FINANCIAL CONSIDERATIONS, COUNTY OF EL DORADO BROADBAND MODELS

August 2018

Abstract

This white paper is the companion report to "The County of El Dorado, Broadband Roadmap." This paper dives into the financial implications and considerations for implementation of a Gigabit broadband strategy for the County's constituents. Connecting Homes and Businesses with Fiber through a Public-Private Partnership or through offering Broadband as a Service" in the Roadmap.

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FINANCIAL CONSIDERATIONS, COUNTY OF EL DORADO BROADBAND MODELS

Introduction

This white paper is the companion report to "The County of El Dorado Broadband Roadmap," referenced herein as the "Roadmap," previously submitted to the County of El Dorado by NEO Connect. This report includes the capital costs projections and financial implications of the various models for implementing a Gigabit broadband strategy for the County's citizens.

NEO's team has put together capital costs estimates for designing and building a Fiber to the Premise network within the County of El Dorado. This information has been compiled for County staff and the Board of Supervisors to be able to understand the models and approaches through the lens of their respective financial implications. This white paper provides the financial framework of the various approaches for Gigabit broadband strategies, including models of public-private partnerships and potential options for financing the build-out of fiber infrastructure.

Strategies to Improve Broadband

As a refresher, there are many strategies that the County may consider to improve broadband services for its constituents. Here are the strategies that were evaluated as part of this study as a whole.

STRATEGIES TO IMPROVE BROADBAND

- Implement Broadband Friendly Policies and Ordinances and Smart Conduit Construction to Gain Assets and Attract Partners
- Connect County Government and Smart City Applications, Potential partnerships with Caltrans, Crown Castle and Others
- Connect other Key Community Anchor Institutions
- Connect Homes and Businesses with Fiber through a Public-Private Partnership or Collaboration
- Further Evaluate Working with Existing Providers to Improve their Services (Comcast, AT&T, Calnet, CVIN, CENIC, Others)

Based upon the initial findings of the broadband plan, NEO and staff recommend the first three strategies can be considered regardless of whether or not the County decides to implement a Fiber to the Premise strategy or Gigabit for all citizens. The first three recommendations will facilitate and lower the costs for broadband implementation and lay the foundation for improving broadband infrastructure within the County, regardless of whether the County decides to move forward with a Gigabit broadband strategy to connecting homes and businesses.

Connecting city government locations (water monitoring systems, public safety, airport facilities and other government buildings), smart city applications (traffic lights and parking meters and other systems as they become important) and key community anchor institutions (i.e. hospitals and universities) with fiber will greatly enhance communications and broadband speeds for these locations, while dramatically reducing communications costs. Most of the schools within the County have already been connected with CENIC's California Research and Education Network (CalREN) fiber network. This network could be further expanded to connect other key facilities and anchor institutions with fiber, and in so doing, the County will gain more fiber assets that can be leveraged for building out to neighborhoods to connect homes and businesses with fiber. Implementing a shadow conduit/dig once policy will allow the

County to facilitate further broadband development by reducing the costs of broadband expansion, by levering existing public works or construction by other entities.

Each of these first three strategies will improve communications for applications that will be needed regardless of whether or how the County moves forward with a more ambitious, ubiquitous Gigabit broadband strategy. Additionally, these strategies will lower the overall cost of further expansion and will provide assets (conduit and fiber) for the County to use as leverage to potentially negotiate a public-private partnership for further expansion.

These strategies; however, may or may not improve broadband services to homes and businesses. Although it could be said that implementing just the first three strategies may attract and incent other service providers to further build out to homes and businesses, there is no guarantee that this will be done.

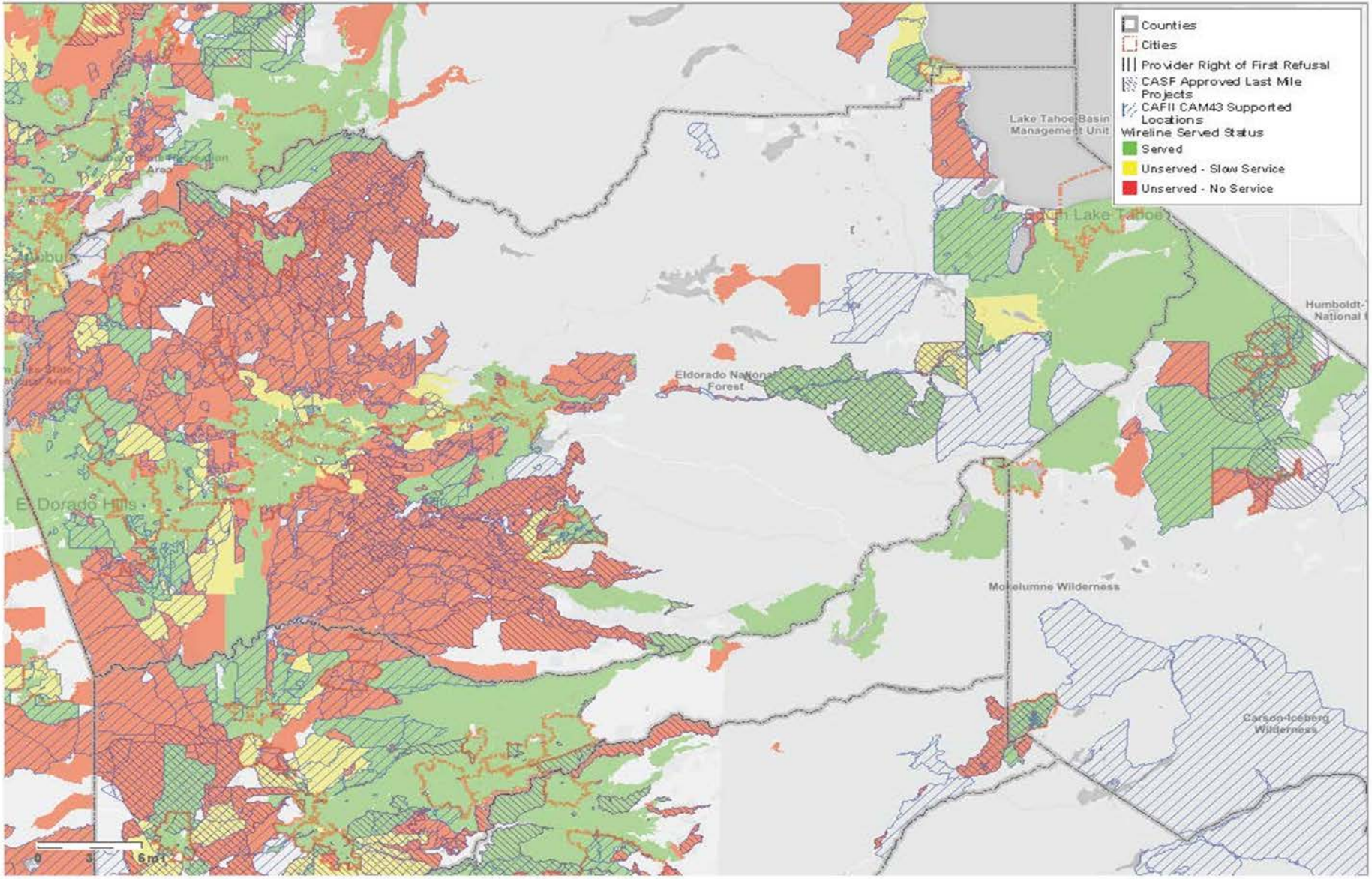
The purpose of this report is to provide the financial implications and considerations for implementation of connecting homes and businesses with fiber.

A Reminder - Why is the County Studying This?

As indicated within the Roadmap report, much of the County does not have adequate broadband services. According to the California Public Utilities Commission, the areas shown in red on the following map have no broadband services at all. Areas shown in yellow have slow service – less than 6 Mbps. The areas shown in green are considered "served;" however, the definition of "served" is greater than 6 Mbps availability. The FCC defines having broadband service available with 25 Mbps in download and 3 Mbps in upload speeds.

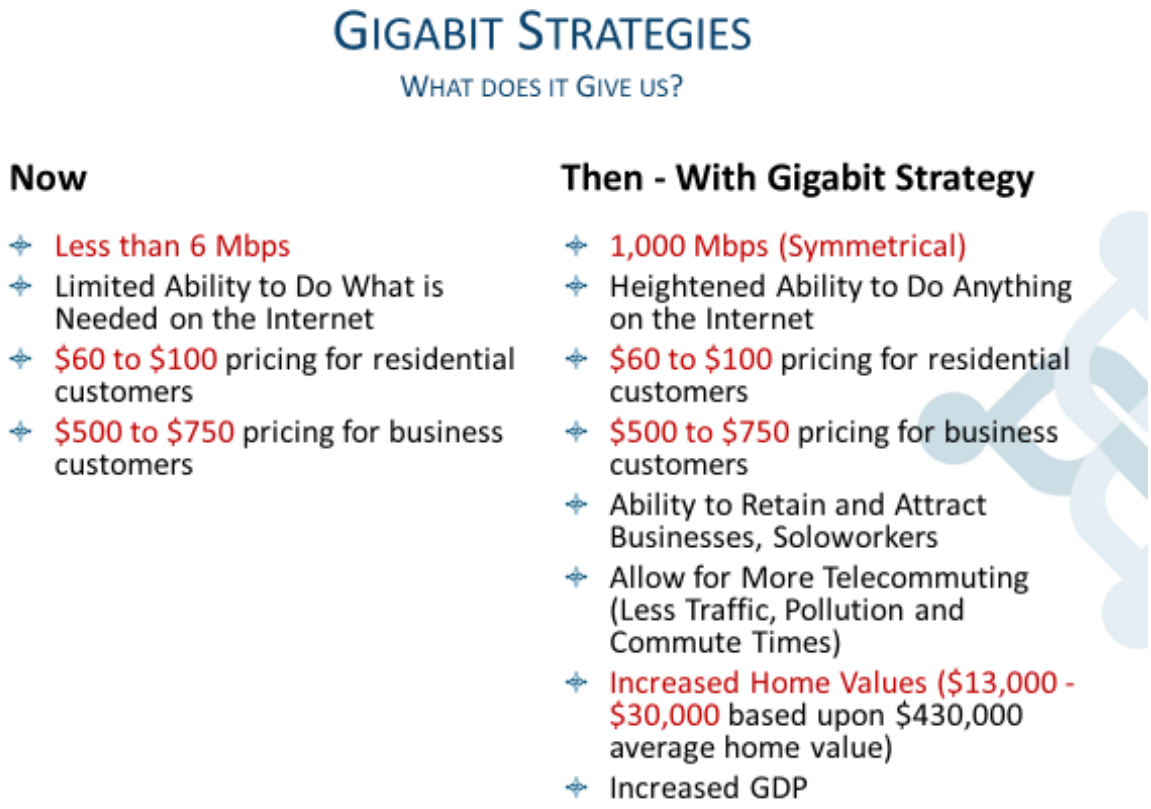
Most communities and local governments are working to increase this speed to 1,000 Mbps or Gigabit service availability.

California Interactive Broadband Map Data as of: 12/31/2016



As described in the Roadmap report, having access to affordable, abundant and redundant broadband is a game-changer. Having access to very high-speed broadband and Internet services has become one of the most critical components for education, government services, economic development, healthcare, utility operations, first responders and business operations. The demand for more bandwidth continues to grow. Access to high-speed broadband services can also increase home values (from 3 – 7%), allow for telecommuting (which reduces traffic congestion, commute times and pollution), and increasing GDP.

Pursuing a Gigabit strategy within the County will increase available broadband services dramatically (from less than 6 Mbps to 1,000 Mbps), while citizens would pay essentially the same monthly fee as they are currently paying.

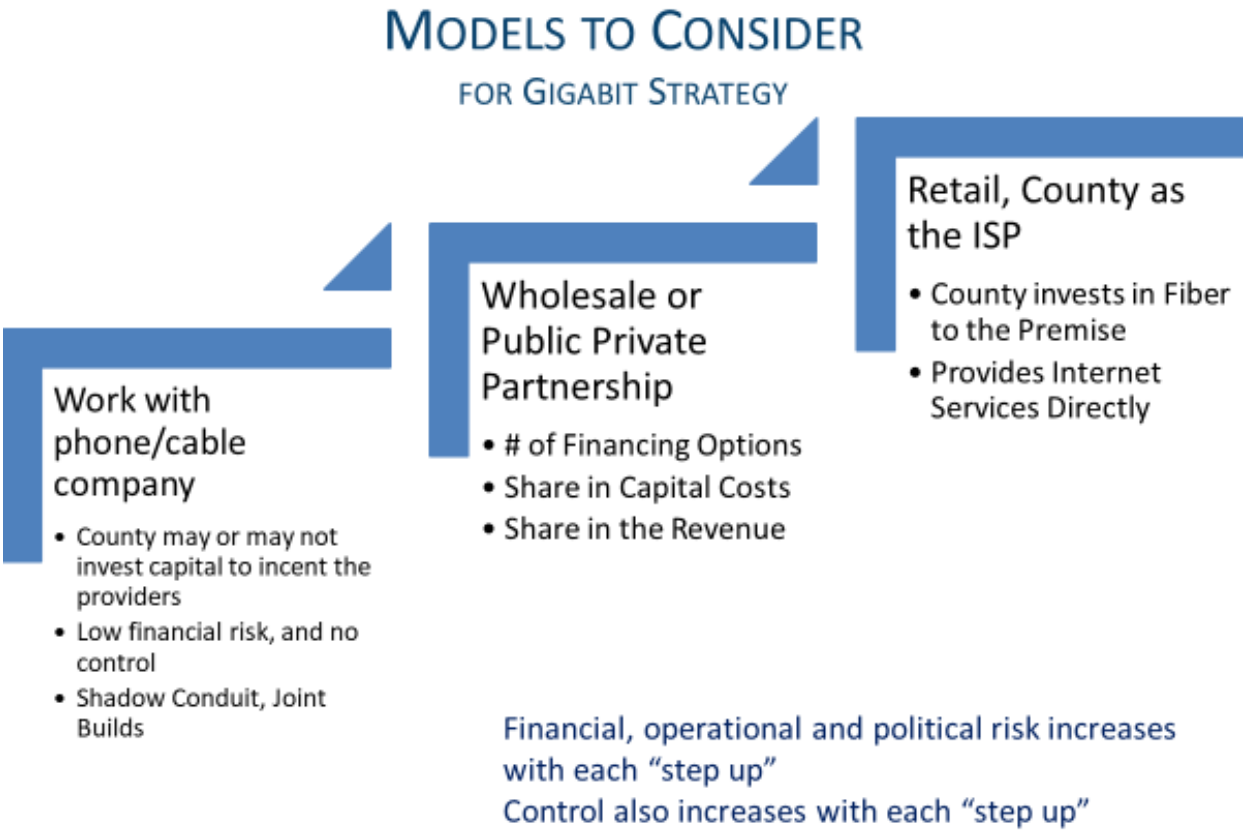


Models Included in this Report

There are a number of things to consider when pursuing a County-led Gigabit broadband strategy. The most ambitious strategy is to have the County design and build a fiber optic network to every home and business and to offer services directly as an Internet Service Provider (ISP). This is often referred to as a "Retail Model," whereby the County provides services directly to end users, or simply the "County as an ISP."

The County could consider designing and building the fiber infrastructure and entering into an agreement with a private company to use the network to provide services to end users. This approach is sometimes referred to as a "Wholesale Model," or as a "Public-Private Partnership." In some cases, the network is available to many private providers to provide services and is available on an "Open Access" basis.

Here is a summary of the various approaches discussed within this report.



There are several types of public-private partnerships and there are several variations of having the County as an ISP. This report will discuss the financial framework of these options, but as there are a number of variables that can be negotiated and implemented, this report is meant to provide a number of options to be considered and cannot address all of the options that may be implemented.

Summary of Findings

NEO encourages County staff to continue to work with the existing phone and cable companies that are currently providing services within the County. At the same time, it should be noted

that no provider is currently implementing Gigabit services within the County and most likely, in order to facilitate this, the County may need to provide some type of assistance for the existing service providers to implement a Gigabit-enabled network.

NEO ran a number of financial models to determine the financial implications of various approaches. The financial models for the County as the ISP (i.e. the Retail Model) or participating in a Wholesale Model approach are not financially feasible without either supplemental funding in the form of a grant or an additional revenue source such as a property tax assessment. As discussed later within this report, the financial model does not work for a service provider or for the County to build fiber to every home and business and cover the debt service required, without supplemental funding or an additional revenue source. This perhaps is why it has not yet been done within the County. If the County implemented a property tax assessment, the financial model works and this type of network could be funded. This report will provided detailed information into what could potentially work from a financial perspective. Here is the summary of our financial modeling:

SUMMARY OF FINDINGS

Retail and Wholesale Models

- Neither are financially feasible without a form of Supplemental Funding (Grant) or Additional Revenue Sources (Annual Property Tax Assessment)
- With a $150 - $300 Annual Property Tax Assessment, the Retail and Wholesale Models work
- Both types of models and their respective results are included within this report.
- NEO focused on the Wholesale Models as the County has stated it does not want to be the ISP.

As detailed list of assumptions used for the various financial models is included in Appendix A of this report. Below is a summary of the primary assumptions for the models.

Key Assumptions, Wholesale Model

- $353 Million in Total Capital Costs
  - $291 Million to build fiber network to each homes/business would be paid by the County.
  - The Service Provider assumes cost of equipment and the costs to install a customer, turn up service (approximately $30 – 62 Million)
- Residential pricing ranges from $80 - $100 per month for Gigabit services
- Business pricing ranges from $80 - $800 for services
- $30 revenue share per customer is paid to the County by the service provider for residential services
- Approximately 10% of add-on business revenue is paid to the County for business services
- 15% take rate in year 1 and an additional 15% in year 2
- Additional take rate of 5% in year 3 and 4

NEO ran the financial models with the revenue share collected from the service providers to understand the impact on Net Operating Cashflows (Total Revenue less Expenses). The models, as stated previously, are not feasible without either supplemental funding or an additional revenue source, such as a property tax assessment. The financial results provide for positive annual Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) starting year 4; however, there is not sufficient cash from operations prior to the property tax assessment, to pay the debt service (principal and interest payments.)

NEO then added various levels of an annual property tax assessment. The range used was from $150 to $300 in an annual assessment. On the low end, the $150 annual property tax assessment allows the County to cover debt service, operate the network and pay off the debt in 20 years. After 20 years, without needing to cover debt service, the entity operates with positive EBITDA.

At a $300 annual property tax assessment, the debt can be paid off sooner – within 8-10 years and there is ample cash to cover debt service, and operate the network. The conclusion of this exercise is that a $150 annual assessment is the lowest amount that the County should consider. Annual assessments greater than $150 improve the financial implications to the County and its citizens.

Summary of Findings, Wholesale Model

Financial Results, Prior to Application of an Annual Property Tax Assessment (Operating Cashflows, Revenues from PPP)

- NEO modeled the Revenue Share from Service Providers and the financial results include:
- EBITDA of
  - ($2.4M) in Year 1
  - ($2.5M) in Year 2
  - ($369k) in Year 3
  - Positive EBITDA starting in Year 4
- Net Income after Principal and Interest Payments
  - ($7.8M) in Year 1
  - ($12.3M) in Year 2
  - ($12.5M) in Year 3
  - Annual Losses Continue, Not enough Net Operating Cashflows to Cover Debt Service without a Subsidy

Summary of Findings, Wholesale Model

Results, $300 Annual Fee

- $30 Million in Annual Property Tax Assessments offsets losses from Operating Cashflows
- Additional $20 Million can be paid toward Principal starting in Year 2
- 10 Year Cumulative Cashflows over $330 Million
- 10 year debt balance is $161 Million (great!)
- Debt can be paid off within 8-10 Years (great!)

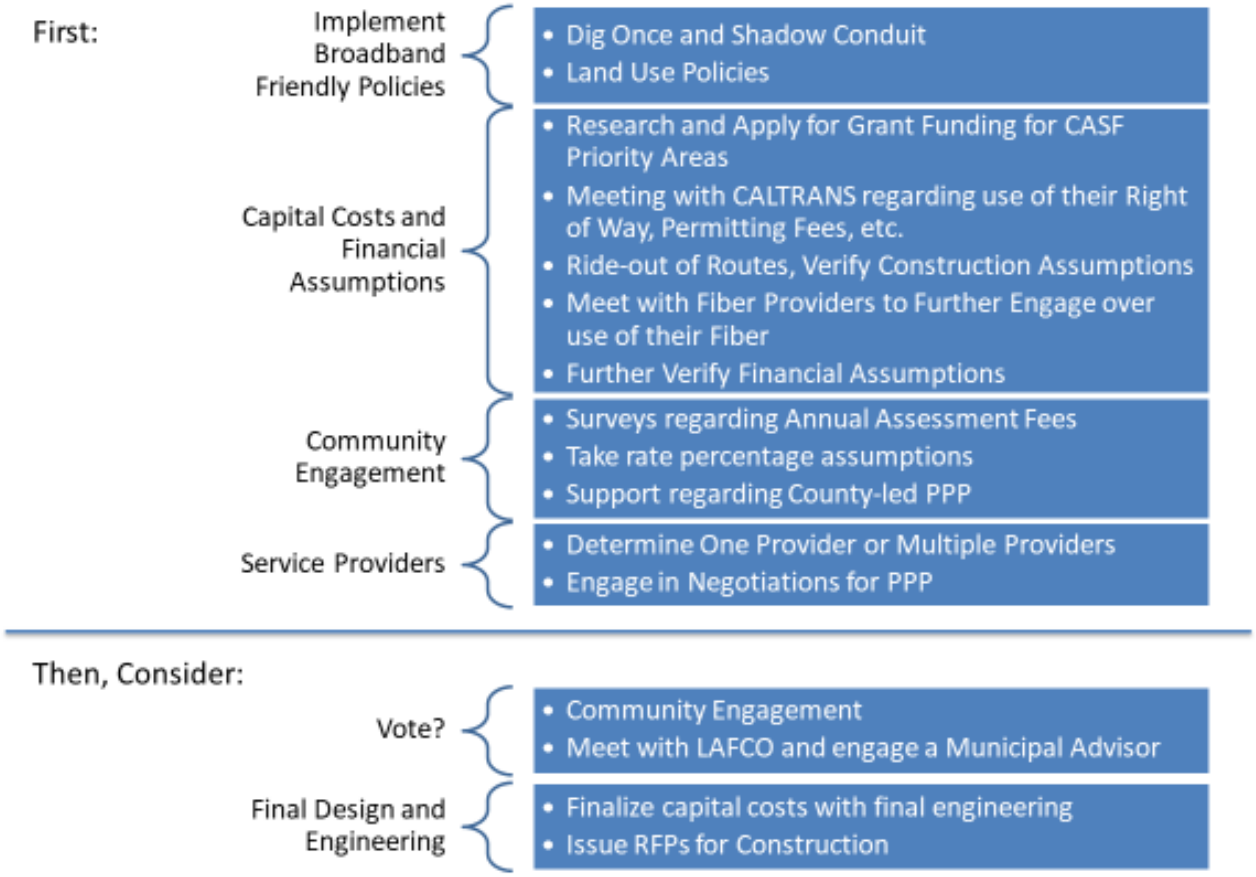
Results, $150 Annual Fee

- $15 Million in Annual Property Tax Assessments offsets losses from Operating Cashflows
- No Additional money can be paid toward Principal
- 10 Year Cumulative Cashflows over $182 Million
- 10 year debt balance is $242 Million (not good)
- Debt can be paid off in 20 years (good)

Conclusion: $150 is the minimum annual property tax assessment that should be considered. The financial model works better with a $200 - $300 assessment.

Possible Next Steps

If the County would like to pursue a Gigabit Strategy, there are a number of next steps that could be taken.



As the capital costs are high and servicing debt is the primary risk to be mitigated, further work can be done to verify and tighten the capital cost estimates. For example, prior to this report, NEO engaged with many infrastructure owners that already have fiber installed within the County. NEO mapped many of the existing fiber assets owned by other entities in the Roadmap report. The capital costs estimates included in the financial models do not include any potential cost savings from use of existing fiber or for any collaboration in regards to installing fiber jointly. Further investigation could be done to potentially reduce the capital costs by using existing fiber or through partnerships with other entities that also need fiber optic facilities (i.e. Caltrans, CVIN, the power companies, cellular and service providers). Additionally, the County could implement broadband friendly policies and ordinances to reduce the overall costs of fiber construction.

Further work can be done to verify the capital cost assumptions. This includes follow-up meetings with Caltrans regarding use of their right of ways, permits and processes. The preliminary design and engineering conducted for this study could be further refined by driving the routes, verifying the aerial and underground assumptions, and meeting with the pole owners to discuss various implementation techniques.

Another potential next step may include further engagement with the community to gain input on the viability or receptivity of an annual property tax assessment, the citizen's view of the importance of abundant broadband and the citizens' position as it relates to a County-led development of a Public Private Partnership(s) to improve broadband services.

After the County determines what it might be willing to consider (i.e. one provider, multiple providers, open access, capital contribution, broadband pricing for citizens, etc.), negotiations with the service providers could take place to frame potential Public Private Partnerships.

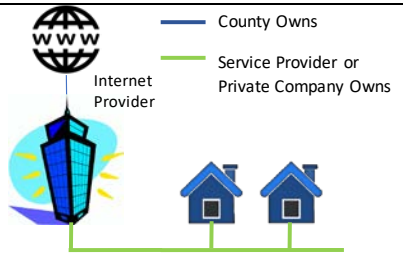
Then, based upon the results of these further investigations, the County might consider putting this out to a vote of the citizens and to begin final design and engineering of the network. Final design and engineering of the network could produce bid documents for construction labor and materials.

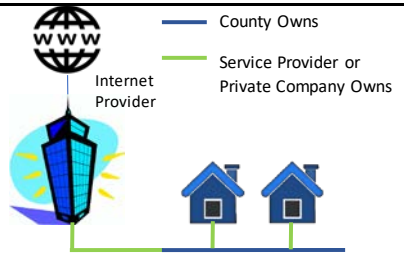
Discussion of the Various Models to Improve Broadband within the County

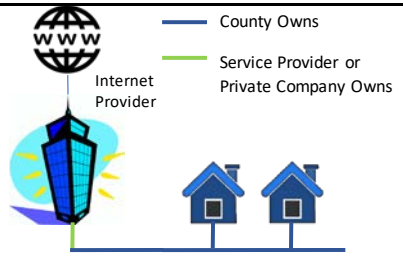
As mentioned, there are a number of models to finance, design, construct and operate a Fiber to the Premise network. With the Retail Model, or when the County is the ISP, the County is responsible for the design, engineering, and all of the capital costs to build the network and costs to operate the network. This model and the financial considerations are discussed in detail below.

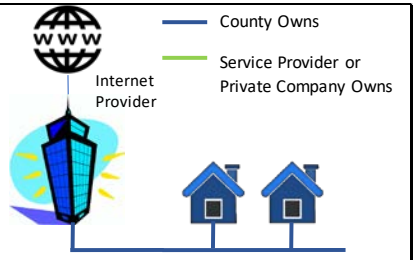
When the County takes the approach of a Wholesale Model or a Public Private Partnership, the capital costs are shared, as are the revenues. The County could consider designing and building the fiber infrastructure and entering into an agreement with a private company to use the network to provide services to end users. In some cases, the network is available to many private providers to provide services and is available on an "Open Access" basis, meaning, more than one or several providers use the network on a non-discriminatory and competitive basis to provide services to end users.

In most cases of the Wholesale approach or the Public Private Partnership, the service provider pays for the capital costs of the equipment, including the equipment located at NOC and the hub sites, as well as the equipment located on the outside of the home. In some cases, the service provider will pay for some of the fiber; such as the fiber from the street to the home. Below is a summary of each of the models.





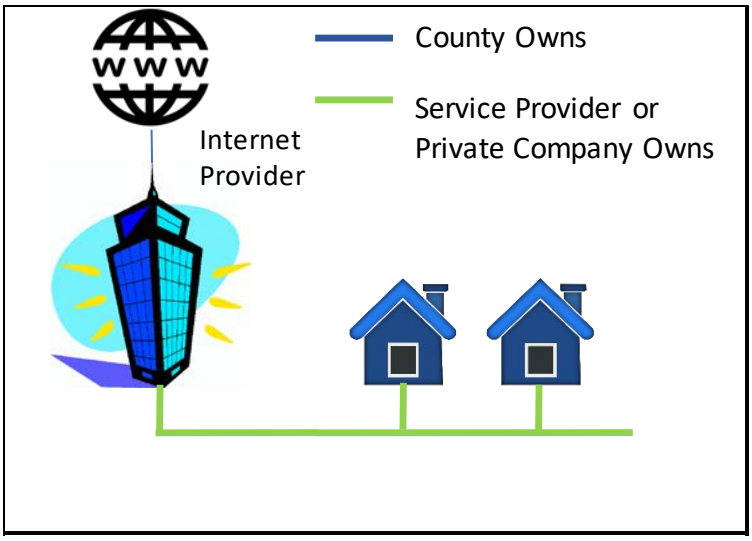




		PUBLIC PRIVATE PARTNERSHIPS		
	WORK WITH THE EXISTING PHONE/CABLE COMPANIES	**WHOLESALE, COUNTY OWNS FIBER BACKBONE NETWORK**	**WHOLESALE, COUNTY OWNS ALL FIBER**	**RETAIL MODEL, COUNTY as an ISP**
DESCRIPTION	The Couty would work with the existing incumbent providers or another private company who would develop a broadband network and provide highspeed internet service. The private provider would construct and operate the network with private capital; the County may or may not provide a subsidy.	The County invests in a portion of useful infrastructure (conduit and fiber) to serve as a backbone for a communications network and then would select a private company to partner with to develop a broadband network and provide high speed internet service	The County would finance and build a fiber broadband network, and then lease the network to one or more internet service providers and entities to utilize the infrastructure.	The County would finance and build a fiber broadband network and begin to provide retail internet service through a new service within the County government
INFRASTRUCTURE OWNER	Backbone: **Private** Distribution: **Private** Electronics: **Private**	Backbone: **County** Distribution: **Private** Electronics: **Private**	Backbone: **County** Distribution: **County** Electronics: **Private Company**	Backbone: **County** Distribution: **County** Electronics: **County**
SERVICE PROVIDER	**Private Company or the Existing Provider**	**Private Company**	**Private Company**	**County**
ORGANIZATIONAL IMPLICATIONS to the County	**Little Risk** * No additional staffing or facility implications * Risk if the private partner or incumbent provider does not perform	**Low Risk** * Minor staffing implications during construction; No facility implications	**High Risk** * probable staffing implications to manage network and 3rd party provider, possible facility implications	**Highest Risk** * Staffing implications to run new broadband service and network * Requires facilities for administration and operations
FINANCIAL IMPLICATIONS OR CONSIDERATIONS	**Very Low** * County would likely negotiate a first right of refusal upon sale	**Medium** * Capital cost breakdown is provided within; the County would likely negotiate a first right of refusal upon sale for remainder	**Medium** * Capital cost breakdown is provided within; the County would likely negotiate a first right of refusal upon sale for remainder	**High** * Capital Costs include the design, construction, operations and and customer service
CONTROL	**Almost No Control** * Price: Set by private provider * Speed: Set by private provider * Minimal customer service requirements * Coverage may be dependent on market demand	**Less Control** * Price: Set by private provider * Speed: Set by private provider * Minimal customer service requirements * Coverage may be dependent on market demand	**Some Control** * Price: May be negotiated with private provider * Speed: May be negotiated with private provider * Negotiated customer service requirements * Universal coverage across County	**High Control** * Price: Set by County * Speed: Set by County * Customer Service Standards controlled by County * Universal coverage across County
ABILITY TO MEET OBJECTIVES	**Does Not Meet** * County-wide Access: Not guaranteed * Equitable and Inclusive: Not guaranteed * Future-Oriented: No * Competititve Marketplace: Same as today * Unfettered Access: Not guaranteed * Open Access: No	**Modest** * County-wide Access: Not guaranteed * Equitable and Inclusive: Not guaranteed * Future-Oriented: Yes * Competititve Marketplace: Better than today * Unfettered Access: Not guaranteed * Open Access: Backbone Yes, Distribution No	**Mixed** * County-wide Access: Yes * Equitable and Inclusive: Likely * Future-Oriented: Yes * Competititve Marketplace: Likely * Unfettered Access: Likely * Open Access: Possibly	**Very High** * County-wide Access: Yes * Equitable and Inclusive: Yes * Future-Oriented: Yes * Competitive Marketplace: Yes * Unfettered Access: Yes * Open Access: Not initially
EXAMPLES OF OTHER Counties	Arvada, CO Westminster, CO Kansas City, KS, MO Lincoln, NE	Holly Spring, NC (Ting) Centennial, CO (Ting) Boulder, CO Urbana-Champaign, IL (I3)	Westminster, MD Huntsville, AL Ammon, ID	Longmont, CO Ft. Collins, CO Loveland, CO Wilson, NC Salisbury, NC

Work with the Existing Phone and Cable Providers or Other Private Providers

NEO met with the existing service providers within the County. None of the current private providers are implementing a Fiber to the Premise network that enables Gigabit services. Nonetheless, this option is described below.



In this approach, the County would work with the existing incumbent providers or another private company who would develop a broadband network and provide highspeed internet service. The private provider would construct and operate the network with private capital; the County may or may not provide capital, or work with the providers to extend their networks, share in the capital costs of various build options or provide County-owned fiber to the service providers as an incentive.

In some cases, the local government provides access to its dark fiber or conduit to the existing providers and vice versa. If the County built out a fiber backbone, or built fiber to its key facilities and/or anchor institutions as discussed in the Roadmap report, the County could provide access to conduit or dark fiber to the service providers. In some instances, there are shared or reduced capital costs for infrastructure build out through implementation of broadband friendly policies and ordinances. These have been discussed in detail in the Roadmap report.

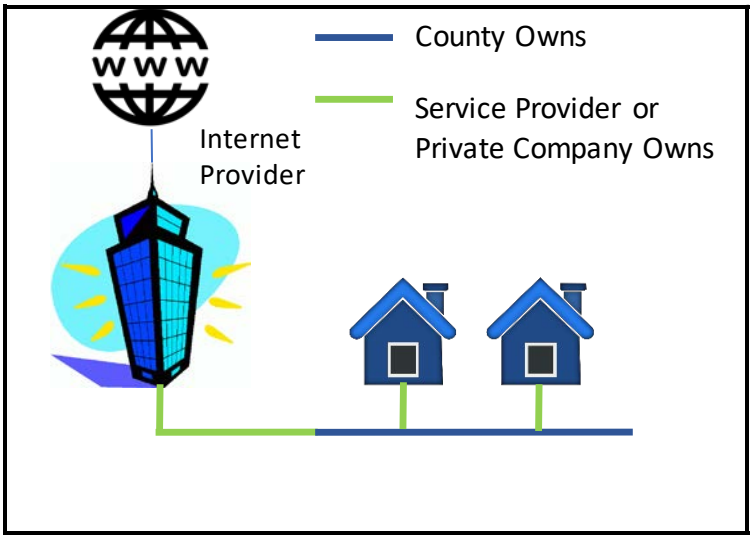
In this model, there is little operational or financial risk to the County and little impact to the County's staffing or use of facilities. The primary executional risk to this model is that the County has little to no control over where network is built, what services are offered and what price is available to the citizens. Pricing, speeds, customer service requirements and coverage or service availability is decided by the private provider, with very little to no input or control from the County. With this model, the County has little to no control over whether or not Net Neutrality rules are followed.

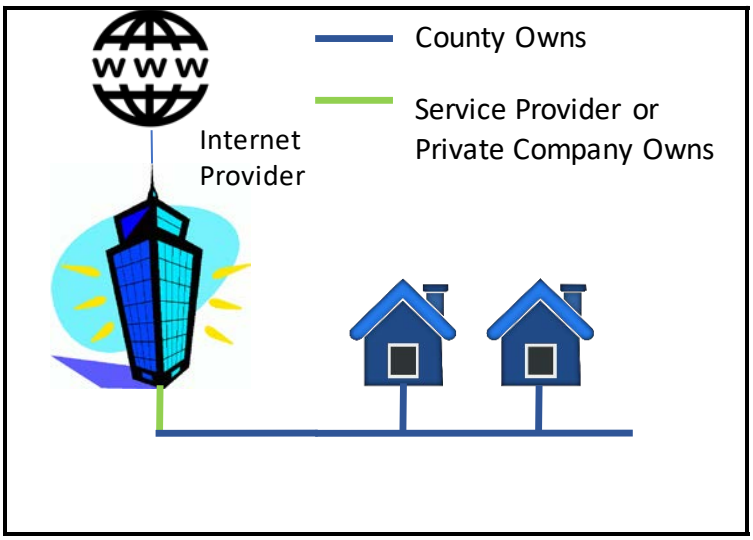
Communities that have used this approach include the City of Arvada and the City of Westminster, CO. Additionally, Kansas City, KS and Kansas City, MO have worked with Google Fiber to roll out Gigabit services to their constituents. Critics of Google Fiber's Kansas

City implementation state that Google has selected more affluent neighborhoods to build their FTTP networks and is slow to build out the remaining community. Proponents of this approach highlight the low risk, both operationally and financially, for the County.

Wholesale Model or Public Private Partnership, Shared Capital Costs and Shared Revenue

As discussed, there are several flavors of the Wholesale Model or the Public Private Partnership approach. Local governments can take several approaches with this model, owning the fiber only or owning the fiber and the equipment it takes for it to run or be "lit." Fiber optic cable that does not have equipment on the ends of it is referred to as "dark" fiber. Fiber optic cable that has equipment in place is referred to as "lit" fiber.





In some of the recent Wholesale Models or Public Private Partnerships, the County absorbs the capital costs to build the fiber distribution network. Sometimes this also includes the County paying for the capital costs to build fiber to the neighborhoods, and even for the fiber from the street to the home or business.

In other examples, the County pays for a ring around the community, or potentially the fiber into various neighborhoods. As discussed, the extent to which the County is responsible is based upon what can be negotiated. When the service provider agrees to pay for some of the capital costs to build fiber – for example, from the street to the home, the County may want to include a Right of First Refusal clause in the agreement with the service provider, allowing the County to potentially buy the fiber from the service provider in the event of a sale of this fiber.

In most cases, the service provider pays for the equipment at the network operations center and the equipment to light the customer.

Whether the County provides dark or lit fiber, the wholesale model assumes at least one and possibly multiple service providers are available to provide Internet services.

This ownership by a county, run by a private entity approach is nothing new; it has been prevalent for decades with toll roads that are managed privately. What is a new and emerging trend, is communities funding a network and turning it over to a traditional carrier to manage and operate the network.

As part of the Northwest Colorado Regional Broadband Strategic Plan effort, Rio Blanco County identified that broadband service in the County was inadequate to sustain 21st century economic development. Rio Blanco County is deploying a wholesale Fiber to the Premise model. In 2014, Rio Blanco County voted to opt out of SB 152 and reclaimed their local telecommunications authority. Shortly after opting out, Rio Blanco received grant funding with the Colorado Department of Local Affairs (DOLA) to build out the network. The County and some of the local community anchor institutions are providing the match funding required by the grant. The County is building fiber infrastructure to the block in Rangely and Meeker and service providers will finish the build-out to each home or business. In the more rural parts of the county, subscribers will be served by wireless infrastructure and technologies.

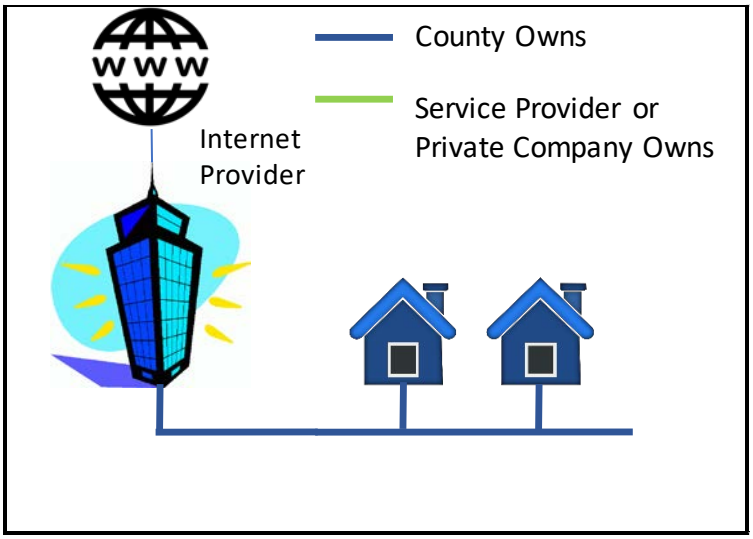
Subscribers have the option to choose between two providers which are offering services on Rio Blanco's network. Local Access Internet (LAI) and Cimarron Telecommunications are offering symmetrical Gigabit Internet access (1,000 Mbps or 1 Gbps) for $70 per month.

Depending upon the level of investment required by the County to enter into a PPP, the operational and financial risk can be low to medium, resulting in some staffing required and potentially use of County facilities.

Although the County has some control, the County then potentially has leverage to contractually negotiate pricing, availability, customer service requirements, build-out requirements and Net Neutrality provisions.

Retail Model, the County as an ISP

In this model, the County designs, builds, owns and operates the network, and essentially becomes the Internet Service Provider.



The County would finance and build a fiber broadband network and begin to provide retail internet service through a new service within the County government.

Most local governments that have deployed a Retail, Fiber to the Premise strategy have been providing electric services to their constituents. Municipal electric utilities have an easier implementation path because they already have the access to utility poles and other infrastructure, billing processes in place, customer service centers operational, and business relationships with each and every homeowner and business.

Regardless of whether the municipality or local government also provides electric service to their constituents, there is an increasingly prevalent case for investing in building municipal broadband being made by advocates defining the Internet as a "utility" and thus a necessity for the public sector to provide when otherwise unavailable. This implies that the county may consider charging a utility fee for this service, whether the home or business contracts for broadband services or not. The "utility" concept also could potentially charge tap fees or installation fees similar to water/sewer hookup charges when a home or business contracts for broadband services.

The City of Longmont, Colorado's model was discussed in detail in the Roadmap. Longmont has deployed a Gigabit fiber network and is offering Internet and voice services directly to homes and businesses. The City of Longmont's project is nationally known as a model of success. Dubbed "NextLight," this Gigabit fiber network is owned and operated by the City and its power utility, Longmont Power & Communications (LPC). Longmont opted out of Colorado's SB 152 law in November of 2011 with 60% of the vote. Two years later, Longmont voters approved a $40.3 million bond issuance to cover the startup costs and network build.

Longmont followed Google Fiber's marketing strategy by launching a pre-build sign-up campaign. The neighborhood with the most market share or "take rate" would be the first area where Longmont would build. The first neighborhood received a 72% take rate prior to construction. Longmont's 38,000 homes and businesses now have symmetrical Gigabit service for $50 per month for those who signed up early. The $50 per month is guaranteed for the lifetime of the home as well as the owner/tenant of the home if he/she moves within the City limits. Longmont's business service includes symmetrical 100 Mbps for $230 per month and symmetrical 250 Mbps service for $500 per month.

Longmont is experiencing an average take rate percentage of 56%. The initial feasibility study conducted in 2013 predicted a 27% take rate. Late in 2016, the City voted to increase LPC's budget by $7 million, sourced from the Electric and Broadband Utility Fund balance, to hire staff needed to support take rates twice as high as initially predicted.

Meanwhile NextLight is helping businesses and fostering growth by providing connectivity that's enabling the community to successfully compete with its neighbor to the south, Boulder. Local businesses that were looking to expand outside the city elected to stay and grow in Longmont thanks to the Gigabit network. The network is also attracting regional work-from-home Coloradans looking for an ideal place to work and raise their family.

The operational and financial risks to the County are the highest; however, with this risk, the County has the ability to build to all constituents, set prices and service availability, insure Net Neutrality rules are followed, and ensure the network is future oriented.

Understanding the Capital Costs of Building a Fiber to the Premise Network

NEO's team put together preliminary design and projected capital cost estimates for building a Fiber to the Premise (FTTP) network that is capable of handling symmetrical Gigabit broadband speeds. We assumed there would be a primary network operation center that would house the equipment to "light up" the fiber in each community.

Most Fiber to the Premise networks use a Gigabit Passive Optical Network (GPON) architecture with active connections to large businesses, mission critical and/or government locations. The terms "active" or "passive" simply refers to whether there are electronics that are powered in the field or between the network operations center and the home or business. With an "active" architecture, electronic equipment that is deployed throughout the community will need to have power. With a "passive" architecture, there are no electronics located between the network operations center and the home or business.

NEO's team provided preliminary capital costs to connect government facilities, smart city applications, traffic lights and systems and other key anchor institutions. If fiber is built to these locations, much of the backbone fiber optic architecture would be in place. For purposes of this report, the capital costs shown do not reflect the assumption that these key anchor institutions and government locations have had fiber built to them. If the County builds to these locations first, then the capital costs reflected in this report would be lower.

Additionally, NEO mapped existing fiber and conduit facilities currently built within both communities. If the existing fiber and conduit are used, there would be additional capital cost

savings that could be realized. This report used the worst-case scenario of needing to build the Fiber to the Premise network without the use of existing fiber or conduit.

Many local governments consider building to the businesses first and then after the major fiber backbones are in place, consider building to the neighborhoods, homes and residential locations. As more students need to access cloud-based services for homework, and as more people are telecommuting or starting a business and working from home, most local governments have determined that building to just the businesses or placing a priority on building to businesses over homes does not serve their constituents. Therefore, this report will focus on the models for including building out to both businesses and to residential locations.

Building Fiber to the Businesses and to the Homes

As stated, the most ambitious strategy for a local government to consider is the opportunity to connect all homes and businesses with fiber. More challenging geographies are sometimes forced to utilize wireless technologies to deliver service with a hybrid fiber/wireless network. NEO did not assume use of wireless technologies in its preliminary design.

To aid the reader's understanding of the information below, a few key terms are defined:

- **Backbone** is a redundant network of conduit and fiber rings that supports a County-wide fiber network and could also be used to connect unserved County sites. Its design would be developed with sufficient capacity and distribution throughout the County to support the future Internet of Things, and sensor-based (Smart City) analytic infrastructures in key.

- **Outside plant (OSP)** fiber construction is the cost of installing fiber, including materials and labor.

- **Nodes (Hubs) and NOCs (Core) sites** are physical locations where the network physically interconnects with the wider Internet, and where equipment connects the various parts of the fiber network together. A Node or a Hub site is typically located out near neighborhoods. The Network Operations Center (NOC) or Core sites are primary locations that connect the Nodes and/or Hub sites.

- **Network electronics** are the equipment necessary to control and route the data being transmitted over the network.

- **Service Entrances, or Subscriber Activation Costs** include cost for the physical drop, or fiber connection from the street to the home or business, as well as the equipment necessary to allow a user to connect devices to the Internet.

Capital Costs are Less Expensive in Higher Density Areas. NEO provided high-level capital costs for the more densely populated areas (Areas marked with "1") within the County and the more rural areas of the County (Areas marked as "2"). The capital costs to build to more densely populated areas shown as "1" are less expensive on a per household basis. The capital costs to build to areas shown as "2" are costlier as the areas have much less household density. Please refer to the map shown on the following page.

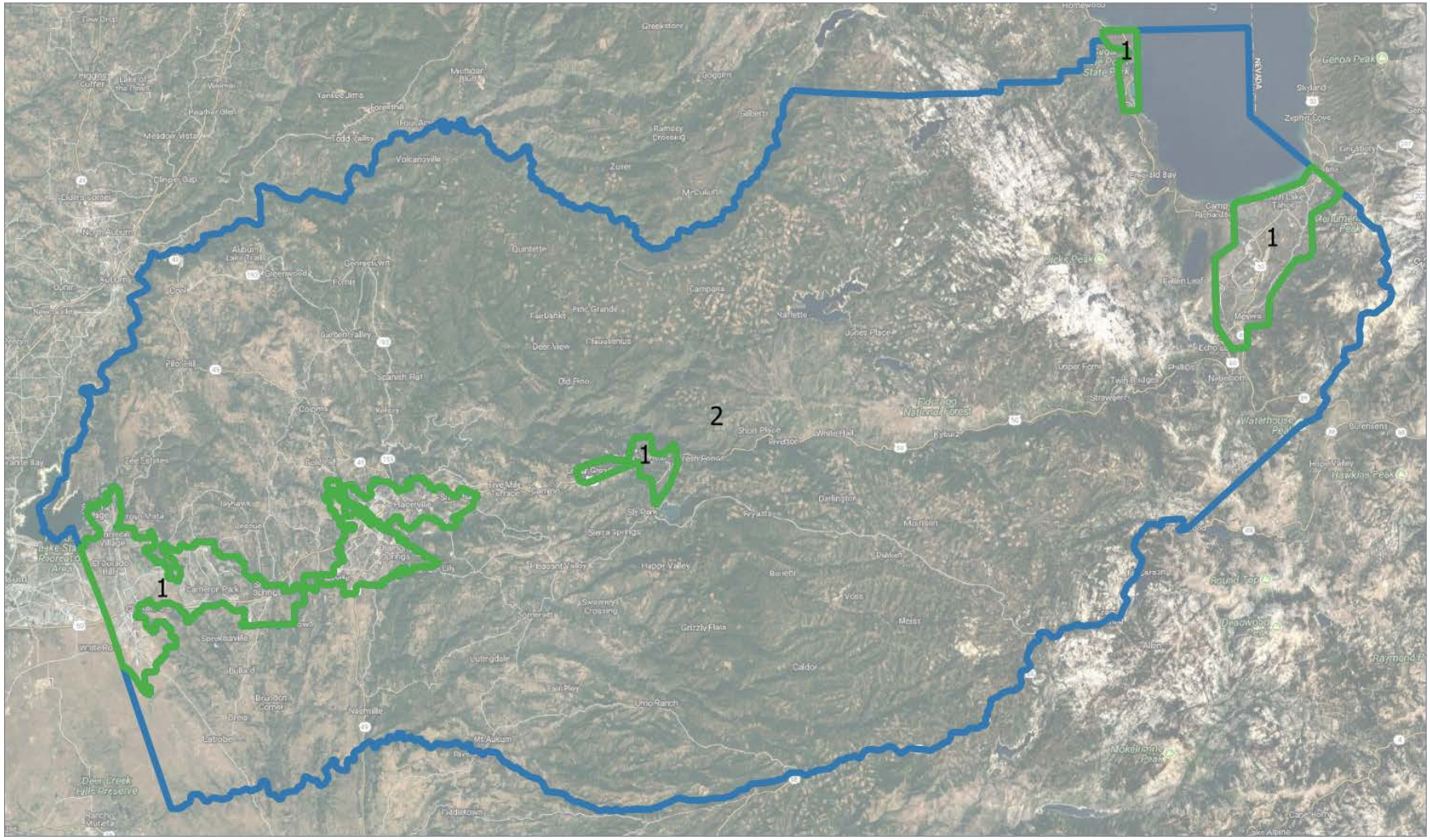
Capital Costs Increase with Greater Task Rate Percentages. Capital costs will increase when the market share or take rate percentage increases. Capital cost expenditures occur to "pass" each parcel with fiber and then occur again when the home or business takes services or the fiber is "lit." With increased take rate percentages, the additional capital costs to "light" a home or business include building fiber from the street to the building, the electronic that are installed on the outside of the home/business and the splicing, test and turn-up of the services. NEO's team has provided County staff and the Technology Advisory Group projected capital costs based upon various take rate assumptions. For purposes of the financial modeling included within this report, a take rate or market share percentage of 40% was used. For each phase of construction, it was assumed that it would take four years to reach the 40% take rate penetration.

Discussion of Capital Costs. NEO provided a further breakdown of the various communities within Areas 1, the more densely populated areas. For locations within Area 2, NEO's team put together capital costs for the more rural parts of the County and also further identified specific capital costs for locations with Area 2 that have been identified as priority areas by the California Advanced Service Fund (CASF). The CASF provides grant funding to locations within California that have less than 6 Mbps in download speeds and 1 Mbps in upload speeds. The CASF has identified several areas within the County as "priority areas" because the locations have significant population and no broadband service. NEO has projected these areas separately in the event that the County may potentially apply for grant funding for these priority areas.

The label of "Area 1" and "Area 2" does not necessarily refer to the order in which services will be deployed or to construction phases. The areas have been identified this way because the capital costs to serve more densely populated areas of the County differ greatly from the more rural areas within the County. Timing of deployment will be addressed in detail within this report. Below are the projected capital costs for the communities within Area 1, the priority areas located in Area 2, and the rest of the households in Area 2.

Summary	Total Capital Costs
Area 1	$ 131,886,557.47
Area 2, Other	$ 141,683,232.30
Area 2, Priority Areas	$ 11,696,243.70
Businesses	$ 67,826,164.00
Total	**$ 353,092,197.47**

NEO has provided a more detailed look at the capital costs by each community identified in Phase 1 above. Here are the more detailed assumptions and capital cost estimates for the communities using a take rate percentage of 40%.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1

FTTP Estimates, Communities in Area 1		Cameron Park	Diamond Springs	El Dorado Hills	Placerville	Pollock Pines	Shingle Springs	South Lake Tahoe	Tahoma	Totals
Overall	Project Cost	$ 12,702,854	$ 10,803,112	$ 27,550,518	$ 12,114,517	$ 7,379,887	$ 4,857,292	$ 28,570,111	$ 4,125,444	$ 108,103,736
	Cost per HHP	$ 1,669	$ 2,205	$ 1,825	$ 2,634	$ 2,171	$ 2,857	$ 1,898	$ 2,364	
	Cost per HHS	$ 4,173	$ 5,512	$ 4,561	$ 6,584	$ 5,426	$ 7,143	$ 4,746	$ 5,910	
	Cost per MI	$ 122,978	$ 97,696	$ 112,413	$ 88,336	$ 98,948	$ 85,794	$ 108,602	$ 94,820	
Engr. Labor	Project Cost	$ 669,737	$ 543,273	$ 1,430,918	$ 594,752	$ 371,512	$ 234,883	$ 1,473,980	$ 203,968	$ 5,523,022
Aerial Labor	Project Cost	$ 1,041,321	$ 1,114,584	$ 2,470,329	$ 1,382,337	$ 751,840	$ 570,837	$ 2,651,726	$ 438,647	$ 10,421,620
UG Labor	Project Cost	$ 3,499,289	$ 3,672,168	$ 8,235,588	$ 4,520,474	$ 2,478,914	$ 1,861,497	$ 8,813,139	$ 1,441,091	$ 34,522,160
Tech Services Labor	Project Cost	$ 908,822	$ 588,031	$ 1,802,119	$ 553,079	$ 408,126	$ 206,636	$ 1,796,723	$ 211,650	$ 6,475,185
Customer Premise Labor and Install Materials including Splitters	Project Cost	$ 4,032,071	$ 2,595,462	$ 7,998,259	$ 2,436,556	$ 1,800,933	$ 900,466	$ 7,973,017	$ 926,897	$ 28,663,661
OSP Materials	Project Cost	$ 2,300,877	$ 2,115,939	$ 5,124,455	$ 2,458,980	$ 1,436,105	$ 1,002,346	$ 5,372,676	$ 822,565	$ 20,633,944
Electronics	Project Cost	$ 250,738	$ 173,656	$ 488,851	$ 168,340	$ 132,457	$ 80,626	$ 488,851	$ 80,626	$ 1,864,144
Total Project Capital Costs Before Contingencies		$ 12,702,854	$ 10,803,112	$ 27,550,518	$ 12,114,517	$ 7,379,887	$ 4,857,292	$ 28,570,111	$ 4,125,444	$ 108,103,736
Administrative and Project Management (2%)		$ 254,057	$ 216,062	$ 551,010	$ 242,290	$ 147,598	$ 97,146	$ 571,402	$ 82,509	$ 2,162,075
Contingency (20%)		$ 2,540,571	$ 2,160,622	$ 5,510,104	$ 2,422,903	$ 1,475,977	$ 971,458	$ 5,714,022	$ 825,089	$ 21,620,747
Total Capital Costs		$ 15,497,482	$ 13,179,797	$ 33,611,632	$ 14,779,711	$ 9,003,462	$ 5,925,896	$ 34,855,536	$ 5,033,042	$ 131,886,557

A substantial part of this build is the backbone routes through the County. The capital costs shown above for FTTP include the backbone routes within the County.

The capital costs of building FTTP for Area 2, which includes the homes and businesses in less dense areas of the county, is shown below. The priority areas per the CASF within Area 2 are also shown.

FTTP Estimates, Area 2, Rural			Area 2 - Revised, without Priority Areas
Overall	Project Cost		$ 116,133,797
	Cost per HHP		$ 3,536
	Cost per HHS		$ 8,839
	Cost per MI		$ 64,269
Engr. Labor	Project Cost		$ 7,735,642
Aerial Labor	Project Cost		$ 20,507,420
UG Labor	Project Cost		$ 39,280,079
Tech Services Labor	Project Cost		$ 3,918,325
Customer Premise Labor and Install Materials including Splitters	Project Cost		$ 17,196,590
OSP Materials	Project Cost		$ 26,409,948
Electronics	Project Cost		$ 1,085,793
Total Project Capital Costs Before Contingencies			$ 116,133,797
Administrative and Project Management (2%)			$ 2,322,676
Contingency (20%)			$ 23,226,759
Total Capital Costs			$ 141,683,232

FTTP Estimates, Priority Areas in Area 2		Chrome Ridge	Coloma	Cool	Garden Valley	Georgetown	Greenwood	Latrobe	Pilot Hill	Pleasant Valley	Rescue	Totals
Overall	**Project Cost**	**$ 120,352**	**$ 334,535**	**$ 1,520,823**	**$ 1,055,543**	**$ 4,370,329**	**$ 320,827**	**$ 158,904**	**$ 267,989**	**$ 526,242**	**$ 911,541**	**$ 9,587,085**
	Cost per HHP	$ 4,814	$ 7,434	$ 2,880	$ 3,095	$ 4,735	$ 6,548	$ 13,242	$ 5,826	$ 3,556	$ 2,319	
	Cost per HHS	$ 12,035	$ 18,585	$ 7,201	$ 7,739	$ 11,837	$ 16,369	$ 33,105	$ 14,565	$ 8,889	$ 5,799	
	Cost per MI	$ 256,069	$ 86,892	$ 89,041	$ 88,850	$ 73,070	$ 89,617	$ 122,233	$ 98,526	$ 91,680	$ 104,176	
Engr. Labor	**Project Cost**	$ 2,532	$ 12,195	$ 71,670	$ 48,446	$ 201,434	$ 11,723	$ 3,947	$ 9,376	$ 22,511	$ 43,270	**$ 427,104**
Aerial Labor	**Project Cost**	$ 4,863	$ 38,811	$ 172,309	$ 119,827	$ 602,897	$ 36,150	$ 13,212	$ 27,526	$ 57,987	$ 88,357	**$ 1,161,939**
UG Labor	**Project Cost**	$ 16,255	$ 125,463	$ 562,327	$ 390,799	$ 1,946,595	$ 116,896	$ 42,468	$ 89,026	$ 188,486	$ 291,054	**$ 3,769,369**
Tech Services Labor	**Project Cost**	$ 8,001	$ 10,159	$ 67,341	$ 44,806	$ 112,704	$ 10,465	$ 6,692	$ 10,236	$ 21,182	$ 50,355	**$ 341,941**
Customer Premise Labor and Install Materials including Splitters	**Project Cost**	$ 15,796	$ 26,431	$ 280,744	$ 182,735	$ 491,323	$ 27,701	$ 9,248	$ 26,471	$ 80,644	$ 210,527	**$ 1,351,620**
OSP Materials	**Project Cost**	$ 36,136	$ 84,707	$ 321,689	$ 226,845	$ 956,014	$ 81,123	$ 46,566	$ 68,586	$ 117,334	$ 185,892	**$ 2,124,892**
Electronics	**Project Cost**	$ 36,769	$ 36,769	$ 44,743	$ 42,085	$ 59,362	$ 36,769	$ 36,769	$ 36,769	$ 38,098	$ 42,085	**$ 410,218**
Total Project Capital Costs Before Contingencies		**$ 120,352**	**$ 334,535**	**$ 1,520,823**	**$ 1,055,543**	**$ 4,370,329**	**$ 320,827**	**$ 158,904**	**$ 267,989**	**$ 526,242**	**$ 911,541**	**$ 9,587,085**
Administrative and Project Management (2%)		$ 2,407	$ 6,691	$ 30,416	$ 21,111	$ 87,407	$ 6,417	$ 3,178	$ 5,360	$ 10,525	$ 18,231	**$ 191,742**
Contingency (20%)		$ 24,070	$ 66,907	$ 304,165	$ 211,109	$ 874,066	$ 64,165	$ 31,781	$ 53,598	$ 105,248	$ 182,308	**$ 1,917,417**
Total Capital Costs		**$ 146,829**	**$ 408,133**	**$ 1,855,404**	**$ 1,287,762**	**$ 5,331,801**	**$ 391,409**	**$ 193,863**	**$ 326,947**	**$ 642,015**	**$1,112,080**	**$ 11,696,244**

The total capital costs for the businesses within the County is projected at $67.826 Million. This brings the total projected capital costs to approximately $353 Million.

Direction from the County has been to investigate potential public-private partnership models with service providers such that the County does not need to become an Internet Service Provider. If a public-private partnership can be reached, the County may share in the capital costs of the FTTP build. For example, the County might build and own the fiber network, paying for the Engineering Labor, Aerial Labor, Underground Labor (UG), the Outside Plant Materials (OSP), and the Technical Services Labor. The private provider might pay for the Customer Premise Labor and Installation and the Electronics. A revenue share would be paid to the County to cover debt for the fiber.

The capital costs were developed using the following assumptions.

Aerial construction percentage: 70%
Underground construction percentage: 30%
Take rate percentage: 40% (spread over four years)
Make ready costs per mile, in labor only: $30,518.40
Strand/Lash for aerial construction

For underground construction:
Missile boring percentage: 2%
Directional boring percentage: 92%
Plow percentage: 5%
Rock adder percentage: 10%
Cut and restore percentage: 2%

The per unit and per foot construction cost assumptions for underground and aerial construction has been provided to County staff and the Technical Advisory Group for each design.

For the purposes of the financial models and projected proformas, NEO added a 20% contingency fee to the capital costs as well as a 2% administrative and management cost. It was assumed that the build-out of the network would be broken into four (4) phases, with each phase taking one year to build out. Financing the network would therefore be done within four tranches of funding. Amortization tables included the assumption of 4.33% annual interest over 20 years.

What Does "Feasible" Mean?

NEO's team looks at several factors in the financial model to determine whether or not the project is financially feasible. These feasibility objectives are primarily looking at debt risk, whether the model allows for the principal and interest payments to be paid during each year of

the project, and what the debt coverage ratios tell us regarding mitigating debt risk. The financial models are "feasible" when the following feasibility objectives can be met:

1. Debt Service Constant, target of over 200% within five years
2. Coverage ratio of each tranche. Generally, the next phase of a fiber project can be funded once the previous phase reaches a coverage ratio of 125%.
3. Cumulative Net Cashflows from Operations are greater than the Debt within ten years.
4. Positive Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) and
5. Positive Net Income, meaning principal and interest (debt service) can be achieved each year.

Financial Proformas and Results

Retail Model, County as an ISP

We will begin our evaluation of the financial models by first taking a look at the Retail Model or the County as an ISP. With the Retail Model, revenues are not shared; the County would receive 100% of the revenues.

NEO assumed 15% of the homes and businesses that were passed with fiber would sign up for services in the first year. An additional 15% would sign up during the second year and an additional 5% would sign up in Year 3 and in Year 4. We conservatively assumed no additional customers were added after Year 4.

Take Rate or Market Share Assumptions	%
Take rate after year 1	15%
Additional Take Rate, Year 2	15%
Additional Take Rate, Year 3	5%
Additional Take Rate, Year 4	5%
Additional Take Rate, Year 5	0%
Additional Take Rate, Year 6	0%

For pricing, we assumed $80 per month for residential and small business Gigabit services and $30 per month for voice services. We assumed 10% of the customers that have signed up for service would subscribe to voice services.

Residential Services	Pricing	% of Customers Taking Service
1 Gbps/1 Gbps	$ 80.00	100%
Residential Voice	$ 30.00	10%
Managed WiFi	$ 4.95	10%
Worry Free WiFi	$ 9.95	5%
Static IP	$ 9.95	1%
Wireless Booster/AP	$ 9.95	5%

NEO used a pricing model for large businesses that would be similar to Longmont, Colorado's pricing for business services.

Large Business Services	Pricing	% of Customers Taking Service
100/20 Mbps	$ 80.00	82%
Add Symmetrical Upstream (100 Mbps)	$ 10.00	5%
Voice services	$ 30.00	10%
500/250 Mbps	$ 300.00	10%
Add Symmetrical Upstream (500 Mbps)	$ 60.00	15%
1000/500 Mbps	$ 799.95	6%
Add Symmetrical Upstream (1000 Mbps)	$ 200.00	20%
Add BGP Routing	$ 100.00	10%

For a list of operating expense assumptions, please refer to Appendix A.

The initial modeling appears that this is not financially feasible without an additional revenue source. This may explain why the existing service providers or the private companies have not built out Fiber to the Premises within the County of El Dorado. It is not financially viable without a supplemental funding through a grant or an additional revenue source such as a property tax assessment or a monthly utility fee.

NEO ran three variations of the Retail financial model with the following assumptions:

1. Retail Model without an Additional Revenue Source
2. Retail Model with a $300 Annual Property Tax Assessment
3. Retail Model with a $150 Annual Property Tax Assessment

In the first model - Retail Model without an additional revenue source, the County has positive EBITDA in Year 2; however, the County does not have enough cashflow from operations to

cover the interest and principal payments under Year 5. There is a loss projected in Year 7 because equipment may need to be refreshed every five to ten years.

Retail Model without an Additional Revenue Source, Proforma Profit and Loss Statement

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues										
Service Revenues										
Residential, Phase 1	$ 2,457,300	$ 6,389,000	$ 8,682,200	$ 9,993,100	$ 10,484,400	$ 10,484,500	$ 10,484,500	$ 10,484,500	$ 10,484,500	$ 10,484,500
Residential, Phase 2	$ -	$ 2,295,700	$ 5,968,600	$ 8,111,000	$ 9,335,200	$ 9,794,200	$ 9,794,200	$ 9,794,200	$ 9,794,200	$ 9,794,200
Residential, Phase 3	$ -	$ -	$ 1,109,300	$ 2,884,300	$ 3,919,600	$ 4,733,100	$ 5,324,700	$ 5,916,400	$ 6,508,100	$ 7,099,700
Residential, Phase 4	$ -	$ -	$ -	$ 2,651,400	$ 6,893,900	$ 9,898,600	$ 11,312,700	$ 12,727,100	$ 14,141,100	$ 15,555,100
Tap Fee or Installation Fee - Residential (one time)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tap Fee or Installation Fee - Business (one time)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Per premise passed fee	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenues from Operations	**$ 3,457,400**	**$ 10,952,200**	**$ 18,427,300**	**$ 26,640,700**	**$ 33,834,300**	**$ 38,111,400**	**$ 40,117,100**	**$ 42,123,200**	**$ 44,128,900**	**$ 46,134,500**
Revenue Inflation	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenues from Operations	**$ 3,457,400**	**$ 10,952,200**	**$ 18,427,300**	**$ 26,640,700**	**$ 33,834,300**	**$ 38,111,400**	**$ 40,117,100**	**$ 42,123,200**	**$ 44,128,900**	**$ 46,134,500**
Expenses										
Internet Access	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000
Additional Internet Access Costs per Customer	$ 54,386	$ 149,556	$ 229,451	$ 333,187	$ 404,806	$ 428,518	$ 452,229	$ 475,941	$ 499,652	$ 523,363
Annual Growth/Reduction of Internet Access	$ -	$ (20,956)	$ (28,945)	$ (39,319)	$ (46,481)	$ (48,852)	$ (51,223)	$ (53,594)	$ (55,965)	$ (58,336)
Software Maintenance	$ 27,193	$ 74,778	$ 114,726	$ 166,594	$ 202,403	$ 214,259	$ 226,115	$ 237,970	$ 249,826	$ 261,682
Utilities, Power & Environmental	$ 12,000	$ 24,000	$ 36,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000
Salaries, Technicians	$ 1,333,735	$ 2,399,711	$ 2,498,241	$ 3,439,712	$ 3,172,690	$ 2,566,585	$ 2,625,863	$ 2,685,142	$ 2,744,420	$ 2,803,699
Salaries, Managerial Staff	$ 480,000	$ 600,000	$ 600,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000
Payroll Taxes and Benefits	$ 471,571	$ 779,925	$ 805,543	$ 1,081,525	$ 1,012,099	$ 854,512	$ 869,925	$ 885,337	$ 900,749	$ 916,162
Health and Dental Insurance	$ 650,150	$ 1,109,892	$ 1,146,840	$ 1,559,892	$ 1,459,759	$ 1,232,469	$ 1,254,699	$ 1,276,928	$ 1,299,158	$ 1,321,387
Equipment Refresh, CPE	$ -	$ -	$ -	$ -	$ -	$ -	$ 16,958,597	$ -	$ -	$ -
Sales Churn, percent of Total Revenue	$ 69,148	$ 219,044	$ 368,546	$ 532,814	$ 676,686	$ 762,228	$ 802,342	$ 842,464	$ 882,578	$ 922,690
Marketing and Sales, percent of Total Revenue	$ 172,870	$ 547,610	$ 921,365	$ 1,332,035	$ 1,691,715	$ 1,905,570	$ 2,005,855	$ 2,106,160	$ 2,206,445	$ 2,306,725
Residential Customer Care, Operations	$ 22,661	$ 44,224	$ 59,422	$ 96,615	$ 120,425	$ 130,305	$ 140,185	$ 150,065	$ 159,944	$ 169,824
Business Customer Care, Operations	$ -	$ 18,092	$ 36,183	$ 42,214	$ 48,244	$ 48,244	$ 48,244	$ 48,244	$ 48,244	$ 48,244
Total Expenses	$ 3,843,729	$ 6,855,753	$ 7,884,691	$ 10,608,402	$ 10,872,410	$ 10,264,356	$ 27,522,317	$ 10,863,113	$ 11,162,477	$ 11,461,834
EBITDA	$ (386,329)	$ 4,096,447	$ 10,542,609	$ 16,032,298	$ 22,961,890	$ 27,847,044	$ 12,594,783	$ 31,260,087	$ 32,966,423	$ 34,672,666
	2019	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Expense	$ 4,618,917	$ 8,969,618	$ 10,804,596	$ 15,288,325	$ 15,000,383	$ 14,699,723	$ 14,385,783	$ 14,057,976	$ 13,715,690	$ 13,358,286
Principal Payments	$ 1,786,775	$ 3,579,245	$ 4,508,337	$ 6,518,980	$ 6,806,922	$ 7,107,582	$ 7,421,522	$ 7,749,328	$ 8,091,614	$ 8,449,019
Net Income	**$ (6,792,021)**	**$ (8,452,416)**	**$ (4,770,324)**	**$ (5,775,007)**	**$ 1,154,585**	**$ 6,039,739**	**$ (9,212,522)**	**$ 9,452,783**	**$ 11,159,118**	**$ 12,865,361**

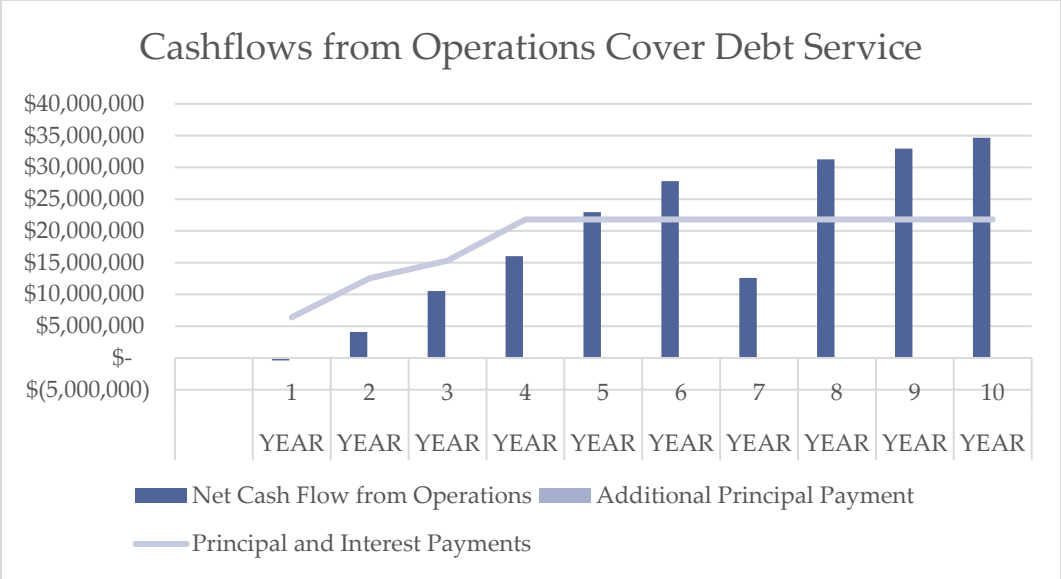
Looking at Financial Feasibility Objectives

As discussed, covering debt is one of the most important financial risks that needs to be examined in detail before embarking upon a Fiber to the Premise strategy.

The first feasibility objective is the debt coverage ratio on each tranche of funding. This ratio provides an indication of whether or not the project can be financed.

Coverage Ratio of each Tranch						
	2019	2020	2021	2022	2023	2024
	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR
	1	2	3	4	5	6
OPERATIONS						
Net Cash Flow from Operations	$ (386,329)	$ 4,096,447	$ 10,542,609	$ 16,032,298	$ 22,961,890	$ 27,847,044
Debt Service	$ -	$ -	$ -	$ -	$ -	$ -
Interest, Phase 1	$ 4,618,917	$ 4,539,996	$ 4,457,588	$ 4,371,541	$ 4,281,693	$ 4,187,877
Principal, Phase 1	$ 1,786,775	$ 1,865,697	$ 1,948,104	$ 2,034,151	$ 2,123,999	$ 2,217,816
Total Principal and Interest for Phase 1	$ 6,405,692	$ 6,405,692	$ 6,405,692	$ 6,405,692	$ 6,405,692	$ 6,405,692
Coverage Ratio	**-6%**	**64%**	**165%**	**250%**	**358%**	**435%**
Interest, Phase 2	$ -	$ 4,429,623	$ 4,353,936	$ 4,274,905	$ 4,192,385	$ 4,106,219
Principal, Phase 2	$ -	$ 1,713,549	$ 1,789,236	$ 1,868,266	$ 1,950,787	$ 2,036,952
Total Principal and Interest for Phase 2	$ -	$ 6,143,171	$ 6,143,171	$ 6,143,171	$ 6,143,171	$ 6,143,171
Coverage Ratio		**33%**	**84%**	**128%**	**183%**	**222%**
Interest, Phase 3	$ -	$ -	$ 1,993,072	$ 1,959,018	$ 1,923,459	$ 1,886,329
Principal, Phase 3	$ -	$ -	$ 770,997	$ 805,052	$ 840,611	$ 877,740
Total Principal and Interest for Phase 3	$ -	$ -	$ 2,764,070	$ 2,764,070	$ 2,764,070	$ 2,764,070
Coverage Ratio			**69%**	**105%**	**150%**	**182%**
Interest, Phase 4	$ -	$ -	$ -	$ 4,682,861	$ 4,602,847	$ 4,519,298
Principal, Phase 4	$ -	$ -	$ -	$ 1,811,511	$ 1,891,525	$ 1,975,073
Total Principal and Interest for Phase 4	$ -	$ -	$ -	$ 6,494,371	$ 6,494,371	$ 6,494,371
Coverage Ratio				**74%**	**105%**	**128%**

Generally, additional tranches of funding may be obtained when the debt coverage ratio of 125% is achieved. As the above chart indicates, if the targeted coverage ratio needed is 125%, the project would not be able to achieve funding each year, but would need to build out each phase in three years. This means that it would take up to twelve years to fully construct the network.



According to the model, cashflows from operations do not cover debt service consistently until Year 8. Additional principal payments cannot be made until after Year 10.

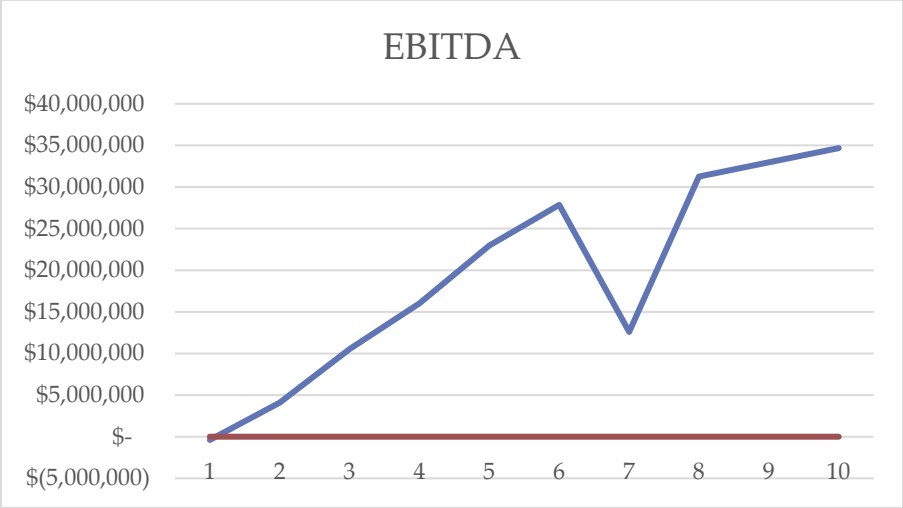
The forecast below shows capital expenditures for each year for four years, representing the four tranches of funding for the network build out.

After ten years, the cumulative cash flows are forecasted at over $192.5 Million; while the outstanding debt in year ten is still substantially greater at over $304 Million.

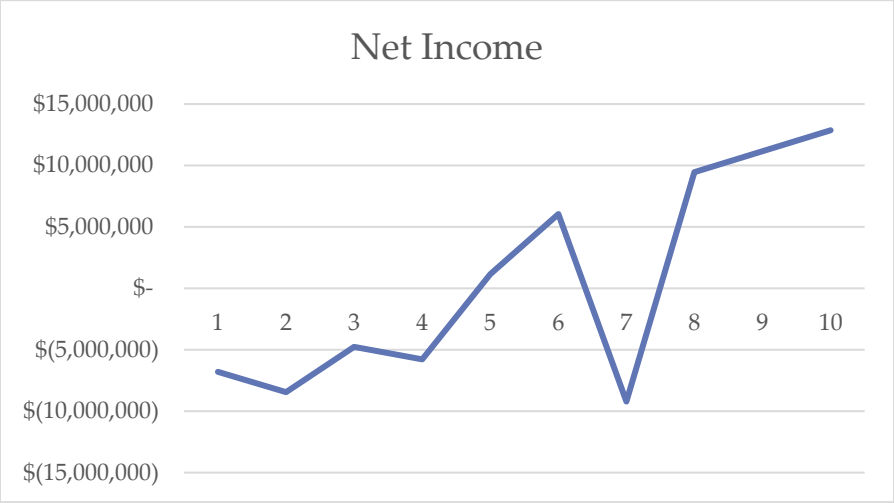
Cumulative cash flows over 10 years greater than the debt service											
		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
OPERATIONS											
Net Cash Flow from Operations		$ (386,329)	$ 4,096,447	$ 10,542,609	$ 16,032,298	$ 22,961,890	$ 27,847,044	$ 12,594,783	$ 31,260,087	$ 32,966,423	$ 34,672,666
Cumulative Cash Flow from Operations		$ (386,329)	$ 3,710,119	$ 14,252,728	$ 30,285,026	$ 53,246,915	$ 81,093,959	$ 93,688,742	$ 124,948,829	$ 157,915,252	$ 192,587,918
CAPITAL EXPENDITURES											
Capital Expenditures		$ 107,485,000	$ 103,330,000	$ 46,380,000	$ 108,973,000	$ -	$ -	$ -	$ -	$ -	$ -
EQUITY	100%	$ 107,485,000	$ 103,330,000	$ 46,380,000	$ 108,973,000	$ -	$ -	$ -	$ -	$ -	$ -
Debt Service											
Required Draws		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Principal Payments		$ 1,786,775	$ 3,579,245	$ 4,508,337	$ 6,518,980	$ 6,806,922	$ 7,107,582	$ 7,421,522	$ 7,749,328	$ 8,091,614	$ 8,449,019
Total Outstanding Debt		$ 105,698,225	$ 205,448,979	$ 247,320,643	$ 349,774,663	$ 342,967,741	$ 335,860,159	$ 328,438,638	$ 320,689,309	$ 312,597,695	$ 304,148,676
Interest		$ 4,618,917	$ 8,969,618	$ 10,804,596	$ 15,288,325	$ 15,000,383	$ 14,699,723	$ 14,385,783	$ 14,057,976	$ 13,715,690	$ 13,358,286

A cash reserve for equipment refreshes could be considered as well. Typically, Customer Premise Equipment is refreshed every 5-7 years after the first build-out and every five years after that. A network refresh for equipment is shown under year 7 above. This is why the net cash flow from operations dips in year 7.

EBITDA (Earnings before Interest, Taxes, Depreciation and Amortization) is forecasted to be close to $34 Million after the network is built. Again, the dip in earnings in year 7 show the equipment refresh.



However, there is not sufficient cashflow from operations to cover principal and interest payments.



Positive EBITDA?						
		2019	2020	2021	2022	2023
		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
EBITDA		$ (386,329)	$ 4,096,447	$ 10,542,609	$ 16,032,298	$ 22,961,890
Less Interest Expense		$ 4,618,917	$ 8,969,618	$ 10,804,596	$ 15,288,325	$ 15,000,383
Less Principal Payment		$ 1,786,775	$ 3,579,245	$ 4,508,337	$ 6,518,980	$ 6,806,922
Earnings after Interest and Principal Payments		$ (6,792,021)	$ (8,452,416)	$ (4,770,324)	$ (5,775,007)	$ 1,154,585

It is concluded, therefore, that the Retail Model with the County as the ISP is not financially feasible without supplemental funding (i.e. a grant) or an additional revenue source such as a property tax assessment or an additional monthly utility fee. NEO therefore modeled the Retail Model with a $300 and a $150 annual property tax assessment.

Retail Model (County as an ISP) without a $300 Annual Property Tax Assessment, Proforma Profit and Loss Statement

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues										
Residential, Phase 1	$ 2,457,300	$ 6,389,000	$ 8,682,200	$ 9,993,100	$ 10,484,400	$ 10,484,500	$ 10,484,500	$ 10,484,500	$ 10,484,500	$ 10,484,500
Residential, Phase 2	$ -	$ 2,295,700	$ 5,968,600	$ 8,111,000	$ 9,335,200	$ 9,794,200	$ 9,794,200	$ 9,794,200	$ 9,794,200	$ 9,794,200
Residential, Phase 3	$ -	$ -	$ 1,109,300	$ 2,884,300	$ 3,919,600	$ 4,733,100	$ 5,324,700	$ 5,916,400	$ 6,508,100	$ 7,099,700
Residential, Phase 4	$ -	$ -	$ -	$ 2,651,400	$ 6,893,900	$ 9,898,600	$ 11,312,700	$ 12,727,100	$ 14,141,100	$ 15,555,100
Total Revenues from Operations	**$ 3,457,400**	**$ 10,952,200**	**$ 18,427,300**	**$ 26,640,700**	**$ 33,834,300**	**$ 38,111,400**	**$ 40,117,100**	**$ 42,123,200**	**$ 44,128,900**	**$ 46,134,500**
Revenue Inflation	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenues from Operations	**$ 3,457,400**	**$ 10,952,200**	**$ 18,427,300**	**$ 26,640,700**	**$ 33,834,300**	**$ 38,111,400**	**$ 40,117,100**	**$ 42,123,200**	**$ 44,128,900**	**$ 46,134,500**
Expenses										
Internet Access	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000
Additional Internet Access Costs per Customer	$ 54,386	$ 149,556	$ 229,451	$ 333,187	$ 404,806	$ 428,518	$ 452,229	$ 475,941	$ 499,652	$ 523,363
Annual Growth/Reduction of Internet Access	$ -	$ (20,956)	$ (28,945)	$ (39,319)	$ (46,481)	$ (48,852)	$ (51,223)	$ (53,594)	$ (55,965)	$ (58,336)
Software Maintenance	$ 27,193	$ 74,778	$ 114,726	$ 166,594	$ 202,403	$ 214,259	$ 226,115	$ 237,970	$ 249,826	$ 261,682
Utilities, Power & Environmental	$ 12,000	$ 24,000	$ 36,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000
Salaries, Technicians	$ 1,333,735	$ 2,399,711	$ 2,498,241	$ 3,439,712	$ 3,172,690	$ 2,566,585	$ 2,625,863	$ 2,685,142	$ 2,744,420	$ 2,803,699
Salaries, Managerial Staff	$ 480,000	$ 600,000	$ 600,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000
Payroll Taxes and Benefits	$ 471,571	$ 779,925	$ 805,543	$ 1,081,525	$ 1,012,099	$ 854,512	$ 869,925	$ 885,337	$ 900,749	$ 916,162
Health and Dental Insurance	$ 650,150	$ 1,109,892	$ 1,146,840	$ 1,559,892	$ 1,459,759	$ 1,232,469	$ 1,254,699	$ 1,276,928	$ 1,299,158	$ 1,321,387
Equipment Refresh, CPE	$ -	$ -	$ -	$ -	$ -	$ -	$ 16,958,597	$ -	$ -	$ -
Sales Churn, percent of Total Revenue	$ 69,148	$ 219,044	$ 368,546	$ 532,814	$ 676,686	$ 762,228	$ 802,342	$ 842,464	$ 882,578	$ 922,690
Marketing and Sales, percent of Total Revenue	$ 172,870	$ 547,610	$ 921,365	$ 1,332,035	$ 1,691,715	$ 1,905,570	$ 2,005,855	$ 2,106,160	$ 2,206,445	$ 2,306,725
Residential Customer Care, Operations	$ 22,661	$ 44,224	$ 59,422	$ 96,615	$ 120,425	$ 130,305	$ 140,185	$ 150,065	$ 159,944	$ 169,824
Business Customer Care, Operations	$ -	$ 18,092	$ 36,183	$ 42,214	$ 48,244	$ 48,244	$ 48,244	$ 48,244	$ 48,244	$ 48,244
Total Expenses	$ 3,843,729	$ 6,855,753	$ 7,884,691	$ 10,608,402	$ 10,872,410	$ 10,264,356	$ 27,522,317	$ 10,863,113	$ 11,162,477	$ 11,461,834
EBITDA	$ (386,329)	$ 4,096,447	$ 10,542,609	$ 16,032,298	$ 22,961,890	$ 27,847,044	$ 12,594,783	$ 31,260,087	$ 32,966,423	$ 34,672,666
	2019	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Expense	$ 4,618,917	$ 8,969,618	$ 10,804,596	$ 15,288,325	$ 15,000,383	$ 14,699,723	$ 14,385,783	$ 14,057,976	$ 13,715,690	$ 13,358,286
Principal Payments	$ 1,786,775	$ 3,579,245	$ 4,508,337	$ 6,518,980	$ 6,806,922	$ 7,107,582	$ 7,421,522	$ 7,749,328	$ 8,091,614	$ 8,449,019
Net Income	**$ (6,792,021)**	**$ (8,452,416)**	**$ (4,770,324)**	**$ (5,775,007)**	**$ 1,154,585**	**$ 6,039,739**	**$ (9,212,522)**	**$ 9,452,783**	**$ 11,159,118**	**$ 12,865,361**
Property Assessment Fees										
Annual Property Tax Assessment, Residential	$ 26,838,900	$ 26,838,900	$ 26,838,900	$ 26,838,900	$ 26,838,900	$ 26,838,900	$ 26,838,900	$ 26,838,900	$ 26,838,900	$ 26,838,900
Annual Property Tax Assessment, Commercial	$ 3,294,300	$ 3,294,300	$ 3,294,300	$ 3,294,300	$ 3,294,300	$ 3,294,300	$ 3,294,300	$ 3,294,300	$ 3,294,300	$ 3,294,300
Total Property Tax Assessment Fees	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**
Net Income after Property Tax Assessment	**$ 23,341,179**	**$ 21,680,784**	**$ 25,362,876**	**$ 24,358,193**	**$ 31,287,785**	**$ 36,172,939**	**$ 20,920,678**	**$ 39,585,983**	**$ 41,292,318**	**$ 42,998,561**

Looking at Financial Feasibility Objectives

As discussed, covering debt is one of the most important financial risks that needs to be examined in detail before embarking upon a Fiber to the Premise strategy. The first feasibility objective is the debt coverage ratio on each tranche of funding. This ratio provides an indication of whether or not the project can be financed; again, targeting a coverage ratio of over 125% for each tranche.

Coverage Ratio of each Tranch						
	2019	2020	2021	2022	2023	2024
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
OPERATIONS						
Net Cash Flow from Operations + Property Tax Assessment	$ 29,746,871	$ 34,229,647	$ 40,675,809	$ 46,165,498	$ 53,095,090	$ 57,980,244
Debt Service	$ -	$ -	$ -	$ -	$ -	$ -
Interest, Phase 1	$ 4,618,917	$ 4,539,996	$ 4,457,588	$ 4,371,541	$ 4,281,693	$ 4,187,877
Principal, Phase 1	$ 1,786,775	$ 1,865,697	$ 1,948,104	$ 2,034,151	$ 2,123,999	$ 2,217,816
Total Principal and Interest for Phase 1	$ 6,405,692	$ 6,405,692	$ 6,405,692	$ 6,405,692	$ 6,405,692	$ 6,405,692
Coverage Ratio	**464%**	**534%**	**635%**	**721%**	**829%**	**905%**
Interest, Phase 2	$ -	$ 4,429,623	$ 4,353,936	$ 4,274,905	$ 4,192,385	$ 4,106,219
Principal, Phase 2	$ -	$ 1,713,549	$ 1,789,236	$ 1,868,266	$ 1,950,787	$ 2,036,952
Total Principal and Interest for Phase 2	$ -	$ 6,143,171	$ 6,143,171	$ 6,143,171	$ 6,143,171	$ 6,143,171
Coverage Ratio		**273%**	**324%**	**368%**	**423%**	**462%**
Interest, Phase 3	$ -	$ -	$ 1,993,072	$ 1,959,018	$ 1,923,459	$ 1,886,329
Principal, Phase 3	$ -	$ -	$ 770,997	$ 805,052	$ 840,611	$ 877,740
Total Principal and Interest for Phase 3	$ -	$ -	$ 2,764,070	$ 2,764,070	$ 2,764,070	$ 2,764,070
Coverage Ratio			**266%**	**301%**	**347%**	**379%**
Interest, Phase 4	$ -	$ -	$ -	$ 4,682,861	$ 4,602,847	$ 4,519,298
Principal, Phase 4	$ -	$ -	$ -	$ 1,811,511	$ 1,891,525	$ 1,975,073
Total Principal and Interest for Phase 4	$ -	$ -	$ -	$ 6,494,371	$ 6,494,371	$ 6,494,371
Coverage Ratio				**212%**	**243%**	**266%**

This financial feasibility objective is met. Each additional phase can be funded and the network could be built out within four years.

According to the model, cashflows from operations and the property tax assessment easily allow for coverage of principal and interest payments.

The forecast below shows capital expenditures for each year for four years, representing the four tranches of funding for the network build out. An additional $20 Million in principal payments can be made each year starting in Year 2.

After ten years, the cumulative cash flows are forecasted at over $493 Million; while the outstanding debt in year ten is $124 Million.

Cumulative cash flows over 10 years greater than the debt service											
		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
OPERATIONS											
Net Cash Flow from Operations + Property Tax Assessment		$ 29,746,871	$ 34,229,647	$ 40,675,809	$ 46,165,498	$ 53,095,090	$ 57,980,244	$ 42,727,983	$ 61,393,287	$ 63,099,623	$ 64,805,866
Cumulative Cash Flow from Operations		$ 29,746,871	$ 63,976,519	$ 104,652,328	$ 150,817,826	$ 203,912,915	$ 261,893,159	$ 304,621,142	$ 366,014,429	$ 429,114,052	$ 493,919,918
CAPITAL EXPENDITURES											
Capital Expenditures		$ 107,485,000	$ 103,330,000	$ 46,380,000	$ 108,973,000	$ -	$ -	$ -	$ -	$ -	$ -
EQUITY	100%	$ 107,485,000	$ 103,330,000	$ 46,380,000	$ 108,973,000	$ -	$ -	$ -	$ -	$ -	$ -
Debt Service											
Required Draws		$ -	$ (20,000,000)	$ (20,000,000)	$ (20,000,000)	$ (20,000,000)	$ (20,000,000)	$ (20,000,000)	$ (20,000,000)	$ (20,000,000)	$ (20,000,000)
Principal Payments		$ 1,786,775	$ 3,579,245	$ 4,508,337	$ 6,518,980	$ 6,806,922	$ 7,107,582	$ 7,421,522	$ 7,749,328	$ 8,091,614	$ 8,449,019
Total Outstanding Debt		$ 105,698,225	$ 185,448,979	$ 207,320,643	$ 289,774,663	$ 262,967,741	$ 235,860,159	$ 208,438,638	$ 180,689,309	$ 152,597,695	$ 124,148,676
Interest		$ 4,618,917	$ 8,969,618	$ 10,804,596	$ 15,288,325	$ 15,000,383	$ 14,699,723	$ 14,385,783	$ 14,057,976	$ 13,715,690	$ 13,358,286

There are enough cash reserves to handle equipment refreshes (see year 7).

Additionally, according to the projected Cash Flow Statement, there is enough cash reserve to make a balloon payment to pay off the debt entirely, with enough cashflows from operations to cover debt, starting in year 8. This means that the annual property tax assessment of $300 could be in effect for 8 – 10 years, depending upon the County meeting all financial objectives and performance assumptions.

Statement of Cash Flows	County of El Dorado, FTTP Retail Model, $80 Residential, $300 Annual Property Tax Assessment									
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Cash	**$ -**	**$ 47,960,096**	**$ 98,610,498**	**$ 154,777,970**	**$ 214,424,488**	**$ 280,712,656**	**$ 351,585,318**	**$ 406,891,780**	**$ 480,535,738**	**$ 555,543,747**
CASH FLOWS FROM OPERATING ACTIVITIES:										
EBITDA	(386,329)	4,096,447	10,542,609	16,032,298	22,961,890	27,847,044	12,594,783	31,260,087	32,966,423	34,672,666
Property Tax Assessments	30,133,200	30,133,200	30,133,200	30,133,200	30,133,200	30,133,200	30,133,200	30,133,200	30,133,200	30,133,200
Net Cash Provided (Used) by Operations	**$ 29,746,871**	**$ 34,229,647**	**$ 40,675,809**	**$ 46,165,498**	**$ 53,095,090**	**$ 57,980,244**	**$ 42,727,983**	**$ 61,393,287**	**$ 63,099,623**	**$ 64,805,866**
CASH FLOWS FROM INVESTING ACTIVITIES:										
Capital Expenditures	107,485,000	103,330,000	46,380,000	108,973,000	-	-	-	-	-	-
Net Cash Used by Investing Activities	**$ 107,485,000**	**$ 103,330,000**	**$ 46,380,000**	**$ 108,973,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
CASH FLOWS FROM FINANCING ACTIVITIES:										
Equity Received from Investing Activities	107,485,000	103,330,000	46,380,000	108,973,000	-	-	-	-	-	-
Notes Payable, Required Draws	-	-	-	-	-	-	-	-	-	-
Principal Payments	(1,786,775)	(3,579,245)	(4,508,337)	(6,518,980)	(6,806,922)	(7,107,582)	(7,421,522)	(7,749,328)	(8,091,614)	(8,449,019)
Additional Principal Payments	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000
Net Cash Provided by Financing Activities	**$ 125,698,225**	**$ 119,750,755**	**$ 61,871,663**	**$ 122,454,020**	**$ 13,193,078**	**$ 12,892,418**	**$ 12,578,478**	**$ 12,250,672**	**$ 11,908,386**	**$ 11,550,981**
Net Increase (Decrease) in Cash	**$ 47,960,096**	**$ 50,650,402**	**$ 56,167,472**	**$ 59,646,518**	**$ 66,288,168**	**$ 70,872,662**	**$ 55,306,461**	**$ 73,643,959**	**$ 75,008,009**	**$ 76,356,847**
Ending Cash	**$ 47,960,096**	**$ 98,610,498**	**$ 154,777,970**	**$ 214,424,488**	**$ 280,712,656**	**$ 351,585,318**	**$ 406,891,780**	**$ 480,535,738**	**$ 555,543,747**	**$ 631,900,594**

The Retail Model also works with an annual property tax assessment of $150 for 15 years.

Retail Model (County as an ISP) without a $150 Annual Property Tax Assessment, Proforma Profit and Loss Statement

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues										
Residential, Phase 1	$ 2,457,300	$ 6,389,000	$ 8,682,200	$ 9,993,100	$ 10,484,400	$ 10,484,500	$ 10,484,500	$ 10,484,500	$ 10,484,500	$ 10,484,500
Residential, Phase 2	$ -	$ 2,295,700	$ 5,968,600	$ 8,111,000	$ 9,335,200	$ 9,794,200	$ 9,794,200	$ 9,794,200	$ 9,794,200	$ 9,794,200
Residential, Phase 3	$ -	$ -	$ 1,109,300	$ 2,884,300	$ 3,919,600	$ 4,733,100	$ 5,324,700	$ 5,916,400	$ 6,508,100	$ 7,099,700
Residential, Phase 4	$ -	$ -	$ -	$ 2,651,400	$ 6,893,900	$ 9,898,600	$ 11,312,700	$ 12,727,100	$ 14,141,100	$ 15,555,100
Total Revenues from Operations	**$ 3,457,400**	**$ 10,952,200**	**$ 18,427,300**	**$ 26,640,700**	**$ 33,834,300**	**$ 38,111,400**	**$ 40,117,100**	**$ 42,123,200**	**$ 44,128,900**	**$ 46,134,500**
Expenses										
Internet Access	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000
Additional Internet Access Costs per Customer	$ 54,386	$ 149,556	$ 229,451	$ 333,187	$ 404,806	$ 428,518	$ 452,229	$ 475,941	$ 499,652	$ 523,363
Annual Growth/Reduction of Internet Access	$ -	$ (20,956)	$ (28,945)	$ (39,319)	$ (46,481)	$ (48,852)	$ (51,223)	$ (53,594)	$ (55,965)	$ (58,336)
Software Maintenance	$ 27,193	$ 74,778	$ 114,726	$ 166,594	$ 202,403	$ 214,259	$ 226,115	$ 237,970	$ 249,826	$ 261,682
Utilities, Power & Environmental	$ 12,000	$ 24,000	$ 36,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000
Salaries, Technicians	$ 1,333,735	$ 2,399,711	$ 2,498,241	$ 3,439,712	$ 3,172,690	$ 2,566,585	$ 2,625,863	$ 2,685,142	$ 2,744,420	$ 2,803,699
Salaries, Managerial Staff	$ 480,000	$ 600,000	$ 600,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000
Payroll Taxes and Benefits	$ 471,571	$ 779,925	$ 805,543	$ 1,081,525	$ 1,012,099	$ 854,512	$ 869,925	$ 885,337	$ 900,749	$ 916,162
Health and Dental Insurance	$ 650,150	$ 1,109,892	$ 1,146,840	$ 1,559,892	$ 1,459,759	$ 1,232,469	$ 1,254,699	$ 1,276,928	$ 1,299,158	$ 1,321,387
Equipment Refresh, CPE	$ -	$ -	$ -	$ -	$ -	$ -	$ 16,958,597	$ -	$ -	$ -
Sales Churn, percent of Total Revenue	$ 69,148	$ 219,044	$ 368,546	$ 532,814	$ 676,686	$ 762,228	$ 802,342	$ 842,464	$ 882,578	$ 922,690
Marketing and Sales, percent of Total Revenue	$ 172,870	$ 547,610	$ 921,365	$ 1,332,035	$ 1,691,715	$ 1,905,570	$ 2,005,855	$ 2,106,160	$ 2,206,445	$ 2,306,725
Residential Customer Care, Operations	$ 22,661	$ 44,224	$ 59,422	$ 96,615	$ 120,425	$ 130,305	$ 140,185	$ 150,065	$ 159,944	$ 169,824
Business Customer Care, Operations	$ -	$ 18,092	$ 36,183	$ 42,214	$ 48,244	$ 48,244	$ 48,244	$ 48,244	$ 48,244	$ 48,244
Total Expenses	$ 3,843,729	$ 6,855,753	$ 7,884,691	$ 10,608,402	$ 10,872,410	$ 10,264,356	$ 27,522,317	$ 10,863,113	$ 11,162,477	$ 11,461,834
EBITDA	$ (386,329)	$ 4,096,447	$ 10,542,609	$ 16,032,298	$ 22,961,890	$ 27,847,044	$ 12,594,783	$ 31,260,087	$ 32,966,423	$ 34,672,666
	2019	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Expense	$ 4,618,917	$ 8,969,618	$ 10,804,596	$ 15,288,325	$ 15,000,383	$ 14,699,723	$ 14,385,783	$ 14,057,976	$ 13,715,690	$ 13,358,286
Principal Payments	$ 1,786,775	$ 3,579,245	$ 4,508,337	$ 6,518,980	$ 6,806,922	$ 7,107,582	$ 7,421,522	$ 7,749,328	$ 8,091,614	$ 8,449,019
Net Income	**$ (6,792,021)**	**$ (8,452,416)**	**$ (4,770,324)**	**$ (5,775,007)**	**$ 1,154,585**	**$ 6,039,739**	**$ (9,212,522)**	**$ 9,452,783**	**$ 11,159,118**	**$ 12,865,361**
Property Assessment Fees										
Annual Property Tax Assessment, Residential	$ 13,419,450	$ 13,419,450	$ 13,419,450	$ 13,419,450	$ 13,419,450	$ 13,419,450	$ 13,419,450	$ 13,419,450	$ 13,419,450	$ 13,419,450
Annual Property Tax Assessment, Commercial	$ 1,647,150	$ 1,647,150	$ 1,647,150	$ 1,647,150	$ 1,647,150	$ 1,647,150	$ 1,647,150	$ 1,647,150	$ 1,647,150	$ 1,647,150
Total Property Tax Assessment Fees	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**
Net Income after Property Tax Assessment	**$ 8,274,579**	**$ 6,614,184**	**$ 10,296,276**	**$ 9,291,593**	**$ 16,221,185**	**$ 21,106,339**	**$ 5,854,078**	**$ 24,519,383**	**$ 26,225,718**	**$ 27,931,961**

Looking at Financial Feasibility Objectives
Each tranche of funding can be reached.

Coverage Ratio of each Tranch						
	2019	2020	2021	2022	2023	2024
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
OPERATIONS						
Net Cash Flow from Operations + Property Tax Assessment	$ 14,680,271	$ 19,163,047	$ 25,609,209	$ 31,098,898	$ 38,028,490	$ 42,913,644
Debt Service	$ -	$ -	$ -	$ -	$ -	$ -
Interest, Phase 1	$ 4,618,917	$ 4,539,996	$ 4,457,588	$ 4,371,541	$ 4,281,693	$ 4,187,877
Principal, Phase 1	$ 1,786,775	$ 1,865,697	$ 1,948,104	$ 2,034,151	$ 2,123,999	$ 2,217,816
Total Principal and Interest for Phase 1	$ 6,405,692	$ 6,405,692	$ 6,405,692	$ 6,405,692	$ 6,405,692	$ 6,405,692
Coverage Ratio	**229%**	**299%**	**400%**	**485%**	**594%**	**670%**
Interest, Phase 2	$ -	$ 4,429,623	$ 4,353,936	$ 4,274,905	$ 4,192,385	$ 4,106,219
Principal, Phase 2	$ -	$ 1,713,549	$ 1,789,236	$ 1,868,266	$ 1,950,787	$ 2,036,952
Total Principal and Interest for Phase 2	$ -	$ 6,143,171	$ 6,143,171	$ 6,143,171	$ 6,143,171	$ 6,143,171
Coverage Ratio		**153%**	**204%**	**248%**	**303%**	**342%**
Interest, Phase 3	$ -	$ -	$ 1,993,072	$ 1,959,018	$ 1,923,459	$ 1,886,329
Principal, Phase 3	$ -	$ -	$ 770,997	$ 805,052	$ 840,611	$ 877,740
Total Principal and Interest for Phase 3	$ -	$ -	$ 2,764,070	$ 2,764,070	$ 2,764,070	$ 2,764,070
Coverage Ratio			**167%**	**203%**	**248%**	**280%**
Interest, Phase 4	$ -	$ -	$ -	$ 4,682,861	$ 4,602,847	$ 4,519,298
Principal, Phase 4	$ -	$ -	$ -	$ 1,811,511	$ 1,891,525	$ 1,975,073
Total Principal and Interest for Phase 4	$ -	$ -	$ -	$ 6,494,371	$ 6,494,371	$ 6,494,371
Coverage Ratio				**143%**	**174%**	**197%**

According to the model, cashflows from operations and the property tax assessment cover debt obligations.

An additional $20 Million in principal payments can be made each year starting in Year 2.

After ten years, the cumulative cash flows are forecasted at over $343 Million; while the outstanding debt in year ten is $124 Million.

Cumulative cash flows over 10 years greater than the debt service											
		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
		YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR
		1	2	3	4	5	6	7	8	9	10
OPERATIONS											
Net Cash Flow from Operations + Property Tax Assessment		$ 14,680,271	$ 19,163,047	$ 25,609,209	$ 31,098,898	$ 38,028,490	$ 42,913,644	$ 27,661,383	$ 46,326,687	$ 48,033,023	$ 49,739,266
Cumulative Cash Flow from Operations		$ 14,680,271	$ 33,843,319	$ 59,452,528	$ 90,551,426	$ 128,579,915	$ 171,493,559	$ 199,154,942	$ 245,481,629	$ 293,514,652	$ 343,253,918
CAPITAL EXPENDITURES											
Capital Expenditures		$ 107,485,000	$ 103,330,000	$ 46,380,000	$ 108,973,000	$ -	$ -	$ -	$ -	$ -	$ -
EQUITY	100%	$ 107,485,000	$ 103,330,000	$ 46,380,000	$ 108,973,000	$ -	$ -	$ -	$ -	$ -	$ -
Debt Service											
Required Draws		$ -	$ (20,000,000)	$ (20,000,000)	$ (20,000,000)	$ (20,000,000)	$ (20,000,000)	$ (20,000,000)	$ (20,000,000)	$ (20,000,000)	$ (20,000,000)
Principal Payments		$ 1,786,775	$ 3,579,245	$ 4,508,337	$ 6,518,980	$ 6,806,922	$ 7,107,582	$ 7,421,522	$ 7,749,328	$ 8,091,614	$ 8,449,019
Total Outstanding Debt		$ 105,698,225	$ 185,448,979	$ 207,320,643	$ 289,774,663	$ 262,967,741	$ 235,860,159	$ 208,438,638	$ 180,689,309	$ 152,597,695	$ 124,148,676
Interest		$ 4,618,917	$ 8,969,618	$ 10,804,596	$ 15,288,325	$ 15,000,383	$ 14,699,723	$ 14,385,783	$ 14,057,976	$ 13,715,690	$ 13,358,286

There are enough cash reserves to handle equipment refreshes (see year 7).

Additionally, according to the projected Cash Flow Statement, there is enough cash reserve to make a balloon payment to pay off the debt entirely, with enough cashflows from operations to cover debt, starting in year 10. This means that the annual property tax assessment of $150 could be in effect for 10-12 years, depending upon the County meeting all financial objectives and performance assumptions.

Statement of Cash Flows	County of El Dorado, FTTP Retail Model, $80 Residential, $150 Annual Property Tax Assessment									
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Cash	**$ -**	**$ 12,893,496**	**$ 48,477,298**	**$ 89,578,170**	**$ 134,158,088**	**$ 185,379,656**	**$ 241,185,718**	**$ 281,425,580**	**$ 340,002,938**	**$ 399,944,347**
CASH FLOWS FROM OPERATING ACTIVITIES:										
EBITDA	(386,329)	4,096,447	10,542,609	16,032,298	22,961,890	27,847,044	12,594,783	31,260,087	32,966,423	34,672,666
Property Tax Assessments	15,066,600	15,066,600	15,066,600	15,066,600	15,066,600	15,066,600	15,066,600	15,066,600	15,066,600	15,066,600
Net Cash Provided (Used) by Operations	**$ 14,680,271**	**$ 19,163,047**	**$ 25,609,209**	**$ 31,098,898**	**$ 38,028,490**	**$ 42,913,644**	**$ 27,661,383**	**$ 46,326,687**	**$ 48,033,023**	**$ 49,739,266**
CASH FLOWS FROM INVESTING ACTIVITIES:										
Capital Expenditures	107,485,000	103,330,000	46,380,000	108,973,000	-	-	-	-	-	-
Net Cash Used by Investing Activities	**$ 107,485,000**	**$ 103,330,000**	**$ 46,380,000**	**$ 108,973,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
CASH FLOWS FROM FINANCING ACTIVITIES:										
Equity Received from Investing Activities	107,485,000	103,330,000	46,380,000	108,973,000	-	-	-	-	-	-
Notes Payable, Required Draws	-	-	-	-	-	-	-	-	-	-
Principal Payments	(1,786,775)	(3,579,245)	(4,508,337)	(6,518,980)	(6,806,922)	(7,107,582)	(7,421,522)	(7,749,328)	(8,091,614)	(8,449,019)
Additional Principal Payments	-	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000
Net Cash Provided by Financing Activities	**$ 105,698,225**	**$ 119,750,755**	**$ 61,871,663**	**$ 122,454,020**	**$ 13,193,078**	**$ 12,892,418**	**$ 12,578,478**	**$ 12,250,672**	**$ 11,908,386**	**$ 11,550,981**
Net Increase (Decrease) in Cash	**$ 12,893,496**	**$ 35,583,802**	**$ 41,100,872**	**$ 44,579,918**	**$ 51,221,568**	**$ 55,806,062**	**$ 40,239,861**	**$ 58,577,359**	**$ 59,941,409**	**$ 61,290,247**
Ending Cash	**$ 12,893,496**	**$ 48,477,298**	**$ 89,578,170**	**$ 134,158,088**	**$ 185,379,656**	**$ 241,185,718**	**$ 281,425,580**	**$ 340,002,938**	**$ 399,944,347**	**$ 461,234,594**

Take-aways on the Retail Model, the County as an ISP

The take rate percentages assumed are conservative. Longmont, Colorado's first neighborhood reached a take rate percentage of 72% of pre-sign ups prior to the build even starting. Longmont's average take rate percentage is currently 56%. The City of Loveland, after two rounds of citizen surveys, is predicting an overall take rate percent of 42%, with a take rate percentage range of 32%-53%. Take rate percentage drives the success of the project. Further research should be done regarding citizens' opinion on the County becoming an Internet service provider.

Additionally, the County's Board of Supervisors, County staff and the Technology Advisory Group have initially stated that the County did not want to become an ISP.

There still are significant financial risks to be considered. The following strategies can mitigate financial risk:

- Begin construction of the network only when a minimum take rate percentage is achieved within each neighborhood or build-out zone. Further final engineering could be completed to verify the capital costs by neighborhood. Implement a pre-sign-up process and begin when take rate risk is mitigated.

Understanding the financial model is important for the County, not only from the viewpoint of whether the City pursued a strategy to own and operate the network, but also, to understand what the implications may be for a potential public-private partnership.

Wholesale or PPP Models

As discussed previously, there are many versions of the Wholesale or Public Private Partnership Models. For starting purposes and for simplicity sake, NEO assumed that the County would pay for the capital costs for all of the fiber construction costs and the service provider would pay for the capital costs for their equipment. The service provider would be responsible for equipment refreshes after 7 years from buildout and every five years after that.

Capital costs with the contingency fee of 20% and the administrative and project management costs of 2% would be reduced from $353 Million to $251 Million with the same 40% take rate assumption.

It was assumed that the service provider or private company would pay a revenue share of $30 per residential subscriber to the County each month and for business services, the following revenue share would be paid to the County.

Large Business Services	Pricing	% of Customers Taking Service
100/20 Mbps	$ 30.00	82%
Add Symmetrical Upstream (100 Mbps)	$ -	5%
Voice services	$ -	10%
500/250 Mbps	$ 50.00	10%
Add Symmetrical Upstream (500 Mbps)	$ -	15%
1000/500 Mbps	$ 80.00	6%
Add Symmetrical Upstream (1000 Mbps)	$ -	20%
Add BGP Routing	$ -	10%

Businesses and residents would still receive the following pricing from the service providers.

Residential Services	Pricing	% of Customers Taking Service
1 Gbps/1 Gbps	$ 80.00	100%
Residential Voice	$ 30.00	10%
Managed WiFi	$ 4.95	10%
Worry Free WiFi	$ 9.95	5%
Static IP	$ 9.95	1%
Wireless Booster/AP	$ 9.95	5%

Large Business Services	Pricing	% of Customers Taking Service
100/20 Mbps	$ 80.00	82%
Add Symmetrical Upstream (100 Mbps)	$ 10.00	5%
Voice services	$ 30.00	10%
500/250 Mbps	$ 300.00	10%
Add Symmetrical Upstream (500 Mbps)	$ 60.00	15%
1000/500 Mbps	$ 799.95	6%
Add Symmetrical Upstream (1000 Mbps)	$ 200.00	20%
Add BGP Routing	$ 100.00	10%

One advantage with the wholesale model over the retail model is that the County would not be responsible for customer care. These costs were reduced significantly with the Wholesale Model as the service provider would be responsible for customer service, billing, and trouble resolution. In most cases, the County would also not be responsible for backhaul or transport costs for Internet Access. Again, for a list of assumptions, please refer to Appendix A.

Again, it was assumed that the network would be built over four years, with four tranches of funding. To mitigate financial risk and to have the most efficient use of capital, NEO recommends spending capital when neighborhoods have a predetermined take rate percentage of pre-sign ups. This ties capital outlay close to when the entity would receive revenue, mitigating debt coverage risk and creating an efficient use of capital.

As in the Retail Model, without an annual property tax assessment, the model is not feasible. NEO modeled both a $300 and $150 annual property tax assessment with the Wholesale Model approach.

Wholesale Model, $300 Property Tax Assessment

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues										
Service Revenues										
Residential, Phase 1	$ 871,400	$ 2,265,800	$ 3,079,200	$ 3,544,000	$ 3,718,400	$ 3,718,400	$ 3,718,400	$ 3,718,400	$ 3,718,400	$ 3,718,400
Residential, Phase 2	$ -	$ 814,000	$ 2,116,800	$ 2,876,500	$ 3,310,800	$ 3,473,600	$ 3,473,600	$ 3,473,600	$ 3,473,600	$ 3,473,600
Residential, Phase 3	$ -	$ -	$ 393,400	$ 1,022,900	$ 1,390,200	$ 1,678,600	$ 1,888,400	$ 2,098,300	$ 2,308,100	$ 2,517,900
Residential, Phase 4	$ -	$ -	$ -	$ 940,300	$ 2,444,900	$ 3,510,600	$ 4,012,100	$ 4,513,600	$ 5,015,200	$ 5,516,700
Total Revenues from Operations	**$ 1,039,200**	**$ 3,460,300**	**$ 6,037,000**	**$ 8,887,300**	**$ 11,401,500**	**$ 12,918,300**	**$ 13,629,600**	**$ 14,341,000**	**$ 15,052,400**	**$ 15,763,700**
Expenses										
Utilities, Power & Environmental	$ 12,000	$ 24,000	$ 36,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000
Salaries, Technicians	$ 1,333,735	$ 2,399,711	$ 2,498,241	$ 3,439,712	$ 3,172,690	$ 2,566,585	$ 2,625,863	$ 2,685,142	$ 2,744,420	$ 2,803,699
Salaries, Managerial Staff	$ 480,000	$ 600,000	$ 600,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000
Payroll Taxes and Benefits	$ 471,571	$ 779,925	$ 805,543	$ 1,081,525	$ 1,012,099	$ 854,512	$ 869,925	$ 885,337	$ 900,749	$ 916,162
Health and Dental Insurance	$ 650,150	$ 1,109,892	$ 1,146,840	$ 1,559,892	$ 1,459,759	$ 1,232,469	$ 1,254,699	$ 1,276,928	$ 1,299,158	$ 1,321,387
Equipment Refresh, CPE	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sales Churn, percent of Total Revenue	$ 20,784	$ 69,206	$ 120,740	$ 177,746	$ 228,030	$ 258,366	$ 272,592	$ 286,820	$ 301,048	$ 315,274
Marketing and Sales, percent of Total Revenue	$ 51,960	$ 173,015	$ 301,850	$ 444,365	$ 570,075	$ 645,915	$ 681,480	$ 717,050	$ 752,620	$ 788,185
Residential Customer Care, Operations	$ 4,532	$ 8,845	$ 11,884	$ 19,323	$ 24,085	$ 26,061	$ 28,037	$ 30,013	$ 31,989	$ 33,965
Business Customer Care, Operations	$ -	$ 3,618	$ 7,237	$ 8,443	$ 9,649	$ 9,649	$ 9,649	$ 9,649	$ 9,649	$ 9,649
Total Expenses	$ 3,487,554	$ 5,926,995	$ 6,406,062	$ 8,498,710	$ 8,244,090	$ 7,361,261	$ 7,509,948	$ 7,658,643	$ 7,807,337	$ 7,956,024
EBITDA	$ (2,448,354)	$ (2,466,695)	$ (369,062)	$ 388,590	$ 3,157,410	$ 5,557,039	$ 6,119,652	$ 6,682,357	$ 7,245,063	$ 7,807,676
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Expense	$ 3,841,971	$ 6,944,098	$ 8,470,589	$ 12,177,348	$ 11,948,170	$ 11,708,871	$ 11,459,001	$ 11,198,095	$ 10,925,664	$ 10,641,201
Principal Payments	$ 1,486,223	$ 2,777,285	$ 3,537,917	$ 5,188,554	$ 5,417,731	$ 5,657,031	$ 5,906,900	$ 6,167,807	$ 6,440,237	$ 6,724,701
Net Income	**$ (7,776,548)**	**$ (12,188,079)**	**$ (12,377,567)**	**$ (16,977,311)**	**$ (14,208,492)**	**$ (11,808,862)**	**$ (11,246,250)**	**$ (10,683,544)**	**$ (10,120,838)**	**$ (9,558,226)**
Property Assessment Fees										
Annual Property Tax Assessment, Residential	$ 26,838,900	$ 26,838,900	$ 26,838,900	$ 26,838,900	$ 26,838,900	$ 26,838,900	$ 26,838,900	$ 26,838,900	$ 26,838,900	$ 26,838,900
Annual Property Tax Assessment, Commercial	$ 3,294,300	$ 3,294,300	$ 3,294,300	$ 3,294,300	$ 3,294,300	$ 3,294,300	$ 3,294,300	$ 3,294,300	$ 3,294,300	$ 3,294,300
Total Property Tax Assessment Fees	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**	**$ 30,133,200**
Net Income after Property Tax Assessment	**$ 22,356,652**	**$ 17,945,121**	**$ 17,755,633**	**$ 13,155,889**	**$ 15,924,708**	**$ 18,324,338**	**$ 18,886,950**	**$ 19,449,656**	**$ 20,012,362**	**$ 20,574,974**

Looking at Financial Feasibility Objectives

As discussed, covering debt is one of the most important financial risks that needs to be examined in detail before embarking upon a Fiber to the Premise strategy. The first feasibility objective is the debt coverage ratio on each tranche of funding. This ratio provides an indication of whether or not the project can be financed; again, targeting a coverage ratio of over 125% for each tranche.

Coverage Ratio of each Tranch						
	2019	2020	2021	2022	2023	2024
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
OPERATIONS						
Net Cash Flow from Operations + Property Tax Assessment	$ 27,657,653	$ 27,575,411	$ 29,604,546	$ 30,286,361	$ 32,988,250	$ 35,347,425
Debt Service	$ -	$ -	$ -	$ -	$ -	$ -
Interest, Phase 1	$ 3,841,971	$ 3,776,325	$ 3,707,780	$ 3,636,206	$ 3,561,472	$ 3,483,436
Principal, Phase 1	$ 1,486,223	$ 1,551,869	$ 1,620,414	$ 1,691,988	$ 1,766,722	$ 1,844,758
Total Principal and Interest for Phase 1	$ 5,328,194	$ 5,328,194	$ 5,328,194	$ 5,328,194	$ 5,328,194	$ 5,328,194
Coverage Ratio	**519%**	**518%**	**556%**	**568%**	**619%**	**663%**
Interest, Phase 2	$ -	$ 3,167,773	$ 3,113,647	$ 3,057,130	$ 2,998,116	$ 2,936,496
Principal, Phase 2	$ -	$ 1,225,417	$ 1,279,543	$ 1,336,060	$ 1,395,074	$ 1,456,694
Total Principal and Interest for Phase 2	$ -	$ 4,393,190	$ 4,393,190	$ 4,393,190	$ 4,393,190	$ 4,393,190
Coverage Ratio		**284%**	**305%**	**312%**	**339%**	**364%**
Interest, Phase 3	$ -	$ -	$ 1,649,162	$ 1,620,984	$ 1,591,560	$ 1,560,838
Principal, Phase 3	$ -	$ -	$ 637,959	$ 666,138	$ 695,561	$ 726,284
Total Principal and Interest for Phase 3	$ -	$ -	$ 2,287,122	$ 2,287,122	$ 2,287,122	$ 2,287,122
Coverage Ratio			**247%**	**252%**	**275%**	**294%**
Interest, Phase 4	$ -	$ -	$ -	$ 3,863,028	$ 3,797,022	$ 3,728,101
Principal, Phase 4	$ -	$ -	$ -	$ 1,494,368	$ 1,560,374	$ 1,629,295
Total Principal and Interest for Phase 4	$ -	$ -	$ -	$ 5,357,396	$ 5,357,396	$ 5,357,396
Coverage Ratio				**174%**	**190%**	**204%**

This financial feasibility objective is met. Each additional phase can be funded and the network could be built out within four years.

According to the model, cashflows from operations and the property tax assessment allow for coverage of principal and interest payments.

The forecast below shows capital expenditures for each year for four years, representing the four tranches of funding for the network build out. An additional $20 Million in principal payments can be made each year starting in Year 2.

After ten years, the cumulative cash flows are forecasted at over $330 Million; while the outstanding debt in year ten is $161 Million.

Cumulative cash flows over 10 years greater than the debt service											
		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
OPERATIONS											
Net Cash Flow from Operations + Property Tax Assessment		$ 27,657,653	$ 27,575,411	$ 29,604,546	$ 30,286,361	$ 32,988,250	$ 35,347,425	$ 35,891,068	$ 36,434,805	$ 36,978,542	$ 37,522,185
Cumulative Cash Flow from Operations		$ 27,657,653	$ 55,233,064	$ 84,837,609	$ 115,123,970	$ 148,112,221	$ 183,459,645	$ 219,350,714	$ 255,785,519	$ 292,764,060	$ 330,286,245
CAPITAL EXPENDITURES											
Capital Expenditures		$ 89,405,000	$ 73,966,000	$ 38,377,000	$ 89,895,000	$ -	$ -	$ -	$ -	$ -	$ -
EQUITY	100%	$ 89,405,000	$ 73,966,000	$ 38,377,000	$ 89,895,000	$ -	$ -	$ -	$ -	$ -	$ -
Debt Service											
Required Draws		$ -	$ (5,000,000)	$ (10,000,000)	$ (5,000,000)	$ (5,000,000)	$ (10,000,000)	$ (10,000,000)	$ (12,000,000)	$ (12,000,000)	$ (12,000,000)
Principal Payments		$ 1,486,223	$ 2,777,285	$ 3,537,917	$ 5,188,554	$ 5,417,731	$ 5,657,031	$ 5,906,900	$ 6,167,807	$ 6,440,237	$ 6,724,701
Total Outstanding Debt		$ 87,918,777	$ 154,107,492	$ 178,946,575	$ 258,653,021	$ 248,235,290	$ 232,578,259	$ 216,671,359	$ 198,503,552	$ 180,063,315	$ 161,338,615
Interest		$ 3,841,971	$ 6,944,098	$ 8,470,589	$ 12,177,348	$ 11,948,170	$ 11,708,871	$ 11,459,001	$ 11,198,095	$ 10,925,664	$ 10,641,201

The service provider would be responsible for equipment refreshes.

Cashflows from operations never cover the debt service without a property tax assessment. However, there is significant cash to pay off the debt, starting in year 8 if the County met all of the other financial assumptions. This concludes that the $300 annual property tax assessment could end after 8-10 year; again, if the County met all of the other financial assumptions in the model.

Statement of Cash Flows	County of El Dorado, $30 Rev Share, $300 Property Tax Assessment									
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Cash	**$ -**	**$ 26,171,430**	**$ 55,969,556**	**$ 92,036,184**	**$ 122,133,992**	**$ 154,704,511**	**$ 194,394,905**	**$ 234,379,073**	**$ 276,646,071**	**$ 319,184,376**
CASH FLOWS FROM OPERATING ACTIVITIES:										
EBITDA	(2,475,547)	(2,557,789)	(528,654)	153,161	2,855,050	5,214,225	5,757,868	6,301,605	6,845,342	7,388,985
Property Tax Assessments	30,133,200	30,133,200	30,133,200	30,133,200	30,133,200	30,133,200	30,133,200	30,133,200	30,133,200	30,133,200
Net Cash Provided (Used) by Operations	**$ 27,657,653**	**$ 27,575,411**	**$ 29,604,546**	**$ 30,286,361**	**$ 32,988,250**	**$ 35,347,425**	**$ 35,891,068**	**$ 36,434,805**	**$ 36,978,542**	**$ 37,522,185**
CASH FLOWS FROM INVESTING ACTIVITIES:										
Capital Expenditures	89,405,000	73,966,000	38,377,000	89,895,000	-	-	-	-	-	-
Net Cash Used by Investing Activities	**$ 89,405,000**	**$ 73,966,000**	**$ 38,377,000**	**$ 89,895,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
CASH FLOWS FROM FINANCING ACTIVITIES:										
Equity Received from Investing Activities	89,405,000	73,966,000	38,377,000	89,895,000	-	-	-	-	-	-
Notes Payable, Required Draws	-	-	-	-	-	-	-	-	-	-
Principal Payments	(1,486,223)	(2,777,285)	(3,537,917)	(5,188,554)	(5,417,731)	(5,657,031)	(5,906,900)	(6,167,807)	(6,440,237)	(6,724,701)
Additional Principal Payments	-	5,000,000	10,000,000	5,000,000	5,000,000	10,000,000	10,000,000	12,000,000	12,000,000	12,000,000
Net Cash Provided by Financing Activities	**$ 87,918,777**	**$ 76,188,715**	**$ 44,839,083**	**$ 89,706,446**	**$ (417,731)**	**$ 4,342,969**	**$ 4,093,100**	**$ 5,832,193**	**$ 5,559,763**	**$ 5,275,299**
Net Increase (Decrease) in Cash	**$ 26,171,430**	**$ 29,798,125**	**$ 36,066,629**	**$ 30,097,807**	**$ 32,570,519**	**$ 39,690,394**	**$ 39,984,168**	**$ 42,266,998**	**$ 42,538,304**	**$ 42,797,484**
Ending Cash	**$ 26,171,430**	**$ 55,969,556**	**$ 92,036,184**	**$ 122,133,992**	**$ 154,704,511**	**$ 194,394,905**	**$ 234,379,073**	**$ 276,646,071**	**$ 319,184,376**	**$ 361,981,860**

The Wholesale Model also works with an annual property tax assessment of $150 for 15 years; however the financial ratios regarding debt services show greater financial risk to the County.

Wholesale Model, $150 Property Tax Assessment

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues										
Service Revenues										
Residential, Phase 1	$ 871,400	$ 2,265,800	$ 3,079,200	$ 3,544,000	$ 3,718,400	$ 3,718,400	$ 3,718,400	$ 3,718,400	$ 3,718,400	$ 3,718,400
Residential, Phase 2	$ -	$ 814,000	$ 2,116,800	$ 2,876,500	$ 3,310,800	$ 3,473,600	$ 3,473,600	$ 3,473,600	$ 3,473,600	$ 3,473,600
Residential, Phase 3	$ -	$ -	$ 393,400	$ 1,022,900	$ 1,390,200	$ 1,678,600	$ 1,888,400	$ 2,098,300	$ 2,308,100	$ 2,517,900
Residential, Phase 4	$ -	$ -	$ -	$ 940,300	$ 2,444,900	$ 3,510,600	$ 4,012,100	$ 4,513,600	$ 5,015,200	$ 5,516,700
Total Revenues from Operations	**$ 1,039,200**	**$ 3,460,300**	**$ 6,037,000**	**$ 8,887,300**	**$ 11,401,500**	**$ 12,918,300**	**$ 13,629,600**	**$ 14,341,000**	**$ 15,052,400**	**$ 15,763,700**
Expenses										
Utilities, Power & Environmental	$ 12,000	$ 24,000	$ 36,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000	$ 48,000
Salaries, Technicians	$ 1,333,735	$ 2,399,711	$ 2,498,241	$ 3,439,712	$ 3,172,690	$ 2,566,585	$ 2,625,863	$ 2,685,142	$ 2,744,420	$ 2,803,699
Salaries, Managerial Staff	$ 480,000	$ 600,000	$ 600,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000	$ 720,000
Payroll Taxes and Benefits	$ 471,571	$ 779,925	$ 805,543	$ 1,081,525	$ 1,012,099	$ 854,512	$ 869,925	$ 885,337	$ 900,749	$ 916,162
Health and Dental Insurance	$ 650,150	$ 1,109,892	$ 1,146,840	$ 1,559,892	$ 1,459,759	$ 1,232,469	$ 1,254,699	$ 1,276,928	$ 1,299,158	$ 1,321,387
Equipment Refresh, CPE	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sales Churn, percent of Total Revenue	$ 20,784	$ 69,206	$ 120,740	$ 177,746	$ 228,030	$ 258,366	$ 272,592	$ 286,820	$ 301,048	$ 315,274
Marketing and Sales, percent of Total Revenue	$ 51,960	$ 173,015	$ 301,850	$ 444,365	$ 570,075	$ 645,915	$ 681,480	$ 717,050	$ 752,620	$ 788,185
Residential Customer Care, Operations	$ 4,532	$ 8,845	$ 11,884	$ 19,323	$ 24,085	$ 26,061	$ 28,037	$ 30,013	$ 31,989	$ 33,965
Business Customer Care, Operations	$ -	$ 3,618	$ 7,237	$ 8,443	$ 9,649	$ 9,649	$ 9,649	$ 9,649	$ 9,649	$ 9,649
Total Expenses	$ 3,487,554	$ 5,926,995	$ 6,406,062	$ 8,498,710	$ 8,244,090	$ 7,361,261	$ 7,509,948	$ 7,658,643	$ 7,807,337	$ 7,956,024
EBITDA	$ (2,448,354)	$ (2,466,695)	$ (369,062)	$ 388,590	$ 3,157,410	$ 5,557,039	$ 6,119,652	$ 6,682,357	$ 7,245,063	$ 7,807,676
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Expense	$ 3,841,971	$ 6,944,098	$ 8,470,589	$ 12,177,348	$ 11,948,170	$ 11,708,871	$ 11,459,001	$ 11,198,095	$ 10,925,664	$ 10,641,201
Principal Payments	$ 1,486,223	$ 2,777,285	$ 3,537,917	$ 5,188,554	$ 5,417,731	$ 5,657,031	$ 5,906,900	$ 6,167,807	$ 6,440,237	$ 6,724,701
Net Income	**$ (7,776,548)**	**$ (12,188,079)**	**$ (12,377,567)**	**$ (16,977,311)**	**$ (14,208,492)**	**$ (11,808,862)**	**$ (11,246,250)**	**$ (10,683,544)**	**$ (10,120,838)**	**$ (9,558,226)**
Property Assessment Fees										
Annual Property Tax Assessment, Residential	$ 13,419,450	$ 13,419,450	$ 13,419,450	$ 13,419,450	$ 13,419,450	$ 13,419,450	$ 13,419,450	$ 13,419,450	$ 13,419,450	$ 13,419,450
Annual Property Tax Assessment, Commercial	$ 1,647,150	$ 1,647,150	$ 1,647,150	$ 1,647,150	$ 1,647,150	$ 1,647,150	$ 1,647,150	$ 1,647,150	$ 1,647,150	$ 1,647,150
Total Property Tax Assessment Fees	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**	**$ 15,066,600**
Net Income after Property Tax Assessment	**$ 7,290,052**	**$ 2,878,521**	**$ 2,689,033**	**$ (1,910,711)**	**$ 858,108**	**$ 3,257,738**	**$ 3,820,350**	**$ 4,383,056**	**$ 4,945,762**	**$ 5,508,374**

Looking at Financial Feasibility Objectives

Each tranche of funding can be reached; however, the third year is tight and the fourth year doesn't meet a coverage ratio over 125% under after its fourth year of operations. It should be concluded by this that the $150 property tax assessment could be raised to reduce the overall risk of the project.

Coverage Ratio of each Tranch						
	2019	2020	2021	2022	2023	2024
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
OPERATIONS						
Net Cash Flow from Operations + Property Tax Assessment	$ 12,618,246	$ 12,599,905	$ 14,697,538	$ 15,455,190	$ 18,224,010	$ 20,623,639
Debt Service	$ -	$ -	$ -	$ -	$ -	$ -
Interest, Phase 1	$ 3,841,971	$ 3,776,325	$ 3,707,780	$ 3,636,206	$ 3,561,472	$ 3,483,436
Principal, Phase 1	$ 1,486,223	$ 1,551,869	$ 1,620,414	$ 1,691,988	$ 1,766,722	$ 1,844,758
Total Principal and Interest for Phase 1	$ 5,328,194	$ 5,328,194	$ 5,328,194	$ 5,328,194	$ 5,328,194	$ 5,328,194
Coverage Ratio	**237%**	**236%**	**276%**	**290%**	**342%**	**387%**
Interest, Phase 2	$ -	$ 3,167,773	$ 3,113,647	$ 3,057,130	$ 2,998,116	$ 2,936,496
Principal, Phase 2	$ -	$ 1,225,417	$ 1,279,543	$ 1,336,060	$ 1,395,074	$ 1,456,694
Total Principal and Interest for Phase 2	$ -	$ 4,393,190	$ 4,393,190	$ 4,393,190	$ 4,393,190	$ 4,393,190
Coverage Ratio		**130%**	**151%**	**159%**	**187%**	**212%**
Interest, Phase 3	$ -	$ -	$ 1,649,162	$ 1,620,984	$ 1,591,560	$ 1,560,838
Principal, Phase 3	$ -	$ -	$ 637,959	$ 666,138	$ 695,561	$ 726,284
Total Principal and Interest for Phase 3	$ -	$ -	$ 2,287,122	$ 2,287,122	$ 2,287,122	$ 2,287,122
Coverage Ratio			**122%**	**129%**	**152%**	**172%**
Interest, Phase 4	$ -	$ -	$ -	$ 3,863,028	$ 3,797,022	$ 3,728,101
Principal, Phase 4	$ -	$ -	$ -	$ 1,494,368	$ 1,560,374	$ 1,629,295
Total Principal and Interest for Phase 4	$ -	$ -	$ -	$ 5,357,396	$ 5,357,396	$ 5,357,396
Coverage Ratio				**89%**	**105%**	**119%**

According to the model, cashflows from operations and the property tax assessment cover debt obligations.

No additional principal payments are assumed to be made.

After ten years, the cumulative cash flows are forecasted at over $182 Million; while the outstanding debt in year ten is $242 Million. This objective of having cumulative cashflows greater than the debt balance after ten year was not met.

Cumulative cash flows over 10 years greater than the debt service											
		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
OPERATIONS											
Net Cash Flow from Operations + Property Tax Assessment		$ 12,618,246	$ 12,599,905	$ 14,697,538	$ 15,455,190	$ 18,224,010	$ 20,623,639	$ 21,186,252	$ 21,748,957	$ 22,311,663	$ 22,874,276
Cumulative Cash Flow from Operations		$ 12,618,246	$ 25,218,151	$ 39,915,689	$ 55,370,879	$ 73,594,888	$ 94,218,527	$ 115,404,779	$ 137,153,737	$ 159,465,400	$ 182,339,676
CAPITAL EXPENDITURES											
Capital Expenditures		$ 89,405,000	$ 73,966,000	$ 38,377,000	$ 89,895,000	$ -	$ -	$ -	$ -	$ -	$ -
EQUITY	100%	$ 89,405,000	$ 73,966,000	$ 38,377,000	$ 89,895,000	$ -	$ -	$ -	$ -	$ -	$ -
Debt Service											
Required Draws		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Principal Payments		$ 1,486,223	$ 2,777,285	$ 3,537,917	$ 5,188,554	$ 5,417,731	$ 5,657,031	$ 5,906,900	$ 6,167,807	$ 6,440,237	$ 6,724,701
Total Outstanding Debt		$ 87,918,777	$ 159,107,492	$ 193,946,575	$ 278,653,021	$ 273,235,290	$ 267,578,259	$ 261,671,359	$ 255,503,552	$ 249,063,315	$ 242,338,615
Interest		$ 3,841,971	$ 6,944,098	$ 8,470,589	$ 12,177,348	$ 11,948,170	$ 11,708,871	$ 11,459,001	$ 11,198,095	$ 10,925,664	$ 10,641,201

Additionally, according to the projected Cash Flow Statement, there is not enough cash reserve to pay off debt with a balloon payment within the first 10 years; however, the County would be able to meet all of its debt obligations after 20 years. This means that the annual property tax assessment of $150 could be in effect for 20 years, depending upon the County meeting all financial objectives and performance assumptions.

Statement of Cash Flows	County of El Dorado, $30 Rev Share, $150 Property Tax Assessment									
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
	Forecast Project Period					Forecast Project Period				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Cash	**$ -**	**$ 11,132,023**	**$ 20,954,643**	**$ 32,114,264**	**$ 42,380,900**	**$ 55,187,179**	**$ 70,153,787**	**$ 85,433,138**	**$ 101,014,289**	**$ 116,885,715**
CASH FLOWS FROM OPERATING ACTIVITIES:										
EBITDA	(2,448,354)	(2,466,695)	(369,062)	388,590	3,157,410	5,557,039	6,119,652	6,682,357	7,245,063	7,807,676
Property Tax Assessments	15,066,600	15,066,600	15,066,600	15,066,600	15,066,600	15,066,600	15,066,600	15,066,600	15,066,600	15,066,600
Net Cash Provided (Used) by Operations	**$ 12,618,246**	**$ 12,599,905**	**$ 14,697,538**	**$ 15,455,190**	**$ 18,224,010**	**$ 20,623,639**	**$ 21,186,252**	**$ 21,748,957**	**$ 22,311,663**	**$ 22,874,276**
CASH FLOWS FROM INVESTING ACTIVITIES:										
Capital Expenditures	89,405,000	73,966,000	38,377,000	89,895,000	-	-	-	-	-	-
Net Cash Used by Investing Activities	**$ 89,405,000**	**$ 73,966,000**	**$ 38,377,000**	**$ 89,895,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
CASH FLOWS FROM FINANCING ACTIVITIES:										
Equity Received from Investing Activities	89,405,000	73,966,000	38,377,000	89,895,000	-	-	-	-	-	-
Notes Payable, Required Draws	-	-	-	-	-	-	-	-	-	-
Principal Payments	(1,486,223)	(2,777,285)	(3,537,917)	(5,188,554)	(5,417,731)	(5,657,031)	(5,906,900)	(6,167,807)	(6,440,237)	(6,724,701)
Additional Principal Payments	-	-	-	-	-	-	-	-	-	-
Net Cash Provided by Financing Activities	**$ 87,918,777**	**$ 71,188,715**	**$ 34,839,083**	**$ 84,706,446**	**$ (5,417,731)**	**$ (5,657,031)**	**$ (5,906,900)**	**$ (6,167,807)**	**$ (6,440,237)**	**$ (6,724,701)**
Net Increase (Decrease) in Cash	**$ 11,132,023**	**$ 9,822,619**	**$ 11,159,621**	**$ 10,266,636**	**$ 12,806,279**	**$ 14,966,608**	**$ 15,279,351**	**$ 15,581,151**	**$ 15,871,426**	**$ 16,149,575**
Ending Cash	**$ 11,132,023**	**$ 20,954,643**	**$ 32,114,264**	**$ 42,380,900**	**$ 55,187,179**	**$ 70,153,787**	**$ 85,433,138**	**$ 101,014,289**	**$ 116,885,715**	**$ 133,035,290**

Take-aways on the Wholesale or PPP Approach

Based upon these findings, it is suggested that if the County were to pursue the Wholesale Model, in order to mitigate debt coverage risk, the County should consider an annual property tax assessment higher than $150. Work engaging the community and citizens could reveal the receptivity of various levels of annual property taxes and the citizens' input of the importance of broadband. Additionally, citizen input could be gaged regarding take rate percentage assumptions, pricing and service levels.

Other strategies to mitigate debt coverage risk include the following strategies:

- Negotiate lowering the capital costs assumed by the County. Negotiate sharing in the capital costs with the private provider
- Negotiate having the private provider pay or share in the debt obligations until a minimum take rate percentage is achieved.
- Negotiate a higher revenue share rate per residential and/or business customer
- Begin construction of the network only when a minimum take rate is achieved. Implement a pre-sign up process and begin when take rate risk is mitigated.

There are several possible next steps that have been suggested on page 10 of this document for the County to consider to further evaluate these options.

In Conclusion

The purpose of this report is to showcase the various approaches, taking a deeper dive into the financial implications of these models for the County of El Dorado to consider. The conclusion of this exercise should be that if the County of El Dorado were to pursue a Fiber to the Premise strategy and either deploy the network on its own, or partner with another company or many companies, the opportunity exists for those strategies. This paper provides the framework for such discussions.

Appendix A, List of Assumptions

For both of the Retail and Wholesale Models, the following assumptions were made regarding phasing, the number of units (residential or business) passed and the take rate percentages.

Phases, Units Passed and Take Rate Percentages					
	Residential, Phase 1	Residential, Phase 2	Residential, Phase 3	Businesses	Residential, Phase 4
Total # of Units Passed	25,822	24,122	11,657	10,981	27,862
Take rate after year 1	15%	0%	0%	6%	0%
Additional Take Rate, Year 2	15%	15%	0%	4%	0%
Additional Take Rate, Year 3	5%	15%	15%	0%	0%
Additional Take Rate, Year 4	5%	5%	15%	2%	15%
Additional Take Rate, Year 5	0%	5%	5%	0%	15%

Construction Methodologies and Assumptions:

Aerial %		70%
UG %		30%
Density HH/Mile		53.19
Take Rate		40%
Make Ready Cost per mile (all in labor only)		$30,518.40
ADSS or Strand/Lash		Strand/Lash
Missile Bore/Open Trench %		2%
Directional Bore %		92%
Plow %		5%
LD Downtown %		1%
HD Downtown %		0%
Rock Adder %		10%
Cut/Restore %		2%

The Density of HH (Households) per mile varies, depending upon the location.
A sample Bill of Materials is shown below. **THIS IS NOT REPRESENTATIVE OF THE ENTIRE BUILD.** This does; however, provide the assumptions used for the per unit pricing for the construction and capital costs of the network.

	Estimated Quantity				Extended Price
Item #	**FTTH GPON**	**UOM**	**Description**	**Unit Price**	**FTTH GPON**
ESTIMATED ENGINEERING PRICING					
0001	4,600	HHP	Preliminary Design (Each)	$13.50	$62,100.00
0003	4,600	HHP	Construction Ride Out (CRO- Each)	$12.00	$55,200.00
0005	4,600	HHP	Post-CRO Edits to Design (Each)	$13.00	$59,800.00
0007	3,379	Pole	Pole Data Collection	$31.00	$104,754.15
0008	3,379	Pole	Make-Ready Engineering	$21.00	$70,962.49
0009	3,379	Pole	Pole Loading Analysis	$25.00	$84,479.15
0010	4,600	HHP	Make-Ready Value Engineering Edits (Each)	$2.50	$11,500.00
0012	4,600	HHP	Construction Package (Each)	$5.00	$23,000.00
0015	4,600	HHP	As-Builts (Each)	$7.50	$34,500.00
0017	1,097	Hour	Permitting Labor	$75.00	$82,284.89
0019	69	Hour	Engineering Services for Out of Scope Activities	$90.00	$6,171.37
TOTAL ESTIMATED ENGINEERING PRICING					**$594,752**
ESTIMATED AERIAL CONSTRUCTION LABOR PRICING					
1001	510,931	Feet	Aerial Placement of Strand	$0.79	$402,358.08
1003	618,387	Feet	Aerial Placement of Lashed Fiber	$1.23	$757,524.54
1005	676	Each	Install Down Guys	$61.25	$41,405.00
1007	608	Each	Install Screw Anchors	$105.00	$63,882.00
1008	68	Each	Install Rock Anchors	$227.50	$15,379.00
1010	3,379	Each	Bond Strand to Neutral/Pole Ground	$7.88	$26,610.93
1012	62	Each	Install Riser Guard	$175.00	$10,799.89
1013	10,219	Feet	Light Tree Trimming	$1.93	$19,670.84
1014	10,219	Feet	Heavy Tree Trimming	$4.38	$44,706.45
TOTAL ESTIMATED AERIAL CONSTRUCTION LABOR PRICING					**$1,382,337**
ESTIMATED UNDERGROUND CONSTRUCTION LABOR PRICING					
2001	21,723	Feet	Rock Cutting Adder	$17.50	$380,156.18
2002	4,345	Square Feet	Cut and Restore Asphalt or Concrete	$31.50	$136,856.22
2003	1,738	Square Feet	Potholing	$17.50	$30,412.49
2004	217,232	Feet	Install Tracer Tape	$0.21	$45,618.74
2006	2,172	Feet	Low Density Underground - 2" Conduit	$157.50	$342,140.56
2007	10,862	Feet	Plow	$5.69	$61,775.38
2008	199,854	Feet	Directional Bore - 2" Conduit	$14.88	$2,972,821.29
2009	4,345	Feet	Missile Bore - 2" Conduit	$10.50	$45,618.74
2010	265,023	Feet	Pull Fiber Through Conduit	$1.05	$278,274.32
2011	330	Each	Install Small Vault (24" x 30")	$262.50	$86,625.00
2012	708	Each	Install Drop Vault	$148.75	$105,315.00
2013	83	Each	Install Large Vault (36" x 48")	$420.00	$34,860.00
TOTAL ESTIMATED UNDERGROUND CONSTRUCTION LABOR PRICING					**$4,520,474**
ESTIMATED TECHNICAL SERVICES LABOR PRICING					
3001	22	Each	FTTH Distribution Centers	$1,312.50	$28,875.00
3002	548	Each	Splice Closure Preparation - Main & Distribution	$315.00	$172,620.00
3004	6,555	Each	Single Fusion Fiber Splicing	$39.38	$258,103.13
3008	9,752	Each	OTDR Testing and Documentation + Power Meter Testing	$8.75	$85,330.00
TOTAL ESTIMATED TECHNICAL SERVICES LABOR PRICING					**$553,079**

ESTIMATED INSTALLATION LABOR AND MATERIALS					
4001	414	Each	Install Fiber Drop to NIU - Direct Buried, up to 600'	$490.00	$202,860.00
4002	966	Each	Install Fiber Drop to NIU - Aerial, up to 600'	$336.00	$324,576.00
4003	460	Each	Install Fiber Drop to NIU - Direct Buried & Aerial with Transition, up to 600	$630.00	$289,800.00
4004	62,100	Feet	Adder to Install for Drops over 600' - Direct Buried	$0.70	$43,470.00
4005	144,900	Feet	Adder to Install for Drops over 600' - Aerial	$0.35	$50,715.00
4006	1,840	Each	In-House/Business Wiring & Activation	$280.00	$515,200.00
4008	1,840	Install	FMS Updates after Drop Installs	$14.00	$25,760.00
			ONT/Install Equipment		
4011	1,840	Each	Drop Hardware for Installs	$37.50	$69,000.00
4012	101,200	Feet	12-Count Flat Drop Cable	$0.13	$13,054.80
4013	910,800	Feet	2-Count Flat Drop Cable	$0.09	$81,061.20
4015	1,840	Each	GigaCenter 844G	$280.00	$515,200.00
4017	1,840	Each	UPS SFU Indoor 12V 7.2AH 24W, Audible Alarm	$46.00	$84,640.00
4018	56	Each	UPS to ONT Power Cable, 1000' spool (assumes 30' per sub)	$353.10	$19,688.00
			Set Top Boxes		
		Each	Materials Management Fee	varies	$117,396.60
		Each	Sales Tax	varies	$64,568.13
		Each	Estimated Freight	varies	$19,566.10
TOTAL ESTIMATED INSTALLATION LABOR					**$2,436,556**
ESTIMATED MATERIALS					
5001	537,971	Feet	1/4" EHS Strand	$0.19	$102,214.47
5005	77,740	Feet	288-Count Ribbon Singlemode Fiber	$1.27	$98,729.96
5009	291,525	Feet	144-Count Loose Tube Singlemode Fiber	$0.70	$204,067.83
5010	262,373	Feet	96-Count Loose Tube Singlemode Fiber	$0.50	$131,186.47
5012	194,350	Feet	48-Count Loose Tube Singlemode Fiber	$0.36	$69,966.11
5013	145,763	Feet	24-Count Loose Tube Singlemode Fiber	$0.27	$39,210.18
5016	557,562	Feet	Pole Hardware - Strand/Lash	$0.26	$144,966.22
5017	238,955	Feet	2" HDPE Conduit	$0.95	$227,007.54
	501,806	Feet	1.25" HDPE Conduit	$0.40	$200,722.46
5018	83	Each	Large Vault (36" x 48")	$750.00	$62,250.00
5019	330	Each	Small Vault (24" x 30")	$320.00	$105,600.00
5020	708	Each	Drop Vault (11" x 12")	$95.00	$67,260.00
5021	96	Mile	Make Ready Materials	$1,500.00	$143,998.55
5024	20	Each	288 Subscriber LCP Cabinet w/ cassettes	$7,500.00	$150,000.00
5026	2	Each	576 Subscriber LCP Cabinet w/ cassettes	$12,000.00	$24,000.00
5027	61	Each	1x32 Optical Splitter with SC/APC pigtails attached	$975.00	$59,800.00
5032	7,038	Each	Heat Shrink Sleeves	$0.30	$2,111.40
5033	238	Each	AIR-FOSC-B-GEN-24-2NO	$130.11	$30,944.32
5034	102	Each	FOSC B-Gel Splice Enclosure	$192.89	$19,660.89
5035	255	Each	B-Tray for B-Gel Enclosure	$12.75	$3,248.96
5036	164	Each	FOSC C-Gel Splice Enclosure	$197.71	$32,503.52
5037	986	Each	C-Tray for C-Gel Enclosure	$14.65	$14,450.76
5038	44	Each	FOSC D-Gel Splice Enclosure	$284.78	$12,484.76
5039	175	Each	Ribbon D-Tray for D-Gel Enclosure	$30.55	$5,357.25
5040	146	Each	Mount Bracket for FOSC450 Enclosures	$25.45	$3,709.80
		Each	Materials Management Fee	varies	$293,317.72
		Each	Sales Tax	varies	$161,324.74
		Each	Estimated Freight	varies	$48,886.29
TOTAL ESTIMATED MATERIALS					**$2,458,980**

ESTIMATED ELECTRONICS					
6000			**OLT Equipment**		
6002	2	Each	10GE SFP+, 300M multimode	$900.00	$1,800.00
6003	58	Each	GPON SFP OIM, Class B+, 1490/1310nm	$1,200.00	$69,600.00
6004	8	Each	GPON-8x line card	$7,200.00	$57,600.00
6007	1	Each	E7-20 chassis and common control	$13,500.00	$13,500.00
6009	1	Each	Dell R420 Server w/ CMS software	$6,000.00	$6,000.00
			Software		
6011	1	Each	GPON Software Subscription Plan (SSP) - Annual fee	$3,500.00	$3,500.00
		Each	Sales Tax	varies	$12,540.00
		Each	Estimated Freight	varies	$3,800.00
TOTAL ESTIMATED ELECTRONICS					**$168,340**

TOTAL ESTIMATED PRICING	**$12,114,517**
ENGINEERING	**$594,752**
AERIAL CONSTRUCTION LABOR	**$1,382,337**
UNDERGROUND CONSTRUCTION LABOR	**$4,520,474**
TECHNICAL SERVICES LABOR	**$553,079**
INSTALLATION LABOR	**$2,436,556**
MATERIALS	**$2,458,980**
ELECTRONICS	**$168,340**

Wholesale Model Assumptions

Residential Services	Pricing	% of Customers Taking Service
500/500 Mbps	$ -	0%
1 Gbps/1 Gbps	$ 30.00	100%
Residential Voice	$ -	10%
Managed WiFi	$ -	10%
Worry Free WiFi	$ -	5%
Static IP	$ -	1%
Wireless Booster/AP	$ -	5%

Business Services	Pricing	% of Customers Taking Service
100/20 Mbps	$ 30.00	82%
Add Symmetrical Upstream (100 Mbps)	$ -	5%
Voice services	$ -	10%
500/250 Mbps	$ 50.00	10%
Add Symmetrical Upstream (500 Mbps)	$ -	15%
1000/500 Mbps	$ 80.00	6%
Add Symmetrical Upstream (1000 Mbps)	$ -	20%
Add BGP Routing	$ -	10%

Other Revenue			
Tap Fee or Installation Fee - Residential (one time)	$ -		
Tap Fee or Installation Fee - Business (one time)	$ -		
Per premise passed fee	$ -		
Annual Property Tax Assessment, Residential	$ 150.00	1/2 paid in April, 1/2 paid in December.	
Annual Property Tax Assessment, Commercial	$ 150.00	1/2 paid in April, 1/2 paid in December.	

We ran a number of models with different Annual Property Tax Assessment assumptions. We assumed no revenue for tap fees or installation fees or for a per premise passed fee.

Capital Expense Assumptions		
CapEx Budget, Fiber network expansion to Pass the customer, 40% take rate		
Build Out Schedule	4	
Total Capital Costs, Year 1	$ 89,405,000	
Total Capital Costs, Year 2	$ 73,716,000	
Total Capital Costs, Year 3	$ 38,377,000	
Total Capital Costs, Year 4	$ 89,895,000	
	$ -	
Video Headend Cost	$ -	
Meta or Soft Switch Cost (Voice services), when 3500 lines	$ 250,000	
Vehicle Expenses	$ 60,000	
# of Vehicles per Technician	1	
Easement Perfection	0	
Easement Perfection Legal and Filing Fees	0	

It was assumed that the Service Providers would pay for the capital costs of the equipment and the installation costs of new homes and businesses taking services. The County would pay for the capital costs of the fiber distribution and to the homes/businesses, including all labor and materials for the construction costs.

Capital Structure Assumptions		
Equity Percentage		0%
Debt Percentage		100%
Interest Rate on Debt		4.33%
Year 1 is what year?		2019
Monthly Principal and Interest Payments, Phase 1		$ 444,016
Monthly Principal and Interest Payments, Phase 2		$ 366,099
Monthly Principal and Interest Payments, Phase 3		$ 190,593
Monthly Principal and Interest Payments, Phase 4		$ 446,450

An Amortization Schedule was run with each tranche of funding. The above principal and interest payments reflect what is due on the first month. These numbers then vary based upon additional principal payments and the interest assessed on the remaining principal amount.

Operating Expenses and Other Assumptions		
Existing Net Revenue		$ -
Uncollectable Revenue Percentage, Bad Debt		0%
Sales Churn, percent of Total Revenue		2%
Revenue Escalation (Inflation of Revenue per year)		0%

Service Providers would be responsible for providing Internet Access and Backhaul Costs.

Network Management Assumptions			
Software Maintenance		$ -	Per subscriber per year
Equipment Refresh, CPE		$ -	Every five years, after initial build-out, per customer taking services
Utilities, Power & Environmental		$ 12,000	Annual, starting in year 1, double that in year 2, etc.
Pole Rent		$ 28	Per pole per year
Facilities Rent		$ -	Per year
Maintenance materials		$ 250.00	Per mile, 1-2% of the total costs
Vehicle repairs/fuel		$ 250.00	Per Tech, per month

Service Providers would pay for the capital costs for the equipment and therefore, would be responsible for annual software maintenance and equipment refreshes. It was assumed that County facilities would be used to house Network Operations Centers and therefore, an assumption of $0 for facilities rent. As this is a phased network build, the budget for Utilities and power is $12,000 per year for the first year and each year it doubles as additional phases are brought on through the end of the construction of the network in year 4.

Network Maintenance/Service Calls/Installs Assumptions		
Install/service Network Technicians Salary	$	80,000
Service call or truck roll (% of customers, per month)		3.0%
Installs per day, per tech		2.00
Service calls per, per tech		4.00
Plant miles per maintenance tech		100
Plant Maintenance tech annual wages	$	80,000
# of Technicians per Supervisor	$	8
Technician Supervisor Salary	$	120,000
% of Network Maintenance/Service Calls/Installs Outsourced		0%
% Higher costs of Outsourcing		0%

The above network maintenance and service call assumptions are conservative and perhaps duplicative. The capital cost assumptions include service technicians installing services during the construction phase. There may be network outages and the need for service technicians and network maintenance technicians during the construction phase and therefore, these assumptions were left in.

Salaries and Staffing Assumptions				
Salary, Administrator, Managerial Staff	$	120,000		
Payroll Taxes and Benefits (% of Wages)		26.00%		
Health and Dental Insurance, Benefits	$	30,000	Per employee	
Marketing and Sales, percent of Total Revenue		5.00%		
Residential Customer Care, Operations	$	1.00	Per Residential Customer	
Business Customer Care, Operations	$	1.00	Per Business Customer	
General and Administrative Overhead, % of Revenue		7.00%		

Three managerial staff members are assumed in the Wholesale Model.

Retail Model Assumptions

Below are the residential and business services, pricing for these services and of the customers that take services, what product mix is selected.

Residential Services	Pricing	% of Customers Taking Service
500/500 Mbps	$ -	0%
1 Gbps/1 Gbps	$ 80.00	100%
Residential Voice	$ 30.00	10%
Managed WiFi	$ 4.95	10%
Worry Free WiFi	$ 9.95	5%
Static IP	$ 9.95	1%
Wireless Booster/AP	$ 9.95	5%

Business Services	Pricing	% of Customers Taking Service
100/20 Mbps	$ 80.00	82%
Add Symmetrical Upstream (100 Mbps)	$ 10.00	5%
Voice services	$ 30.00	10%
500/250 Mbps	$ 300.00	10%
Add Symmetrical Upstream (500 Mbps)	$ 60.00	15%
1000/500 Mbps	$ 799.95	6%
Add Symmetrical Upstream (1000 Mbps)	$ 200.00	20%
Add BGP Routing	$ 100.00	10%

Other Revenue					
Tap Fee or Installation Fee - Residential (one time)		$ -			
Tap Fee or Installation Fee - Business (one time)		$ -			
Per premise passed fee		$ -			
Annual Property Tax Assessment, Residential		$ 150.00	1/2 paid in April, 1/2 paid in December.		
Annual Property Tax Assessment, Commercial		$ 150.00	1/2 paid in April, 1/2 paid in December.		

As with the Wholesale Models, a number of financial models were run with various assumptions for the annual property tax assessment.

Capital Expense Assumptions		
CapEx Budget, Fiber network expansion to Pass the customer, 40% take rate		
Build Out Schedule		4
Total Capital Costs, Year 1		$ 107,485,000
Total Capital Costs, Year 2		$ 103,080,000
Total Capital Costs, Year 3		$ 46,380,000
Total Capital Costs, Year 4		$ 108,973,000
		$ -
Video Headend Cost		$ -
Meta or Soft Switch Cost (Voice services), when 3500 lines		$ 250,000
Vehicle Expenses		$ 60,000
# of Vehicles per Technician		1
Easement Perfection		0
Easement Perfection Legal and Filing Fees		0

The Retail Model assumes that the County, as the ISP, would assume 100% of the capital costs for the fiber construction, equipment and costs to install services to homes and businesses.

Capital Structure Assumptions		
Equity Percentage		0%
Debt Percentage		100%
Interest Rate on Debt		4.33%
Year 1 is what year?		2019
Monthly Principal and Interest Payments, Phase 1		$ 533,808
Monthly Principal and Interest Payments, Phase 2		$ 511,931
Monthly Principal and Interest Payments, Phase 3		$ 230,339
Monthly Principal and Interest Payments, Phase 4		$ 541,198

An Amortization Schedule was run with each tranche of funding. The above principal and interest payments reflect what is due on the first month. These numbers then vary based upon additional principal payments and the interest assessed on the remaining principal amount.

Operating Expenses and Other Assumptions		
Existing Net Revenue	$ -	
Uncollectable Revenue Percentage, Bad Debt	0%	
Sales Churn, percent of Total Revenue	2%	
Revenue Escalation (Inflation of Revenue per year)	0%	
Cost of Goods Sold (Bandwidth, Video)		
Average Peak use per customer in Mbps	100	
Oversubscription Rate	200	
Internet Access	$ 5,000	Monthly Rate
Cost of Additional Backhaul per Gbps	$ 500.00	
Annual Growth/Reduction of Internet Access Costs	-0.10	
Annual Growth rate of Bandwidth per Customer	120%	
Additional Internet Access Costs per Customer	$ 1.00	
Voice Services, Fees per Customer	$ 8.00	

Network Management Assumptions		
Software Maintenance	$ 6	$6 per sub per year
Equipment Refresh, CPE	$ 450	Every five years, after initial build-out, per customer taking services
Utilities, Power & Environmental	$ 12,000	Annual, starting in year 1, double that in year 2, etc.
Pole Rent	$ 28	Per pole per year
Facilities Rent	$ -	Per year
Maintenance materials	$ 250.00	Per mile, 1-2% of the total costs
Vehicle repairs/fuel	$ 250.00	Per Tech, per month

The equipment refresh is shown in year 7. It was assumed that County facilities would be used to house the Network Operations Centers and therefore, an assumption of $0 was used for facilities rent. As this is a phased network build, the budget for utilities and power is $12,000 per year for the first year and each year it doubles as additional phases are brought on through the end of the construction of the network in year 4.

Network Maintenance/Service Calls/Installs Assumptions		
Install/service Network Technicians Salary	$	80,000
Service call or truck roll (% of customers, per month)		3.0%
Installs per day, per tech		2.00
Service calls per, per tech		4.00
Plant miles per maintenance tech		100
Plant Maintenance tech annual wages	$	80,000
# of Technicians per Supervisor	$	8
Technician Supervisor Salary	$	120,000
% of Network Maintenance/Service Calls/Installs Outsourced		0%
% Higher costs of Outsourcing		0%

As in the Wholesale Model above, the capital cost budget includes service technicians to install customers. These operating expenses therefore, may be duplicative. As with the Wholesale Model, there may be a need for network technicians to make repairs to the network during the construction phase. Out of an abundance of caution, we left these assumptions in the operating budget.

Salaries and Staffing Assumptions				
Salary, Administrator, Managerial Staff	$	120,000		
Payroll Taxes and Benefits (% of Wages)		26.00%		
Health and Dental Insurance, Benefits	$	30,000	Per employee	
Marketing and Sales, percent of Total Revenue		5.00%		
Residential Customer Care, Operations	$	5.00	Per Residential Customer	
Business Customer Care, Operations	$	5.00	Per Business Customer	
General and Administrative Overhead, % of Revenue		7.00%		

The Retail Model assumes a much larger cost of providing customer care ($5 per customer in the Retail Model vs. $1 per customer in the Wholesale Model). In the Wholesale Model, it is assumed that the Service Provider would be responsible for providing customer service, billing, the first line of support for trouble resolution, etc. In the Retail Model, it assumes that the County is responsible for providing these services.