



# City of Palo Alto

## City Council Staff Report

(ID # 13956)

**Meeting Date: 9/19/2022**

**Report Type: Study Session**

**Title: Joint Study Session With City Council and Utilities Advisory Commission (UAC) Regarding Fiber-to-the-Premises Efforts**

**From: City Manager**

**Lead Department: Utilities**

### **Recommendation**

This item is being presented for the City Council's and Utility Advisory Commission (UAC)'s information and discussion only. Staff is not providing any recommendations at this time.

### **Executive Summary**

The Council and UAC are holding a joint session to discuss the City's fiber expansion plan and specifically Fiber-to-the-Premises (FTTP). This report summarizes information presented to the UAC and UAC Fiber Subcommittee earlier this summer and is intended to foster further Council discussion on whether the City should pursue FTTP and become a new internet service provider (ISP) serving all residents and businesses in Palo Alto.

City Council and the UAC have had several discussions about FTTP and staff is seeking input at this stage in the evaluation of this effort. This joint session provides an opportunity to review the current status of this effort, and seek Council and UAC feedback on any remaining outstanding information for Council direction.

Areas for Council and UAC discussion include, but are not limited to:

- The tradeoffs of offering FTTP to the community as a service and the capital and operating investment needed for build out and program support
- Becoming a new internet service provider and the benefits and risks associated
- Financial models and organizational structure options

The report includes the following information for Council as it considers FTTP next steps:

- Engineering design details
- Fiber construction cost estimates
- Market analysis results
- Financial models, and organizational structure options
- Stakeholder engagement summary

While recognizing that this is a significant volume of information, this report reflects the recognition that making progress across these topic areas is important to enabling informed decisions on next steps.

In 2021 the City Council identified Fiber-to-the-Premises (FTTP) as a City Priority Initiative under the Community and Economic Recovery work plan and directed staff to accelerate key phases of the integrated fiber expansion approach to a) upgrade the existing dark fiber optic network and b) explore the feasibility of a FTTP enterprise. As a result, the engineering design for the City fiber optic backbone and FTTP distribution network is 90% complete, and in June 2022 the project team commenced a community survey to gauge market potential. These efforts enabled the project team to develop and analyze three business models for a City-operated ISP. The three models cover a range of potential staffing scenarios: (1) 100% in-house staffing; (2) hybrid in-house and contract; and (3) 100% contract. The composition of in-house City staff versus non-City staff may be altered in the models to change over time or as needs evolve.

The City's Fiber Enterprise Fund has been fiscally sustainable over the past 15 years. From a competitive perspective, the City's current licensing of dark fiber to end users is a service which isn't normally offered by retail internet service providers. These providers instead offer only "managed" network services to homes and businesses. Conversely, FTTP is a competitive market served by major incumbent ISPs, AT&T and Comcast.

It is unclear whether the existing dark fiber network business model serves as a springboard to FTTP. The City's fiber network has proven to be a valuable asset for supporting internal communication needs and serving a limited base of commercial and institutional customers. The City is also an established provider of several utilities (i.e. electric, gas, water, sewer, stormwater, and refuse). However, the competitive landscape for FTTP is very different from dark fiber licensing and managing other City-owned utilities. Although the City has long-term experience in building and maintaining its fiber optic infrastructure, offering FTTP internet services in a competitive marketplace poses new and different challenges. The City must not only build a reliable FTTP distribution network capable of delivering ultra-high-speed Internet options, but also capture market share, provide responsive customer service and support, efficiently implement and install FTTP services, and respond to competitors' efforts.

Staff plans to return to the City Council before the end of the year with any additional information needed. This could enable actions to solidify the FTTP financial model, organization structure associated, and budgetary actions.

### **Background**

The City of Palo Alto's dark fiber optic backbone network was conceived in the mid-1990s and is maintained and operated by the City of Palo Alto Utilities (CPAU). Dark fiber is unused fiber through which no light is transmitted or installed fiber optic cable not carrying a signal. The basic business model is to provide dark fiber connectivity to customers requiring access to large

amounts of bandwidth, and customers are responsible for providing and maintaining the equipment to “light-up” or provision licensed fiber strands. Dark fiber is licensed or leased by the City, the provider in this case, without the accompanying transmission service. The City’s fiber network infrastructure is comprised of underground conduits (underground housing for fiber optic cables, or “underground infrastructure”) and utility pole attachments (overhead or “aerial infrastructure”). The dark fiber optic network has been expanded over the years to accommodate the needs of the City, as well as the commercial sector and Palo Alto Unified School District (PAUSD).

The Fiber Enterprise Fund has operated with fiscal sustainability over the past 15 years, accumulating over \$34 million in Fiber Fund Reserves to provide a dark fiber network for City communication purposes and dark fiber licensing for commercial purposes. During efforts to upgrade the existing fiber network infrastructure, the City also explored the feasibility of expanding its fiber services and building out the network further to connect to homes and businesses with a citywide FTTP distribution network that would offer retail services such as broadband and possibly more services. This is commonly known as building out the “last mile” in a network. When considering the deployment of the last mile, a key metric for analysis is market share or “take rate.” Within the context of fiber network investment, take rate is an economic driver of the investment and a key metric for network viability and success.

During recent efforts to upgrade the existing fiber network infrastructure (see these efforts outlined in [Linked Document](#)), Council directed staff to explore how best to fully leverage the expansion of the fiber network, and coordinate efforts to potentially reduce the incremental cost of extending fiber to the premises. On October 5, 2020, City Council approved a multi-phased Fiber Network Expansion plan ([CMR #11580](#)) to upgrade and expand the existing dark fiber optic network, and explore adding the last mile for FTTP distribution in the network. There was a unanimous approval to pursue the upgrade of the dark fiber optic backbone, and to adopt a workplan to establish a City-operated ISP model for providing FTTP service within five years. The City retained the services of a consulting firm, Magellan Broadband, to work on the engineering design, community engagement, FTTP business models and market analysis. Details and findings are summarized and shared for further discussion below.

## **Discussion**

The following discussion topics cover studies conducted by City staff and the City’s consultant, Magellan Broadband and presents key findings used to build business models which will fit the framework of the City’s financial, operational, and organizational requirements. The business models include business risk analyses across a spectrum of providing FTTP services and the impact those risks may have on the financial sustainability of the fiber utility over time.

### Engineering Design for Dark Fiber Optic Backbone and FTTP Distribution Network

Magellan provided an engineering design of the dark fiber optic backbone and FTTP network to inform on physical feasibility and help determine construction costs. To accelerate the fiber expansion plan, the City combined the detailed engineering designs for the City fiber optic

backbone and FTTP networks. The combined approach included a more integrated design for both networks, streamlined constructability analysis, reduced costs for onsite fielding and engineering, and optimal redundancy. The engineering design will provide a comprehensive construction blueprint including cable sizes, vault locations, splice details, existing infrastructure, laterals, drops, and slack locations. Magellan estimates \$10.9 million of shared construction savings if both networks are to be built in parallel.

The engineering design of the dark fiber optic backbone will support a dedicated communication network for City substations, advanced metering infrastructure (AMI), supervisory control and data acquisition (SCADA) of critical utility infrastructures, and wireless field communication for City staff. The engineering design for the FTTP portion includes three optimal hut locations (i.e. Colorado Power Station, Hale Well, Briones Park) for fiber distribution and allocates specific fibers for future broadband usage throughout the City. Magellan designed the FTTP network using a phased approach based on the City's departmental business needs, commercial dark fiber opportunities and to provide affordable, reliable, fast, and equitable access to broadband for the Palo Alto community.

The Citywide FTTP network is segmented across the City into many "fiber zones," which allows the City to determine the order of construction for the network. This construction phasing approach is also incorporated into the business models discussed in further detail in the report. Magellan will continue working with the City to refine the construction phasing based on the considerations such as connecting priority areas, minimizing community impact, and maintaining a sufficient take rate. Additionally, construction in areas with aerial infrastructure is quicker and less costly than in underground areas, and this could influence decisions regarding construction phasing.

As of July 2022, Magellan completed 90% of the engineering design for the City fiber optic backbone and FTTP networks, which is currently under review for further refinements. Construction cost estimates have been refined at the 90% design stage from original estimates provided during the initial design process in 2021. The remaining 10% is anticipated to be completed around October 2022 and includes finishing the make-ready pole analysis and final construction packages for the network, and final construction methodologies and standards. Estimates from local construction contractors are obtained to ensure pricing represents the local construction environment and costs and is likely higher than prior estimates.

Magellan's engineering design is consistent with the high-level 30% design developed earlier this year. The amount of additional mileage anticipated for the fiber backbone is 44.92 miles and for FTTP is 176.01 miles.

- Fiber optic backbone: 144-count loose-tube fiber cable for electric, to support reliability, redundancy, and future grid modernization growth.
- FTTP: 432-count loose-tube fiber cable for City departments, fiber enterprise and broadband expansion

For the remaining 10% design, Magellan will finalize construction methodologies and standards. A summary of the key construction methods includes:

#### Underground

*Construction will typically utilize directional drilling and trenching*

- 24" to 36" depth unless Palo Alto has a greater depth requirement
- 12" separation from other utilities unless Palo Alto has a greater separation requirement
- Soft and hard surface restoration, erosion control per City standards. The detailed engineering design will codify all City requirements.

#### Aerial

*Construction will utilize strand and lash on existing utility poles*

- Utility pole loading and make ready analysis is being conducted and total make ready estimates (including pole replacement) will be provided in the final 100% design.
- Estimates of make ready costs based on a representative portion of pole surveys has been included in the overall construction costs.

Pricing fluctuations are anticipated for construction cost estimates as final refinements in the design may affect pricing to some degree, and supply chain shortages have resulted in higher-than-average inflation. Additional contingencies have been budgeted in the figures below to account for the current environment. Based on the 90% engineering design, there is an increase in cost saving of \$10.9 million if fiber backbone and FTTP were constructed in parallel due to network overlap.

Description	2021 Estimates	2022 Estimates	% Change
Fiber Backbone	\$22.3 M	\$25.6 M	15.0%
Fiber-To-The-Premises (FTTP)	\$86.0 M	\$102.3 M	19.0%
Cost Savings if Built Together	(\$4.5) M	(\$10.9) M	143.1%
Working Capital Set Aside	\$12.5 M	\$15.0 M	20.0%
<b>Total Costs</b>	<b>\$116.3 M</b>	<b>\$132.0 M</b>	<b>13.5%</b>

#### Market Analysis for FTTP Distribution

The market analysis was conducted to provide insight into the community appetite for municipal FTTP services and build the value proposition (who are the beneficiaries, what are the services being offered) of the business models with analytics. As part of the development of the market analysis, the project team designed a survey to learn more about internet preference, service needs, and the overall market landscape from Palo Alto residents and

businesses. A further description of the survey instruments and results are in [Attachment A. Market Research Summary](#).

### *Survey Background*

On June 23, 2022, the City launched the Palo Alto Fiber Market Research Survey and Fiber Deposit program through SurveyGizmo from Magellan and sent 21,925 survey e-mails to residents and businesses. 3,254 surveys were completed (14.8% response rate) and 703 deposits received as of August 3, 2022. The original statistical goals in the survey were to achieve a 95% confidence interval with a 5% margin of error, which translated to receiving 380 surveys. Given the actual survey responses received and analyzed exceeded 380, the calculated confidence interval is 98% with a 2.2% margin of error, which significantly improves the statistical validity of the survey.

The survey questions address the following factors required to perform the competitive analysis:

1. What speeds should be provided?
2. What features are most important?
3. What do competitors charge today/future?
4. What should Palo Alto charge?
5. How elastic is the market?
  - a. What impact do price changes have on take rates?
  - b. What is the expected take rate at the optimal price?

The responses provide insights for defining service details such as broadband service tiers, features, pricing, and speeds. The deposit program allowed residents and businesses to voluntarily submit a \$50 deposit for the Palo Alto Fiber project to demonstrate their support for locally owned and controlled municipal internet services.

### *Survey Results, Market Analysis*

The survey utilizes a set of behavioral questions to understand importance and satisfaction levels with current internet service and helps craft a market strategy. The survey also incorporates conjoint analysis, and more specifically choice-based conjoint simulation (CBC) to predict how many households would sign up for service. CBC is an industry standard methodology utilized among major broadband providers, wireless companies and other consumer-direct businesses to determine what features of a product or service are important to consumers. By simulating the actual buying decisions of consumers through presenting a series of offers in the survey, the surveyor may understand the relationships between different features of a product or service. Here, speed, price, and brand were utilized to determine the preferences of households for different internet offers, including those of existing providers and the potential fiber internet offering from the City. The statistical relationships derived from the survey data are used to predict market shares, or “take rates” for each product and service.

High-level findings from survey results in [Attachment A. Market Research Summary](#) are provided below:

1. 28.4% of households are either very dissatisfied or somewhat dissatisfied with their current internet services. An additional 14.4% are neither satisfied nor dissatisfied.
2. 53% of households subscribe to internet streaming only and do not subscribe to cable television which is also known as “cutting the cord”. An additional 18% of customers would consider canceling cable television and using only internet streaming.
3. Top three reasons to switch from current providers (in priority order) are lower price, faster speed, and higher reliability.

*Competitive Risk and Mitigation*

Staff identified several significant competitive risk factors and potential risk mitigation strategies:

1. Market demand for a municipal broadband offering:

Below are some risks to attaining required take rates, and mitigation strategies for maintaining interest in the community while the FTTP network gets built out.

Risks	Strategies
Incumbent ISPs may employ aggressive tactics such as deep discounts to discourage potential customers from switching.	<ul style="list-style-type: none"> <li>▪ Continuous customer acquisition campaigns and community engagement prior to and during FTTP construction.</li> <li>▪ Differentiate competitor with higher reliability, service quality, and customer service.</li> <li>▪ Develop customer retention tactics to counter promotional pricing from competitors.</li> <li>▪ Maintain the message City of Palo Alto ISP keeps resident and business dollars in the community and provides more local control over an essential service.</li> </ul>
Multi-year deployment may lead to waning interest and significantly decrease the assumed take rate.	<ul style="list-style-type: none"> <li>▪ Maintain strong Palo Alto Fiber presence and long-term engagement through continuous outreach, community events, and media/social networks.</li> <li>▪ Recruit and train influencers to champion City FTTP by being able to communicate features and benefits.</li> <li>▪ Expand engagement to include other agencies and groups such as professional associations.</li> </ul>
Difficulty accessing the new FTTP network could significantly impact the take rate. Multi-dwelling units (MDUs), such as apartment	<ul style="list-style-type: none"> <li>▪ Conduct early exploratory outreach to MDUs before and after construction commences. Develop fiber access agreements for residential</li> </ul>

<p>buildings, condominium complexes and office parks may encounter challenges accessing the new network (Note: approximately 39% <sup>1</sup>of the residential dwellings in Palo Alto are in MDUs).</p>	<p>and commercial MDUs.</p> <ul style="list-style-type: none"> <li>▪ Explain the benefits to MDU owners and property managers of providing their tenants with more choice for broadband services.</li> <li>▪ Research legal and regulatory issues concerning MDU access for facilities-based broadband service providers.</li> </ul>
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2. FTTP speed to market

The speed at which the City establishes a fiber business presence (speed to market) is critical to meet the anticipated take rate goals. With existing providers of the service, the competitive pressure grows when implementation is prolonged.

Risks	Strategies
<p>Dependency on other stakeholders may delay certain processes, for example wood utility pole make-ready and replacements are highly dependent on the cooperation of other pole attachers (e.g., AT&amp;T Fiber, Comcast, AT&amp;T Mobility, Verizon Wireless, Crown Castle, CPAU electric power) completing pole make-ready and/or pole replacement work in a timely manner.</p>	<p>Communicate early in the FTTP network construction process with the other incumbents about utility pole make ready work and/or pole replacements required, including the City’s expectation that cooperation will be facilitated under existing pole attachment agreements.</p>
<p>Fiber construction methods may adversely affect street conditions (e.g., open trench, directional/horizontal boring, micro-trenching), which may cause delays.</p>	<p>Work closely with the Department of Public Works to review fiber construction standards and methods to ensure street conditions are preserved after fiber plant is installed in undergrounded areas of the City.</p>
<p>Potential resident opposition towards installing fiber network facilities in the public rights-of-way and other City-owned properties (e.g., fiber cabinets, hub sites and underground vaults).</p>	<p>Develop outreach campaigns to communicate with neighborhood groups and homeowner associations about the construction of the FTTP network on utility poles and underground in the public rights-of-way.</p>
<p>City processes may impede timeliness, such as the permitting process.</p>	<p>Work with the Development Center and Public Works to implement a streamlined permitting process.</p>

<sup>1</sup> Source: American Community Survey 2020, ACS 5-Year Estimates Data Profiles, City of Palo Alto, Table DP04



3. Vendor contract management and employee recruitment:

Dependent on the operational model selected (insource, outsource and hybrid insource/outsource) deployment of a FTTP network will rely heavily on contactors for daily operations, a Network Operations Center (NOC), marketing and sales activities, service installations and other customer fulfillment activities.

Risks	Strategies
<p>Finding qualified contractors in the current competitive telecom job market may be difficult.</p>	<ul style="list-style-type: none"> <li>▪ Evaluate and develop a list of potential contractors to cover functions identified in the business model</li> <li>▪ Develop a standard Request for Proposals (RFPs) to quickly evaluate and engage potential customers</li> <li>▪ Negotiate strong services level agreements (SLAs) with effective corrective action plans based on performance and/or service delivery</li> <li>▪ Hire experienced project management team to manage vendor contracts and resolve issues</li> </ul>
<p>Recruitment and employee retention are difficult in a competitive telecom job market. Various job descriptions need to be developed, including compensation ranges and consideration of existing labor agreements as applied to new telecom positions. In-house staff is subject to City/Civil Service hiring processes and practices. Additionally, CalPERS pension obligations as applied to new telecom positions need to be evaluated and finalized</p>	<ul style="list-style-type: none"> <li>▪ Contingent upon approval of the FTTP network build, the City can pre-emptively develop final job descriptions and compensation ranges in preparation for recruiting in-house staff. Additionally, the City may use a recruitment firm specializing in telecom industry positions to find qualified in-house staff</li> </ul>

Staff also addressed concern over technology obsolescence while the project is under construction, such as if Fixed Wireless Access (FWA) and/or Mobile 5G becomes a viable alternative service to traditional wireline broadband services. In the short-term, FWA poses a relatively minor risk since it requires a significant investment in infrastructure and network security (e.g., small cell antennas, fiber backhaul, macro towers) from cellular carriers, in addition to deploying new wireless spectrum at comparable download and upload speeds currently delivered by traditional wireline broadband services. Although there may be technological advancements creating new entrants in the future, as an existing provider of fiber, the City is positioned to adopt the new technologies or seek strategic partners to utilize the new technologies. Fiber is arguably considered the gold standard infrastructure for

broadband. Fiber has a life expectancy of two to four decades with unlimited capacity and is the most-reliable internet service.

If City of Palo Alto establishes itself as the third major ISP provider in Palo Alto, it is unlikely new ISPs will enter Palo Alto in the future. ISPs are profit driven and are going to deploy their capital into markets where they can attain a large market share and those that are not highly competitive. Palo Alto Fiber will be an entrenched provider with significant market share. Comcast and AT&T will also remain as competitors in the market. This would likely be an unattractive market for new providers with highly competitive, entrenched providers, all with superior technology to wireless. Wireless providers have dominated the rural markets because no competitive wireline providers exist. They are not widely found in urbanized markets because the technology is less superior to cable and fiber.

#### Financial Models for FTTP Distribution

For each of the business models outlined, Magellan developed a financial model demonstrating how the finances may flow. The components of the financial plans with the greatest impacts on the anticipated outcomes are Staffing; Take Rate; Construction and Operations; and the Debt Repayment. Please see [Attachment B. Financial Plans](#) for further details.

#### *Staffing*

Staffing is a major component which varies greatly in a business model, it impacts how a business operates depending on a) composition of in-house City staff augmented by non-City staff; and b) count of FTEs. To cover a broad spectrum of potential City-operated ISP business models, Magellan compared three staffing models, contrasting two with one “in-the-middle” hybrid composition. The FTE count in all three models ramp up over time to align with a fully implemented City-operated ISP business model:

- Insource: 100% in-house staffing
- Hybrid: 70% insource and 30% outsource\*
- Outsource: Most functions are outsourced to multiple strategic vendors

*\*Note: The staffing composition of the hybrid model can be altered for more or less in-house staff since outsourced functions have the potential to be absorbed in-house and vice versa.*

All three models assume the same take rate of 40%, construction phasing with starting year FY 2023, and the same key functions needed to deliver a fully implemented fiber business. Certain functions, such as customer service or accounts payable were identified as core competencies existing among current City staff. Other functions require new expertise which the City would need to acquire or outsource, for example Network Operations Center (NOC) technicians. Magellan highlighted specific advantages and disadvantages for each model, which will be further discussed at the meeting.

*Table 1 Summary of pros and cons from a staffing perspective*

<b>Insource</b>	
This model begins with an anticipated 7.0 minimum FTE at the start of implementation and ramps up to 25.0 in-house FTE by 2026. Staffing costs range from \$1.93M at the start of implementation, to \$5.6M when staffing levels reach 25.0 FTE.	
<b>Pros</b>	<b>Cons</b>
<ul style="list-style-type: none"> <li>✓ Total control;</li> <li>✓ Quality of service;</li> <li>✓ Institutional knowledge</li> </ul>	<ul style="list-style-type: none"> <li>✗ Highest labor costs;</li> <li>✗ More training costs</li> </ul>
<b>Hybrid</b>	
This model begins with an anticipated 7.0 minimum FTE at the start of implementation and ramps up to 17.0 in-house FTE by 2025. Staffing costs (including anticipated vendor costs) range from \$1.93M at the start of implementation, to \$3.7M when staffing levels reach 17.0 in-house FTE.	
<b>Pros</b>	<b>Cons</b>
<ul style="list-style-type: none"> <li>✓ Flexible start-up;</li> <li>✓ Scalability</li> <li>✓ Some Institutional knowledge</li> <li>✓ Some control of service levels</li> </ul>	<ul style="list-style-type: none"> <li>✗ High labor costs;</li> <li>✗ Higher contract costs; Contract risks</li> </ul>
<b>Outsource</b>	
This model begins with an anticipated 3.0 minimum FTE at the start of implementation and ramps up to 5.0 in-house FTE by 2024. Staffing costs (including anticipated in-house costs to manage vendors) range from \$0.8M at the start of implementation, to \$1.3M when staffing levels reach 5.0 in-house FTE.	
<b>Pros</b>	<b>Cons</b>
<ul style="list-style-type: none"> <li>✓ Lower labor costs;</li> <li>✓ Experienced vendors</li> <li>✓</li> </ul>	<ul style="list-style-type: none"> <li>✗ Low control of service levels;</li> <li>✗ Low institutional knowledge;</li> <li>✗ Contract costs and risks</li> </ul>

While all three financial business models are viable, the operating margins (profit and loss) with an insource model may be less compared to the outsource model. However, a potential trade-off of outsourcing is lower control over the quality of outsourced services and contract risks.

### *Take Rates*

Take rates, or the percentage of potential subscribers who subscribe, are used in fiber market research and play a key role in anticipating revenue. Nationwide, the take rates for retail municipal systems after three to five years of operation are between 40% - 55%. This is much higher than the take rate of larger incumbent service providers and is also well above the typical FTTP business plan 30% - 40% take rate. Based on the City's available customer base and fiber business model, for the City of Palo Alto to break even, a 27% - 30% take rate is necessary. The three business models compared in the Financial Business Model section of this report assumes a conservative take rate on the lower end of potential take rates and project the City to reach 37% - 42% after the first 5 years. Many factors contribute to take rates, most of which

depend on a successful business execution. It is important to note, take rates should not be analyzed in a vacuum, but in relation to all other factors that impact the broadband business.

### *Construction Phasing*

Due to the scale of construction necessary to build the infrastructure to reach every premises in the City, construction will most likely proceed in a multi-phased approach. This approach is reflected in the business models, which reflect a construction timeline beginning in FY 2023, ramping up within five years, and completing based on market take rates. With a multi-phased approach, the City can accelerate or de-accelerate certain phases to adapt to market conditions but the complete buildout in Palo Alto may take up to 15 years.

### *Sensitivity Analysis*

Magellan conducted sensitivity analysis models for fiber broadband including take rate, construction cost, and internet pricing to include for further analysis ([Linked Document Sensitivity Analysis](#)). Analyzing the interrelation of these important parameters helps demonstrate how these assumptions influence revenue projection, net income, and becoming a fiscally sustainable fiber broadband utility. In a business environment with unfavorable circumstances, the City would have mitigation strategies to deploy (i.e. decelerate buildout, scale down operations) to address these situations.

### *Financing Options*

Based on the current business models and anticipated construction costs for the fiber backbone and FTTP distribution network the project team estimates a funding gap of approximately \$98 million, with costs allocated to both the Fiber Fund and Electric Fund. The allocation of construction costs between the two funds and the bond financing structure are still under evaluation.

<b>Costs</b>	<b>Original Estimates 2021</b>	<b>Current Estimates 2022</b>
Fiber Backbone	\$22.3 M	\$25.6 M
Fiber-to-the-Premise	\$86.0 M	\$102.3 M
Working Capital Set Aside	\$12.5 M	\$15.0 M
Total Costs	\$120.8 M	\$142.9 M
<b>Funding</b>	<b>Original Estimates 2021</b>	<b>Current Estimates 2022</b>
Cost Savings if Built Jointly	(\$4.5 M)	(\$10.9 M)
Existing Fiber Fund	(\$32.5 M)	(\$34.0 M)
Total New Funding Required	\$83.8 M	\$98.0 M
New Funding Allocation*	Fiber \$70 M - \$75 M Electric \$10 M - \$15 M	Fiber \$80 M - \$85 M Electric \$13 M - \$18 M

*\*New funding allocation will depend on final construction costs.*

Magellan analyzed two financing options to deploy fiber to the entire City.

Option 1. Fiber reserve with bond financing: FTTP buildout within five years

Option 2. Fiber reserve without bond financing: FTTP buildout within 15 years

**Option 1: Funding from Fiber Reserve and Revenue Bonds**

As a long-term capital improvement project with a large funding gap estimated at \$98.0 million, a cost-effective option to finance this project is with a Utility Revenue Bond. Staff is currently exploring various revenue bonds structures and potential bonds rating assumptions for the fiber backbone and FTTP distribution network. The bonds are anticipated to be issued by both the Fiber Optics Fund (for FTTP construction) and the Electric Fund (for the fiber backbone expansion). Given the financial strength (i.e. reserves, assets) and lack of current debt by the Electric utility, the new revenue bonds for the backbone and FTTP should not prevent additional future Electric bond issuance(s). The Electric utility is the City's the strongest utility (financially) and the other City utilities with outstanding bonds have a triple A credit ratings from Standard and Poor's. Therefore, staff anticipates the Electric utility will also receive the highest credit rating as well. The credit rating for the Fiber utility is uncertain, as is the credit rating for a combined (Fiber and Electric) bonds issuance is also unknown. The allocation of construction costs between the two funds and the bond financing structure are still under evaluation, and the potential bond rating will be determined after a rating presentation (usually occurs a month prior to the bond issuance). The table below shows the preliminary potential bond structures estimated on a 30-year \$98 million (par) bond issuance needed to fund the project gap for the following scenarios:

Scenario	Rating	Capitalized Interest	All-In True Interest Cost	Annual Average Debt Service	Total Debt Service (net of CapI)
1*	AA+	18 months	4.42%	\$6.47 M	\$186.82 M
2**	AA+	None	4.42%	\$5.96 M	\$179.45 M
3*	AA	18 months	4.49%	\$6.52 M	\$188.34 M
4**	AA	None	4.49%	\$6.01 M	\$180.80 M

*\*Scenarios 1 and 3: 18 months Capitalized Interest. First three (interest only) semi-annual debt service payments during project construction are paid by bond funds. This amount is added to the principal bond issuance.*

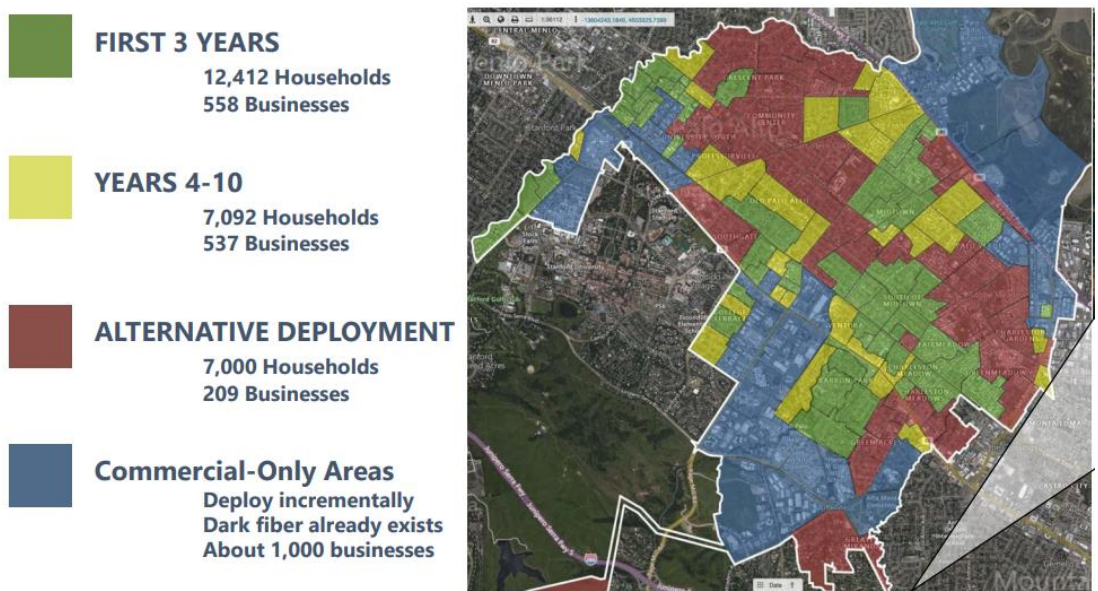
*\*\*Scenarios 2 and 4: No capitalized interest. First debt service would be due six months after the bond issuance.*

**Option 2: Funding from Fiber Reserve without Bond Financing**

An incremental approach to deployment would allow the City to first target areas with higher potential take rates, which minimizes the amount of funding needed at the beginning of the project although overall project costs typically increase when construction is prolonged. The revenue realized from initial deployments could then be reinvested each year to build out more

of the fiber network in subsequent areas on an incremental basis. This model would eventually cover 100% of the City.

The following map illustrates if the City provides FTTP to 46% or 12,412 homes and 558 businesses located in the aerial construction area with the higher density within three years utilizing funding from the existing \$34 million fiber reserve. Depending on the take rate and reserve level, the City could reinvest an additional \$3 million annually in the 4<sup>th</sup> to 10<sup>th</sup> years to provide FTTP to an additional 25% or 7,092 homes and 537 businesses. The remaining 7,000 homes and 200 businesses will require another \$50-\$60 million in capital expenditures to complete the citywide buildout. The City would seek companion infrastructure projects (i.e. undergrounding, grid modernization) to accelerate FTTP buildout whenever opportunities arise.



Other Funding Options Explored

Magellan worked with the City to assess funding available from federal, state, and regional agencies to support a FTTP deployment in Palo Alto. Magellan engaged with these agencies to help determine applicability of various grant programs to fund a portion of the City’s fiber build and found federal and state broadband funding released thus far has been restricted to unserved, underserved (less than 45 Mbps download and 15 Mbps upload) and rural areas which Palo Alto does not qualify under. Magellan will continue to evaluate potential federal, state programs from Housing and Urban Development, Transportation, Homeland Security and related agencies to identify grant opportunities, and if available, assess how they may fit into the City’s fiber construction project. For example, Magellan has been monitoring California’s SB 156 Broadband Program and the federal Broadband Equity, Access, and Deployment (BEAD) Program to identify funding opportunities to municipalities. As grant opportunities are identified, Magellan will provide the City with its program rules, constraints, timing, and an action plan to target these funding opportunities.

### Organizational Structure

Apart from potential business models, staff is seeking Council’s guidance on whether to explore organizational structures other than a City-owned and operated ISP to better address perceived challenges associated with operating in a competitive market (staffing costs/capabilities, procurement policies, rate pricing models). The table below summarizes some potential organizational structures for the Council’s consideration:

*Table 2. Potential organizational structures*

<b>Organizational Structure</b>	<b>Definition</b>
City Owned & Operated (City ISP)	The City provides the service either through an existing department, new department, or managing a fully outsourced staffing model. The City Council may be responsible for developing policies and procedures for the fiber enterprise.*
Joint Powers Authorities (JPA) Operated	The City forms a JPA with at least one other public agency, sharing a common power to jointly implement programs, build facilities and provide the service. The JPA board may be responsible for developing policies and procedures for the fiber enterprise.
Nonprofits(NP)	The City forms or partners with a nonprofit entity that serves the governing body to provide the service. The nonprofit may be responsible for developing policies and procedures for the fiber enterprise.
Private/Partnership (Partner ISP)	City operates the network and partners with a private entity to provide the ISP service. The partner entity could develop and adopt its own policies and procedures to closely align with the business model the board selects.*

\*See previous discussion for background on City ISP vs Partner ISP in (CMR [12117](#))

If the City Council is interested in exploring alternative organizational structures, staff would need to revise the analysis discussed in above sections to account for factors such as expanding the network outside the City’s boundaries (JPA) and other financing options (Private/Partnership).

### **Stakeholder Engagement**

The community engagement and education campaign for FTTP was launched in October 2021 to build awareness of the City’s efforts, inform the community about the overall effort and gain community input. In October 2021, the City launched a new digital engagement platform offering an interactive map to “pin” your home, gain resources about the effort underway and answer community questions about fiber. The community engagement and communications efforts generally included a dedicated fiber social media series and blog series to inform and

build awareness, the launch of a new digital newsletter dedicated to fiber, printed and mailed materials, videos, and updates shared on the City’s website and the creation of a project web page specific to fiber. These outreach tactics have supported community education about the fiber effort throughout each phase, garnering both community engagement in the process and building awareness of the effort underway.

City staff and Magellan teamed up to host an information session in February 2022. Over 80 community members attended to learn about the fiber effort, its benefits, the market survey details and why that was important to gain market information, and answer community questions. The recording of the information session and PowerPoint presentation were made available to community members on the Palo Alto Fiber City project web page for those weren’t able to attend the live meeting ([Palo Alto Information Session](#)).

The table below provides a snapshot of the public information efforts and community engagement seen between October 2021 to August 3, 2022:

Communications Tool	Metrics
<a href="#">Palo Alto Fiber Hub</a>	- Visits: 12,221 - Neighborhood Pins: 2743
<a href="#">Palo Alto FIBERLink Digital Newsletter</a>	- Subscribers: 949 - Average Open Rate: 75.2%
<a href="#">Palo Alto Fiber Blog Series</a>	- Views: 2,448
Information Session and recording views	-80 attendees, 105 views
Fiber videos	-535 Views
Social media series	Reach and Impressions Twitter: 10,952 Facebook: 12,380 Instagram: 13,671 LinkedIn: 5,428 Nextdoor: 15,049
Market Survey	3,561 surveys completed 738 deposits received

#### *Utilities Advisory Commission Meetings*

Over the last two years, the UAC has held several discussions relevant to FTTP, including:

- Overview of fiber network expansion project by phases (August 5, 2020; [Staff Report #11468](#); [Minutes](#); [Video](#))
- Recommend the City Council develop community engagement, accelerate engineering designs, explore public-private partnership, and evaluate funding (April 21, 2021; [Staff Report #12118](#); [Minutes](#); [Video](#))
- Update of community engagement activities and engineering designs (October 6, 2021; [Staff Report #13591](#); [Minutes](#); [Video](#))



- Communication and community engagement efforts for Palo Alto Fiber (February 8, 2022; [Staff Report #13939](#); [Minutes](#); [Video](#))
- Preliminary financial business models for Palo Alto Fiber (April 6, 2022; [Staff Report #14200](#); [Minutes](#); [Video](#))
- Preliminary internet survey results and financial business models for Palo Alto Fiber (August 3, 2022; [Staff Report #14582](#); [Video](#))

### **Resource Impact**

This report is for a study session so there is no resource impact. Based on Council and UAC input, staff will return with specific actions associated with the FTTP effort.

### **Environmental Review**

This report is not a project for the purpose of the California Environmental Quality Act (CEQA)

### **Attachments**

- Attachment A: Market Research Summary
- Attachment B: Financial Plans

### **Attachments:**

- **Attachment6.a:** Attachment A: Market Research Summary
- **Attachment6.b:** Attachment B: Financial Plans

## Palo Alto Fiber Quantitative Market Research Summary



The purpose of the market research assessment was to understand how Palo Alto's citizens felt about the City providing internet services and to determine approximately how many Palo Alto households would sign up for Palo Alto Fiber's internet service if provided.

Secondary goals of the survey included:

1. To help the City better understand citizens' attitudes and perceptions of current providers and services, satisfaction levels and current issues. This information could help the City focus its marketing strategy on the aspects of service that are most important to citizens.
2. To help the City better understand what features were most important in citizens' internet services, to help the City craft service plans that were most attractive to citizens and ensure competitiveness with the current market.
3. Gain market intelligence to determine the City would best approach the competitive market, in terms of its go to market strategy for internet services.

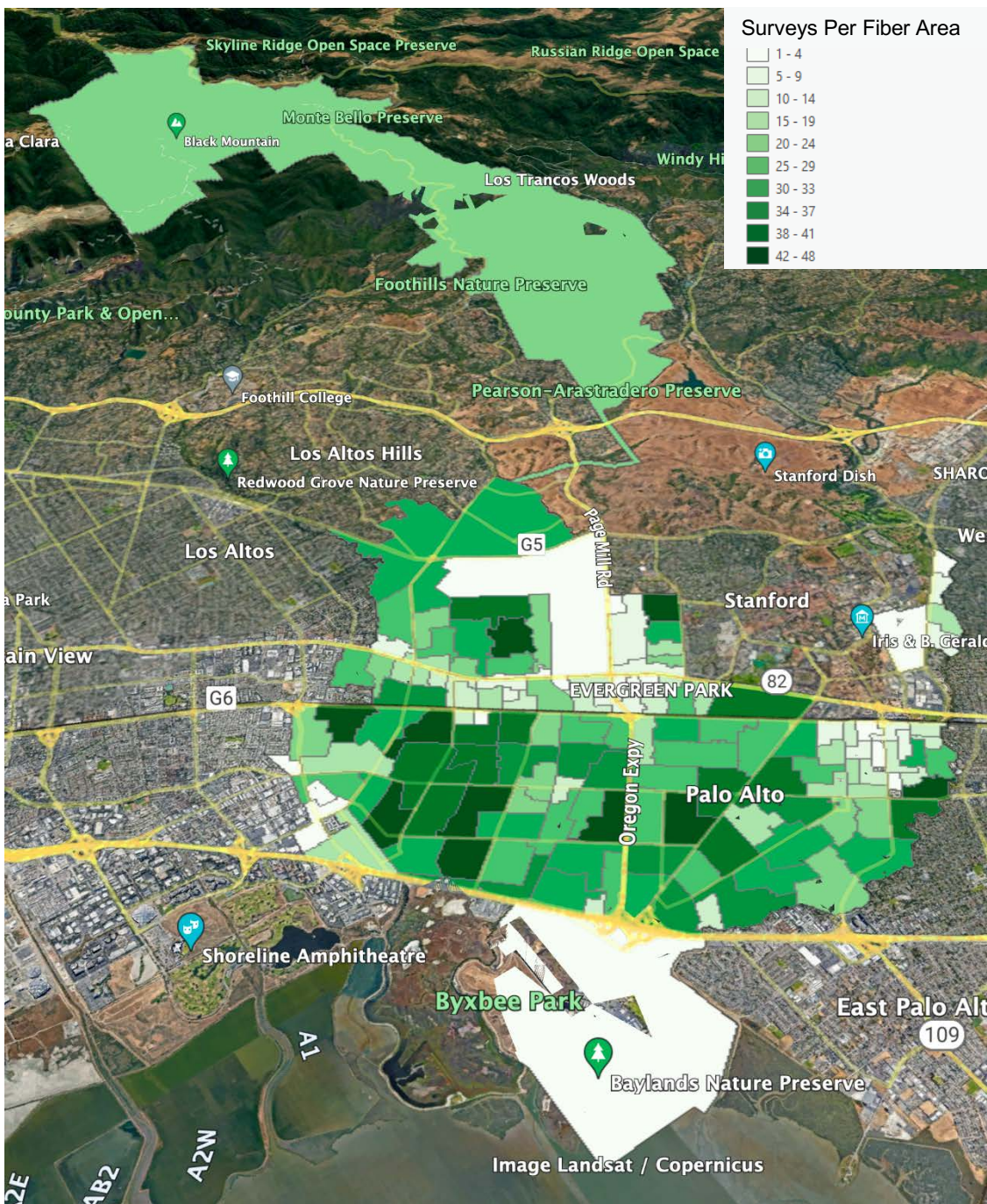
Individual surveys were distributed electronically via email. Households received a unique survey identifier and link, which only allowed a single response from the household. A weblink was also provided on the Palo Alto Fiber Hub and on various City communications for those that may have not taken the survey through the link.

The survey contained a behavioral portion, which solicited information on current residential and business internet services and included information on pricing, satisfaction, importance and household demographics. The survey also contained a choice-based conjoint ("CBC") portion which determined quantitative demand for services by asking respondents to select their preferred choice from a series of market offers, as well as a City-provided offer. Surveys were analyzed to determine take rates resulting from the CBC, while the behavioral portion of each survey provided additional insight into the preferences of customers.

The survey instrument utilized an online platform for distribution of surveys to 21,925 utility accounts. A total of 3,254 surveys were completed by Palo Alto households with a 14.8% response rate. The results yielded a 98% confidence interval with a 2.2% margin of error.

## Distribution of Responses







The figure below illustrates the distribution of survey responses across the City. The engineering team utilized the fiber to the home design to partition the City into smaller fiber zones, which were used as a boundary to count survey responses. By doing so, the City can easily identify the levels of interest in Palo Alto Fiber at a granular neighborhood by neighborhood level.



## Internet Service Providers

Households subscribe to the internet providers illustrated in Figure 1. Comcast is the dominant provider in the market today, with the majority share of the market at 69.6%. AT&T follows at 23.2%. The remaining 7.2% is made up of smaller providers including Sonic, Etheric and satellite providers.







*Figure 1: Palo Alto Residential Provider Market Share*

Value		Percent
Comcast/Xfinity		69.6%
AT&T		23.2%
Sonic		3.7%
Etheric		0.2%
Unsure		0.3%
Other - Write In		2.9%

## Residential Internet Prices

About 50% of Palo Alto households pay between \$60 - \$100 for internet service per month. About 29% of households pay between \$41 – \$60 per month. Prices are on par with other communities where at least one high-speed internet provider exists. Palo Alto is a bit different than the typical community because AT&T also provides competitive high-speed internet over fiber. AT&T’s service competes with Comcast/Xfinity’s cable-based broadband services to at 1 gigabit and lower speeds. However, AT&T’s service is not available in all areas.

*Figure 2: Prices Paid by Palo Alto Households for Internet Services*

Value		Percent
\$20 - \$40 Per Month		7.3%
\$41 - \$60 Per Month		28.9%
\$61 - \$80 Per Month		28.3%
\$81 - \$100 Per Month		19.6%
\$101 - \$120 Per Month		8.4%
More Than \$120		7.5%

## Satisfaction

Satisfaction levels for internet services include 28% of households that are dissatisfied with their internet service, 14.4% which are neutral and 57.2% that are satisfied with their internet services. These figures assume satisfaction levels at the rates households currently pay for their services. Satisfaction levels for each aspect of respondents' internet service were also gathered.

*Figure 3: Satisfaction Levels for Internet Services*

Value	Percent
Very dissatisfied	6.7%
Somewhat dissatisfied	21.7%
Neither satisfied nor dissatisfied	14.4%
Somewhat satisfied	39.4%
Very satisfied	17.8%

*Figure 4: Satisfaction Levels for Individual Aspects of Internet Services*

	Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Very satisfied
Speed Count Row %	270 8.1%	668 19.9%	519 15.5%	1,129 33.7%	766 22.9%
Price Count Row %	484 14.5%	1,070 31.9%	775 23.1%	750 22.4%	270 8.1%
Reliability Count Row %	327 9.7%	791 23.6%	463 13.8%	1,094 32.6%	683 20.3%
Customer service Count Row %	465 13.9%	757 22.7%	1,006 30.1%	724 21.7%	390 11.7%
In-Home Technical support Count Row %	338 10.2%	561 16.9%	1,526 46.1%	566 17.1%	321 9.7%

## Bundling

Respondents were also asked what other services they “bundle” with their internet services. The purpose of asking this question is to understand whether the City should consider offering bundled services such as cable tv and home telephone along with its internet services in order to gain higher market share. Figure 5 illustrates what percentage of Palo Alto households bundle services. The responses indicate a low rate of bundling, with only 30% of residents bundling cable tv and 24% bundling home phone. At these low rates, the additional cost of providing these services may not be worth the additional customer subscriptions. In other words, the costs of providing bundled services may exceed the revenues generated by them, which would be unfavorable to the overall financial business case.

Further, respondents were asked whether they would “cut the cord,” i.e. cancel their cable tv subscriptions and utilize streaming services like Netflix or Hulu over the next 3 years. As illustrated in Figure 6, most respondents have already discontinued their cable tv or plan to in the next 3 years, reinforcing the argument that cable tv is not needed as a complementary service for Palo Alto Fiber.

*Figure 5: Other Services that Palo Alto Households Purchase from their Internet Provider*

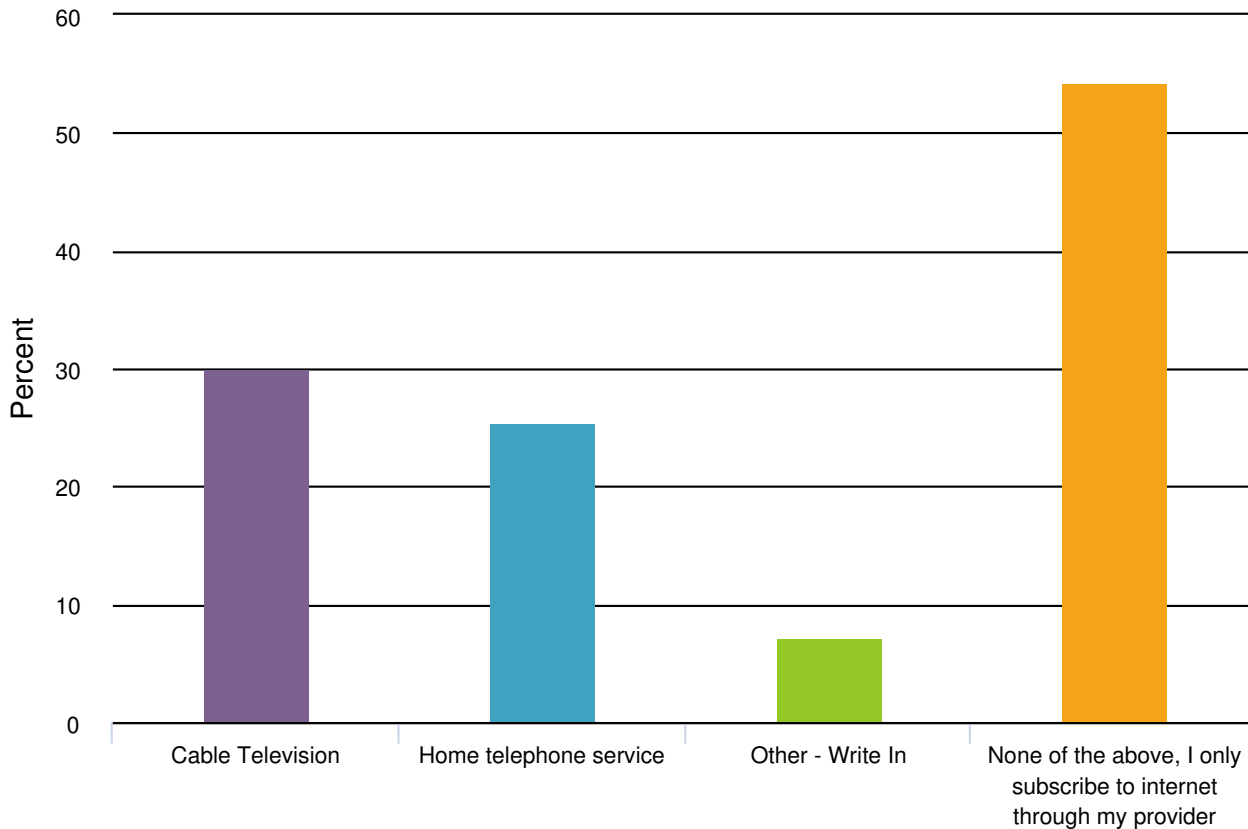
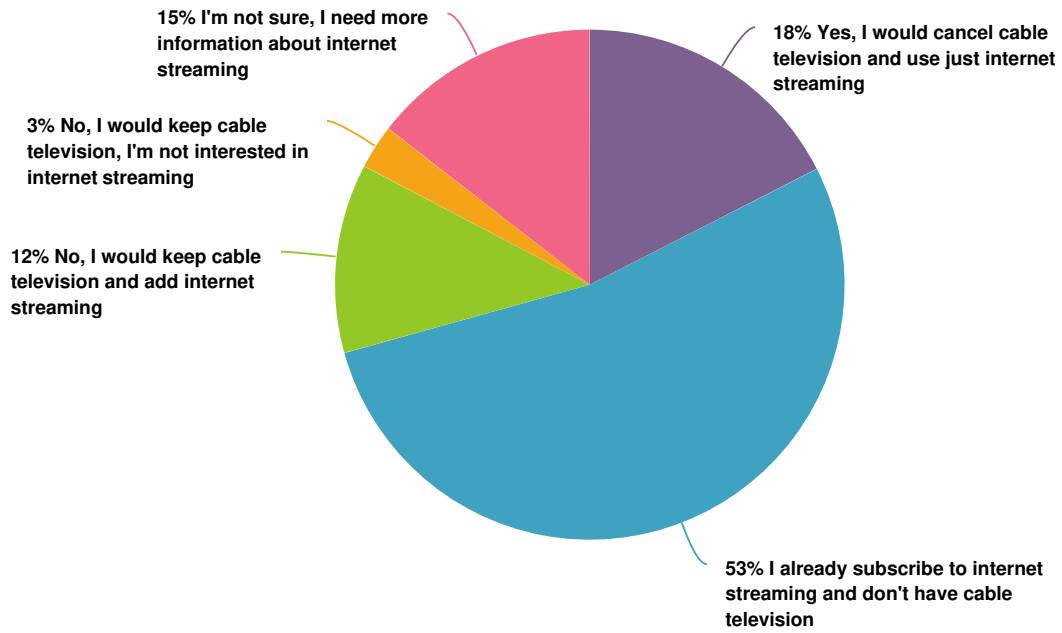


Figure 6: Cord-Cutting Preferences of Palo Alto's Residents

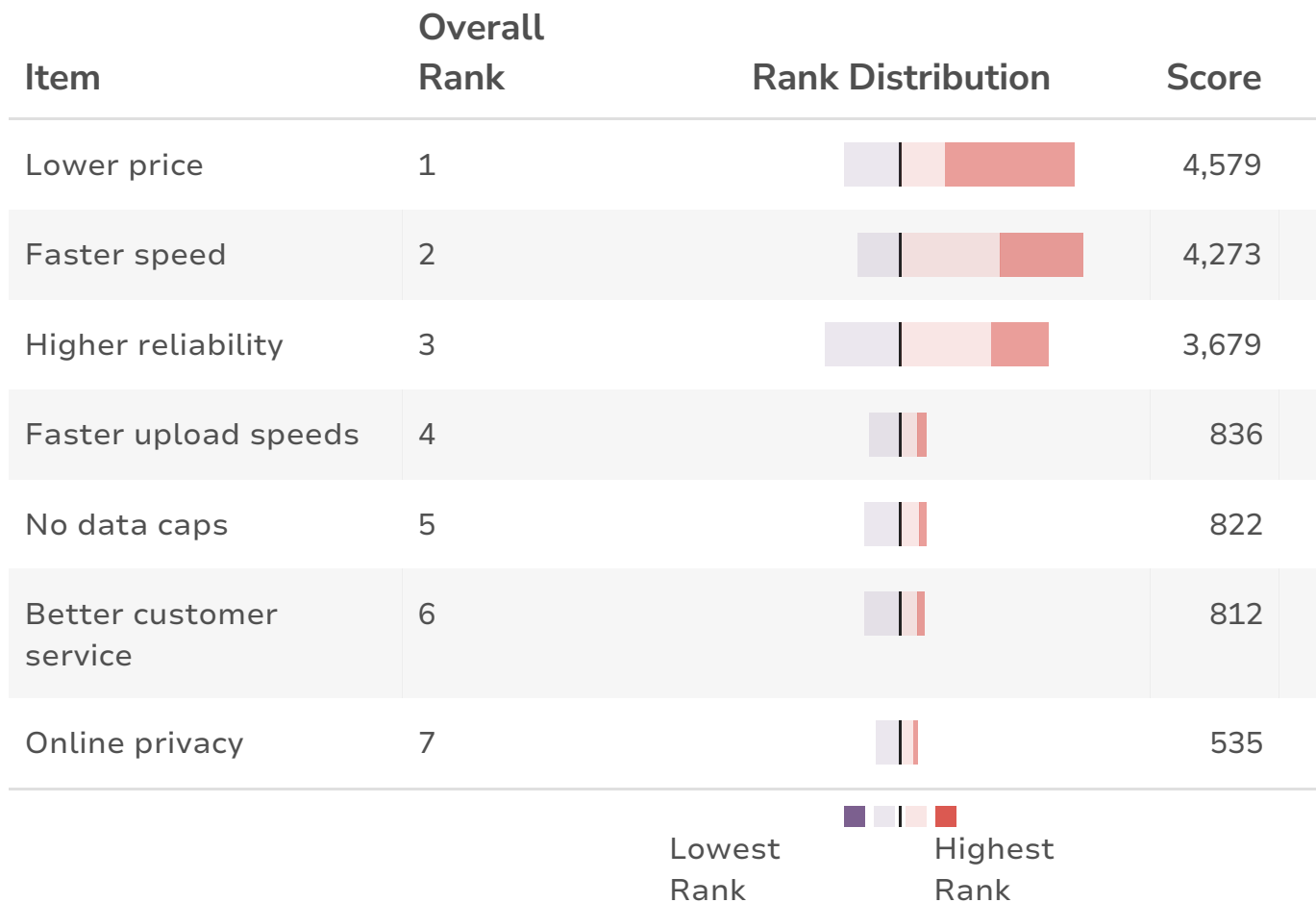




## Reasons to Switch

The survey asked respondents to rank the top 3 reasons they would switch from their current provider to Palo Alto Fiber. Price ranked highest, which is customary for responses to this question. Faster speeds ranked second and reliability ranked third. The ranking spread between speed and reliability was relatively strong, showing a higher preference for switching based on higher speeds rather than higher reliability.

Figure 7: Reasons to Switch



## Market Share Calculations

Choice-based-conjoint analysis, or CBC, provides a predictive assessment of take rates that the City could achieve if it offered internet services. CBC is used by broadband providers nationwide to help them understand which product and service features customers value over others, which gives useful insight to determine pricing, speeds and other aspects of internet service.

CBC analysis asks citizens to make choices about their internet service in the same fashion as consumers normally do, by trading off features one against the other when presented with multiple offers. The survey presented ten pairs of offers to respondents and for each pair, asked which offer the respondent preferred.

Results of the CBC analysis determined an estimate of market share that the City could attain if it provided internet services to households. Part-worth utilities were calculated for the three attributes: Speed, Brand and Price, along with the relative importance of each attribute.

From these part-worth utilities, take rates (market share preferences) were calculated through use of a market share simulator. This process converted part-worth utilities into shares of market preference, for each provider (brand) studied and provided a market share preference for each product offered by the provider. This was valuable in determining the right product mix of speeds and prices that would drive the greatest market share for the City.

It was also important for the analysis to discount expected market share by the execution risk that the City faces in building and operating its network. The CBC analysis only predicts customer behavior to derive take rates, it does not consider the risks and threats of providing internet services that may reduce overall take rates.

The City will be a new market entrant that must build its network, operations and salesforce from scratch. The City should also anticipate that competitors will react by lowering rates and by negotiating long-term contracts with their customers. These three forces together may yield lower take rates for the Palo Alto Fiber than if it was an existing operator in the marketplace.

Therefore, market share from the CBC analysis was discounted based on the business and competitive threats that are part of any new business venture. The City will need to successfully execute sales, marketing, construction and operations functions for Palo Alto Fiber to achieve the market shares that are predicted by the CBC analysis. This discounting process reduced the predicted take rates to a reasonable level based on an analysis of the many risks that Palo Alto Fiber will experience as an ISP.

Preliminary market share from the conjoint analysis indicated a 62.2% overall take rate for the City. Using the risk discounting method, this study discounted the 62.2% by 22% to arrive at a final take rate of 40.26%.

Figure 8: Market Share Calculations

Provider	Provider and Service Offering	Base Market Share from CBC	Discounted for Execution Risk	Predicted Market Share
City of Palo Alto	1 Gigabit at \$89.99	22%	13.00%	40.26%
	500 Megabit at \$69.99	44%	26.19%	
	100 Megabit at \$49.99	2%	1.07%	

# FINANCIAL PLANS (INSOURCE)

## Pro Forma (Insource)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
<b>Service Revenues</b>										
New Residential Internet	\$ -	\$ 495,489	\$ 2,288,619	\$ 5,452,596	\$ 7,915,096	\$ 8,974,130	\$ 9,609,627	\$ 9,915,164	\$ 10,230,307	\$ 10,555,354
Existing Dark Fiber	\$ 1,700,000	\$ 1,734,000	\$ 1,768,680	\$ 1,804,054	\$ 1,840,135	\$ 1,876,937	\$ 1,914,476	\$ 1,952,766	\$ 1,991,821	\$ 2,031,657
New Business Internet	\$ -	\$ 282,540	\$ 1,305,029	\$ 3,109,208	\$ 4,513,388	\$ 5,117,276	\$ 5,479,653	\$ 5,653,878	\$ 5,833,580	\$ 6,018,930
<b>Subtotal: Service Revenues</b>	<b>\$ 1,700,000</b>	<b>\$ 2,512,029</b>	<b>\$ 5,362,328</b>	<b>\$ 10,365,858</b>	<b>\$ 14,268,618</b>	<b>\$ 15,968,343</b>	<b>\$ 17,003,756</b>	<b>\$ 17,521,808</b>	<b>\$ 18,055,708</b>	<b>\$ 18,605,942</b>
<b>Installation Revenues</b>										
Residential	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Business	\$ -	\$ 18,731	\$ 48,118	\$ 68,123	\$ 18,110	\$ 13,991	\$ 1,201	\$ 1,237	\$ 1,275	\$ 1,313
<b>Subtotal: Installation Revenues</b>	<b>\$ -</b>	<b>\$ 18,731</b>	<b>\$ 48,118</b>	<b>\$ 68,123</b>	<b>\$ 18,110</b>	<b>\$ 13,991</b>	<b>\$ 1,201</b>	<b>\$ 1,237</b>	<b>\$ 1,275</b>	<b>\$ 1,313</b>
<b>Equipment Rental Revenues</b>										
Residential	\$ -	\$ 14,791	\$ 68,317	\$ 162,764	\$ 236,272	\$ 267,884	\$ 286,855	\$ 295,975	\$ 305,382	\$ 315,085
Business	\$ -	\$ 11,352	\$ 52,434	\$ 124,922	\$ 181,340	\$ 205,603	\$ 220,163	\$ 227,163	\$ 234,383	\$ 241,830
<b>Subtotal: Equipment Rental Revenues</b>	<b>\$ -</b>	<b>\$ 26,143</b>	<b>\$ 120,751</b>	<b>\$ 287,687</b>	<b>\$ 417,611</b>	<b>\$ 473,488</b>	<b>\$ 507,017</b>	<b>\$ 523,138</b>	<b>\$ 539,765</b>	<b>\$ 556,915</b>
<b>TOTAL REVENUES</b>	<b>\$ 1,700,000</b>	<b>\$ 2,556,903</b>	<b>\$ 5,531,196</b>	<b>\$ 10,721,667</b>	<b>\$ 14,704,339</b>	<b>\$ 16,455,822</b>	<b>\$ 17,511,975</b>	<b>\$ 18,046,183</b>	<b>\$ 18,596,747</b>	<b>\$ 19,164,170</b>
<b>Cost of Services</b>										
Direct Staff	\$ 427,041	\$ 2,640,168	\$ 3,852,253	\$ 4,196,255	\$ 4,301,161	\$ 4,408,690	\$ 4,518,908	\$ 4,631,880	\$ 4,747,677	\$ 4,866,369
Internet Peering		\$ 61,500	\$ 63,038	\$ 64,613	\$ 66,229	\$ 67,884	\$ 69,582	\$ 71,321	\$ 73,104	\$ 74,932
Bandwidth (Transport & Internet)		\$ 178,800	\$ 178,800	\$ 190,304	\$ 214,825	\$ 233,307	\$ 234,855	\$ 236,411	\$ 237,974	\$ 239,545
Overnight Customer Management 6pm - 6am	\$ -	\$ 63,687	\$ 212,543	\$ 422,386	\$ 476,810	\$ 517,832	\$ 521,267	\$ 524,720	\$ 528,190	\$ 531,677
<b>Subtotal: Cost of Services</b>	<b>\$ 427,041</b>	<b>\$ 2,944,155</b>	<b>\$ 4,306,634</b>	<b>\$ 4,873,559</b>	<b>\$ 5,059,025</b>	<b>\$ 5,227,714</b>	<b>\$ 5,344,612</b>	<b>\$ 5,464,332</b>	<b>\$ 5,586,946</b>	<b>\$ 5,712,524</b>
<b>GROSS PROFIT</b>	<b>\$ 1,272,959</b>	<b>\$ (387,253)</b>	<b>\$ 1,224,562</b>	<b>\$ 5,848,108</b>	<b>\$ 9,645,315</b>	<b>\$ 11,228,108</b>	<b>\$ 12,167,363</b>	<b>\$ 12,581,851</b>	<b>\$ 13,009,802</b>	<b>\$ 13,451,646</b>
<b>Operating Costs</b>										
General & Administrative Staff	\$ 540,354	\$ 1,315,750	\$ 1,348,644	\$ 1,382,360	\$ 1,416,919	\$ 1,452,342	\$ 1,488,651	\$ 1,525,867	\$ 1,564,014	\$ 1,603,114
Fiber Plant Maintenance	\$ -	\$ 89,828	\$ 184,148	\$ 283,128	\$ 386,942	\$ 396,615	\$ 406,531	\$ 416,694	\$ 427,111	\$ 437,789
Data Center Maintenance		\$ 128,125	\$ 131,328	\$ 134,611	\$ 137,977	\$ 141,426	\$ 144,962	\$ 148,586	\$ 152,300	\$ 156,108
Vehicle Maintenance		\$ 47,663	\$ 48,854	\$ 50,075	\$ 51,327	\$ 52,610	\$ 53,926	\$ 55,274	\$ 56,656	\$ 58,072
Software Maintenance		\$ 138,375	\$ 141,834	\$ 145,380	\$ 149,015	\$ 152,740	\$ 156,559	\$ 160,473	\$ 164,484	\$ 168,597
Facilities Maintenance		\$ 66,625	\$ 68,291	\$ 69,998	\$ 71,748	\$ 73,542	\$ 75,380	\$ 77,265	\$ 79,196	\$ 81,176
Reporting & Compliance		\$ 35,875	\$ 36,772	\$ 37,691	\$ 38,633	\$ 39,599	\$ 40,589	\$ 41,604	\$ 42,644	\$ 43,710
Utilities		\$ 41,000	\$ 42,025	\$ 43,076	\$ 44,153	\$ 45,256	\$ 46,388	\$ 47,547	\$ 48,736	\$ 49,955
Legal (Increase by 3X, first 3 years)	\$ 102,500	\$ 105,063	\$ 107,689	\$ 110,381	\$ 113,141	\$ 115,969	\$ 118,869	\$ 121,840	\$ 124,886	\$ 128,008
Office Expense	\$ 61,500	\$ 63,038	\$ 64,613	\$ 66,229	\$ 67,884	\$ 69,582	\$ 71,321	\$ 73,104	\$ 74,932	\$ 76,805
Pole Attachment Fees (Subtract out electric)		\$ 91,877	\$ 183,754	\$ 190,185	\$ 196,842	\$ 203,731	\$ 210,862	\$ 218,242	\$ 225,880	\$ 233,786
Sales & Marketing	\$ 350,000	\$ 350,000	\$ 250,000	\$ 256,250	\$ 262,656	\$ 269,223	\$ 275,953	\$ 282,852	\$ 289,923	\$ 297,171
<b>Subtotal: Sales, General &amp; Administrative</b>	<b>\$ 1,054,354</b>	<b>\$ 2,473,218</b>	<b>\$ 2,607,953</b>	<b>\$ 2,769,365</b>	<b>\$ 2,937,236</b>	<b>\$ 3,012,636</b>	<b>\$ 3,089,989</b>	<b>\$ 3,169,347</b>	<b>\$ 3,250,763</b>	<b>\$ 3,334,291</b>
Depreciation	\$ 1,421,379	\$ 2,629,968	\$ 3,954,717	\$ 5,400,771	\$ 5,526,806	\$ 5,618,035	\$ 5,792,092	\$ 6,063,659	\$ 6,071,376	\$ 6,079,132
Interest on Long-Term Debt		\$ 669,837	\$ 1,812,319	\$ 2,993,047	\$ 4,237,370	\$ 4,168,027	\$ 4,095,217	\$ 4,018,766	\$ 3,938,493	\$ 3,854,206
<b>NET INCOME</b>	<b>\$ (1,202,774)</b>	<b>\$ (6,160,275)</b>	<b>\$ (7,150,426)</b>	<b>\$ (5,315,075)</b>	<b>\$ (3,056,097)</b>	<b>\$ (1,570,590)</b>	<b>\$ (809,935)</b>	<b>\$ (669,922)</b>	<b>\$ (250,831)</b>	<b>\$ 184,017</b>
Principal on Long Term Debt		\$ 201,640	\$ 558,677	\$ 950,453	\$ 1,386,858	\$ 1,456,201	\$ 1,529,011	\$ 1,605,461	\$ 1,685,734	\$ 1,770,021
Operating Reserve Fund		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Renewal & Replacement Fund			\$ 1,476,872	\$ 1,502,129	\$ 1,520,601	\$ 1,547,110	\$ 1,594,043	\$ 1,595,605	\$ 1,597,176	\$ 1,597,176
Capital Budget	\$ 25,396,732	\$ 23,051,287	\$ 24,173,243	\$ 25,836,899	\$ 1,683,761	\$ 1,231,447	\$ 1,767,294	\$ 3,128,855	\$ 104,168	\$ 104,688
<b>TOTAL NON-OPERATING, CAPITAL AND RESERVES</b>	<b>\$ 25,396,732</b>	<b>\$ 23,252,927</b>	<b>\$ 24,731,920</b>	<b>\$ 28,264,224</b>	<b>\$ 4,572,748</b>	<b>\$ 4,208,249</b>	<b>\$ 4,843,415</b>	<b>\$ 6,328,359</b>	<b>\$ 3,385,507</b>	<b>\$ 3,471,885</b>
<b>Cash Flow</b>										
Beginning of Year	\$ -	\$ 13,218,605	\$ 9,486,658	\$ 5,732,271	\$ 3,390,642	\$ 1,288,603	\$ 1,127,800	\$ 1,266,543	\$ 331,921	\$ 2,766,959
Add: Net Income	\$ (1,202,774)	\$ (6,160,275)	\$ (7,150,426)	\$ (5,315,075)	\$ (3,056,097)	\$ (1,570,590)	\$ (809,935)	\$ (669,922)	\$ (250,831)	\$ 184,017
Add: Depreciation	\$ 1,421,379	\$ 2,629,968	\$ 3,954,717	\$ 5,400,771	\$ 5,526,806	\$ 5,618,035	\$ 5,792,092	\$ 6,063,659	\$ 6,071,376	\$ 6,079,132
Add: New Debt	\$ 13,396,732	\$ 23,051,287	\$ 24,173,243	\$ 25,836,899	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Add: Existing Funds	\$ 25,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Less: Non-Operating, CAPITAL and RESERVES	\$ 25,396,732	\$ 23,252,927	\$ 24,731,920	\$ 28,264,224	\$ 4,572,748	\$ 4,208,249	\$ 4,843,415	\$ 6,328,359	\$ 3,385,507	\$ 3,471,885
<b>End of Year</b>	<b>\$ 13,218,605</b>	<b>\$ 9,486,658</b>	<b>\$ 5,732,271</b>	<b>\$ 3,390,642</b>	<b>\$ 1,288,603</b>	<b>\$ 1,127,800</b>	<b>\$ 1,266,543</b>	<b>\$ 331,921</b>	<b>\$ 2,766,959</b>	<b>\$ 5,558,222</b>

## Staffing Plan (Insource)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Year #	1	2	3	4	5	6	7	8	9	10
Total Subscribers	0	1,353	4,745	9,429	10,644	11,560	11,637	11,714	11,791	11,869
<b>Total FTE</b>										
Customer Service Rep	-	3	3	3	3	3	3	3	3	3
NOC Technicians	-	2	3	4	4	4	4	4	4	4
Customer Service Supervisor	-	1	2	2	2	2	2	2	2	2
Billing Tech	-	1	1	1	1	1	1	1	1	1
Revenue & Accounting Manager	1	1	1	1	1	1	1	1	1	1
Network Designer	1	1	2	1	1	1	1	1	1	1
Network Engineer	1	1	2	3	3	3	3	3	3	3
Installation & Service Tech	-	2	3	3	3	3	3	3	3	3
Maintenance & Repair Tech	-	2	2	2	2	2	2	2	2	2
Field Services Manager	1	1	1	1	1	1	1	1	1	1
Commercial Account Manager	-	1	1	1	1	1	1	1	1	1
Sales & Marketing Manager	1	1	1	1	1	1	1	1	1	1
Assistant Director	1	1	1	1	1	1	1	1	1	1
Operations & Engineering Manager	1	1	1	1	1	1	1	1	1	1
<b>Total FTE</b>	<b>7.00</b>	<b>19.00</b>	<b>24.00</b>	<b>25.00</b>	<b>25.00</b>	<b>25.00</b>	<b>25.00</b>	<b>25.00</b>	<b>25.00</b>	<b>25.00</b>
<b>Total Costs</b>										
Customer Service Rep	-	405,646	415,787	426,182	436,837	447,758	458,952	470,425	482,186	494,241
NOC Technicians	-	322,437	495,747	677,520	694,458	711,820	729,615	747,856	766,552	785,716
Customer Service Supervisor	-	159,485	326,944	335,118	343,496	352,083	360,885	369,907	379,155	388,634
Billing Tech	-	149,084	152,811	156,631	160,547	164,560	168,675	172,891	177,214	181,644
Revenue & Accounting Manager	253,688	260,030	266,530	273,194	280,024	287,024	294,200	301,555	309,094	316,821
Network Designer	263,835	270,431	554,383	284,121	291,224	298,505	305,968	313,617	321,457	329,494
Network Engineer	336,559	344,973	707,194	1,087,311	1,114,494	1,142,356	1,170,915	1,200,188	1,230,192	1,260,947
Installation & Service Tech	-	364,042	559,714	573,707	588,049	602,751	617,819	633,265	649,097	665,324
Maintenance & Repair Tech	-	364,042	373,143	382,471	392,033	401,834	411,880	422,177	432,731	443,549
Field Services Manager	312,881	320,703	328,721	336,939	345,362	353,996	362,846	371,917	381,215	390,746
Commercial Account Manager	-	208,024	213,224	218,555	224,019	229,619	235,360	241,244	247,275	253,457
Sales & Marketing Manager	295,969	303,368	310,952	318,726	326,694	334,861	343,233	351,814	360,609	369,624
Assistant Director*	135,300	138,683	142,150	145,703	149,346	153,080	156,907	160,829	164,850	168,971
Operations & Engineering Manager	336,559	344,973	353,597	362,437	371,498	380,785	390,305	400,063	410,064	420,316
Direct Staff	\$ 854,081	\$ 2,640,168	\$ 3,852,253	\$ 4,196,255	\$ 4,301,161	\$ 4,408,690	\$ 4,518,908	\$ 4,631,880	\$ 4,747,677	\$ 4,866,369
General & Administrative Staff	\$ 1,080,709	\$ 1,315,750	\$ 1,348,644	\$ 1,382,360	\$ 1,416,919	\$ 1,452,342	\$ 1,488,651	\$ 1,525,867	\$ 1,564,014	\$ 1,603,114
<b>Total Costs</b>	<b>\$ 1,934,790</b>	<b>\$ 3,955,918</b>	<b>\$ 5,200,897</b>	<b>\$ 5,578,615</b>	<b>\$ 5,718,081</b>	<b>\$ 5,861,033</b>	<b>\$ 6,007,558</b>	<b>\$ 6,157,747</b>	<b>\$ 6,311,691</b>	<b>\$ 6,469,483</b>

\*The Assistant Director position will be revised to reflect full-time costs, which will not be a material change to overall costs

## Assumptions (Insource)

## Operating Cost Assumptions

	Type	Per Unit	Annual Change
<b>Cost of Services</b>			
Direct Staff	Calculated Separately		
Internet Peering	Flat Fee	\$ 60,000	2.50%
Bandwidth (Transport & Internet)	Per Subscriber	\$ 2.00	0.00%
Wholesale Voice	Per Subscriber	\$ 7.00	0.00%
Customer Management	Per Subscriber	\$ 3.50	2.50%
<b>Operating Costs</b>			
General & Administrative Staff	Calculated Separately		
Fiber Plant Maintenance	Per Mile Per Year	\$ 950	2.50%
Data Center Maintenance	Fixed Annual	\$ 125,000	2.50%
Vehicle Maintenance	Fixed Annual	\$ 46,500	2.50%
Software Maintenance	Fixed Annual	\$ 135,000	2.50%
Facilities Maintenance	Fixed Annual	\$ 65,000	2.50%
Reporting & Compliance	Fixed	\$ 35,000	2.50%
Utilities	Fixed Annual	\$ 40,000	2.50%
Legal & Professional Services	Fixed	\$ 100,000	2.50%
Office Expense	Fixed	\$ 60,000	2.50%
Pole Attachment Fees	Fixed	\$ 178,740	3.50%
Sales & Marketing	Fixed	\$ 250,000	2.50%
<b>FTE Salaries</b>			
	FTE Salary	Fully Loaded	Annual Increase
Customer Service Rep	\$ 78,000	\$ 128,700	2.50%
Service Techs	\$ 93,000	\$ 153,450	2.50%
Customer Service Supervisor	\$ 92,000	\$ 151,800	2.50%
Billing Tech	\$ 86,000	\$ 141,900	2.50%
Revenue & Accounting Manager	\$ 150,000	\$ 247,500	2.50%
Network Designer	\$ 156,000	\$ 257,400	2.50%
Network Engineer	\$ 199,000	\$ 328,350	2.50%
Installation & Service Tech	\$ 105,000	\$ 173,250	2.50%
Maintenance & Repair Tech	\$ 105,000	\$ 173,250	2.50%
Field Services Manager	\$ 185,000	\$ 305,250	2.50%
Commercial Account Manager	\$ 120,000	\$ 198,000	2.50%
Sales & Marketing Manager	\$ 175,000	\$ 288,750	2.50%
Assistant Director	\$ 229,000	\$ 377,850	2.50%
Engineering & Operations Manager	\$ 199,000	\$ 328,350	2.50%
Salary & Benefit Overhead	Percent of Salary	65%	
<b>Depreciation</b>			
Equipment (Averaged, 5, 7, 10 Year)	Auto-Calculated	Lifetime 10	
Infrastructure (Fiber, Facilities)	Auto-Calculated	Lifetime 20	
<b>Financial Assumptions</b>			
<b>Fund Type</b>		<b>Percentage</b>	
Operating Reserve Fund	% of Operating Costs	0.00%	
Renewal & Replacement Fund	% of Cumul. Capital	1.50%	
Capital Expansion Fund	% of Cumul. Capital	0.00%	
<b>Expense Categories</b>		<b>Capitalize</b>	
Materials	Materials	Yes	
Equipment	Equipment	Yes	
Labor	Labor	Yes	
<b>Annual Inflation Adjustment (CPI)</b>	CPI	2.50%	
Interest Rate		5.00%	

**Capital Cost Assumptions**

	Type	Per Unit	Annual Inc/Dec
<b><u>Cost to Connect + Home Equipment</u></b>			
<b>Materials Cost</b>			
6 Count tight buffer fiber drop (120 ft @ \$.60/ft)		\$ 72.00	0.00%
APC Fiber Unicam Connector (4 @ \$16 ea)		\$ 64.00	0.00%
Mounting Hardware		\$ 60.00	0.00%
<b>Total Materials Cost Per Passing</b>		<b>\$ 196.00</b>	
<b>Equipment Cost</b>			
Inside Wiring		\$ 50.00	0.00%
Optical Network Terminal + Power Supply		\$ 350.00	0.00%
Wireless Gateway		\$ 100.00	0.00%
2 STBs with 1 Master Whole-Home DVR			0.00%
<b>Total Equipment Cost</b>		<b>\$ 500.00</b>	
<b>Labor Cost</b>			
Install Aerial Cable Drop (120 Ft @ \$2/foot), Terminate Ped/Home		\$ 450.00	0.00%
Premise Equipment Installation Per Passing (2 Hours) - Installers Included in Staffing Plan		\$ 175.00	0.00%
Premise Inside Wiring Per Passing - Installers Included in Staffing Plan		\$ 75.00	0.00%
<b>Total Labor Cost Per Passing</b>		<b>\$ 700.00</b>	
<b>Total Cost to Connect + Home Equipment</b>		<b>\$ 1,396.00</b>	
<b><u>Equipment Costs</u></b>			
Fiber Termination		\$ 35,000	0.00%
Equipment Racks		\$ 15,000	0.00%
Intra-facility cabling		\$ 20,000	0.00%
Ladder/raceway		\$ 50,000	0.00%
Core switch routers		\$ 350,000	0.00%
Edge routers		\$ -	0.00%
Firewalls		\$ 45,000	0.00%
Access Equipment		\$ 31,512	0.00%
Billing Systems		\$ 300,000	0.00%
Provisioning Systems		\$ 300,000	0.00%
Network Management Systems		\$ 50,000	0.00%
Fiber Management Systems		\$ 50,000	0.00%
Workforce Management Systems		\$ 75,000	0.00%
Trouble Ticketing Systems		\$ 100,000	0.00%
Project & Construction Management		\$ 2,700,000	0.00%
<b><u>Facility &amp; Office Improvements</u></b>			
Data Center Retrofit Existing Facility		\$ 500,000	0.00%
Network Operations Center			0.00%
Sales & Administrative Offices			0.00%
<b><u>General Equipment</u></b>			
Service Vans		\$ 85,000	0.00%
Bucket Trucks		\$ 275,000	0.00%
Maintenance Trucks		\$ 115,000	0.00%
Splicing Trailers		\$ 50,000	0.00%
OTDRs		\$ 20,000	0.00%
Mobile Test Sets		\$ 7,000	0.00%
Fusion Splicers		\$ 20,000	0.00%
Toolkits		\$ 10,000	0.00%
Miscellaneous Equipment			0.00%



# FINANCIAL PLANS (HYBRID)

Pro Forma (Hybrid)

Proprietary & Confidential Property of the City of Palo Alto

Year #	2023 1	2024 2	2025 3	2026 4	2027 5	2028 6	2029 7	2030 8	2031 9	2032 10
<b>Service Revenues</b>										
New Residential Internet	\$ -	\$ 495,489	\$ 2,288,619	\$ 5,452,596	\$ 7,915,096	\$ 8,974,130	\$ 9,609,627	\$ 9,915,164	\$ 10,230,307	\$ 10,555,354
Existing Dark Fiber	\$ 1,700,000	\$ 1,734,000	\$ 1,768,680	\$ 1,804,054	\$ 1,840,135	\$ 1,876,937	\$ 1,914,476	\$ 1,952,766	\$ 1,991,821	\$ 2,031,657
New Business Internet	\$ -	\$ 282,540	\$ 1,305,029	\$ 3,109,208	\$ 4,513,388	\$ 5,117,276	\$ 5,479,653	\$ 5,653,878	\$ 5,833,580	\$ 6,018,930
<b>Subtotal: Service Revenues</b>	<b>\$ 1,700,000</b>	<b>\$ 2,512,029</b>	<b>\$ 5,362,328</b>	<b>\$ 10,365,858</b>	<b>\$ 14,268,618</b>	<b>\$ 15,968,343</b>	<b>\$ 17,003,756</b>	<b>\$ 17,521,808</b>	<b>\$ 18,055,708</b>	<b>\$ 18,605,942</b>
<b>Installation Revenues</b>										
Residential	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Business	\$ -	\$ 18,731	\$ 48,118	\$ 68,123	\$ 18,110	\$ 13,991	\$ 1,201	\$ 1,237	\$ 1,275	\$ 1,313
<b>Subtotal: Installation Revenues</b>	<b>\$ -</b>	<b>\$ 18,731</b>	<b>\$ 48,118</b>	<b>\$ 68,123</b>	<b>\$ 18,110</b>	<b>\$ 13,991</b>	<b>\$ 1,201</b>	<b>\$ 1,237</b>	<b>\$ 1,275</b>	<b>\$ 1,313</b>
<b>Equipment Rental Revenues</b>										
Residential	\$ -	\$ 14,791	\$ 68,317	\$ 162,764	\$ 236,272	\$ 267,884	\$ 286,855	\$ 295,975	\$ 305,382	\$ 315,085
Business	\$ -	\$ 11,352	\$ 52,434	\$ 124,922	\$ 181,340	\$ 205,603	\$ 220,163	\$ 227,163	\$ 234,383	\$ 241,830
<b>Subtotal: Equipment Rental Revenues</b>	<b>\$ -</b>	<b>\$ 26,143</b>	<b>\$ 120,751</b>	<b>\$ 287,687</b>	<b>\$ 417,611</b>	<b>\$ 473,488</b>	<b>\$ 507,017</b>	<b>\$ 523,138</b>	<b>\$ 539,765</b>	<b>\$ 556,915</b>
<b>TOTAL REVENUES</b>	<b>\$ 1,700,000</b>	<b>\$ 2,556,903</b>	<b>\$ 5,531,196</b>	<b>\$ 10,721,667</b>	<b>\$ 14,704,339</b>	<b>\$ 16,455,822</b>	<b>\$ 17,511,975</b>	<b>\$ 18,046,183</b>	<b>\$ 18,596,747</b>	<b>\$ 19,164,170</b>
<b>Cost of Services</b>										
Direct Staff	\$ 427,041	\$ 2,026,498	\$ 2,381,005	\$ 2,440,530	\$ 2,501,544	\$ 2,564,082	\$ 2,628,184	\$ 2,693,889	\$ 2,761,236	\$ 2,830,267
Internet Peering	\$ -	\$ 61,500	\$ 63,038	\$ 64,613	\$ 66,229	\$ 67,884	\$ 69,582	\$ 71,321	\$ 73,104	\$ 74,932
Bandwidth (Transport & Internet)	\$ -	\$ 178,800	\$ 178,800	\$ 190,304	\$ 214,825	\$ 233,307	\$ 234,855	\$ 236,411	\$ 237,974	\$ 239,545
Wholesale Voice	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Overnight Customer Management 6pm - 6am	\$ -	\$ 272,945	\$ 910,899	\$ 1,810,225	\$ 2,043,470	\$ 2,219,278	\$ 2,234,002	\$ 2,248,800	\$ 2,263,671	\$ 2,278,617
<b>Subtotal: Cost of Services</b>	<b>\$ 427,041</b>	<b>\$ 2,539,743</b>	<b>\$ 3,533,742</b>	<b>\$ 4,505,674</b>	<b>\$ 4,826,067</b>	<b>\$ 5,084,552</b>	<b>\$ 5,166,623</b>	<b>\$ 5,250,420</b>	<b>\$ 5,335,985</b>	<b>\$ 5,423,361</b>
<b>GROSS PROFIT</b>	<b>\$ 1,272,959</b>	<b>\$ 17,160</b>	<b>\$ 1,997,454</b>	<b>\$ 6,215,994</b>	<b>\$ 9,878,272</b>	<b>\$ 11,371,270</b>	<b>\$ 12,345,352</b>	<b>\$ 12,795,763</b>	<b>\$ 13,260,762</b>	<b>\$ 13,740,809</b>
<b>Operating Costs</b>										
General & Administrative Staff	\$ 540,354	\$ 1,315,750	\$ 1,348,644	\$ 1,382,360	\$ 1,416,919	\$ 1,452,342	\$ 1,488,651	\$ 1,525,867	\$ 1,564,014	\$ 1,603,114
Fiber Plant Maintenance	\$ -	\$ 89,828	\$ 184,148	\$ 283,128	\$ 386,942	\$ 396,615	\$ 406,531	\$ 416,694	\$ 427,111	\$ 437,789
Data Center Maintenance	\$ -	\$ 128,125	\$ 131,328	\$ 134,611	\$ 137,977	\$ 141,426	\$ 144,962	\$ 148,586	\$ 152,300	\$ 156,108
Vehicle Maintenance	\$ -	\$ 47,663	\$ 48,854	\$ 50,075	\$ 51,327	\$ 52,610	\$ 53,926	\$ 55,274	\$ 56,656	\$ 58,072
Software Maintenance	\$ -	\$ 138,375	\$ 141,834	\$ 145,380	\$ 149,015	\$ 152,740	\$ 156,559	\$ 160,473	\$ 164,484	\$ 168,597
Facilities Maintenance	\$ -	\$ 66,625	\$ 68,291	\$ 69,998	\$ 71,748	\$ 73,542	\$ 75,380	\$ 77,265	\$ 79,196	\$ 81,176
Reporting & Compliance	\$ -	\$ 35,875	\$ 36,772	\$ 37,691	\$ 38,633	\$ 39,599	\$ 40,589	\$ 41,604	\$ 42,644	\$ 43,710
Utilities	\$ -	\$ 41,000	\$ 42,025	\$ 43,076	\$ 44,153	\$ 45,256	\$ 46,388	\$ 47,547	\$ 48,736	\$ 49,955
Legal (Increase by 3X, first 3 years)	\$ 102,500	\$ 105,063	\$ 107,689	\$ 110,381	\$ 113,141	\$ 115,969	\$ 118,869	\$ 121,840	\$ 124,886	\$ 128,008
Office Expense	\$ 61,500	\$ 63,038	\$ 64,613	\$ 66,229	\$ 67,884	\$ 69,582	\$ 71,321	\$ 73,104	\$ 74,932	\$ 76,805
Pole Attachment Fees (Subtract out electric)	\$ -	\$ 91,877	\$ 183,754	\$ 190,185	\$ 196,842	\$ 203,731	\$ 210,862	\$ 218,242	\$ 225,880	\$ 233,786
Sales & Marketing	\$ 350,000	\$ 350,000	\$ 250,000	\$ 256,250	\$ 262,656	\$ 269,223	\$ 275,953	\$ 282,852	\$ 289,923	\$ 297,171
<b>Subtotal: Sales, General &amp; Administrative</b>	<b>\$ 1,054,354</b>	<b>\$ 2,473,218</b>	<b>\$ 2,607,953</b>	<b>\$ 2,769,365</b>	<b>\$ 2,937,236</b>	<b>\$ 3,012,636</b>	<b>\$ 3,089,989</b>	<b>\$ 3,169,347</b>	<b>\$ 3,250,763</b>	<b>\$ 3,334,291</b>
Depreciation	\$ 1,421,379	\$ 2,629,968	\$ 3,954,717	\$ 5,400,771	\$ 5,526,806	\$ 5,618,035	\$ 5,792,092	\$ 6,063,659	\$ 6,071,376	\$ 6,079,132
Interest on Long-Term Debt	\$ -	\$ 669,837	\$ 1,812,319	\$ 2,993,047	\$ 4,237,370	\$ 4,168,027	\$ 4,095,217	\$ 4,018,766	\$ 3,938,493	\$ 3,854,206
<b>NET INCOME</b>	<b>\$ (1,202,774)</b>	<b>\$ (5,755,863)</b>	<b>\$ (6,377,534)</b>	<b>\$ (4,947,190)</b>	<b>\$ (2,823,139)</b>	<b>\$ (1,427,428)</b>	<b>\$ (631,946)</b>	<b>\$ (456,010)</b>	<b>\$ 129</b>	<b>\$ 473,179</b>
Principal on Long Term Debt	\$ -	\$ 201,640	\$ 558,677	\$ 950,453	\$ 1,386,858	\$ 1,456,201	\$ 1,529,011	\$ 1,605,461	\$ 1,685,734	\$ 1,770,021
Operating Reserve Fund	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Renewal & Replacement Fund	\$ -	\$ -	\$ 1,476,872	\$ 1,502,129	\$ 1,502,129	\$ 1,520,601	\$ 1,547,110	\$ 1,594,043	\$ 1,595,605	\$ 1,597,176
<b>Capital Spending</b>										
Capital Budget	\$ 25,396,732	\$ 23,051,287	\$ 24,173,243	\$ 25,836,899	\$ 1,683,761	\$ 1,231,447	\$ 1,767,294	\$ 3,128,855	\$ 104,168	\$ 104,688
<b>TOTAL NON-OPERATING, CAPITAL AND RESERVES</b>	<b>\$ 25,396,732</b>	<b>\$ 23,252,927</b>	<b>\$ 24,731,920</b>	<b>\$ 28,264,224</b>	<b>\$ 4,572,748</b>	<b>\$ 4,208,249</b>	<b>\$ 4,843,415</b>	<b>\$ 6,328,359</b>	<b>\$ 3,385,507</b>	<b>\$ 3,471,885</b>
<b>Cash Flow</b>										
Beginning of Year	\$ -	\$ 13,218,605	\$ 9,891,070	\$ 6,909,576	\$ 4,935,832	\$ 3,066,751	\$ 3,049,109	\$ 3,365,841	\$ 2,645,131	\$ 5,331,129
Add: Net Income	\$ (1,202,774)	\$ (5,755,863)	\$ (6,377,534)	\$ (4,947,190)	\$ (2,823,139)	\$ (1,427,428)	\$ (631,946)	\$ (456,010)	\$ 129	\$ 473,179
Add: Depreciation	\$ 1,421,379	\$ 2,629,968	\$ 3,954,717	\$ 5,400,771	\$ 5,526,806	\$ 5,618,035	\$ 5,792,092	\$ 6,063,659	\$ 6,071,376	\$ 6,079,132
Add: New Debt	\$ 13,396,732	\$ 23,051,287	\$ 24,173,243	\$ 25,836,899	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Add: Existing Funds	\$ 25,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Less: Non-Operating, CAPITAL and RESERVES	\$ 25,396,732	\$ 23,252,927	\$ 24,731,920	\$ 28,264,224	\$ 4,572,748	\$ 4,208,249	\$ 4,843,415	\$ 6,328,359	\$ 3,385,507	\$ 3,471,885
<b>End of Year</b>	<b>\$ 13,218,605</b>	<b>\$ 9,891,070</b>	<b>\$ 6,909,576</b>	<b>\$ 4,935,832</b>	<b>\$ 3,066,751</b>	<b>\$ 3,049,109</b>	<b>\$ 3,365,841</b>	<b>\$ 2,645,131</b>	<b>\$ 5,331,129</b>	<b>\$ 8,411,555</b>

## Staffing Plan (Hybrid)

Proprietary &amp; Confidential Property of the City of Palo Alto

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Year #	1	2	3	4	5	6	7	8	9	10
<b>Total Subscribers</b>	0	1,353	4,745	9,429	10,644	11,560	11,637	11,714	11,791	11,869
<b>Total FTE</b>										
Customer Service Rep	-	1	2	2	2	2	2	2	2	2
NOC Technicians	-	1	2	2	2	2	2	2	2	2
Customer Service Supervisor	-	1	1	1	1	1	1	1	1	1
Billing Tech	-	1	1	1	1	1	1	1	1	1
Revenue & Accounting Manager	1	1	1	1	1	1	1	1	1	1
Network Designer	1	1	1	1	1	1	1	1	1	1
Network Engineer	1	1	1	1	1	1	1	1	1	1
Installation & Service Tech	-	1	1	1	1	1	1	1	1	1
Maintenance & Repair Tech	-	2	2	2	2	2	2	2	2	2
Field Services Manager	1	1	1	1	1	1	1	1	1	1
Commercial Account Manager	-	1	1	1	1	1	1	1	1	1
Sales & Marketing Manager	1	1	1	1	1	1	1	1	1	1
Assistant Director	1	1	1	1	1	1	1	1	1	1
Operations & Engineering Manager	1	1	1	1	1	1	1	1	1	1
<b>Total FTE</b>	<b>7.00</b>	<b>15.00</b>	<b>17.00</b>	<b>17.00</b>	<b>17.00</b>	<b>17.00</b>	<b>17.00</b>	<b>17.00</b>	<b>17.00</b>	<b>17.00</b>
<b>Total Costs</b>										
Customer Service Rep	-	135,215	277,192	284,121	291,224	298,505	305,968	313,617	321,457	329,494
NOC Technicians	-	161,218	330,498	338,760	347,229	355,910	364,808	373,928	383,276	392,858
Customer Service Supervisor	-	159,485	163,472	167,559	171,748	176,041	180,442	184,954	189,577	194,317
Billing Tech	-	149,084	152,811	156,631	160,547	164,560	168,675	172,891	177,214	181,644
Revenue & Accounting Manager	253,688	260,030	266,530	273,194	280,024	287,024	294,200	301,555	309,094	316,821
Network Designer	263,835	270,431	277,192	284,121	291,224	298,505	305,968	313,617	321,457	329,494
Network Engineer	336,559	344,973	353,597	362,437	371,498	380,785	390,305	400,063	410,064	420,316
Installation & Service Tech	-	182,021	186,571	191,236	196,016	200,917	205,940	211,088	216,366	221,775
Maintenance & Repair Tech	-	364,042	373,143	382,471	392,033	401,834	411,880	422,177	432,731	443,549
Field Services Manager	312,881	320,703	328,721	336,939	345,362	353,996	362,846	371,917	381,215	390,746
Commercial Account Manager	-	208,024	213,224	218,555	224,019	229,619	235,360	241,244	247,275	253,457
Sales & Marketing Manager	295,969	303,368	310,952	318,726	326,694	334,861	343,233	351,814	360,609	369,624
Assistant Director*	135,300	138,683	142,150	145,703	149,346	153,080	156,907	160,829	164,850	168,971
Operations & Engineering Manager	336,559	344,973	353,597	362,437	371,498	380,785	390,305	400,063	410,064	420,316
Direct Staff	\$ 854,081	\$ 2,026,498	\$ 2,381,005	\$ 2,440,530	\$ 2,501,544	\$ 2,564,082	\$ 2,628,184	\$ 2,693,889	\$ 2,761,236	\$ 2,830,267
General & Administrative Staff	\$ 1,080,709	\$ 1,315,750	\$ 1,348,644	\$ 1,382,360	\$ 1,416,919	\$ 1,452,342	\$ 1,488,651	\$ 1,525,867	\$ 1,564,014	\$ 1,603,114
<b>Total Costs</b>	<b>\$ 1,934,790</b>	<b>\$ 3,342,248</b>	<b>\$ 3,729,649</b>	<b>\$ 3,822,890</b>	<b>\$ 3,918,463</b>	<b>\$ 4,016,424</b>	<b>\$ 4,116,835</b>	<b>\$ 4,219,756</b>	<b>\$ 4,325,250</b>	<b>\$ 4,433,381</b>

\*The Assistant Director position will be revised to reflect full-time costs, which will not be a material change to overall costs

## Assumptions (Hybrid)

Proprietary &amp; Confidential Property of the City of Palo Alto

**Operating Cost Assumptions****Cost of Services**

Direct Staff	Calculated Separately			
Internet Peering	Flat Fee	\$	60,000	2.50%
Bandwidth (Transport & Internet)	Per Subscriber	\$	2.00	0.00%
Wholesale Voice	Per Subscriber	\$	7.00	0.00%
Customer Management	Per Subscriber	\$	15.00	2.50%

**Operating Costs**

General & Administrative Staff	Calculated Separately			
Fiber Plant Maintenance	Per Mile Per Year	\$	950	2.50%
Data Center Maintenance	Fixed Annual	\$	125,000	2.50%
Vehicle Maintenance	Fixed Annual	\$	46,500	2.50%
Software Maintenance	Fixed Annual	\$	135,000	2.50%
Facilities Maintenance	Fixed Annual	\$	65,000	2.50%
Reporting & Compliance	Fixed	\$	35,000	2.50%
Utilities	Fixed Annual	\$	40,000	2.50%
Legal & Professional Services	Fixed	\$	100,000	2.50%
Office Expense	Fixed	\$	60,000	2.50%
Pole Attachment Fees	Fixed	\$	178,740	3.50%
Sales & Marketing	Fixed	\$	250,000	2.50%

**FTE Salaries**

	FTE Salary	Fully Loaded	Annual Increase
Customer Service Rep	\$ 78,000	\$ 128,700	2.50%
Service Techs	\$ 93,000	\$ 153,450	2.50%
Customer Service Supervisor	\$ 92,000	\$ 151,800	2.50%
Billing Tech	\$ 86,000	\$ 141,900	2.50%
Revenue & Accounting Manager	\$ 150,000	\$ 247,500	2.50%
Network Designer	\$ 156,000	\$ 257,400	2.50%
Network Engineer	\$ 199,000	\$ 328,350	2.50%
Installation & Service Tech	\$ 105,000	\$ 173,250	2.50%
Maintenance & Repair Tech	\$ 105,000	\$ 173,250	2.50%
Field Services Manager	\$ 185,000	\$ 305,250	2.50%
Commercial Account Manager	\$ 120,000	\$ 198,000	2.50%
Sales & Marketing Manager	\$ 175,000	\$ 288,750	2.50%
Assistant Director	\$ 229,000	\$ 377,850	2.50%
Engineering & Operations Manager	\$ 199,000	\$ 328,350	2.50%

Salary & Benefit Overhead	Percent of Salary	65%
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**Depreciation**

		Lifetime
Equipment (Averaged, 5, 7, 10 Year)	Auto-Calculated	10
Infrastructure (Fiber, Facilities)	Auto-Calculated	20

**Financial Assumptions****Fund Type**

		Percentage
Operating Reserve Fund	% of Operating Costs	0.00%
Renewal & Replacement Fund	% of Cumul. Capital	1.50%
Capital Expansion Fund	% of Cumul. Capital	0.00%

**Expense Categories**

		Capitalize
Materials	Materials	Yes
Equipment	Equipment	Yes
Labor	Labor	Yes
<b>Annual Inflation Adjustment (CPI)</b>	CPI	2.50%
Interest Rate		5.00%

## Assumptions (Hybrid)

Proprietary &amp; Confidential Property of the City of Palo Alto

**Capital Cost Assumptions****Cost to Connect + Home Equipment****Materials Cost**

6 Count tight buffer fiber drop (120 ft @ \$.60/ft)	\$	72.00	0.00%
APC Fiber Unicam Connector (4 @ \$16 ea)	\$	64.00	0.00%
Mounting Hardware	\$	60.00	0.00%
<b>Total Materials Cost Per Passing</b>	<b>\$</b>	<b>196.00</b>	

**Equipment Cost**

Inside Wiring	\$	50.00	0.00%
Optical Network Terminal + Power Supply	\$	350.00	0.00%
Wireless Gateway	\$	100.00	0.00%
2 STBs with 1 Master Whole-Home DVR			0.00%
<b>Total Equipment Cost</b>	<b>\$</b>	<b>500.00</b>	

**Labor Cost**

Install Aerial Cable Drop (120 Ft @ \$2/foot), Terminate Ped/Home	\$	450.00	0.00%
Premise Equipment Installation Per Passing (2 Hours) - Installers Included in S	\$	175.00	0.00%
Premise Inside Wiring Per Passing - Installers Included in Staffing Plan	\$	75.00	0.00%
<b>Total Labor Cost Per Passing</b>	<b>\$</b>	<b>700.00</b>	
<b>Total Cost to Connect + Home Equipment</b>	<b>\$</b>	<b>1,396.00</b>	

**Equipment Costs**

Fiber Termination	\$	35,000	0.00%
Equipment Racks	\$	15,000	0.00%
Intra-facility cabling	\$	20,000	0.00%
Ladder/raceway	\$	50,000	0.00%
Core switch routers	\$	350,000	0.00%
Edge routers	\$	-	0.00%
Firewalls	\$	45,000	0.00%
Access Equipment	\$	31,512	0.00%
Billing Systems	\$	300,000	0.00%
Provisioning Systems	\$	300,000	0.00%
Network Management Systems	\$	50,000	0.00%
Fiber Management Systems	\$	50,000	0.00%
Workforce Management Systems	\$	75,000	0.00%
Trouble Ticketing Systems	\$	100,000	0.00%
Project & Construction Management	\$	2,700,000	0.00%

**Facility & Office Improvements**

Data Center Retrofit Existing Facility	\$	500,000	0.00%
Network Operations Center			0.00%
Sales & Administrative Offices			0.00%

**General Equipment**

Service Vans	\$	85,000	0.00%
Bucket Trucks	\$	275,000	0.00%
Maintenance Trucks	\$	115,000	0.00%
Splicing Trailers	\$	50,000	0.00%
OTDRs	\$	20,000	0.00%
Mobile Test Sets	\$	7,000	0.00%
Fusion Splicers	\$	20,000	0.00%
Toolkits	\$	10,000	0.00%
Miscellaneous Equipment			0.00%

# FINANCIAL PLANS (OUTSOURCE)

## Pro Forma (Outsource)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Year #	1	2	3	4	5	6	7	8	9	10
<b>Service Revenues</b>										
New Residential Internet	\$ -	\$ 495,489	\$ 2,288,619	\$ 5,452,596	\$ 7,915,096	\$ 8,974,130	\$ 9,609,627	\$ 9,915,164	\$ 10,230,307	\$ 10,555,354
Existing Dark Fiber	\$ 1,700,000	\$ 1,734,000	\$ 1,768,680	\$ 1,804,054	\$ 1,840,135	\$ 1,876,937	\$ 1,914,476	\$ 1,952,766	\$ 1,991,821	\$ 2,031,657
New Business Internet	\$ -	\$ 282,540	\$ 1,305,029	\$ 3,109,208	\$ 4,513,388	\$ 5,117,276	\$ 5,479,653	\$ 5,653,878	\$ 5,833,580	\$ 6,018,930
<b>Subtotal: Service Revenues</b>	<b>\$ 1,700,000</b>	<b>\$ 2,512,029</b>	<b>\$ 5,362,328</b>	<b>\$ 10,365,858</b>	<b>\$ 14,268,618</b>	<b>\$ 15,968,343</b>	<b>\$ 17,003,756</b>	<b>\$ 17,521,808</b>	<b>\$ 18,055,708</b>	<b>\$ 18,605,942</b>
<b>Installation Revenues</b>										
Residential	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Business	\$ -	\$ 18,731	\$ 48,118	\$ 68,123	\$ 18,110	\$ 13,991	\$ 1,201	\$ 1,237	\$ 1,275	\$ 1,313
<b>Subtotal: Installation Revenues</b>	<b>\$ -</b>	<b>\$ 18,731</b>	<b>\$ 48,118</b>	<b>\$ 68,123</b>	<b>\$ 18,110</b>	<b>\$ 13,991</b>	<b>\$ 1,201</b>	<b>\$ 1,237</b>	<b>\$ 1,275</b>	<b>\$ 1,313</b>
<b>Equipment Rental Revenues</b>										
Residential	\$ -	\$ 14,791	\$ 68,317	\$ 162,764	\$ 236,272	\$ 267,884	\$ 286,855	\$ 295,975	\$ 305,382	\$ 315,085
Business	\$ -	\$ 11,352	\$ 52,434	\$ 124,922	\$ 181,340	\$ 205,603	\$ 220,163	\$ 227,163	\$ 234,383	\$ 241,830
<b>Subtotal: Equipment Rental Revenues</b>	<b>\$ -</b>	<b>\$ 26,143</b>	<b>\$ 120,751</b>	<b>\$ 287,687</b>	<b>\$ 417,611</b>	<b>\$ 473,488</b>	<b>\$ 507,017</b>	<b>\$ 523,138</b>	<b>\$ 539,765</b>	<b>\$ 556,915</b>
<b>TOTAL REVENUES</b>	<b>\$ 1,700,000</b>	<b>\$ 2,556,903</b>	<b>\$ 5,531,196</b>	<b>\$ 10,721,667</b>	<b>\$ 14,704,339</b>	<b>\$ 16,455,822</b>	<b>\$ 17,511,975</b>	<b>\$ 18,046,183</b>	<b>\$ 18,596,747</b>	<b>\$ 19,164,170</b>
<b>Cost of Services</b>										
Direct Staff	\$ -	\$ 260,030	\$ 266,530	\$ 273,194	\$ 280,024	\$ 287,024	\$ 294,200	\$ 301,555	\$ 309,094	\$ 316,821
Internet Peering	\$ -	\$ 61,500	\$ 63,038	\$ 64,613	\$ 66,229	\$ 67,884	\$ 69,582	\$ 71,321	\$ 73,104	\$ 74,932
Bandwidth (Transport & Internet)	\$ -	\$ 178,800	\$ 178,800	\$ 190,304	\$ 214,825	\$ 233,307	\$ 234,855	\$ 236,411	\$ 237,974	\$ 239,545
Wholesale Voice	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Overnight Customer Management 6pm - 6am	\$ -	\$ 564,085	\$ 1,882,524	\$ 3,741,132	\$ 4,223,171	\$ 4,586,508	\$ 4,616,938	\$ 4,647,519	\$ 4,678,254	\$ 4,709,142
<b>Subtotal: Cost of Services</b>	<b>\$ -</b>	<b>\$ 1,064,415</b>	<b>\$ 2,390,892</b>	<b>\$ 4,269,244</b>	<b>\$ 4,784,248</b>	<b>\$ 5,174,724</b>	<b>\$ 5,215,574</b>	<b>\$ 5,256,806</b>	<b>\$ 5,298,426</b>	<b>\$ 5,340,440</b>
<b>GROSS PROFIT</b>	<b>\$ 1,700,000</b>	<b>\$ 1,492,487</b>	<b>\$ 3,140,304</b>	<b>\$ 6,452,423</b>	<b>\$ 9,920,091</b>	<b>\$ 11,281,098</b>	<b>\$ 12,296,401</b>	<b>\$ 12,789,377</b>	<b>\$ 13,298,322</b>	<b>\$ 13,823,730</b>
<b>Operating Costs</b>										
General & Administrative Staff	\$ 383,914	\$ 995,047	\$ 1,019,923	\$ 1,045,421	\$ 1,071,557	\$ 1,098,346	\$ 1,125,804	\$ 1,153,949	\$ 1,182,798	\$ 1,212,368
Fiber Plant Maintenance	\$ -	\$ 89,828	\$ 184,148	\$ 283,128	\$ 386,942	\$ 396,615	\$ 406,531	\$ 416,694	\$ 427,111	\$ 437,789
Data Center Maintenance	\$ -	\$ 128,125	\$ 131,328	\$ 134,611	\$ 137,977	\$ 141,426	\$ 144,962	\$ 148,586	\$ 152,300	\$ 156,108
Vehicle Maintenance	\$ -	\$ 47,663	\$ 48,854	\$ 50,075	\$ 51,327	\$ 52,610	\$ 53,926	\$ 55,274	\$ 56,656	\$ 58,072
Software Maintenance	\$ -	\$ 138,375	\$ 141,834	\$ 145,380	\$ 149,015	\$ 152,740	\$ 156,559	\$ 160,473	\$ 164,484	\$ 168,597
Facilities Maintenance	\$ -	\$ 66,625	\$ 68,291	\$ 69,998	\$ 71,748	\$ 73,542	\$ 75,380	\$ 77,265	\$ 79,196	\$ 81,176
Reporting & Compliance	\$ -	\$ 35,875	\$ 36,772	\$ 37,691	\$ 38,633	\$ 39,599	\$ 40,589	\$ 41,604	\$ 42,644	\$ 43,710
Utilities	\$ -	\$ 41,000	\$ 42,025	\$ 43,076	\$ 44,153	\$ 45,256	\$ 46,388	\$ 47,547	\$ 48,736	\$ 49,955
Legal (Increase by 3X, first 3 years)	\$ 102,500	\$ 105,063	\$ 107,689	\$ 110,381	\$ 113,141	\$ 115,969	\$ 118,869	\$ 121,840	\$ 124,886	\$ 128,008
Office Expense	\$ 61,500	\$ 63,038	\$ 64,613	\$ 66,229	\$ 67,884	\$ 69,582	\$ 71,321	\$ 73,104	\$ 74,932	\$ 76,805
Pole Attachment Fees (Subtract out electric)	\$ -	\$ 91,877	\$ 183,754	\$ 190,185	\$ 196,842	\$ 203,731	\$ 210,862	\$ 218,242	\$ 225,880	\$ 233,786
Sales & Marketing	\$ 350,000	\$ 350,000	\$ 250,000	\$ 256,250	\$ 262,656	\$ 269,223	\$ 275,953	\$ 282,852	\$ 289,923	\$ 297,171
<b>Subtotal: Sales, General &amp; Administrative</b>	<b>\$ 897,914</b>	<b>\$ 2,152,515</b>	<b>\$ 2,279,232</b>	<b>\$ 2,432,426</b>	<b>\$ 2,591,874</b>	<b>\$ 2,658,639</b>	<b>\$ 2,727,143</b>	<b>\$ 2,797,430</b>	<b>\$ 2,869,548</b>	<b>\$ 2,943,546</b>
Depreciation	\$ 1,421,379	\$ 2,629,968	\$ 3,954,717	\$ 5,400,771	\$ 5,526,806	\$ 5,618,035	\$ 5,792,092	\$ 6,063,659	\$ 6,071,376	\$ 6,079,132
Interest on Long-Term Debt	\$ -	\$ 669,837	\$ 1,812,319	\$ 2,993,047	\$ 4,237,370	\$ 4,168,027	\$ 4,095,217	\$ 4,018,766	\$ 3,938,493	\$ 3,854,206
<b>NET INCOME</b>	<b>\$ (619,292)</b>	<b>\$ (3,959,832)</b>	<b>\$ (4,905,964)</b>	<b>\$ (4,373,821)</b>	<b>\$ (2,435,958)</b>	<b>\$ (1,163,604)</b>	<b>\$ (318,051)</b>	<b>\$ (90,478)</b>	<b>\$ 418,905</b>	<b>\$ 946,846</b>
Principal on Long Term Debt	\$ -	\$ 201,640	\$ 558,677	\$ 950,453	\$ 1,386,858	\$ 1,456,201	\$ 1,529,011	\$ 1,605,461	\$ 1,685,734	\$ 1,770,021
Operating Reserve Fund	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Renewal & Replacement Fund	\$ -	\$ -	\$ -	\$ 1,476,872	\$ 1,502,129	\$ 1,520,601	\$ 1,547,110	\$ 1,594,043	\$ 1,595,605	\$ 1,597,176
Capital Budget	\$ 25,396,732	\$ 23,051,287	\$ 24,173,243	\$ 25,836,899	\$ 1,683,761	\$ 1,231,447	\$ 1,767,294	\$ 3,128,855	\$ 104,168	\$ 104,688
<b>TOTAL NON-OPERATING, CAPITAL, &amp; RESERVES</b>	<b>\$ 25,396,732</b>	<b>\$ 23,252,927</b>	<b>\$ 24,731,920</b>	<b>\$ 28,264,224</b>	<b>\$ 4,572,748</b>	<b>\$ 4,208,249</b>	<b>\$ 4,843,415</b>	<b>\$ 6,328,359</b>	<b>\$ 3,385,507</b>	<b>\$ 3,471,885</b>
<b>Cash Flow</b>										
Beginning of Year	\$ -	\$ 13,802,086	\$ 12,270,582	\$ 10,760,658	\$ 9,360,283	\$ 7,878,382	\$ 8,124,566	\$ 8,755,192	\$ 8,400,015	\$ 11,504,788
Add: Net Income	\$ (619,292)	\$ (3,959,832)	\$ (4,905,964)	\$ (4,373,821)	\$ (2,435,958)	\$ (1,163,604)	\$ (318,051)	\$ (90,478)	\$ 418,905	\$ 946,846
Add: Depreciation	\$ 1,421,379	\$ 2,629,968	\$ 3,954,717	\$ 5,400,771	\$ 5,526,806	\$ 5,618,035	\$ 5,792,092	\$ 6,063,659	\$ 6,071,376	\$ 6,079,132
Add: New Debt	\$ 13,396,732	\$ 23,051,287	\$ 24,173,243	\$ 25,836,899	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Add: Existing Funds	\$ 25,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Less: Non-Operating, CAPITAL, & RESERVES	\$ 25,396,732	\$ 23,252,927	\$ 24,731,920	\$ 28,264,224	\$ 4,572,748	\$ 4,208,249	\$ 4,843,415	\$ 6,328,359	\$ 3,385,507	\$ 3,471,885
<b>End of Year</b>	<b>\$ 13,802,086</b>	<b>\$ 12,270,582</b>	<b>\$ 10,760,658</b>	<b>\$ 9,360,283</b>	<b>\$ 7,878,382</b>	<b>\$ 8,124,566</b>	<b>\$ 8,755,192</b>	<b>\$ 8,400,015</b>	<b>\$ 11,504,788</b>	<b>\$ 15,058,881</b>

## Staffing Plan (Outsource)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Year #	1	2	3	4	5	6	7	8	9	10
<b>Total Subscribers</b>	0	1,353	4,745	9,429	10,644	11,560	11,637	11,714	11,791	11,869
<b>Total FTE</b>										
Customer Service Rep	-	-	-	-	-	-	-	-	-	-
NOC Technicians	-	-	-	-	-	-	-	-	-	-
Customer Service Supervisor	-	-	-	-	-	-	-	-	-	-
Billing Tech	-	-	-	-	-	-	-	-	-	-
Revenue & Accounting Manager	-	1	1	1	1	1	1	1	1	1
Network Designer	-	-	-	-	-	-	-	-	-	-
Network Engineer	-	-	-	-	-	-	-	-	-	-
Installation & Service Tech	-	-	-	-	-	-	-	-	-	-
Maintenance & Repair Tech	-	-	-	-	-	-	-	-	-	-
Field Services Manager	-	-	-	-	-	-	-	-	-	-
Commercial Account Manager	-	1	1	1	1	1	1	1	1	1
Sales & Marketing Manager	1	1	1	1	1	1	1	1	1	1
Assistant Director	1	1	1	1	1	1	1	1	1	1
Operations & Engineering Manager	1	1	1	1	1	1	1	1	1	1
<b>Total FTE</b>	<b>3.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>	<b>5.00</b>
<b>Total Costs</b>										
Customer Service Rep	-	-	-	-	-	-	-	-	-	-
NOC Technicians	-	-	-	-	-	-	-	-	-	-
Customer Service Supervisor	-	-	-	-	-	-	-	-	-	-
Billing Tech	-	-	-	-	-	-	-	-	-	-
Revenue & Accounting Manager	-	260,030	266,530	273,194	280,024	287,024	294,200	301,555	309,094	316,821
Network Designer	-	-	-	-	-	-	-	-	-	-
Network Engineer	-	-	-	-	-	-	-	-	-	-
Installation & Service Tech	-	-	-	-	-	-	-	-	-	-
Maintenance & Repair Tech	-	-	-	-	-	-	-	-	-	-
Field Services Manager	-	-	-	-	-	-	-	-	-	-
Commercial Account Manager	-	208,024	213,224	218,555	224,019	229,619	235,360	241,244	247,275	253,457
Sales & Marketing Manager	295,969	303,368	310,952	318,726	326,694	334,861	343,233	351,814	360,609	369,624
Assistant Director*	135,300	138,683	142,150	145,703	149,346	153,080	156,907	160,829	164,850	168,971
Operations & Engineering Manager	336,559	344,973	353,597	362,437	371,498	380,785	390,305	400,063	410,064	420,316
Direct Staff	\$ -	\$ 260,030	\$ 266,530	\$ 273,194	\$ 280,024	\$ 287,024	\$ 294,200	\$ 301,555	\$ 309,094	\$ 316,821
General & Administrative Staff	\$ 767,828	\$ 995,047	\$ 1,019,923	\$ 1,045,421	\$ 1,071,557	\$ 1,098,346	\$ 1,125,804	\$ 1,153,949	\$ 1,182,798	\$ 1,212,368
<b>Total Costs</b>	<b>\$ 767,828</b>	<b>\$ 1,255,077</b>	<b>\$ 1,286,454</b>	<b>\$ 1,318,615</b>	<b>\$ 1,351,580</b>	<b>\$ 1,385,370</b>	<b>\$ 1,420,004</b>	<b>\$ 1,455,504</b>	<b>\$ 1,491,892</b>	<b>\$ 1,529,189</b>

\*The Assistant Director position will be revised to reflect full-time costs, which will not be a material change to overall costs



## Assumptions (Outsource)

**Operating Cost Assumptions**

	Type	Per Unit	Annual Change
<b>Cost of Services</b>			
Direct Staff	Calculated Separately		
Internet Peering	Flat Fee	\$ 60,000	2.50%
Bandwidth (Transport & Internet)	Per Subscriber	\$ 2.00	0.00%
Wholesale Voice	Per Subscriber	\$ 7.00	0.00%
Customer Management (\$30/hour, 2 FTEs, 12 Hour Shift, 365 Days, Plus OH)	Per Subscriber	\$ 31.00	2.50%
<b>Operating Costs</b>			
General & Administrative Staff	Calculated Separately		
Fiber Plant Maintenance	Per Mile Per Year	\$ 950	2.50%
Data Center Maintenance	Fixed Annual	\$ 125,000	2.50%
Vehicle Maintenance	Fixed Annual	\$ 46,500	2.50%
Software Maintenance	Fixed Annual	\$ 135,000	2.50%
Facilities Maintenance	Fixed Annual	\$ 65,000	2.50%
Reporting & Compliance	Fixed	\$ 35,000	2.50%
Utilities	Fixed Annual	\$ 40,000	2.50%
Legal & Professional Services	Fixed	\$ 100,000	2.50%
Office Expense	Fixed	\$ 60,000	2.50%
Pole Attachment Fees	Fixed	\$ 177,540	3.50%
Sales & Marketing	Fixed	\$ 250,000	2.50%
<b>FTE Salaries</b>			
	FTE Salary	Fully Loaded	Annual Increase
Customer Service Rep	\$ 78,000	\$ 128,700	2.50%
Service Techs	\$ 93,000	\$ 153,450	2.50%
Customer Service Supervisor	\$ 92,000	\$ 151,800	2.50%
Billing Tech	\$ 86,000	\$ 141,900	2.50%
Revenue & Accounting Manager	\$ 150,000	\$ 247,500	2.50%
Network Designer	\$ 156,000	\$ 257,400	2.50%
Network Engineer	\$ 199,000	\$ 328,350	2.50%
Installation & Service Tech	\$ 105,000	\$ 173,250	2.50%
Maintenance & Repair Tech	\$ 105,000	\$ 173,250	2.50%
Field Services Manager	\$ 185,000	\$ 305,250	2.50%
Commercial Account Manager	\$ 120,000	\$ 198,000	2.50%
Sales & Marketing Manager	\$ 175,000	\$ 288,750	2.50%
Assistant Director	\$ 229,000	\$ 377,850	2.50%
Operations & Engineering Manager	\$ 199,000	\$ 328,350	2.50%
Salary & Benefit Overhead	Percent of Salary	65%	
<b>Depreciation</b>			
		Lifetime	
Equipment (Averaged, 5, 7, 10 Year)	Auto-Calculated	10	
Infrastructure (Fiber, Facilities)	Auto-Calculated	20	
<b>Financial Assumptions</b>			
<b>Fund Type</b>			
		Percentage	
Operating Reserve Fund	% of Operating Cost	0.00%	
Renewal & Replacement Fund	% of Cumul. Capital	1.50%	
Capital Expansion Fund	% of Cumul. Capital	0.00%	
<b>Expense Categories</b>			
		Capitalize	
Materials	Materials	Yes	
Equipment	Equipment	Yes	
Labor	Labor	Yes	
Annual Inflation Adjustment (CPI)	CPI	2.50%	
Interest Rate		3.50%	
<b>Contingencies</b>			
Contingency-Design		15.00%	
Contingency-Labor		15.00%	
Contingency-Materials		15.00%	

**Capital Cost Assumptions**

	Type	Per Unit	Annual Inc/Dec
<b><u>Cost to Connect + Home Equipment</u></b>			
<b>Materials Cost</b>			
6 Count tight buffer fiber drop (120 ft @ \$.60/ft)		\$ 72.00	0.00%
APC Fiber Unicam Connector (4 @ \$16 ea)		\$ 64.00	0.00%
Mounting Hardware		\$ 60.00	0.00%
<b>Total Materials Cost Per Passing</b>		<b>\$ 196.00</b>	
<b>Equipment Cost</b>			
Inside Wiring		\$ 50.00	0.00%
Optical Network Terminal + Power Supply		\$ 350.00	0.00%
Wireless Gateway		\$ 100.00	0.00%
2 STBs with 1 Master Whole-Home DVR			0.00%
<b>Total Equipment Cost</b>		<b>\$ 500.00</b>	
<b>Labor Cost</b>			
Install Aerial Cable Drop (120 Ft @ \$2/foot), Terminate Ped/Home Premise Equipment Installation Per Passing (2 Hours) - Installers Included in Staffing Plan		\$ 450.00	0.00%
Premise Inside Wiring Per Passing - Installers Included in Staffing Plan		\$ 175.00	0.00%
		\$ 75.00	0.00%
<b>Total Labor Cost Per Passing</b>		<b>\$ 700.00</b>	
<b>Total Cost to Connect + Home Equipment</b>		<b>\$ 1,396.00</b>	
<b><u>Equipment Costs</u></b>			
Fiber Termination		\$ 35,000	0.00%
Equipment Racks		\$ 15,000	0.00%
Intra-facility cabling		\$ 20,000	0.00%
Ladder/raceway		\$ 50,000	0.00%
Core switch routers		\$ 350,000	0.00%
Edge routers		\$ -	0.00%
Firewalls		\$ 45,000	0.00%
Access Equipment		\$ 31,512	0.00%
Billing Systems		\$ 300,000	0.00%
Provisioning Systems		\$ 300,000	0.00%
Network Management Systems		\$ 50,000	0.00%
Fiber Management Systems		\$ 50,000	0.00%
Workforce Management Systems		\$ 75,000	0.00%
Trouble Ticketing Systems		\$ 100,000	0.00%
Project & Construction Management		\$ 2,700,000	0.00%
<b><u>Facility &amp; Office Improvements</u></b>			
Data Center Retrofit Existing Facility		\$ 500,000	0.00%
Network Operations Center			0.00%
Sales & Administrative Offices			0.00%
<b><u>General Equipment</u></b>			
Service Trucks		\$ 40,000	0.00%
Bucket Trucks		\$ 150,000	0.00%
Maintenance Trucks		\$ 40,000	0.00%
Splicing Trailers		\$ 50,000	0.00%
OTDRs		\$ 20,000	0.00%
Mobile Test Sets		\$ 7,000	0.00%
Fusion Splicers		\$ 20,000	0.00%
Toolkits		\$ 10,000	0.00%
Miscellaneous Equipment			0.00%
<b><u>Wireless Equipment</u></b>			
Sector Antenna Equipment			0.00%
Line & Antenna Equipment			0.00%
Attachment Hardware			0.00%
Miscellaneous Wireless Equipment			0.00%