber termination. The MST units have fiber pigtailed in standard lengths that shall route back to the feeder fiber cables and are then spliced back to the FSC Node. These MST's are sized for the number of subscribers along with future lots, spare ports for maintenance and additional spares based on design limitations of the standard MST configurations. The MST's design is around 85% to 90% fill based on subscriber breakout for route and future growth.

The network design has all distribution fiber being installed in duct, which provides additional protection from certain types of damage and if damage occurs, it allows quicker repair of the distribution facilities over direct buried facilities.

Non- Metallic Netspan Pro8 Pedestal with 6 Port Multi Service housing (MST)



iii) Fiber Access Points

The fiber connectivity for the feeder fiber to FSC Node and FSC Node to distribution fiber in this network design is Tunnel Mill Vaults with a locate terminal in lid and Tyco Splice cases. The fiber connectivity for distribution fiber to drop fiber proposed in this network design is the Vertiv, Netspan Pro8 pedestal with MST's. Utilization of this design allows for quick and easy access when adding or replacing drops in the future.



Tunnel Mill Vault

The fiber connectivity for the OSP facilities from the CO to distribution fiber cable are designed to be a fusion splice with a protection sleeve. The distribution fiber to subscriber drop to subscriber ONT demarcation housing connectivity shall utilize ruggedized connectors.

iv) Drop Fiber

The drop fiber design for this network is the utilization of tonable flat drop cable placed by direct burial with ruggedized connectors on both ends. The use of the ruggedized connectors allows for quick connection on the initial turn-up and for future maintenance.



Ruggedized Connector

The drop fiber cable is being direct buried. This method is the most economical solution however make the drop cable more susceptible to accidental fiber cuts from activities such as backyard digging by hand or post hole digging, etc. If damaged, the cable can be repaired with buried splice closures or drop cable can be re-buried.

This study also evaluated a design that placed drops in duct for added protection similar to the feeder and distribution fiber cables (see b), iii) in this section for additional detail).

c) Alternative Design Options:

i) Centralized Fiber Design

An alternative design that utilized one (1) centralized location to feed all subscribers rather than having distributed fiber splitter cabinet nodes in field.

The one (1) centralized location design is consider to be overall the best solution for ongoing subscriber additions, ongoing maintenance and unexpected bandwidth growth. The reason for this thought is that with all fiber and equipment in one (1) location the technician can complete all fiber jumper placement, equipment connection or changes in one location. The utilization of Nodes adds another connection point to system that requires additional truck rolls for every jumper connection when adding or changing subscribers service along with another location to maintain and troubleshoot when network has issues. Additionally, as the fiber bandwidth requirements grow the single centralize location allows for quickest response to adapting to this requirement by allowing utilization of existing equipment or addition new equipment depending on the amount of bandwidth demand. The multiple Node solution would require a fiber facility upgrade from CO to each Node or placement of electronic equipment at each Node to accomplish the same thing.

The design analysis of this alternative indicates an approximate outside plant project cost increase of approximately \$125,000.00 to this part of build for a Centralized location. FARR recommends that strong consideration be given for the centralized fiber design evaluated during the final design/RFP phase of the project.

ii) Aerial vs. Buried

An alternative design that considered utilizing aerial infrastructure for certain portions of build instead of buried was also evaluated. The design looked at the distribution routes being installed on aerial infrastructure while the feeder and drop routes remained buried.

This design scenario still provides protection of buried facilities for the main feeder routes and drops but allows reduction of outside plant costs by placing aerial distribution facilities. The distribution routes being aerial potential minimize outages to just that route. Also, based on field review of existing aerial plant, these routes would have minimal make ready costs.

The impact to the outside plant construction cost based on this hybrid buried & aerial fiber design indicated a potential cost reduction to this part of project of approximately \$425,000.00. The option to utilize aerial construction should be included as an alternate during the Request for Proposal (RFP) bid process.

Other factors to consider if aerial cable construction is selected:

- Increased staking costs.
- Requires bucket truck(s) for service, maintenance and repair which may eliminate potential 3rd party service providers.
- Technicians required to must be certified to work on poles near electric power at an increased labor cost as opposed to buried infrastructure.

iii) Conduits for Drops

An alternative design that considered utilizing conduit for all drop facility placement was evaluated. The reason for placement of conduit and then pulling fiber cable into the conduit is for additional protection from accidental damage in the subscriber's yard shall allow the quickest restoration by repairing conduit and pulling new drop fiber.

The additional material cost for drops placed in conduit would increase the overall project cost by about \$140,000 for the initial 40% penetration or addition of around \$155.00 per subscriber. It is important to note that placing drops in conduit is most beneficial if the overall network design places mainline, feeder, and distribution fiber in conduit. FARR recommends that alternate's for placing fiber in conduit be evaluated during the final design / RFP phase of the project.

d) Fiber Connectivity

Broadband, voice, and video services will require Vinton Broadband to connect to other providers to gain access to the internet backbone, to the public switched telephone network (PSTN), and certain video headend providers. This fiber link to the outside world makes it possible to bring fiber based services to residences and business in Vinton. There are several entities within the region near Vinton that have facilities close to or within the City of Vinton. These entities would all be possible sources of connections to the nationwide network.

Engineering standards also dictate that the fiber connections be designed to be survivable and / or redundant in order to survive potential service outages due to fiber cuts, or acts of God. The fiber connection is typically purchased as fiber transport or "lit" services based on bandwidth capacity. The fiber can also be purchased by leasing dark fiber which may require the customer to provide the fiber transport electronics on both ends of the circuit. Dark fiber is less common but does have long term pricing advantages.

With these principles in mind, FARR Technologies identified the following options for fiber connectivity:

i) Transport from Incumbent Providers

Vinton Broadband could purchase fiber transport from CenturyLink or Mediacom to obtain access to the internet backbone and other downstream providers. Although this option is possible, it is not recommended due to the fact that both companies will be the primary competitors to the Vinton Broadband project.

ii) Fiber Transport

Vinton Broadband may be required to build fiber optic cable to these fiber transport providers that are near Vinton in order to interconnect with long haul fiber networks. The following options for interconnection were considered:

- (1) Option 1 - The redundant fiber connection for this option creates a protected ring configuration by have connection at Aureon fiber splice points south of Vinton and west of Vinton. The fiber connectivity build shall consist of approximately 15 miles of direct buried 48 fiber with reel ends approximately every 5 miles. The pro forma currently includes \$264,500 in the capital investment in Year 0 to accomplish this interconnection.
- (2) Option 2 - The redundant fiber connection for this option creates a protected ring configuration by having connectivity at Garrison, Iowa and at a fiber splice point on the north side of Urbana. The fiber connectivity build shall consist of approximately 20 miles of direct buried 48 fiber with reel ends approximately every 5 miles. This option requires additional construction cost and state permits fees in order to

construct fiber optic cable across the river. The estimated cost of this option is \$471,500.

The pro forma budget for fiber connectivity is \$264,500. Following are alternative and viable fiber connection options which should be considered during the design / RFP phase of the project.

iii) Other Fiber Connection Options

- (1) Cedar Falls Utilities (CFU) – CFU offers reasonable fiber transport rates, however, CFU does not have fiber facilities near Vinton to accommodate fiber interconnection. In order to interconnect with CFU, Vinton Broadband would need to build fiber to Hiawatha, IA and / or Cedar Falls, IA. This fiber build is cost prohibitive. Vinton Broadband may have the ability to interconnect with other providers that have connections to CFU which enables Vinton Broadband to consider CFU for video signal and broadband backbone services.
- (2) USA Communications – USA Communications is currently a communications provider in Vinton with fiber facilities. The company has not expressed a strong interest in building a FTTH network in Vinton, but does provide broadband service to a handful of business and governmental customers. Conversations with USA Communications indicate a willingness to explore not only fiber transport services but other network support services in the future.
- (3) Unite Private Networks (UPN) – In conversations with representatives with UPN, the nearest location to interconnect with the UPN network would be just to the east of Urbana. This option would require a fiber build to Urbana.
- (4) BroadNet Connect – BroadNet Connect is part of the HealthNet Connect / UnityPoint Health network. The company currently has fiber facilities in Vinton and may provide an opportunity for interconnection. Conversations with company representatives could not establish with any certainty estimated costs for interconnection, however, this option is worth strong consideration.

e) FTTH Electronics Design

The electronics portion of the capital investment is based on using Gigabit Passive Optical Network (GPON) technology. This technology will allow for one gigabit service offerings today if so desired. If future service offerings over 1 gigabit up to 10 gigabits are necessary, the existing electronics can be overlaid with any of the new 10GPON technologies currently available.

The study was done with the assumption that all Optical Line Termination (OLT) units would be located in the Central Office (CO). This pricing was based off some very aggressive competitive pricing between the two vendors seen most in this marketplace, ADTRAN INC. and Calix Networks.

Gigabit Passive Optical Network (GPON) is the FTTH standard that was used for the design. This design allows for the delivery of gigabit services to the customer and fits the criteria to be a certified gigabit community. The standard allows for a shared 2.4 Gbps download and 1.2 Gbps upload speeds. With multiplexing this allows for all subscribers sharing the GPON network to obtain gigabit speeds.

NGPON2 technologies were discussed but not included in this study as they are cost prohibitive to purchase at this time. These technologies provide for the ability to deliver more than 1 Gbps to a subscriber with the upper limit of downstream bandwidth being 10 Gbps.

Regarding providing protection to subscribers connected at remote splitters there are two options in cases where the feeder fiber may become damaged:

- (1) Having dedicated spare fibers pre-spliced with a method of procedure in place for fast restoral by reconnecting at each end of the circuit. The major drawback of this method is that it requires manual intervention and a truck roll.
- (2) Place electronics at the remote splitter locations. These electronics would have their path the to the central office protected by using the fiber ring architecture. The drawbacks of this method are:
 - (a) Time spent negotiating land to place the cabinet.
 - (b) Having to install local power.
 - (c) Monthly recurring charges for power.
 - (d) Higher cost for more electronics at both the remote and central office locations.
 - (e) Additional complexity if the owner wishes to migrate to NGPON2 technologies in the future.

Optical Network Termination (ONT) Options

There are three deployment models for providing service at the subscriber premise and are listed from least expensive to most expensive.

- (1) Indoor ONT
- (2) Outdoor ONT
- (3) Indoor ONT with Residential Gateway features (built in remote manageable router)



Optical Network Termination (ONT)

The study used the Indoor ONT with Residential Gateway (RG). The per unit cost difference between the outdoor ONT and the RG was negligible. Having the ONT with RG features allows the operator to see into the subscriber's premise and remotely troubleshoot issues. This should have the effect of reducing truck rolls to the subscriber's premise.



Residential Gateway (RG)

The RG's have the ability to serve 1 Gbps via their Ethernet ports. It also has built in 2.4 Ghz and 5 Ghz Wi-Fi radios for providing access for technicians as well as Internet and Video services to subscribers. They also include two plain old telephone service (POTS) ports for delivering voice service to the customer.

For RG's, care and consideration should be given to IP address assignment. With the global exhaustion of IPv4 addresses, the majority of subscribers will be assigned IPv6 addresses. If any subscriber needs to reach an IPv4 address on the Internet, the gateway router will translate the traffic from IPv6 to IPv4 similar to how a home router translates private addresses to public addresses. This gateway router will also be the router for voice and video services.

f) Smart Meter / Smart Grid

Smart Grids are being built as part of modernized electric systems. A key component of the Smart Grid is the use of Smart Meters. These meters collect customer electricity (and water, etc.) information which allows for the automated collection of this information rather than having human "meter readers" walking through backyards to read the meters on individual homes and businesses.

Some benefits include the following

- 1) Can help customers better manage their energy use
- 2) Capable of measuring electricity use in smaller intervals (e.g. - hourly)
- 3) Sends data through a secure network to the local utility
- 4) Can provide 2-way communications to provide more reliable service by receiving accurate readings and up-to-date outage information

- 5) Modernizes the metering infrastructure by replacing mechanical analog meters with digital meters
- 6) Provides customers with more detailed information about their individual electricity usage which helps customers to be better informed.
- 7) Allows electric utilities to be more creative with pricing programs as subscribers utilize more of the smart meter capabilities within their homes.
- 8) Can be used not only for use by the utilities that make use of the meters but homeowners can see benefits as more “smart appliances” are coming into play.
 - a) Example: smart refrigerators can “send you” a list of items needed for grocery shopping from the list you have on the monitor on the refrigerator. You do not need to remember to take the list with you to the store.

6) FINANCIAL PRO FORMA

a) Overview

The financial pro forma or business plan has been developed to determine the feasibility of providing customers in the City of Vinton with reliable high-speed broadband access via a fiber-to-the-premise (FTTP) network. The assumptions that formulate the business plan are derived from a variety of sources such as vendor estimates, industry metrics, historical trends, as well as data gathered through conversations and interviews with interested parties. Specifically, the five (5) year proforma uses the following fundamental assumptions to create the Profit and Loss, Balance Sheet and Cash Flow statements shown in **Appendix C**.

1. Capital cost of cable, electronics, work equipment, buildings \$8.9M
2. 100% of capital cost is financed at a rate of 4.5% with a 20-year amortization.
3. 2,100 business and residential locations passed.
4. Voice service take rate of 35% in year 1 decreasing to 30% in year 5 for residential customers and 40% in year 1 – 5 for business customers.
5. Video service take rate of 35% in year 1 decreasing to 30% in year 5 for residential customers and 10% in year 1 – 5 for business customers
6. High speed data service take rate of 40% in year 1 growing to 62% in year 5 for residential and 40% in year 1 growing to 62% in year 5 for business customers.
7. Net Revenue available for operating and financing expenses are dominantly driven by the residential and business data service subscription and service rates. Voice and video services provide a very small contribution for operating and financing expenses.
8. Operations expenses provided by Vinton Broadband (network, customer service and management) are based on a personnel and equipment model that will support the network’s operation throughout the life of the network including the first 5 years in this study. **One recommendation we make is to solicit bids from regional providers to perform some or all the operations during the first five years and bring on staff and equipment as the growth of the network occurs. The financial model responses to**

any savings in operational expenses are very positive especially in the early years of the project.

The financial results using these assumptions project the project to have positive net income in year 5, cash flow in year 4, Times Interest Earned Ratio (TIER) of 1.11 and Debt Service Coverage (DSC) 1.2 in year 3 increasing to 1.44 in year 5. **At these levels of ratios, the penetration rates included in the study are equivalent to “breakeven” rates.**

Some of the key factors in the pro forma financials of the study include:

1. Vinton’s geographic and population size require the financials to support a proportionally larger amount of the mainline backbone (feeder and distribution) cable capital costs compared to other small Iowa municipalities 2 to 3 times Vinton’s size. The backbone must be sized to serve the entire population even though the Vinton Broadband would only build drops to actual subscribers.
2. The backbone cable needs to be built completely as opposed to being built in phases.
3. The operations expenses are based on a fully staffed model for personnel and equipment. FARR’s experience with other new fiber networks is to outsource most if not all the early year operations to a third party to gain economies of scale that those providers may be able to provide to the City. Several neighboring broadband providers have recently built FTTP networks in their service territories and upon completion of the fiber networks, their maintenance and repair calls will likely decrease substantially, thereby freeing up resources to be used elsewhere.
4. Based on FARR’s experience with other fiber networks, the best time to acquire customers is during the construction phase of the project through a “pre-commitment campaign”. This approach will provide important information regarding expected customer subscription rates which are critical to the overall financial success of the project.
5. It is important to begin providing service to customers as soon as the core network is operational to build operational revenue as quickly as possible.

Additional information regarding key assumptions and other financial highlights are discussed following. The financial pro forma and additional supporting information can be found in **Appendix C**.

b) Capital Investment / Assets

Estimated capital investment for the proposed FTTP build during the initial construction phase of the project is \$7,971,065. The projected capital investment in years 1 – 5, anticipates the capital cost to extend the fiber network to provide service to additional subscribing customers (customer drops). The estimated capital investment in years 1-5 is \$956,875. The total capital investment for the project is \$8,927,940.

The breakdown of capital investments is as follows:

<u>Asset Description</u>	Year 0 Construction Phase	Years 1 – 5 Operations Phase
Land / Building Improvements / Fiber Nodes	\$344,641	
Outside Plant (Fiber & Construction)	\$5,202,360	\$638,250
Fiber Electronics & Equipment	\$1,435,881	\$318,625
Video Equipment / Set-Top Boxes	\$223,550	
Trucks, Tools, & Equipment	\$203,500	
Office Equipment / Billing Software	\$195,000	
Organizational Costs	\$150,000	
Capitalized Interest	\$216,133	
Subtotal Capital Investment	\$7,971,065	\$956,875
Total Capital Investment	\$8,927,940	

c) Project Funding

Funding for the project will likely come from a combination of electric utility revenue bonds, communications utility revenue bonds, and a working capital / line of credit if necessary. Specific financing arrangements will need to be coordinated with a capital investment advisor that specializes in municipal bonding issues as well as an attorney familiar with Iowa law and restrictions applicable to municipal communications financing.

FARR Technologies consulted with capital investment advisors involved with other municipal communications fiber projects to determine the best financing / bonding options available to Vinton Broadband. Recent municipal broadband buildout financing plans were structured to minimize risk and to attract investors by diversifying the debt / bonds between Vinton Municipal Electric Utility (VMEU) and a newly formed Vinton Communications Utility (VCU) subsidiary. Recent projects similar to Vinton Broadband were structured in a way that the electric utility issued revenue bonds for the outside plant or fiber infrastructure portion of the project or approximately 50% of the capital investment. VMEU thus would have the core network to utilize for smart metering / smart grid applications either now or in the future should it choose to implement those technologies. The repayment of the revenue bonds would be made by VCU under a long term operating lease, leasing the spare capacity of the

network for its use. Under this scenario, the remaining capital investment would be financed by revenue bonds issued by VCU and guaranteed by its operating revenues.

Working capital is extremely important in any start-up business and is also critical to the success of the Vinton broadband expansion project. Other municipal broadband projects have included working capital financing arrangements which are loaned from electric utility or city cash reserves if available. Working capital loans are necessary to pay operating expenses and debt service payments while customer penetration is ramping up in the early years of the project. Loans can range from 10 – 30% of the overall capital investment and are typically set up under line-of-credit arrangements with advances only when necessary for cash flow needs. These intergovernmental loans typically carry a lower interest and is governed by Iowa law. As the proposed fiber project moves forward, we encourage Vinton Broadband to make provisions for a working capital line of credit, however, the current pro forma does not reflect a working capital loan as cash flow is sufficient without the additional funding with current assumptions.

For the purposes of this feasibility study, the project is financed utilizing a single loan amortization schedule with terms and average interest rates consistent with a bond issue similar to that described above. Additionally, organizational costs of \$150,000 are included in the capital investment total to fund bond issue costs.

The pro forma financial statements contain the following assumptions to finance capital investments for the Vinton Broadband expansion project:

Financing Terms - The pro forma contains financing for 100% of the capital investment required through year 5 of the financial projection or \$8,927,940. Other financing terms assumed in the pro forma are: (1) Repayment Term of 20 years; (2) 4.5% annual interest rate; (3) Loan advances during construction phase as needed for construction; (4) Construction phase (Year 0) accrued interest capitalized and included in financing amount; (5) Quarterly principal and interest payments begin in Year 1.

d) Financing Alternatives

FARR Technologies also considered the following loan/grant programs to fund the Vinton Broadband buildout project.

- **USDA COMMUNITY CONNECT GRANTS**

Purpose: To fund broadband deployment through grants into rural communities where it is not economically viable for private sector providers to deliver service.

Funding: Up to \$3,000,000 Grant, requires 15% matching funds.

Uses of Funds: Construction, acquisition or leasing of facilities, spectrum, land or buildings used to deploy broadband service for:

- All residential & business customers located in the proposed funded service area

- All participating critical community facilities (such as public schools, fire stations, and public libraries)
 - Cost of providing broadband service free of charge to the critical community facilities for 2 years

Eligibility: Rural areas that lack any existing broadband speed of 4 Mbps downstream and 1 Mbps upstream are eligible.

COMMENTS: Vinton Broadband is **not eligible** for funding under this program due to the fact that both Mediacom and CenturyLink offer broadband service of at least 4 Mbps downstream and 1 Mbps upstream.

- **USDA RURAL BROADBAND ACCESS LOAN AND LOAN GUARANTEE PROGRAM**

Purpose: To furnish loans and loan guarantees to provide funds for the costs of construction, improvement, or acquisition of facilities and equipment needed to provide service at the broadband lending speed in eligible rural areas.

Funding: Up to \$10,000,000 cost of money loan, requires 10% equity match (requirement may be satisfied by issuing general obligation bonds).

Uses of Funds: Construction and / or acquisition or leasing of facilities used to deploy broadband service of at least 25 Mbps downstream and 3 Mbps upstream.

Eligibility:

- Rural areas where at least 15% of the proposed funded service area are considered unserved (lack access to broadband at speeds of 10 Mbps downstream and 1 Mbps upstream are eligible).
- No part of the proposed funded service area has three or more “incumbent service providers.”

COMMENTS: Vinton Broadband is **not eligible** for funding under this program due to the fact that both Mediacom and CenturyLink offer broadband service of at least 10 Mbps downstream and 1 Mbps upstream.

- **USDA Rural Utilities Service – Electric Program: Leveraging Smart Grid Investments for Rural Broadband Deployment**

Purpose: To promote smart grid deployment among electric utilities serving rural customers. Provides loans to fund: 1) smart grid initiatives; 2) communications facilities for energy management; 3) fiber to the meter for increased energy efficiency initiatives; 4) to aid in the support and deployment of broadband through the use of those facilities implemented for smart grid purposes.

Funding: Part of the RUS Electric program annual loan budget of \$5.5 billion.

Uses of Funds: Construction of facilities used for fully integrated “smart grid” purposes, including fiber connections directly to the meters of electric service. However, the RUS electric program cannot be used to solely to finance the delivery of broadband services to consumers. Expenditures for smart grid must be funded separately from broadband infrastructure funding. Necessitates utilizing both the electric program and the telecommunications program.

Eligibility:

- Must segregate and/or allocate smart grid expenditures separately from consumer broadband capital expenditures.
- Consumer broadband infrastructure allocation would need to be funded separately through the RUS Broadband program, equity, or other financing source.

COMMENTS: Although Vinton Broadband may on the surface be eligible for funding through this program, the application process is extremely complex and time consuming. In addition, this program would only provide a portion of the necessary funding for the project.

e) Revenues

Recurring revenue is directly associated with anticipated customer subscription estimates for voice, video, and broadband services. The results of the City’s 2015 special election to approve a municipal telecommunications utility for Vinton indicated that quality broadband, services are in high demand. Although customers may also indicate high demand for video and voice services, nationally, the trends for traditional subscription cable TV and wireline voice services are declining. Residential subscription / customer penetration rates are applied to the total estimated residential locations of 2,000 and the business subscription / customer penetration rates are applied to the total estimated business locations of 220. Detailed forecasted subscription / customer penetration rates utilized in the pro forma financial projections are provided in **Appendix C**:

Broadband – Broadband revenue is the primary revenue source in the Vinton Broadband feasibility study. The initial broadband subscription rate of 40% in Year 1 was estimated as an achievable level of customer penetration taking into consideration Residents overwhelming approval of the communication utility, and a substantial marketing “blitz” to roll out the new FTTH service. The customer penetration rate applies equally to residential and business locations. Customer penetration rates are vitally important to the pro forma because of the size of the community. The capital investment necessary for Vinton’s core network could support a much larger community. Communications is an extremely capital intensive business and in order to create a successful business plan a minimum level of customer penetration. Based on the current assumptions contained in the pro forma, a 62% penetration of broadband service is the level that creates both positive cash flow and profitability and is the “breakeven” level for the proposed FTTP buildout.

Rates for Broadband service –The financial pro forma assumes 4 residential broadband service offerings and 4 business service offerings as detailed below:

Residential Service Offering			Business Service Offering		
Downstream	Upstream	Rates	Downstream	Upstream	Rates
100 Mbps	100 Mbps	\$75.00	100 Mbps	100 Mbps	\$100.00
200 Mbps	200 Mbps	\$105.00	200 Mbps	200 Mbps	\$125.00
500 Mbps	500 Mbps	\$125.00	500 Mbps	500 Mbps	\$190.00
1 Gbps	1 Gbps	\$150.00	1 Gbps	1 Gbps	\$275.00

The rate for the entry level residential broadband service offering of 100/100 Mbps is \$5 less than Mediacom’s nonpromotional monthly rate for a 100/10 Mbps service offering. It is management’s belief that neither Mediacom nor CenturyLink can provide consistent, reliable service at 100 Mbps download speeds or greater. The remaining residential and business service offerings are priced similar to rates found in other communities in the region. Rates have been kept constant over the 5-year forecast period (Years 1-5).

Business customers and high end users can be offered SLA (Service Level Agreements) that guarantee a minimum rate upstream and downstream. The electronics and monitoring equipment can do detailed reports for each business user to monitor usage and alert both the Utility and the customer of usage rates and potential peaks. This allows both the customer and the Utility to be proactive in enhancing service offerings before usage levels reach a maximum.

Rates will undoubtedly affect demand and sufficient demand is necessary to achieve positive cash flow, create profitability, and maintain debt service. The current projected subscription rates and rates for service create a reasonable balance between price and demand. Vinton Broadband will need to monitor customer response and adjust its marketing practices to reach the customer subscription targets. The projected broadband penetration rates for the five-year forecast period are as follows:

Service	Residential Subscription / Customer Penetration Rates				
	Year 1	Year 2	Year 3	Year 4	Year 5
Broadband	40%	50%	54%	58%	62%

Service	Business Subscription / Customer Penetration Rates				
	Year 1	Year 2	Year 3	Year 4	Year 5
Broadband	40%	50%	54%	58%	62%

The projected customer estimates for broadband, voice, and video assume that during the Year 0 construction phase, customers will be connected to the FTTP network and revenue will be realized beginning in Year 1. Each year’s additional customer connections will be constructed during the year and begin realizing revenue the following year.

Video – Nationwide trends for small cable television and video service providers shows operators struggling to make a profit or even to break even. Young adults are no longer subscribing to traditional cable TV services. Young adults opt instead for low cost or no cost over the top (OTT) video services such as Netflix and YouTube. These services are streamed over the internet and have exponentially increased the demand for high speed broadband. However, among middle aged and older adults, subscription based cable TV services still maintain strong demand. With these trends in mind, conservative subscription rates have been projected for video services. Projected customer subscription rates are as follows:

Residential Subscription / Customer Penetration Rates					
Service	Year 1	Year 2	Year 3	Year 4	Year 5
Video	35%	35%	32%	32%	30%

Business Subscription / Customer Penetration Rates					
Service	Year 1	Year 2	Year 3	Year 4	Year 5
Video	10%	10%	10%	10%	10%

Higher subscription rates would have relatively insignificant impacts on the financials as video services are a break-even proposition at best. In analyzing a potential 15% increase in residential subscription, Gross profit increases by an average of approximately \$40,000 per year. The current proposed video solution projects an approximate 4% gross profit which leaves little to cover general and administrative expenses. This scenario is common to the rural video market. Video content costs rise annually making it necessary for video providers to pass on the increases to customers with no perceived increase in value.

It is important to note however, that our recommendation is that Vinton Broadband offer video services despite the lack of significant profit potential due to important marketing implications. By offering video services, Vinton Broadband offers each customer an opportunity to choose a new provider and thereby disassociates that customer from their current communications provider.

Video service offering, discussed previously in the technology section, includes the following packages and rates:

Service Offering	Description	Proposed Rate (Year 1)
Basic	Local Channels / Religious / Shopping / Etc. (approx. 25 channels)	\$35.00
Expanded	Basic + 56 SD/HD Channels	\$86.00
Premium	Basic + Expanded + 40 SD/HD Channels	\$96.00

Based on historical data and industry trends video service rates are projected to increase 6% annually. Programming costs are also expected to increase 10% per year for Basic and 6%

annually for Expanded and Premium packages. Additional information on the proposed video services are included in **Appendix C**.

Voice –Competitive local exchange carriers (CLEC) historically could rely on multiple revenue sources from wireline voice services as a new entrant into the market. CLEC’s earned local service revenue from basic dial tone service, long distance revenue, access revenue from long distance carriers, and in some cases per line subsidies from high cost universal service support. These historical revenue sources, particularly, universal support and access revenue, have been significantly decreased if not eliminated due to regulatory reforms. Competition from IP long distance providers has also reduced potential revenue from per minute long distance charges.

Nationally, wireline voice services have been steadily declining for many years due in large part to wireless substitution. The Federal Communications Commission (FCC) reports that cellphones have overtaken the number traditional wireline phones. That disparity continues to grow year after year, however, surveys indicate that rural wireline voice subscription is stronger in rural markets. Considering these national and regional trends, wireline voice service subscription rates are expected to decrease over the forecast period. Business subscription will be higher due to the need for multiline service requirements. Businesses will tend to maintain wireline services because business phone numbers are published in yellow page and other directories. The projected customer subscription rates for residential customers and business customers are as follows:

Residential Subscription / Customer Penetration Rates					
Service	Year 1	Year 2	Year 3	Year 4	Year 5
Voice	35%	35%	32%	32%	32%

Business Subscription / Customer Penetration Rates					
Service	Year 1	Year 2	Year 3	Year 4	Year 5
Voice	40%	40%	40%	40%	40%

The proposed voice offering is based on a hybrid “wholesale” model where the fiber optic connection to the customer is leased by an authorized CLEC certified by the Iowa Utilities Board (IUB) to provide voice services in Vinton. In general, the CLEC leases residential lines from Vinton Broadband for \$10 per residential voice line per month and \$15 per business voice line per month. The arrangement provides additional revenue for a 2nd residential line and multiline business services, however, those revenues have not been projected in the pro forma due to a lack of data on which to base a projection. Additional information on the proposed voice services are included in **Appendix C**.

Miscellaneous Revenue – During the construction phase customers will be given the option to subscribe to Vinton Broadband services. Fiber optic cable will not be placed to residence and business locations which decline service during the construction phase in an effort to hold down capital costs. If a customer subsequently subscribes to service during Year 1-5, customers will be charged a portion of the cost to construct the fiber facilities to their

location. The pro forma projects 48 new residential customers and 6 new business customers annually in Years 1-5 during the forecast period. Residential customers will pay \$250 and businesses will pay \$1,000 as a nonrecurring contribution toward the cost to construct the customer fiber facility to their location.

The pro forma also has a provision for uncollectible revenue estimated at 1% of gross revenue.

f) Expenses

Expenses were projected based on historical trends experienced by other communications providers and specific estimates associated with the proposed project. Significant assumptions are highlighted below:

Personnel / Staffing - Wages, salaries and benefits have been estimated to adequately staff a standalone communications utility. The pro forma projections include 4 full time (FT) staff and 2 part-time (PT) staff. Wages, salaries, and benefits are projected to increase 3% annually through-out the forecast period.

Specific staffing projections include the following positions: 1) General manager, PT; 2) Accounting staff, PT; 3) FTTH technician lead / manager, FT; 4) FTTH technician, FT; 5) Customer service supervisor, FT; 6) Customer service staff, FT. The personnel / staffing expenses are allocated to Plant Specific Operations, Plant Nonspecific Operations, Customer Operations, and Corporate Operations expense categories consistent with the anticipated job function.

The communications utility may choose instead to operate the utility through contracted service providers depending upon the management and organizational structure selected. Although the expenditures represent an estimate of costs to operate the business with hired employees, the expenditures would offset any services purchased through contract service providers.

Plant Specific Operations Expense

- Video Expense – Includes Video programming expense, transport fees, and circuit expense. Accounts for between 70% - 73% of total “Plant Specific Operations Expense”.
- FTTH Technician Lead – 50% of wages and benefits for this position are allocated to “Plant Specific Operations Expense”.
- Circuit Lease Expense – Projected cost to connect to internet backbone, underlying voice CLEC provider, and video programming backhaul from video headend provider. Circuit lease expense is between 10% - 13% of total “Plant Specific Operations Expense”.
- Building Lease Expense – Estimated expense for customer service location, and communications equipment space. Rate is projected to be \$7 per square foot / per month with an estimated 1,080 square foot space required.
- Other expenses – Other expense include; building maintenance, vehicle expense, tools and equipment expense, office equipment expense, computer expense, etc.

Plant Nonspecific Operations Expense

- FTTH Technician Lead – 50% of wages and benefits for this position are allocated to “Plant Nonspecific Operations Expense”. This expense line item is approximately 55% of total “Plant Nonspecific Operations Expense”.
- Other Expenses – Other expenses include, Power expense, Engineering expense, Testing Expense, and Network Administration expense.

Customer Operations Expense

- Marketing – Launching communications services in a competitive environment will require a substantial marketing effort. The marketing budget was developed based on historical data from similar market launch campaigns as well as discussions with marketing professionals. Projected marketing expense is budgeted as follows:

	Year 1	Year 2	Year 3	Year 4	Year 5
Marketing Expense	\$50,000	\$30,000	\$15,000	\$10,000	\$8,000

- Customer Service Staff – Customer service staff wages and benefits account for the majority of “Customer Operations Expense”. The projected expense includes wages and benefits for 2 full time positions.

Corporate Operations

- General Manager – The pro forma projection is for a shared “general manager” with VMEU. However, the budgeted amount provides sufficient dollars to alternatively hire a FT person or hire a PT person to assist the VMEU GM.
- Accounting and Finance – Accounting and finance expense anticipates required expenditures for an annual audit and tax reporting. The budget is \$25,000 and increases 3% each year.
- Accountant / Bookkeeping – Projected expense includes budget for a part time staff person to perform and / or coordinate monthly bookkeeping functions. Staff person could be a shared position within existing electric utility / municipal staff or alternatively, dollars could be utilized to contract with a local accounting firm.
- Legal Expense – Year 1 will require additional legal expense to create customer agreements, review contracts and comply with regulatory requirements. Budget for Year 1 is \$25,000 and declines to \$15,000 in each of Years 2-5 thereafter.
- Other Expense – Other expenses include budget amounts for; regulatory expense, human resources, and other general and administrative expenses.

Depreciation / Amortization – Depreciation and Amortization Expense is based USDA Rural Utilities Service (RUS) guidelines. Assets have been depreciated / amortized based on the following useful lives:

Asset Description	Useful Life (Years)
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Building Improvements	30.3
Outside Plant (Fiber & Construction)	25
Organizational Costs (Amortization)	15
Tools, & Equipment	10
Office Equipment	10
Trucks,	8.3
Fiber Electronics & Equipment	7
Video Set-Top Boxes	5
General Purpose Computers	5

Income and Property Taxes – An effort has been made in the pro forma financial statements to estimate the financial feasibility assuming a non-taxable public entity. Therefore the pro forma only includes a provision for estimated property tax expenses.

g) Operational Strategy

i) Contract Service Providers

The Feasibility Study assumes a cost structure as if the new entity, Vinton Broadband, is a standalone company. This approach includes the assumption that the company will be fully staffed with customer service, accounting, administrative, and technical personnel as construction begins or at least day one of operations. It also assumes that as soon as financing is obtained all essential assets are acquired to operate the business such as service trucks, tools & equipment, office furniture, and computers. Approaching the feasibility study in this way allows Vinton Broadband to view a “worst-case” scenario as a new communications provider in the City of Vinton. However, there are several existing communications service providers that are willing to leverage the investments their companies have made in systems, personnel, and equipment to provide services on a contract basis. The Vinton Broadband City may be able to utilize one, or multiple service providers to provide the services initially, which could aide in lowering upfront capital investment, and reduce operating cost especially in the early years of the project. FARR Technologies believes strongly that there are substantial opportunities in this regard to improve the financial results and thereby reduce risk.

In order to take advantage of these opportunities, and upon approval of the feasibility study, FARR Technologies recommends that requests for proposals be developed for specific services. This could include services such as customer service, customer billing, accounting, customer drop installation, network monitoring, service repair and maintenance, etc.

Vinton Broadband would be free to negotiate the terms for these contract services and may be set up for annual renewal or for longer renewal terms. This approach gives Vinton Broadband the flexibility to create a thriving communications business and pay for operational expenses on an as needed basis. The communications utility can continually monitor and analyze the appropriate time to bring contracted services in house. Vinton

Broadband can determine the optimal time to hire personnel, purchase equipment, and provide its own back-office support based on cash-flow and the experience it has gained over the first few years of operation. Conversely, Vinton Broadband may decide to stay with a “Contracted Services” model into the future.

7) ORGANIZATIONAL STRUCTURE

a) Communications Subsidiary

As the Vinton Broadband FTTH project advances beyond the feasibility stage into financing and construction activities, it is important to give careful consideration to organizational structure to facilitate effective day to day operations and decision making. FARR Technologies provides the following recommendations.

- i) Vinton’s Communications Utility will need to be established with the assistance of legal counsel under the laws and regulations of the State of Iowa.
- ii) Governing Body –It is important to have unity and consistency between Vinton Municipal Electric Utility and a newly created Communications Utility. The governing board of the Communications Utility should be the same board as VMEU.
- iii) Administration – Day to day operations, including supervision of staff and coordination with contract service providers, should be placed under the direction of VMEU’s general manager or a full-time manager if one is hired. Normally, this is a transitional action that evolves as the utility matures and revenues and expenses become less fluid. It allows for the gradual increase in personnel (and associated expenses), if needed, on a timetable driven by actual revenues and expenses.

8) RECOMMENDATIONS

The results of this broadband feasibility study are based on the best information currently available.

1. Review and approve feasibility study
2. RFP’s for potential service providers for outsourced operations
3. Seek additional marketing research / surveys to validate package pricing and take rates
4. Begin discussing with capital investment advisor for financing
5. Staking outside plant cable
6. RFQ / RFP for outside plant cable construction and electronics
7. Update pro forma with newly acquired information

APPENDICES

- A. Home Values with Broadband Impact - Article
- B. Network Design / OSP Layout Diagram
- C. Pro Forma Financials
- D. SkitterTV Channel Line Up
- E. Acronyms / Terms
- F. Service Providers / Potential Partners

APPENDIX A – Fiber Access Impact on Home Values

FierceTelecom

Fiber access increases home values by 3.1 percent, says FTTH Council

by [Sean Buckley](#) |

Jun 29, 2015 12:46pm

Fiber may still be far from a ubiquitously available in every American household, but according to a new FTTH Council study, access to a fiber connection could increase a home's value by up to 3.1 percent.

In conducting their study, the authors used the National Broadband Map and a nationwide sample of real estate prices from 2011 to 2013 and examined the relationship between fiber-delivered Internet services and housing prices.

The researchers found that the having a fiber-to-the-home (FTTH) connection increased a home's value by \$5,437, which is nearly equivalent to adding a fireplace, half of a bathroom or a quarter of a swimming pool to the home.

This latest study follows one FTTH Council released in 2014 that found that there was a higher per capita GDP in communities where gigabit Internet was available.

Similarly, the new study revealed that in homes where 1 Gbps broadband was available, transaction prices were over 7 percent higher than homes located where the highest speed available is 25 Mbps or lower.

For more:

- see the release

Related articles:

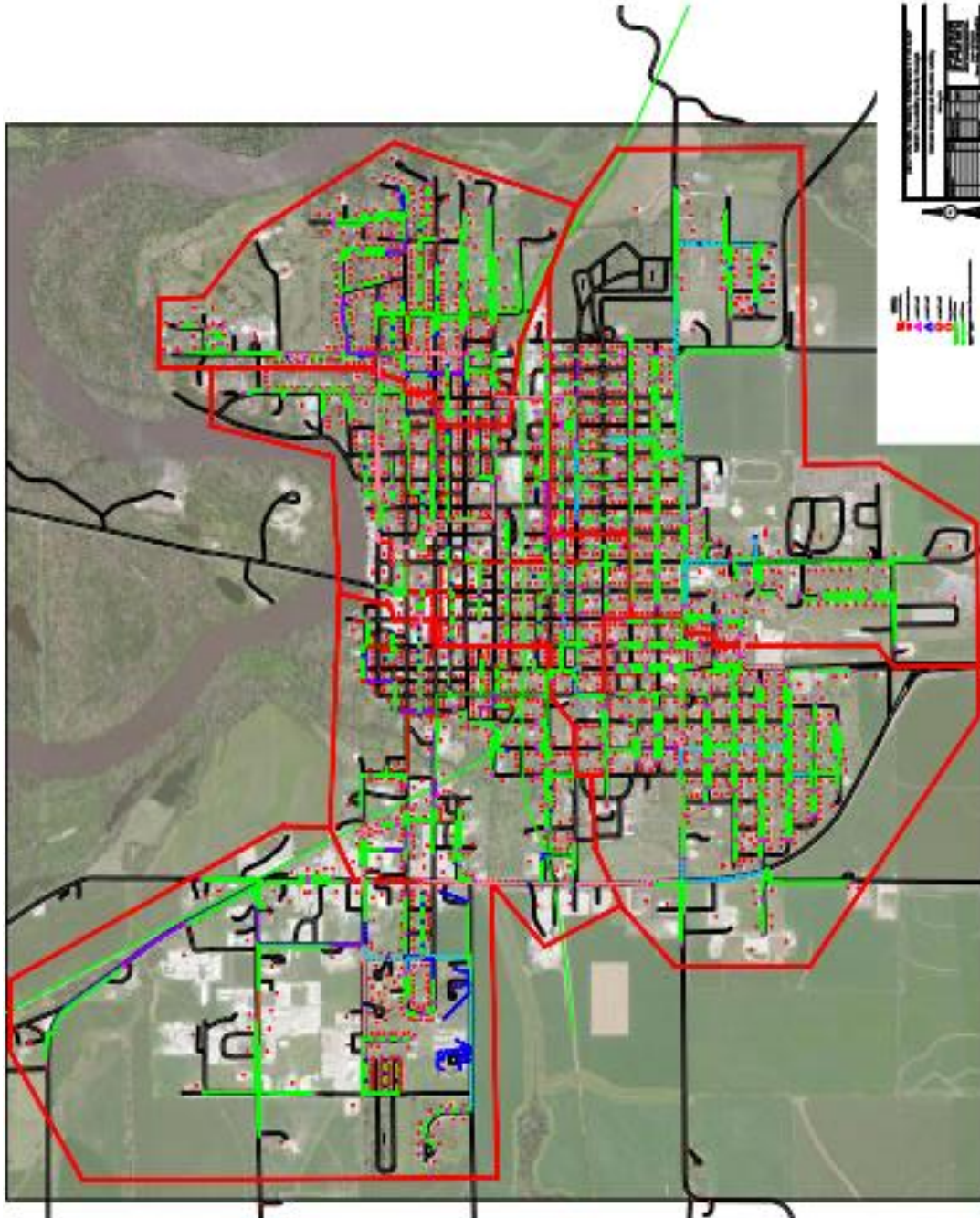
1 Gbps-enabled communities have higher GDP, says FTTH Council study

Telcos see 20% operational savings with all-fiber networks, says FTTH Council

Smaller telcos lead FTTH charge with 9M U.S. homes connected

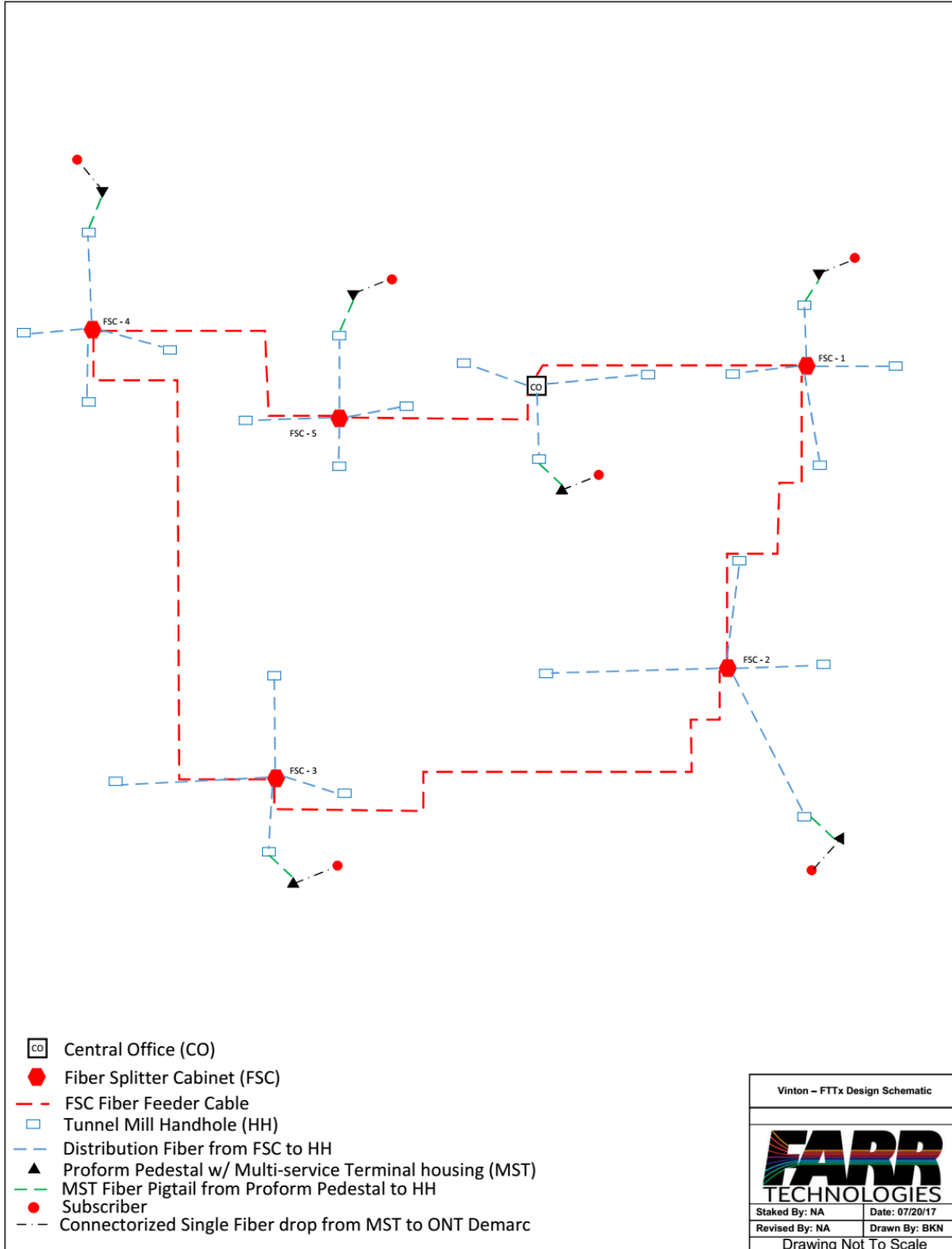
WebLink: <http://www.fiercetelecom.com/node/10806>

APPENDIX B – Maps & Diagrams

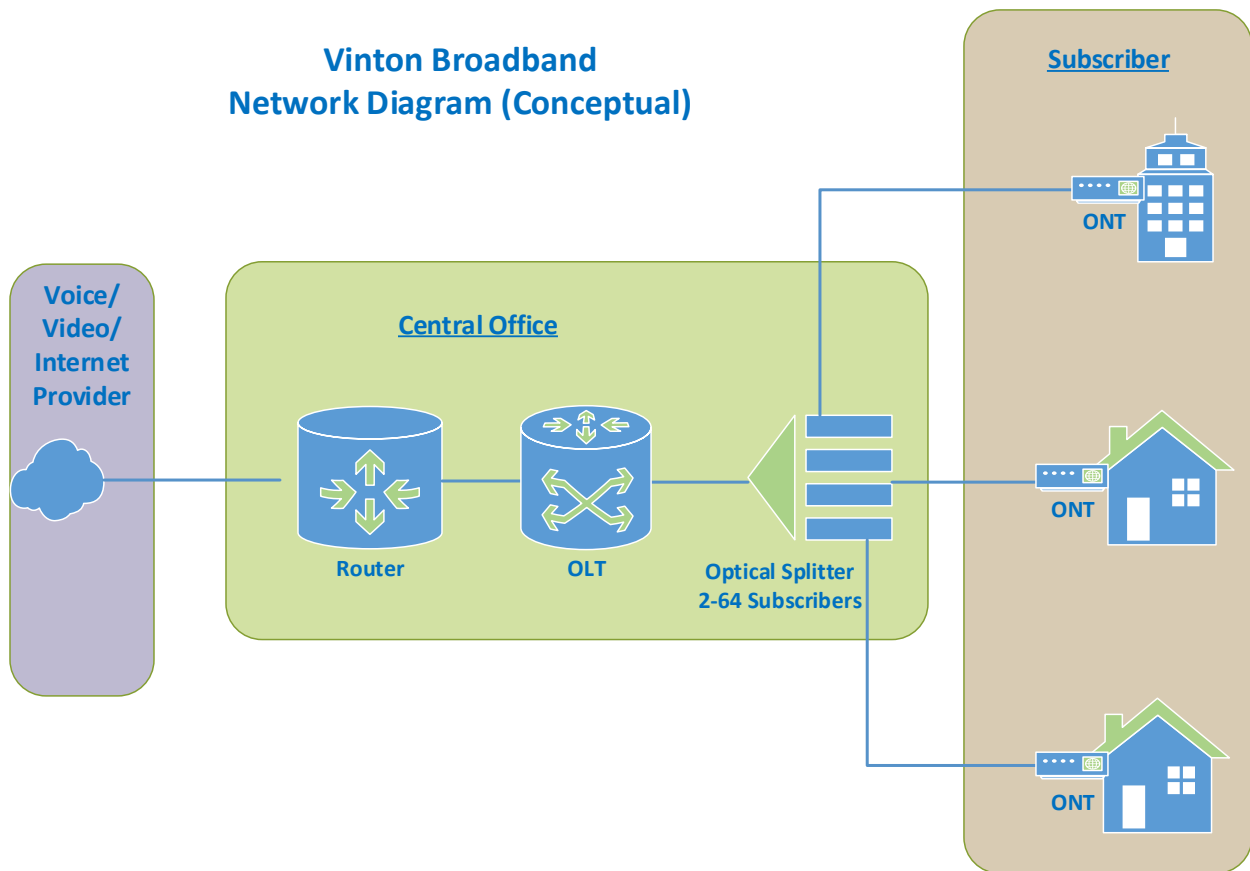


Note: Diagram available as a separate PDF document.

APPENDIX B.2 – Maps & Diagrams



APPENDIX B.3 – Maps & Diagrams



APPENDIX C – Pro Forma Financials

VINTON BROADBAND FEASIBILITY STUDY

STATEMENTS OF INCOME AND RETAINED EARNINGS OR MARGINS (INCOME STATEMENT)

ITEM	FORECAST PERIOD											
	Year 0	% Chg	Year 1	% Chg	Year 2	% Chg	Year 3	% Chg	Year 4	% Chg	Year 5	% Chg
1. Broadband Services Revenue:	\$0		\$927,300		\$1,161,660	25%	\$1,254,540	8%	\$1,346,160	7%	\$1,437,840	7%
2. Video Services Revenue:	\$0		\$878,484		\$918,780	5%	\$882,390	-4%	\$926,292	5%	\$970,590	5%
3. Local Network Services Revenue:	\$0		\$99,840		\$99,840	0%	\$92,640	-7%	\$92,640	0%	\$92,640	0%
2. Network Access Services Revenue												
3. Long Distance Network Service Revenue												
4. Carrier Billing & Collection Revenue			\$0		\$0		\$0		\$0		\$0	
5. Miscellaneous Revenue			\$72,000		\$29,000	-60%	\$29,000	0%	\$28,000	-3%	\$22,000	-24%
6. Uncollectible Revenue			(\$19,056)		(\$21,803)	14%	(\$22,296)	2%	(\$23,651)	6%	(\$25,011)	12%
7. Net Operating Revenues (1 thru 5 less 6)	\$0		\$1,996,680		\$2,231,083	12%	\$2,280,866	2%	\$2,416,743	6%	\$2,548,081	5%
8. Plant Specific Operations Expense	\$22,425		\$1,081,273		\$1,123,496	4%	\$1,130,903	1%	\$1,175,038	4%	\$1,221,400	4%
9. Plant Nonspecific Operations Expense (excluding Depreciation & Amo	\$22,425		\$82,350		\$85,202	3%	\$87,760	3%	\$90,392	3%	\$93,105	3%
10. Depreciation Expense	\$0		\$553,093		\$558,780	1%	\$570,155	2%	\$581,403	2%	\$591,259	2%
11. Amortization Expense	\$0		\$10,253		\$10,253	0%	\$10,253	0%	\$10,253	0%	\$10,253	0%
12. Customer Operations Expense	\$17,438		\$179,000		\$162,871	-9%	\$151,854	-7%	\$150,949	-1%	\$153,163	1%
13. Corporate Operations Expense	\$33,058		\$151,579		\$145,069	-4%	\$148,631	2%	\$152,317	2%	\$156,029	2%
14. Total Operating Expenses (8 thru 13)	\$95,346		\$1,985,671		\$1,985,671	1%	\$1,999,556	1%	\$2,060,352	3%	\$2,125,209	3%
15. Operating Income or Margins (7 less 14)	(\$95,346)		\$39,132		\$245,412	527%	\$281,310	15%	\$356,391	27%	\$422,872	19%
16. Other Operating Income & Expenses												
17. State & Local Taxes												
18. Federal Income Taxes												
19. Other Taxes			\$40,000		\$42,500	6%	\$42,500	0%	\$45,000	6%	\$45,000	6%
20. Total Operating Taxes (17+18+19)	\$0		\$40,000		\$42,500	6%	\$42,500	0%	\$45,000	6%	\$45,000	6%
21. Net Operating Income or Margins (15 + 16 - 20)	(\$95,346)		(\$868)		\$202,912	-23477%	\$238,810	18%	\$311,391	30%	\$377,872	58%
22. Interest on Funded Debt			\$392,370		\$383,904	-2%	\$370,383	-4%	\$356,243	-4%	\$341,456	-8%
23. Interest Expense - Capital Leases												
24. Other Interest Expense												
25. Allowance For Funds Used During Construction												
26. Total Fixed Charges (22+23+24-25)	\$0		\$392,370		\$383,904	-2%	\$370,383	-4%	\$356,243	-4%	\$341,456	-8%
27. Nonoperating Net Income												
28. Extraordinary Items												
29. Jurisdictional Differences												
30. Nonregulated Net Income												
31. Total Net Income or Margins (21+27+28+29+30-26)	(\$95,346)		(\$393,238)		(\$180,992)	-54%	(\$131,573)	-27%	(\$44,852)	-66%	\$36,416	-128%
Annual Debt Service Payments			\$679,352		\$679,352		\$679,352		\$679,352		\$679,352	
TIER [(31+26) / 26]			-		0.53		0.64		0.87		1.11	
DSCR [(31+26+10+11) / (Annual Debt Service Payments)]			0.83		1.14		1.21		1.33		1.44	
EBITDA	(\$95,346)		\$552,225		\$761,692		\$808,965		\$892,794		\$969,131	

Annual Debt Service Payments			\$679,352		\$679,352		\$679,352		\$679,352		\$679,352	
TIER [(31+26) / 26]			-		0.53		0.64		0.87		1.11	
DSCR [(31+26+10+11) / (Annual Debt Service Payments)]			0.83		1.14		1.21		1.33		1.44	
EBITDA	(\$95,346)		\$552,225		\$761,692		\$808,965		\$892,794		\$969,131	



VINTON BROADBAND FEASIBILITY STUDY

BALANCE SHEET

	FORECAST PERIOD					
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
ASSETS						
CURRENT ASSETS						
1. Cash & Equivalents	\$ 861,529	\$ 361,905	\$ 300,873	\$ 287,114	\$ 359,809	\$ 543,966
2. Cash-RUS Construction Fund						
3. Affiliates						
a. Telecom Accounts Receivable						
b. Other Accounts Receivable						
c. Notes Receivable						
4. Non-Affiliates						
a. Telecom Accounts Receivable						
b. Other Accounts Receivable						
c. Notes Receivable						
5. Interest & Dividends Receivable						
6. Material-Regulated						
7. Material-Nonregulated						
8. Prepayments						
9. Other Current Assets						
10. Total Current Assets (1 thru 9)	\$ 861,529	\$ 361,905	\$ 300,873	\$ 287,114	\$ 359,809	\$ 543,966
NON-CURRENT ASSETS						
11. Investment in Affiliated Companies						
a. Approx.						
b. Nonrural Development						
Other Investments						
a. Rural Development						
b. Nonrural Development						
13. Nonregulated Investments						
14. Other Noncurrent Assets						
15. Deferred Charges						
16. Jurisdictional Differences						
17. Total Non-Current Assets (11 thru 16)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
PLANT, PROPERTY & EQUIPMENT						
18. Telecom Plant-in-Service	\$ 7,816,884	\$ 8,199,634	\$ 8,353,259	\$ 8,506,884	\$ 8,657,884	\$ 8,773,759
19. Property Held for Future Use						
20. Plant Under Construction	\$ 154,181	\$ 154,181	\$ 154,181	\$ 154,181	\$ 154,181	\$ 154,181
21. Plant Adj. Nonop Plant & Goodwill	\$ -	\$ (563,346)	\$ (1,132,379)	\$ (1,712,787)	\$ (2,304,443)	\$ (2,905,955)
22. Less Accumulated Depreciation	\$ 7,971,065	\$ 7,790,469	\$ 7,375,061	\$ 6,948,278	\$ 6,507,622	\$ 6,021,985
23. Net Plant (18 thru 21 less 22)	\$ 8,832,594	\$ 8,152,374	\$ 7,675,934	\$ 7,235,392	\$ 6,867,431	\$ 6,565,951
24. TOTAL ASSETS	\$ 8,832,594	\$ 8,152,374	\$ 7,675,934	\$ 7,235,392	\$ 6,867,431	\$ 6,565,951



VINTON BROADBAND FEASIBILITY STUDY

BALANCE SHEET

	FORECAST PERIOD					
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
LIABILITIES AND EQUITY						
CURRENT LIABILITIES						
25. Accounts Payable						
26. Notes Payable						
27. Advance Billings & Payments						
28. Customer Deposits						
29. Current Mat L/T Debt	\$ 286,982	\$ 295,448	\$ 308,969	\$ 323,109	\$ 337,896	\$ 353,360
30. Current Mat L/T Debt-Rur. Dev.						
31. Current Mat.-Capital Leases						
32. Income Taxes Accrued						
33. Other Taxes Accrued						
34. Other Current Liabilities						
35. Total Current Liabilities (25 thru 34)	\$ 286,982	\$ 295,448	\$ 308,969	\$ 323,109	\$ 337,896	\$ 353,360
LONG-TERM DEBT						
36. Funded Debt-RUS Notes						
37. Funded Debt-RTB Notes						
38. Funded Debt-FFB Notes						
39. Funded Debt-Other	\$ 8,640,958	\$ 8,345,510	\$ 8,036,541	\$ 7,713,432	\$ 7,375,536	\$ 7,022,176
40. Funded Debt-Rural Develop. Loan						
41. Premium (Discount) on L/T Debt						
42. Reacquired Debt						
43. Obligations Under Capital Lease						
44. Advance From Affiliated Companies						
45. Other Long-Term Debt						
46. Total Long-Term Debt (36 thru 45)	\$ 8,640,958	\$ 8,345,510	\$ 8,036,541	\$ 7,713,432	\$ 7,375,536	\$ 7,022,176
OTHER LIAB. & DEF. CREDITS						
47. Other Long-Term Liabilities						
48. Other Deferred Credits						
49. Other Jurisdictional Differences						
50. Total Other Long-Term Liabilities & Deferred Credits(47 thru 49)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
EQUITY						
51. Cap. Stock Outstand & Subscribed						
52. Additional Paid-in-Capital	\$0	\$ -	\$ -	\$ -	\$ -	\$ -
53. Treasury Stock						
54. Memberships & Cap. Certificates						
55. Other Capital						
56. Patronage Capital Credits						
57. Retained Earnings	\$ (95,346)	\$ (488,584)	\$ (669,576)	\$ (801,149)	\$ (846,001)	\$ (809,585)
58. Total Equity (51 thru 57)	\$ (95,346)	\$ (488,584)	\$ (669,576)	\$ (801,149)	\$ (846,001)	\$ (809,585)
59. TOAL LIABILITIES & EQUITY (35+46+50+58)	\$ 8,832,594	\$ 8,152,374	\$ 7,675,934	\$ 7,235,392	\$ 6,867,431	\$ 6,565,951

Total Equity as a % of Assets

-1.08%

-5.99%

-8.72%

-11.07%

-12.32%

-12.33%



VINTON BROADBAND FEASIBILITY STUDY

STATEMENT OF CASH FLOWS

	FORECAST PERIOD					
	Period Ending Year 0	Period Ending Year 1	Period Ending Year 2	Period Ending Year 3	Period Ending Year 4	Period Ending Year 5
1. Beginning Cash (Cash & Equivalents plus RUS Const. Fund)	\$0	\$861,529	\$361,905	\$300,873	\$287,114	\$359,809
CASH FLOWS FROM OPERATING ACTIVITIES						
2. Net Income (Loss)	(\$95,346)	(\$393,238)	(\$180,992)	(\$131,573)	(\$44,852)	\$36,416
Adjustments to Reconcile Net Income (Loss) to Net Cash Provided by Operating Activities						
3. Add: Depreciation	\$0	\$553,093	\$558,780	\$570,155	\$581,403	\$591,259
4. Add: Amortization	\$0	\$10,253	\$10,253	\$10,253	\$10,253	\$10,253
5. Other (Explain) Interest Receivable, Nonregulated Depreciation	\$0	\$0	\$0	\$0	\$0	\$0
	\$0	\$0	\$0	\$0	\$0	\$0
Changes in Operating Assets & Liabilities						
6. Decrease/(Increase) in Accounts Receivable	\$0	\$0	\$0	\$0	\$0	\$0
7. Decrease/(Increase) in Materials & Inventory	\$0	\$0	\$0	\$0	\$0	\$0
8. Decrease/(Increase) in Prepayments & Deferred Charges	\$0	\$0	\$0	\$0	\$0	\$0
9. Decrease/(Increase) in Other Current Assets	\$0	\$0	\$0	\$0	\$0	\$0
10. Increase/(Decrease) in Accounts Payable	\$0	\$0	\$0	\$0	\$0	\$0
11. Increase/(Decrease) in Advanced Billings & Payments	\$0	\$0	\$0	\$0	\$0	\$0
12. Increase/(Decrease) in Other Current Liabilities	\$0	\$0	\$0	\$0	\$0	\$0
13. Net Cash Provided/(Used) by Operations	\$0	\$563,346	\$569,033	\$580,408	\$591,656	\$601,612
CASH FLOWS FROM FINANCING ACTIVITIES						
14. Decrease/(Increase) in Notes Receivable	\$0	\$0	\$0	\$0	\$0	\$0
15. Incr. Approx.	\$0	\$0	\$0	\$0	\$0	\$0
16. Increase/(Decrease) in Customer Deposits	\$0	\$0	\$0	\$0	\$0	\$0
17. Net Increase/(Decrease) in Long Term Debt (Including Current Maturities)	\$9,927,940	(\$286,982)	(\$295,448)	(\$308,969)	(\$323,109)	(\$337,896)
18. Increase/(Decrease) in Other Liabilities & Deferred Credits	\$0	\$0	\$0	\$0	\$0	\$0
19. Increase/(Decrease) in Capital Stock, Paid-in-Capital, Membership and Capital Certificates & Other Capital	\$0	\$0	\$0	\$0	\$0	\$0
20. Less: Payment of Dividends	\$0	\$0	\$0	\$0	\$0	\$0
21. Less: Patronage Capital Credits Retired	\$0	\$0	\$0	\$0	\$0	\$0
22. Other (Explain) Patronage Adjustment	\$0	\$0	\$0	\$0	\$0	\$0
23. Net Cash Provided/(Used) by Financing Activities	\$9,927,940	(\$286,982)	(\$295,448)	(\$308,969)	(\$323,109)	(\$337,896)
CASH FLOWS FROM INVESTING ACTIVITIES						
24. Capital Expenditures	(\$7,754,932)	(\$382,750)	(\$153,625)	(\$153,625)	(\$151,000)	(\$115,875)
25. Capitalized Interest	(\$216,133)	\$0	\$0	\$0	\$0	\$0
26. Other Long-Term Investments	\$0	\$0	\$0	\$0	\$0	\$0
27. Other Noncurrent Assets & Jurisdictional Differences	\$0	\$0	\$0	\$0	\$0	\$0
Other (Explain) Retirement of regulated TPIS net of salvage	\$0	\$0	\$0	\$0	\$0	\$0
28. Net Cash Provided/(Used) by Investment Activities	(\$7,971,065)	(\$382,750)	(\$153,625)	(\$153,625)	(\$151,000)	(\$115,875)
29. Net Increase (Decrease) in Cash	\$861,529	(\$499,624)	(\$61,032)	(\$13,759)	\$72,695	\$184,157
30. Ending Cash	\$861,529	\$361,905	\$300,873	\$287,114	\$359,809	\$543,966



VINTON BROADBAND FEASIBILITY STUDY

Significant Assumptions

Locations Passed:

Residential	Business	Total
2,000	220	2,220

Broadband Subscription Rate:

		Year 1	Year 2	Year 3	Year 4	Year 5
Residential Internet	%	40%	50%	54%	58%	62%
	Count	800	1,000	1,080	1,160	1,240
Business Internet	%	40%	50%	54%	58%	62%
	Count	88	110	119	128	136
Total		888	1,110	1,199	1,288	1,376

Internet Rates:

	Year 1	Year 2	Year 3	Year 4	Year 5
Residential					
100 Mbps Downstream / 100 Mbps Upstream	\$75.00	\$75.00	\$75.00	\$75.00	\$75.00
200 Mbps Downstream / 200 Mbps Upstream	\$105.00	\$105.00	\$105.00	\$105.00	\$105.00
500 Mbps Downstream / 500 Mbps Upstream	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00
1 Gbps Downstream / 1 Gbps Upstream	\$225.00	\$225.00	\$225.00	\$225.00	\$225.00
Business					
100 Mbps Downstream / 100 Mbps Upstream	\$100.00	\$100.00	\$100.00	\$100.00	\$100.00
200 Mbps Downstream / 200 Mbps Upstream	\$125.00	\$125.00	\$125.00	\$125.00	\$125.00
500 Mbps Downstream / 500 Mbps Upstream	\$190.00	\$190.00	\$190.00	\$190.00	\$190.00
1 Gbps Downstream / 1 Gbps Upstream	\$275.00	\$275.00	\$275.00	\$275.00	\$275.00

Working Capital

Approx.

Financing

	Financing Terms	Working Capital Loan	Total Financed
Term	20 Years	n/a	
Interest	4.50%	n/a	
Loan Amount	\$8,927,940	\$0	\$8,927,940

Capital Investment:

Yr 0	\$ 7,754,932
Capitalized Interest	\$ 216,133
Customer Drops (Yr 2-5)	\$ 956,875
Total Capital Investment	\$ 8,927,940

VINTON BROADBAND FEASIBILITY STUDY
Locations Passed / Customer Subscription Rates

Locations							
	Year 0 Subscribers	Year 1 Subscribers	Year 2 Subscribers	Year 3 Subscribers	Year 4 Subscribers	Year 5 Subscribers	Year 6 Subscribers
Locations Passed:							
Existing Locations (Beginning of Period)	2,220	2,220	2,220	2,220	2,220	2,220	2,220
Estimated Growth Rate	0%	0%	0%	0%	0%	0%	0%
Subtotal Locations	2,220	2,220	2,220	2,220	2,220	2,220	2,220
Residential Locations (Note 1)	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Business Location (Note 2)	220	220	220	220	220	220	220
Total Potential Locations Passed	2,220	2,220	2,220	2,220	2,220	2,220	2,220
Residential (Note 3)							
Voice Service							
Subscription Rate (% of Res. Locations)	0%	35%	35%	32%	32%	32%	30%
Estimated Subscribers	0	700	700	640	640	640	600
Broadband Data / Internet							
Subscription Rate (% of Res. Locations)	0%	40%	50%	54%	58%	62%	65%
Estimated Subscribers	0	800	1000	1080	1160	1240	1300
Cable TV / Video Service							
Subscription Rate (% of Res. Locations)	0%	35%	35%	32%	32%	32%	30%
Estimate Approx.	0	700	700	640	640	640	600
Business (Note 3)							
	Year 0 Subscribers	Year 1 Subscribers	Year 2 Subscribers	Year 3 Subscribers	Year 4 Subscribers	Year 5 Subscribers	Year 6 Subscribers
Voice Service							
Subscription Rate (% of Bus. Locations)		40%	40%	40%	40%	40%	40%
Estimated Subscribers	0	88	88	88	88	88	88
Broadband Data / Internet							
Subscription Rate (% of Bus. Locations)	0%	40%	50%	54%	58%	62%	65%
Estimated Subscribers	0	88	110	119	128	136	143
Video Service							
Subscription Rate (% of Bus. Locations)	0%	10%	10%	10%	10%	10%	10%
Estimated Subscribers	0	22	22	22	22	22	22

Note 1: Residential locations are based on approximate count provided by VMEU staff.

Note 2: Business locations are based on approximate count provided by VMEU staff.

VINTON BROADBAND FEASIBILITY STUDY
Capital Investment Summary

		Capital Investment Summary					
Investment Category	Notes:	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
<u>Building (Bldg)</u>							
Land	5 sites	\$ 150,000					
Central Office Building		See Recurring Expense Below					
Nodes	5 sites	\$ 119,641					
Service / Maintenance Bldg	Utilize Existing						
Office / Customer Service Location		See Recurring Expense Below					
Building Improvements	Convert Available Space	\$ 75,000					
BLDG Subtotal		\$344,641.00	\$ -	\$ -	\$ -	\$ -	\$ -
<u>Outside Plant (OSP)</u>							
FTTx - OSP Mainline / 1st Year Drops		\$ 4,937,860					
Customer Drops	\$1,150 per drop (yrs 2-5)	\$ -	\$ 255,300	\$ 102,350	\$ 102,350	\$ 101,200	\$ 77,050
FTTH - Site Survey		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Middle Mile Fiber		\$ 264,500					
OSP Subtotal		\$ 5,202,360	\$ 255,300	\$ 102,350	\$ 102,350	\$ 101,200	\$ 77,050
<u>Electronics / Equipment</u>							
Voice Switch	Hosted Services						
Transport Electronics		\$ 260,000					
Broadband Router		\$ 300,000					
OSP Frames, Panels Splitters		\$85,200					
FTTH Electronics		\$710,681	\$ 127,450	\$ 51,275	\$ 51,275	\$ 49,800	\$ 38,825
Generator / Standby Power		\$ 20,000					
Batteries		\$ 60,000					
Electronics Subtotal		\$ 1,435,881	\$ 127,450	\$ 51,275	\$ 51,275	\$ 49,800	\$ 38,825
		\$ 706,931	\$ 132,350	\$ 37,350	\$ 37,350	\$ 37,350	\$ 37,350
<u>Video</u>							
Middleware		\$ -					
Transport Electronics		\$ -					
Headend / Converters		\$ 25,000					
Set-Top Boxes		\$198,550	\$0	\$0	\$0	\$0	\$0
Video Subtotal		\$ 223,550	\$ -	\$ -	\$ -	\$ -	\$ -
<u>Tools & Equipment</u>							
Service Truck		\$ 150,000					
Fiber Splicing Trailer		\$ 23,000					
Test Equipment		\$ 14,000					
Fiber Splicing Equipment		\$ 16,500					
Tools/Equip Subtotal		\$ 203,500	\$ -	\$ -	\$ -	\$ -	\$ -
<u>Office Equipment</u>							
Computers		\$ 10,000					
Office Furniture		\$ 10,000					
Software		\$ 175,000					
Office Equip Subtotal		\$ 195,000	\$ -	\$ -	\$ -	\$ -	\$ -

VINTON BROADBAND FEASIBILITY STUDY
Capital Investment Summary

		Capital Investment Summary					
Investment Category	Notes:	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Other Assets							
Organizational Costs		\$ 150,000					
Office Equip Subtotal		<u>\$ 150,000</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
SubTotal - Capital Investment		<u>\$ 7,754,932</u>	<u>\$ 382,750</u>	<u>\$ 153,625</u>	<u>\$ 153,625</u>	<u>\$ 151,000</u>	<u>\$ 115,875</u>
Capitalized Interest							
		<u>\$ 216,133</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
Total Capitalized Investment Amount		<u>\$ 7,971,065</u>	<u>\$ 382,750</u>	<u>\$ 153,625</u>	<u>\$ 153,625</u>	<u>\$ 151,000</u>	<u>\$ 115,875</u>
Cumulative Total			<u>\$ 8,353,815</u>	<u>\$ 8,507,440</u>	<u>\$ 8,661,065</u>	<u>\$ 8,812,065</u>	<u>\$ 8,927,940</u>

		Lease Cost Summary					
Expense Category	Notes:	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Building Space Lease							
Office / Customer Service Location	600 sq ft @ \$7/Sq.Ft.	\$ 50,400	\$ 50,400	\$ 50,400	\$ 50,400	\$ 50,400	\$ 50,400
Central Office Building	480 sq ft @ \$7/Sq.Ft.	<u>\$ 40,320</u>	<u>\$ 40,320</u>	<u>\$ 40,320</u>	<u>\$ 40,320</u>	<u>\$ 40,320</u>	<u>\$ 40,320</u>
		<u>\$ 90,720</u>	<u>\$ 90,720</u>	<u>\$ 90,720</u>	<u>\$ 90,720</u>	<u>\$ 90,720</u>	<u>\$ 90,720</u>

VINTON BROADBAND FEASIBILITY STUDY

Broadband Revenue

	FORECAST					
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
RESIDENTIAL SUBSCRIPTION SUMMARY						
Locations Passed	2,000	2,000	2,000	2,000	2,000	2,000
Res. Subscription Rate (%)	0%	40%	50%	54%	58%	62%
Residential Broadband Subscribers	0	800	1,000	1,080	1,160	1,240
RESIDENTIAL SUBSCRIBER DISTRIBUTION						
100 Mbps Downstream / 100 Mbps Upstream	0	680	850	917	986	1,054
% Distribution Approx.	0%	85%	85%	85%	85%	85%
200 Mbps Downstream / 200 Mbps Upstream	0	96	120	130	139	149
% Distribution	0%	12%	12%	12%	12%	12%
500 Mbps Downstream / 500 Mbps Upstream	0	16	20	22	23	25
% Distribution	0%	2%	2%	2%	2%	2%
1 Gbps Downstream / 1 Gbps Upstream	0	8	10	11	12	12
% Distribution	0%	1%	1%	1%	1%	1%
Total Broadband Customers	0	800	1,000	1,080	1,160	1,240
RESIDENTIAL BROADBAND - MONTHLY RATES						
100 Mbps Downstream / 100 Mbps Upstream		\$75.00	\$75.00	\$75.00	\$75.00	\$75.00
200 Mbps Downstream / 200 Mbps Upstream		\$105.00	\$105.00	\$105.00	\$105.00	\$105.00
500 Mbps Downstream / 500 Mbps Upstream		\$150.00	\$150.00	\$150.00	\$150.00	\$150.00
1 Gbps Downstream / 1 Gbps Upstream		\$225.00	\$225.00	\$225.00	\$225.00	\$225.00
RESIDENTIAL BROADBAND - REVENUE						
100 Mbps Downstream / 100 Mbps Upstream	\$0	\$612,000	\$765,000	\$825,300	\$887,400	\$948,600
200 Mbps Downstream / 200 Mbps Upstream	\$0	\$120,960	\$151,200	\$163,800	\$175,140	\$187,740
500 Mbps Downstream / 500 Mbps Upstream	\$0	\$28,800	\$36,000	\$39,600	\$41,400	\$45,000
1 Gbps Downstream / 1 Gbps Upstream	\$0	\$21,600	\$27,000	\$29,700	\$32,400	\$32,400
Total Residential Broadband Revenue	\$0	\$783,360	\$979,200	\$1,058,400	\$1,136,340	\$1,213,740

VINTON BROADBAND FEASIBILITY STUDY

Broadband Revenue

	FORECAST					
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
BUSINESS LOCATION / SUBSCRIPTION SUMMARY						
Locations Passed	220	220	220	220	220	220
Business Subscription Rate (%)	0%	40%	50%	54%	58%	62%
Business Broadband Subscribers	0	88	110	119	128	136
BUSINESS SUBSCRIBER DISTRIBUTION						
100 Mbps Downstream / 100 Mbps Upstream		18	22	24	26	27
% Distribution		20%	20%	20%	20%	20%
200 Mbps Downstream / 200 Mbps Upstream		53	65	71	77	82
% Distribution		60%	60%	60%	60%	60%
500 Mbps Downstream / 500 Mbps Upstream		13	17	18	19	20
% Distribution		15%	15%	15%	15%	15%
1 Gbps Downstream / 1 Gbps Upstream		4	6	6	6	7
% Distribution		5%	5%	5%	5%	5%
Total Business Broadband Customers		88	110	119	128	136
BUSINESS BROADBAND - MONTHLY RATES						
100 Mbps Downstream / 100 Mbps Upstream		\$100.00	\$100.00	\$100.00	\$100.00	\$100.00
200 Mbps Downstream / 200 Mbps Upstream		\$125.00	\$125.00	\$125.00	\$125.00	\$125.00
500 Mbps Downstream / 500 Mbps Upstream		\$190.00	\$190.00	\$190.00	\$190.00	\$190.00
1 Gbps Downstream / 1 Gbps Upstream		\$275.00	\$275.00	\$275.00	\$275.00	\$275.00
BUSINESS BROADBAND REVENUES						
100 Mbps Downstream / 100 Mbps Upstream		\$21,600	\$26,400	\$28,800	\$31,200	\$32,400
200 Mbps Downstream / 200 Mbps Upstream		\$79,500	\$97,500	\$106,500	\$115,500	\$123,000
500 Mbps Downstream / 500 Mbps Upstream		\$29,640	\$38,760	\$41,040	\$43,320	\$45,600
1 Gbps Downstream / 1 Gbps Upstream		\$13,200	\$19,800	\$19,800	\$19,800	\$23,100
Total Business Broadband Revenue		\$143,940	\$182,460	\$196,140	\$209,820	\$224,100
Total Broadband Revenue		\$927,300	\$1,161,660	\$1,254,540	\$1,346,160	\$1,437,840

VINTON BROADBAND FEASIBILITY STUDY
Video Services Revenue / Expense

Assumptions:	FORECAST					
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
LOCATIONS PASSED SUMMARY						
Locations Passed	2,220	2,220	2,220	2,220	2,220	2,220
Res. Subscription %	0%	35%	35%	32%	32%	32%
Basic Subscribers	0	700	700	640	640	640
Business Subscribers	0	22	22	22	22	22
Subtotal - Video Subscribers	0	722	722	662	662	662

VIDEO SERVICE - SUBSCRIPTION RATES (% OF TOTAL VIDEO SUBSCRIBERS)						
Basic Subscription %	0%	15%	15%	15%	15%	15%
Basic Subscribers	0	108	108	99	99	99
Expanded Subscription %	0%	75%	75%	75%	75%	75%
Expanded Subscribers	0	542	542	497	497	497
Premium Subscription %	0%	10%	10%	10%	10%	10%
Premium Subscribers	0	72	72	66	66	66
Movie Channels - Subscription %	0%	25%	25%	25%	25%	25%
Movie Channels - Subscribers	0	181	181	166	166	166
Caller ID Subscription %	0%	50%	50%	50%	50%	50%
Caller ID Subscribers	0	361	361	331	331	331
Set Top Box						
Video Subscribers		722	722	662	662	662
Average # of Set Top Boxes per Household		2.5	2.5	2.5	2.5	2.5
Total Set Top Box Devices		1,805	1,805	1,655	1,655	1,655
Set Top Box - Free	40%	721	721	661	661	661
Set Top Box - Additional Charge	30%	542	542	497	497	497
Set Top Box - DVR	30%	542	542	497	497	497
	100%	1,805	1,805	1,655	1,655	1,655

VIDEO SERVICES - MONTHLY RATES						
	Annual Growth					
Basic	6%	\$35.00	\$37.00	\$39.00	\$41.50	\$44.00
Expanded	6%	\$86.00	\$91.00	\$96.50	\$102.50	\$108.50
Premium	6%	\$96.00	\$102.00	\$108.00	\$114.50	\$121.50
Movie Channels	0%	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00
Caller ID	0%	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00
Set Top Box	0%	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00
DVR Rental	0%	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00

VIDEO SERVICES - ANNUAL REVENUE						
Basic - Residential (OTA + 10 SD / HD)	\$0.00	\$45,360	\$47,952	\$46,332	\$49,302	\$52,272
Expanded (Basic + 56 SD / HD)	\$0.00	\$559,344	\$591,864	\$575,526	\$611,310	\$647,094
Premium (Basic + Expanded +40 SD/HD)	\$0.00	\$82,944	\$88,128	\$85,536	\$90,684	\$96,228
Movie Channels	\$0.00	\$32,580	\$32,580	\$29,880	\$29,880	\$29,880
Caller ID	\$0.00	\$8,664	\$8,664	\$7,944	\$7,944	\$7,944
Set Top Box	\$0.00	\$52,032	\$52,032	\$47,712	\$47,712	\$47,712
DVR Rental	\$0.00	\$97,560	\$97,560	\$89,460	\$89,460	\$89,460
Total Video Service Revenue:	\$0.00	\$878,484	\$918,780	\$882,390	\$926,292	\$970,590

VINTON BROADBAND FEASIBILITY STUDY
Video Services Revenue / Expense

VIDEO EXPENSES							
		FORECAST					
<u>Programming Expense (Note 1)</u>	Annual Growth	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Video Programing - Basic	10%		\$33,695	\$36,130	\$35,495	\$38,170	\$40,985
Video Programing - Expanded	6%		\$513,815	\$543,930	\$528,590	\$560,615	\$594,195
Video Programing - Premium	6%		\$75,930	\$80,570	\$78,210	\$82,865	\$87,910
Movie Channels			\$26,726	\$26,726	\$24,512	\$24,512	\$24,512
Caller ID			\$1,083	\$1,083	\$993	\$993	\$993
Set Top Box			\$38,988	\$38,988	\$35,748	\$35,748	\$35,748
DVR Rental			\$26,016	\$26,016	\$23,856	\$23,856	\$23,856
Video Programing Expense		\$0	\$716,253	\$753,443	\$727,404	\$766,759	\$808,199
% of Gross Revenue		0%	82%	82%	82%	83%	83%
Other Expense							
Transport Fee	\$600.00		\$7,200	\$7,200	\$7,200	\$7,200	\$7,200
Circuit Expense			\$57,600	\$57,600	\$57,600	\$57,600	\$57,600
Depreciation - Video Equipment			\$44,489	\$44,489	\$44,489	\$44,489	\$44,488
Total Other Expense			\$109,289	\$109,289	\$109,289	\$109,289	\$109,288
Total Video Service Expense			\$825,542	\$862,732	\$836,693	\$876,048	\$917,487
Net CATV / Video Revenue (Expense)			\$52,942	\$56,048	\$45,697	\$50,244	\$53,103
% of Gross Revenue			6%	6%	5%	5%	5%

VINTON BROADBAND FEASIBILITY STUDY Local Voice Service Revenue Forecast

	FORECAST					
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
LOCATION / SUBSCRIPTION SUMMARY						
Total Locations Passed	2,220	2,220	2,220	2,220	2,220	2,220
Residential Voice Lines	2,000	2,000	2,000	2,000	2,000	2,000
Business Voice Lines	220	220	220	220	220	220
Total Forecasted Voice Lines	2,220	2,220	2,220	2,220	2,220	2,220

RESIDENTIAL SERVICE						
Total Locations Passed	2,000	2,000	2,000	2,000	2,000	2,000
Residential Subscription %	0%	35%	35%	32%	32%	32%
Forecasted Residential Access Lines	0	700	700	640	640	640
Residential Monthly Rates:						
Local Service - Wholesale Lease Rate	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00
Residential Voice Revenue:						
Local Service - Wholesale Lease Rate	\$0	\$84,000	\$84,000	\$76,800	\$76,800	\$76,800
Total Residential Local Service Revenue:	\$0	\$84,000	\$84,000	\$76,800	\$76,800	\$76,800

BUSINESS SERVICE						
Total Locations Passed	220	220	220	220	220	220
Business Subscription %	0%	40%	40%	40%	40%	40%
Forecasted Business Lines	0	88	88	88	88	88
Business Monthly Rates:						
Local Service - Wholesale Lease Rate	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00
Business Voice Revenue:						
Local Service - Wholesale Lease Rate	\$0	\$15,840	\$15,840	\$15,840	\$15,840	\$15,840
Total Business Local Service Revenue:	\$0	\$15,840	\$15,840	\$15,840	\$15,840	\$15,840

Total Local Voice Service Revenue:	\$0	\$99,840	\$99,840	\$92,640	\$92,640	\$92,640
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Notes:

- Monthly rates are based on wholesale lease rate of VMEU's fiber loop for voice service.

Potential Retail Service Rates:

Residential local phone service is \$20

Business single line local phone service is \$25

Multiline Business – all services are quoted on an individual case basis.

Long Distance retail rates are \$0.04 - \$0.06 / per minute range.

Unlimited Long Distance plan – VCU would be free to offer an unlimited Long Distance plan for a set price (typically see a \$10 - \$15 add on fee). There is no standard offering for unlimited Long Distance.

VINTON BROADBAND FEASIBILITY STUDY
Competitive Service Provider Offerings

Service Provider	Service	Residential Service					Internet Bandwidth		Terms / Offerings				Other Charges			
		Promotional Price / Month Year 1	Price / Month Year 2	Price / Month Year 3	Price / Month Year 4	Average Price / Month	Download	Upload	Monthly Usage Cap	Video Channels	Voice	Install Charge	Modem Fee	Local Channels	Regional Sports Coverage	
MediaCom	Video Internet Phone	\$69.98	\$99.98	\$119.98	\$159.98	\$112.48	Up To 100 Mbps	Up To 10 Mbps	1000 GB	125+	Unlimited LD	\$109.00	\$10.00	\$11.94		
MediaCom	Video Internet Phone	\$89.98	\$119.98	\$139.98	\$179.98	\$132.48	Up To 100 Mbps	Up To 10 Mbps	1000 GB	230+	Unlimited LD	\$109.00	\$10.00	\$11.94	\$4.57	
MediaCom	Video Internet Phone	\$109.98	\$139.98	\$159.98	\$199.98	\$152.48	Up To 100 Mbps	Up To 10 Mbps	1000 GB	260+	Unlimited LD	\$109.00	\$10.00	\$11.94	\$4.57	
MediaCom	Video Internet Phone	\$129.98	\$159.98	\$179.98	\$219.98	\$172.48	Up To 100 Mbps	Up To 10 Mbps	1000 GB	380+	Unlimited LD	\$109.00	\$10.00	\$11.94	\$4.57	
MediaCom	Family TV + Internet 60 + Phone	\$79.98	\$99.98	\$119.98	\$179.98	\$119.98	Up To 60 Mbps	Up To 5 Mbps	400 GB	230+	Unlimited LD	\$109.00	\$10.00	\$11.94	\$4.57	
MediaCom	Family TV + Internet 60	\$79.98	\$99.98	\$119.98	\$155.44	\$113.85	Up To 60 Mbps	Up To 5 Mbps	400 GB	230+		\$84.99	\$10.00	\$11.94	\$4.57	
MediaCom	Local TV + Internet 60	\$49.98	\$69.98	\$89.98	\$110.44	\$80.10	Up To 60 Mbps	Up To 5 Mbps	400 GB	100+		\$84.99	\$10.00	\$11.94		
MediaCom	Internet 60	\$49.98	\$69.98	\$69.98	\$69.98	\$64.98	Up To 60 Mbps	Up To 5 Mbps	400 GB			\$59.99	\$10.00			
MediaCom	Internet 100	\$59.99	\$79.99	\$79.99	\$79.99	\$74.99	Up To 100 Mbps	Up To 10 Mbps	1000 GB			\$59.99	\$10.00	\$59.99		
MediaCom	Internet 200	\$79.99	\$99.99	\$99.99	\$99.99	\$94.99	Up To 200 Mbps	Up To 20 Mbps	2000 GB			\$59.99	\$10.00			



VINTON BROADBAND FEASIBILITY STUDY
Projected Operating Expense Summary

Annual Growth Factor	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	
PLANT SPECIFIC OPERATIONS EXPENSE:							
General Support Expense:							
Motor Vehicle Expense	3%	\$0	\$3,000	\$3,090	\$3,183	\$3,278	\$3,376
Special Purpose Vehicle Expense	3%	\$0	\$9,600	\$9,888	\$10,185	\$10,491	\$10,806
Other Work Equipment Expense	3%	\$0	3,000	\$3,090	\$3,183	\$3,278	\$3,376
Building Lease Expense		\$0	90,720	90,720	90,720	90,720	90,720
Building Expense	3%	\$0	10,900	\$11,227	\$11,564	\$11,911	\$12,268
Office Equipment Expense	3%	\$0	\$1,500	\$1,545	\$1,591	\$1,639	\$1,688
General Purpose Computer Expense	3%	0	\$2,700	\$2,781	\$2,864	\$2,950	\$3,039
Total		\$0	\$121,420	\$122,341	\$123,290	\$124,267	\$125,273
Central Office Transmission Expense:							
FTTH Technician (Lead) ¹		\$22,425	\$44,850	\$46,577	\$47,975	\$49,414	\$50,897
Circuit Equipment Expense	3%		\$5,000	\$5,150	\$5,305	\$5,464	\$5,628
Total		\$22,425	\$49,850	\$51,727	\$53,280	\$54,878	\$56,525
Cable & Wire Facilities Expense:							
Buried Fiber Cable Expense		\$0	\$5,200	\$5,450	\$5,550	\$5,650	\$5,750
FTTH Technician		0	66,150	68,135	70,179	72,284	74,453
Leased Circuit Expense		0	57,600	57,600	86,400	86,400	86,400
Total		\$0	\$128,950	\$131,185	\$162,129	\$164,334	\$166,603
Video Expense:							
Video Programming Expense		\$0	\$716,253	\$753,443	\$727,404	\$766,759	\$808,199
Transport Fee		0	\$7,200	\$7,200	\$7,200	\$7,200	\$7,200
Leased Circuit Expense		0	57,600	57,600	57,600	57,600	57,600
Total		\$0	\$781,053	\$818,243	\$792,204	\$831,559	\$872,999
Total Plant Specific Operations Expense		\$22,425	\$1,081,273	\$1,123,496	\$1,130,903	\$1,175,038	\$1,221,400
PLANT NONSPECIFIC OPERATIONS EXPENSE:							
Network Operations Expense:							
Installation & Maintenance Manager ¹		\$22,425	\$44,850	\$46,577	\$47,975	\$49,414	\$50,897
Engineering	3%	\$0	\$15,000	\$15,450	\$15,914	\$16,391	\$16,883
Testing Expense	3%	\$0	\$2,500	\$2,575	\$2,652	\$2,732	\$2,814
Power Expense	3%	\$0	\$15,000	\$15,450	\$15,914	\$16,391	\$16,883
Network Administration Expense	3%	\$0	\$5,000	\$5,150	\$5,305	\$5,464	\$5,628
Total		\$22,425	\$82,350	\$85,202	\$87,760	\$90,392	\$93,105
Total Plant Nonspecific Operations Expense		\$22,425	\$82,350	\$85,202	\$87,760	\$90,392	\$93,105
CUSTOMER OPERATIONS EXPENSE:							
Marketing Expense:							
Customer Service Supervisor		\$17,438	\$69,750	\$71,843	\$73,999	\$76,218	\$78,504
Advertising, Promotion, etc.		0	50,000	30,000	15,000	10,000	8,000
Total		\$17,438	\$119,750	\$101,843	\$88,999	\$86,218	\$86,504
Customer Services Expense:							
Customer Service Staff		\$0	\$54,250	\$55,878	\$57,555	\$59,281	\$61,059
Other Customer Service Expense	3%	0	5,000	\$5,150	\$5,300	\$5,450	\$5,600
Total		\$0	\$59,250	\$61,028	\$62,855	\$64,731	\$66,659
Total Customer Operations Expense		\$17,438	\$179,000	\$162,871	\$151,854	\$150,949	\$153,163
CORPORATE OPERATIONS EXPENSES							
Executive & Planning Expense:							
General Manager		\$33,058	\$66,116	\$68,099	\$70,142	\$72,247	\$74,414
Executive Expense	15%	0	9,900	10,200	10,500	10,850	11,150
Accounting & Finance		0	25,000	25,500	26,000	26,500	27,000
Total		\$33,058	\$101,016	\$103,799	\$106,642	\$109,597	\$112,564
General & Administrative Expense:							
Accountant / Bookkeeping		\$0	\$13,563	\$13,970	\$14,389	\$14,820	\$15,265
FCC & State Regulatory Expense	3%	0	8,000	\$8,250	\$8,500	\$8,750	\$9,000
Human Resources		0	3,000	3,000	3,000	3,000	3,000
Legal		0	25,000	15,000	15,000	15,000	15,000
Other General & Administrative	3%	0	1,000	\$1,050	\$1,100	\$1,150	\$1,200
Total		\$0	\$50,563	\$41,270	\$41,989	\$42,720	\$43,465
Total Corporate Operations Expense		\$33,058	\$151,579	\$145,069	\$148,631	\$152,317	\$156,029
Total Operating Expenses		\$95,346	\$1,344,782	\$1,364,974	\$1,367,233	\$1,411,826	\$1,461,327
Depreciation and Amortization Expense:		\$0	\$563,346	\$569,033	\$580,408	\$591,656	\$601,512

Notes:

¹ FTTH Technician (Lead) salary and benefits are allocated 50% to Plant Specific Expense and 50% to Plant Non-Specific Expense

VINTON BROADBAND FEASIBILITY STUDY
Projected Personnel Expense ¹

	Annual Cost	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Annual Labor/Benefits Growth Factor		0%	0%	3%	3%	3%	3%
Network Operations							
<u>FTTH Technician (Lead)</u>							
Labor Cost per Employee	\$65,000	\$65,000	\$65,000	\$66,950	\$68,959	\$71,028	\$73,159
Benefits Cost per Employee ²	38%	24,700	24,700	26,204	26,991	27,800	28,634
Total Cost Per Employee		\$89,700	\$89,700	\$93,154	\$95,950	\$98,828	\$101,793
Number of Employees		0.50	1.00	1.00	1.00	1.00	1.00
Subtotal		\$44,850	\$89,700	\$93,154	\$95,950	\$98,828	\$101,793
Outside Plant:							
<u>FTTH Technician</u>							
Labor Cost per Employee	\$45,000	\$45,000	\$45,000	\$46,350	\$47,741	\$49,173	\$50,648
Benefits Cost per Employee ²	47%	21,150	21,150	21,785	22,438	23,111	23,805
Total Cost Per Employee		\$66,150	\$66,150	\$68,135	\$70,179	\$72,284	\$74,453
Number of Employees		0.00	1.00	1.00	1.00	1.00	1.00
Subtotal		\$0	\$66,150	\$68,135	\$70,179	\$72,284	\$74,453
Customer Service Operations:							
<u>Customer Service Supervisor</u>							
Labor Cost per Employee	\$45,000	\$45,000	\$45,000	\$46,350	\$47,741	\$49,173	\$50,648
Benefits Cost per Employee ²	47%	24,750	24,750	25,493	26,258	27,045	27,856
Total Cost Per Employee		\$69,750	\$69,750	\$71,843	\$73,999	\$76,218	\$78,504
Number of Employees		0.25	1.00	1.00	1.00	1.00	1.00
Subtotal		\$17,438	\$69,750	\$71,843	\$73,999	\$76,218	\$78,504
<u>Customer Service Staff</u>							
Labor Cost per Employee	\$35,000	\$35,000	\$35,000	\$36,050	\$37,132	\$38,246	\$39,393
Benefits Cost per Employee ²	55%	19,250	19,250	19,828	20,423	21,035	21,666
Total Cost Per Employee		\$54,250	\$54,250	\$55,878	\$57,555	\$59,281	\$61,059
Number of Employees		0.00	1.00	1.00	1.00	1.00	1.00
Subtotal		\$0	\$54,250	\$55,878	\$57,555	\$59,281	\$61,059
Administrative Operations:							
<u>General Manager</u>							
Labor Cost per Employee	\$100,000	\$100,940	\$100,940	\$103,968	\$107,087	\$110,300	\$113,609
Benefits Cost per Employee ²	31%	31,291	31,291	32,230	33,197	34,193	35,219
Total Cost Per Employee		\$132,231	\$132,231	\$136,198	\$140,284	\$144,493	\$148,828
Number of Employees		0.25	0.50	0.50	0.50	0.50	0.50
Subtotal		\$33,058	\$66,116	\$68,099	\$70,142	\$72,247	\$74,414
<u>Accountant / Bookkeeping</u>							
Labor Cost per Employee	\$35,000	\$35,000	\$35,000	\$36,050	\$37,132	\$38,246	\$39,393
Benefits Cost per Employee ²	55%	19,250	19,250	19,828	20,423	21,035	21,666
Total Cost Per Employee		\$54,250	\$54,250	\$55,878	\$57,555	\$59,281	\$61,059
Number of Employees		0.00	0.25	0.25	0.25	0.25	0.25
Subtotal		\$0	\$13,563	\$13,970	\$14,389	\$14,820	\$15,265
Total Personnel Expense:		\$95,346	\$359,529	\$371,079	\$382,214	\$393,678	\$405,488

Notes:

- 1 The Projected Personnel Expenses shown here are intended to provide further detail with regard to costs that have been incorporated into the "Projected Expense Summary".
- 2 Benefits Cost is estimated based on unemployment taxes, workman's comp insurance, medical insurance, retirement, etc.

VINTON BROADBAND FEASIBILITY STUDY Circuit Requirements

Circuit Requirements							
		Forecast					
	Circuit Type	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Broadband Service							
Forecasted Broadband Subscribers (Residential & Business)		0	888	1,110	1,199	1,288	1,376
% of Locations Passed		0%	40%	50%	54%	58%	62%
Internet Backhaul							
Estimated Capacity Requirements		Gbps Capacity		1	1	2	2
Monthly Rate				\$2,400	\$2,400	\$2,400	\$2,400
Estimated Annual Expense		\$0	\$28,800	\$28,800	\$57,600	\$57,600	\$57,600

Video Transport							
Forecasted Video Subscribers (Residential & Business)		0	722	722	662	662	662
% of Locations Passed		0%	33%	33%	30%	30%	30%
Estimated Capacity Requirements							
		Gbps Capacity		2	2	2	2
Monthly Rate				\$2,400	\$2,400	\$2,400	\$2,400
Estimated Annual Expense		\$0	\$57,600	\$57,600	\$57,600	\$57,600	\$57,600

Voice Service							
Forecasted Voice Lines (Residential & Business)		0	788	788	728	728	728
% of Locations Passed		0%	35%	35%	33%	33%	33%
Local Interconnection							
Estimated Capacity Requirements		Gbps Capacity		1	1	1	1
Monthly Rate				\$2,400	\$2,400	\$2,400	\$2,400
Estimated Annual Expense		\$0	\$28,800	\$28,800	\$28,800	\$28,800	\$28,800
EAS Traffic							
EAS Exchanges: Cedar Rapids, Urbana, & Shellsburg							
Estimated Capacity Requirements		DS1's / Gbps Capacity		included in local interconnection capacity			
Monthly Rate							
Estimated Annual Expense		\$0	\$0	\$0	\$0	\$0	\$0
Toll / Long Distance							
Estimated Capacity Requirements		DS1's / Gbps Capacity		included in local interconnection capacity			
Monthly Rate							
Estimated Annual Expense		\$0	\$0	\$0	\$0	\$0	\$0
Total Voice Circuit Expense		\$0	\$28,800	\$28,800	\$28,800	\$28,800	\$28,800

Total Leased Circuit Expense		\$0	\$115,200	\$115,200	\$144,000	\$144,000	\$144,000
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APPENDIX D – Sample Channel Lineup



Channel Lineups

<u>Select</u>	<u>Prime</u> <small>(includes all in Select)</small>	<u>Total</u> <small>(includes all in Prime)</small>
<i>\$24.95/mo.</i>	<i>\$74.95/mo.</i>	<i>\$89.95/mo.</i>
C-SPAN HD C-SPAN2 HD C-SPAN3 HD Duck TV HD EWTN HD FamilyNet HD HSN – Home Shopping Network HD Inspiration Network Jewelry TV QVC HD RFDTV HD TBN HD The Weather Channel HD UP <i>Plus all local over-the-air channels.</i>	A&E HD AMC HD Animal Planet HD BET HD Blue Highways HD Bravo HD BTN – Big Ten Network HD Cartoon Network HD CMT – Country Music Television HD CNBC HD CNN HD CNN Headline News HD Comedy Central HD Discovery HD Disney Channel HD E! Entertainment HD ESPN HD ESPN2 HD ESPN News HD ESPNU HD Food Network HD Fox News Channel HD Fox Sports 1 HD Fox Sports 2 HD Fox Sports Regionals HD Freeform (formerly ABC Family) HD FX Movie HD FX Network HD FXX HD Golf HD Hallmark Channel HD HGTV HD History Channel HD ID – Investigation Discovery HD Justice Central TV HD Lifetime HD Lifetime Movie Network HD MSNBC HD MTV HD National Geographic Channel HD NBC Sports Network HD Nickelodeon HD Outdoor Channel HD Oxygen HD Science HD Spike HD Syfy HD TBS HD TLC HD TNT HD Travel Channel HD truTV HD TVLand HD USA HD VH1 HD	American Heroes Channel HD AWE HD BBC America HD BBC World News HD Boomerang CARS TV HD Chiller CNN International Comedy TV HD Cooking Channel HD Crime & Investigation Destination America HD Discovery Family Channel HD Discovery Life HD Disney Junior HD Disney XD HD DIY HD DMX Music ES TV HD ESPN Classic Fantasy Sports Network Fox Business Network HD Fox College Sports HD Fusion HD FYI HD GAC – Great American Country HD GSN – Game Show Network HD Hallmark Movie Channel HD IFC HD Lifetime Real Women Military History MyDestination TV HD National Geographic Wild HD NFL Network HD One America News HD Outside TV HD Parables HD Pets TV HD Pursuit Channel Recipe TV HD SEC Network HD Sundance HD TCM – Turner Classic Movie HD Velocity HD Viceland (formerly H2) HD We TV HD WGN America HD

Premium

STARZ STARZENCORE.

*STARZ and STARZENCORE available now;
 HBO / Cinemax and Showtime /
 The Movie Channel coming soon.*

Note: Channels are subject to change.

APPENDIX E – Acronyms / Terms

ACRONYM / TERM	DESCRIPTION
10GPON	10 Gigabit Passive Optical Network
CALEA	Communications Assistance for Law Enforcement Act
CLEC	Competitive Local Exchange Carrier
CO	Central Office
DSC	Debt Service Coverage
FCC	Federal Communications Commission
FSC	Fiber Splitter Cabinet
FTTH	Fiber to the Home
FOTP	Fiber to the Premises
FTTx	Fiber to the x (can be Fiber to the Home, Premises, Node, etc.)
Gbps	Gigabits per second
GPON	Gigabit Passive Optical Network
IPv4	Internet Protocol version 4 - connectionless protocol for use on packet switched networks
IPv6	Internet Protocol version 6 - connectionless protocol for use on packet switched networks
ITSP	Internet telephone service providers
Mbps	Megabits per second
MST	Multi Service Terminal
NGPON2	Next Generation Passive Optical Network
OLT	Optical Line Termination
ONT	Optical Network Terminal
OSP	Outside Plant - refers to all of the physical cabling and supporting infrastructure (such as conduit, cabinets, etc.), and any associated hardware (such as splice cases, field electronics, etc.) located between a demarcation point in a central office and a demarcation point in another central office or customer premises.
OTT	Over the Top – delivery of one or more services across an IP network
PBX	Private Branch Exchange
POTS	Plain Old Telephone Service
RFP	Request for Proposal
RFQ	Request for Quote
RG	Residential Gateway
RUS	Rural Utilities Service
SIP	Session Initiation Protocol
TIER	Times Interest Earned Ratio
USDA	United States Department of Agriculture
Vinton Broadband	Intended to represent the Fiber to the Home project in Vinton generally. May also represent a separate legal entity or subsidiary which will be required to be established as part of the project. Vinton Broadband may or may not be the eventual name of the subsidiary.
VMEU	Vinton Municipal Electric Utility
VoIP	Voice over Internet Protocol

APPENDIX F – Potential Service Providers / Partners

Company Name	Potential Services
Ahlers Cooney, P.C.	Public Finance Attorney
Aureon	Fiber Transport, Interconnection, Voice Service
BroadNet Connect / HealthNet Connect	Fiber Transport, Interconnection
Cedar Falls Utilities	Fiber Transport, Interconnection, Video Services
D.A. Davidson	Public Finance Banking
ISPN	Network Services, Help Desk Support
Unite Private Networks	Fiber Transport, Interconnection
USA Communications	Fiber Transport, Interconnection, Voice Switching, Service & Maintenance, Billing Services, Video Services
SecurityCoverage	Internet Security, Help Desk Support
SkitterTV	Video Services