

Market Analysis Report

User-Financed FTTP Model

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Stephen A. Blum
Tellus Venture Associates

www.tellusventure.com

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1. Executive Summary

One approach to building a municipal fiber-to-the-premise (FTTP) system is to finance it through voluntary user connection fees. In other words, if a resident wants FTTP service, then he or she pays an upfront fee that partially or fully covers the cost of connecting his or her home to the system. Residents that don't want to be connected pay nothing.

The user-financed FTTP concept being considered for Palo Alto would give the City responsibility for building the system and connecting residents who opt in. Those residents would then choose a private sector Internet service provider, presumably a company that utilizes the City's FTTP system on an open access basis. These providers would charge subscribers a monthly fee and split the revenue with the City.

Service levels are assumed to be sufficient to justify the expense of connecting to the system. Residents could purchase other kinds of service, such as television, from any provider that wanted to offer it, but the City would not receive any revenue or be exposed to any risks involved.

The ultimate goal of this analysis is to determine whether it is feasible to embark on a citywide, user-financed fiber-to-the-premise project.

This report goes through four steps to evaluate the feasibility of doing so:

1. Develop a method for estimating the neighborhood by neighborhood cost of a user-financed system, starting with the simplest feasible scenario possible: the “perfect” case.
2. Turn the perfect case into a plausible scenario – an “average” case – that could form the basis for an estimate of typical and likely costs based on real world assumptions.
3. Build a model that assesses the financial viability of a system based on the average case, if it were to be offered citywide.
4. Test the model and evaluate alternatives by making a variety of different assumptions about pricing and user demand.

Under perfect conditions where subscribing homes are in a tight cluster with nearby access to the existing dark fiber network, upfront user fees could pay the full cost of construction. But those conditions are unlikely to be found in the real world. Instead, a more likely – the average – situation would find subscribing homes scattered at random in any given neighborhood.

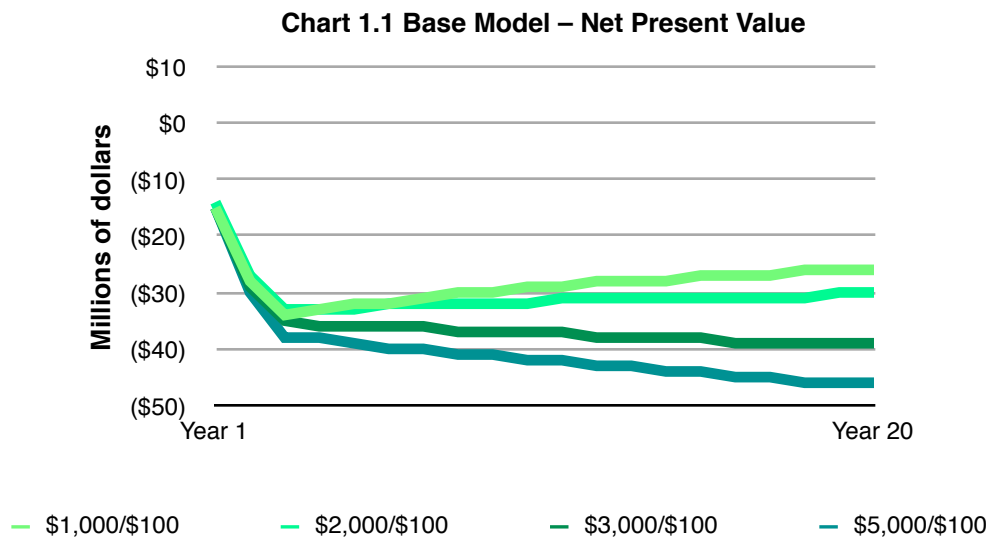
In that case, a much higher proportion of residents in a neighborhood would have to opt in to completely cover construction costs. A much higher proportion, in fact, than market research would indicate is possible. Nevertheless, an operational FTTP system might be able to pay for itself over time through a combination of upfront fees and operating surpluses.

A citywide, user-financed FTTP system was modeled using market research data compiled by RKS Research and Consulting and cost estimates based on previous studies and proposals developed specifically for the City of Palo Alto. As a starting point, optimistic assumptions were made concerning construction and operating costs.

The model was then used to test five different scenarios:

1. Base model using four different price point combinations: \$1,000 upfront and \$75 monthly, \$2,000/\$100, \$3,000/\$100 and \$5,000/\$100. These points bracket the high and low demand figures, other price points (e.g. \$3,000/\$75) would fall within the boundaries of this range.
2. Pessimistic demand projections at the four price point combinations.
3. Optimistic demand projections at the four price point combinations.
4. Increasing subscription rate scenarios using 2% and 5% annual growth rates.
5. Effect of using the surplus generated by the existing CPAU dark fiber system

Taking into account the cost of borrowing money to cover deficits, the base model results showed long term losses over many years, with the net present value of the system being negative – between –\$46 million and –\$26 million – after twenty years.



Various other scenarios showed better results, but most showed net system value to be significantly negative over a twenty period and many showed substantial annual operating losses as well. Even at the hypothetical extremes, the system would require substantial, ongoing financial subsidies from the City to show a positive net value within 20 years.

A fully user-financed citywide fiber-to-the-premise system is not possible to achieve in Palo Alto. An opt-in FTTP system can be built using a combination of upfront user fees and City financing, but there is very little probability of the debt incurred being repaid through operations. Ongoing subsidies would be required, very likely in excess of the surpluses generated by the CPAU dark fiber system.

2. Introduction

This report evaluates the financial prospects of an opt-in, user-financed fiber-to-the-premise (FTTP) system built and offered by the City of Palo Alto.

A user-financed system is one where willing subscribers pay an upfront fee to cover the cost of building FTTP infrastructure into their neighborhood, and then pay an ongoing monthly fee for service. Several different pricing alternatives are considered in this report, with a nominal starting point of \$3,000 in construction costs upfront and \$100 per month for Internet service.

Under a user-financed system, for a given upfront cost, how many households in a typical block have to sign up in order to cover the cost of extending an FTTP system to that block?

Conceptually, a user-financed model is based on the idea that some neighborhoods will receive FTTP service and some won't, and some residents in a served neighborhood will have access to an FTTP system and some won't, in accordance with the economic choices made by those individual residents. This idea is different from a utility or improvement district model, where a neighborhood might vote on installing a fiber system, making everyone subject to the decision of a sufficient majority.

Instead, the City would make the option available citywide and collect binding commitments from prospective subscribers, either directly or through retail service providers. When enough subscribers make a commitment to pay a certain upfront fee, the FTTP system will be extended to their neighborhood and only their homes would be connected to the system. Retail Internet companies would use the system to deliver service on an open access basis, charge subscribers a monthly fee and pay the City a share.

The purpose of this report is not to determine whether a user-financed model would be feasible in rare or special cases: it would certainly work under perfect circumstances, as discussed in Section 4.1 below. Nor does it look at the possibility of a service provider or group of homeowners building a small, private FTTP system. It is already possible to do so using the City of Palo Alto Utilities (CPAU) dark fiber network, and the economics of this business model have been explored in a previous study.¹

¹ Market Research Report: Citywide Ultra High-Speed Broadband System Project for the City of Palo Alto, Tellus Venture Associates, May 2011, see page 31 “Commercial Property Pricing” and page 44 “Fiber to the Basement Business Model Scenarios”. Although the specific example discussed involves office buildings, the general business model can be applied to any small, private system.

Instead, this report looks at the economic case for a City-led and user-financed FTTP program that would be offered throughout the City, but implemented on a neighborhood by neighborhood basis as sufficient numbers of households opt in. Only households that opt in would receive FTTP service. Those who choose not to participate would not be exposed financially, and would not have service drops built to their properties.

This approach raises questions regarding fair treatment of subscribers and non-subscribers alike, as well as parity and equity between neighborhoods. For example, once a neighborhood has been built out and the initial subscribers have been served, how much should latecomers be charged to join and how would the money be spent?

There are many possible answers to these questions and this report does not attempt to pick one over another. Instead, it focuses on establishing an economic basis for deciding whether or not to implement a citywide user-financed FTTP program in Palo Alto.

This report takes four steps to develop and test a financial model that can be used to evaluate the economic case for and against a user-financed system, and ultimately decide whether to proceed with it:

1. Develop a method for estimating the neighborhood by neighborhood cost of a user-financed system, starting with the simplest feasible scenario possible: the “perfect” case.
2. Turn the perfect case into a plausible scenario – an “average” case – that could form the basis for an estimate of typical and likely costs based on real world assumptions.
3. Build a model that assesses the financial viability of a system based on the average case, if it were to be offered citywide.
4. Test the model and evaluate alternatives by making a variety of different assumptions about pricing and user demand.

The underlying data used in creating and testing the model is based on market research conducted by RKS Research and Consulting, cost estimates previously developed for fiber optic projects in Palo Alto and other industry information.

The FTTP system envisioned for this analysis would only provide Internet connectivity and bandwidth, at speeds and quality levels presumably chosen on an individual basis by subscribers. To justify the cost, this service would need to be superior to existing offerings.

Although a particular level of service isn't specifically estimated or identified, it can be assumed to be sufficient to support telephone and television service at some level. These additional services are not included in the financial analysis and are assumed to be purchased separately, if at all, by individual subscribers from their provider of choice. The City would not share in revenue from additional services, or be exposed to the costs and risks.

3. Business and Technology Assumptions

3.1. Business model

The City of Palo Alto can theoretically play two different roles in providing user-financed FTTP service: 1. be the retail Internet service provider to end users, take responsibility for all operations and risks, and keep all the monthly subscriber revenue, or 2. provide a wholesale transport-only service to one or more retail Internet service providers, be responsible for maintaining the core network while leaving customer service, support and provisioning to retail partners, and split the revenue.

We chose the second option for the purpose of this analysis, and assumed a fifty-fifty monthly subscriber revenue split. The wholesale option is much simpler to implement and operate, and minimizes the fixed costs relating to customer service, support and billing that the City will have to bear. If a wholesale model won't work for the City, then a retail one won't either. The analysis assumes that the prospective retail partners are currently serving customers and have already incurred those fixed costs.

The assumption of a fifty-fifty revenue split was based on the City's need to fully fund the entire fixed and variable costs of its side of the operation, while assuming that the retail partners will be able to spread their fixed costs over a larger customer base. If anything, this assumption is optimistic on the City's behalf. There are valid arguments for assigning a smaller share of the revenue to the City, but a fifty-fifty assumption is a good starting point and, as discussed below, it sufficed for the purposes of this analysis.

The resulting business model used to evaluate a user-financed FTTP system minimizes the City's costs, operational complexity and risks. The City...

- Pays the capital cost of building fiber lines to and through served neighborhoods, including the cost of active network electronics.
- Installs the fiber drops and subscriber terminals for served homes.
- Maintains an Ethernet (Layer 2) network connecting served homes to the end user's service provider of choice.
- Provides service through retail partners and not directly to end-users. Retail partners would be the City's only customers.

The retail partners...

- Establish a business relationship with subscribers to provide Internet access. Other services (e.g., telephone and television) could be offered, but are outside of the scope of this analysis.

- Collect the upfront connection fee and the monthly service fee from the subscriber and, in turn, pay the City.
- Provide and maintain Internet (Layer 3) service to subscribers.
- Are responsible for all subscriber support, service, billing and other customer relationship functions.

This model makes optimistic assumptions for the City's construction, operating costs and revenue. It would be possible to justify a more pessimistic approach, but difficult to make better assumptions on the City's behalf. Any business case developed using this model would have to be stress tested before moving forward. However, given the conclusions reached below, that necessity is unlikely.

3.2. Technology

The cost of building fiber to the home infrastructure in the City of Palo Alto has been examined three times in the past eight years. The initial study was completed in March 2004 by Uptown Services, LLC.

In 2006, the City solicited interest in building an FTTP system via a Request for Proposal. Two companies responded, and 180 Connect Network Services, Inc. (180 Connect) was selected to build the system. In the course of preparing the RFP and subsequently negotiating with the City, 180 Connect produced a second cost estimate for a citywide FTTP system.

Ultimately, 180 Connect did not build the system. In 2011, Columbia Telecommunications Corporation (CTC) prepared a conceptual plan for a phased buildout of an FTTP system, based on the City's existing dark fiber network. The 180 Connect and CTC plans share a common set of assumptions about network architecture and costs, although there are significant differences.

The 180 Connect proposal relies on an active, Ethernet architecture, while CTC recommends a passive optical network (PON) system. These approaches have various advantages and disadvantages, and either could be used for modeling purposes. Costs are in the same ballpark, although arguably an active network is the more inexpensive and operationally simpler option given an open access business model.

In this analysis, we assumed an active, Ethernet architecture because it is better suited to supporting multiple retail service providers and to a scalable, noncontiguous deployment pattern. An active network can be more easily built out to specific neighborhoods where demand exists while bypassing neighborhoods where it doesn't, without making it too costly or inefficient to meet future demand by backfilling.

3.3. Capital costs

The estimates developed by 180 Connect and CTC were used as the starting point to model the per-subscriber cost of building a user-financed network. Other cost information developed for the purpose of this and other studies was used for comparison purposes, and to fill in gaps. The following key assumptions were made:

Table 3.1 – Capital cost metrics and estimates

Item	Amount	Basis
Total passable parcels	20,879	180 Connect
Average parcels per block	33	180 Connect and map data
Average new system fiber feet required per parcel	53	180 Connect
Fiber installation cost per foot	\$28.48	180 Connect and CPAU
Fiber drop and equipment per home	\$622	180 Connect
Cost of building a node	\$90,000	CTC and TVA research
Maximum nodes needed to cover City	87	CTC
Blocks served by one node	7	Calculation
City inside plant	\$140,000	TVA research
Project design and management, as a percentage of direct construction costs	10%	TVA research

For the most part, the cost assumptions used by CTC and 180 Connect were consistent. The one major difference was in the estimated cost per foot of installing new fiber optic lines. CTC used an estimate of \$9.96 per foot, while 180 Connect used \$28.48. 180 Connect's estimate is consistent with CPAU's experience installing fiber optic lines in Palo Alto and with actual costs incurred on projects elsewhere. CTC's figure might be achievable for a long haul, aerial fiber installation in a rural setting, but it is implausibly low for a piecemeal urban retrofit project in California.

The 2004 Uptown study does not provide detailed estimates of capital costs, but to the extent it considers capital costs, it is consistent with CTC and 180 Connect. All three estimates assume that the existing CPAU dark fiber system will be used to the extent possible to support FTTP service. The value of the existing fiber network is not included as a cost in this analysis.

3.4. Operating costs

The CTC and 180 Connect estimates did not go into great detail regarding operating cost assumptions. The Uptown study did and the figures it uses are largely consistent with the experience of other system operators. However, the Uptown study assumed a retail business model and a triple play service offering (television, telephone and Internet service).

An operating cost estimate for a wholesale, Layer 2 user-financed network was developed using base City of Palo Alto costs and cost information from other systems developed for the purpose of this study and others. To extent it is comparable, the Uptown estimates are consistent with this approach.

Table 3.2 – Operating cost estimates

Item	Amount	Basis
Fiber plant maintenance, per route mile per year	\$1,000	Small, urban system costs
Node and site operations, per location per year	\$1,200	Electrical and physical maintenance costs
Network operations per year	\$60,000	Outsourcing estimate
Active plant maintenance per year	3%	Percentage of capital cost
Interconnect per year	\$30,000	Shared facilities estimate
Subscriber equipment maintenance per year	\$4,500	Peer systems
Personnel per year	\$238,000	CPAU costs, based on total 2 FTEs spread over 5 positions.
Sales, general and administrative	\$55,000	Peer systems

Generally speaking, the above figures fall in the lower range of estimates developed for this analysis, and assume smooth implementation with little additional overhead cost. It would be plausible to use more pessimistic assumptions, but not necessary given the conclusions below.

3.5. Subscriber adoption

In December 2011, RKS Research and Consulting conducted 401 interviews of randomly selected Palo Alto households on behalf of CPAU². The goal of the study was to “measure

² City of Palo Alto Fiber to the Premise Study, RKS Research and Consulting, January 2012.

consumer receptiveness to an ‘open-access’ user-financed approach to residential Fiber-to-the-Premise (FTTP).”

Questions about willingness to purchase service at various price points were included. The small sample size and the type of questions asked lead to a high degree of statistical uncertainty for any projections that result. Nonetheless, the research does establish a range of possibilities that is sufficient to evaluate the likely number of subscribers and the expected revenue.

To explore this range, we took the raw subscriber interest and price point numbers provided by RKS and calculated three demand cases:

- A base case, which discounts the raw numbers by 20% to factor in a typical gap between expressed interest in surveys and actual service purchases later.
- A pessimistic scenario, which uses a 50% discount to account for the effect of an aggressive competitive response from incumbent providers.
- An optimistic scenario, which adds 50% to the raw numbers in order to consider the possibility that a successful system will attract subscribers who aren’t currently interested.

Complete tables of demand at various combinations of price points for all three cases are in Appendix A. The ranges used in the modeling discussed below are:

Table 3.3 Demand for user-financed FTTP in Palo Alto

Upfront fee	\$1,000	\$2,000	\$3,000	\$5,000
Monthly fee	\$75	\$100	\$100	\$100
Base case	21.2%	10.6%	4.3%	0.5%
Pessimistic scenario	13.2%	6.6%	2.7%	0.3%
Optimistic scenario	39.7%	19.9%	8.0%	0.9%

It’s assumed that the City would receive the entire upfront fee and half the monthly fee. Monthly fees above \$100 per month weren’t considered because demand dropped sharply at that point, making the question moot. Similarly, monthly fees below \$75 weren’t considered because the revenue generated wouldn’t support operations.

Comparisons with other Bay Area cities suggest that the pessimistic case is likelier to reflect actual results if a user-financed FTTP system is implemented. A study³ conducted in San Francisco concluded that a user-financed system would gain a 4.7% market share with a \$1,000 upfront fee, a 1.3% share with a \$2,000 fee and no subscribers at all at \$2,500 or more. Business case projections for a city-operated cable television and Internet system in Alameda predicted a 39% market share⁴, but the best it could achieve was 30%. At that point, intense competition from the incumbent service providers, particularly Comcast, caused market share to drop to the point that the City of Alameda could not meet its bond obligations.

Another factor to consider is how subscribers would be distributed across the City. In a user-financed model, a low overall subscription rate might not be a problem if the users were concentrated in a few neighborhoods. However, in its Palo Alto research, RKS did not find any geographic clumping:

No one zip code in Palo Alto reports significantly higher interest in the Fiber Optic build-out than another area. (There is slightly higher support in 94303 and 94306, but the difference is not significant.) The data also show that support (and opposition and “Don’t Knows”) are equally distributed; this suggests that “buyers” are likely to be drawn from all areas of Palo Alto⁵.

Based on RKS’s conclusion it would be reasonable to assume that there would be random differences in subscription rates between various neighborhoods, but there is no basis for believing that subscribers would be concentrated to a meaningful degree or in a predictable way.

Even so, it’s fair to consider the possible effect of concentrated demand. In zip code 94301, conceptual subscriber willingness to invest in network extensions was 109% of the average, and 94% in zip code 94303. This difference of 15% is the maximum subscriber concentration factor that can be plausibly supported by the research.

In keeping with the optimistic assumptions explained above, we assumed that subscribers would be concentrated into 85% of the City’s neighborhoods, and that facilities and service would not be extended into the remaining 15%.

³ *Enhanced Communications in San Francisco: Phase II Fiber Optics Feasibility Report*, prepared for the City and County of San Francisco by Columbia Telecommunications Corporation, October 2009.

⁴ *Market Research Report: Citywide Ultra High-Speed Broadband System Project for the City of Palo Alto*, Tellus Venture Associates, May 2011

⁵ City of Palo Alto Fiber to the Premise Study, RKS Research and Consulting, January 2012.

4. User-Financed Model

The key question that has to be addressed in evaluating the user-financed model is: for a given upfront cost, how many households in a block need to participate in order to break even?

4.1. The “Perfect” case

The answer to that question depends on the cost of building the facilities to serve that neighborhood, which in turn depends on how a neighborhood is defined. One way to picture it is as a string of properties, all of which participate and one end of which is directly on a node. In this “perfect” case, only the minimum amount of fiber needs to be installed.

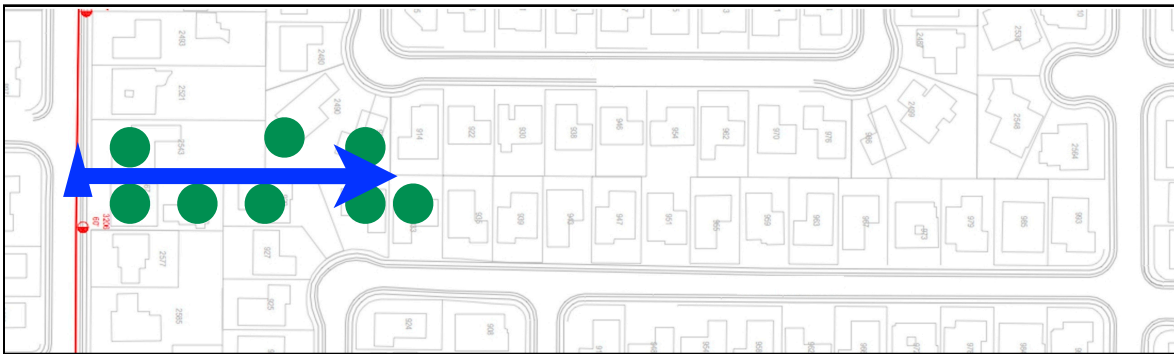


Figure 4.1 An example of what a “perfect” case might look like. Eight subscribing homes (green dots) are in a cluster next to a node (blue triangle), requiring a minimum amount of fiber optic cable (blue arrow) to reach the existing CPAU network (red line).

A per subscriber cost was developed using the construction cost estimates detailed above, with the additional assumption that the amount of fiber necessary per household is 50% less due to the ideal nature of this case. The total cost of the system and drop fiber and subscriber equipment is approximately \$1,400 per home served. Using the base figure of \$3,000 per subscriber in user financing, that leaves about \$1,600 to contribute toward the cost of building the node.

An active system requires switching and routing nodes to be installed along the fiber route. Bigger nodes can handle more subscribers, at a higher cost per node. A mid-range estimate was used, based on the shared system architecture parameters used by CTC and 180 Connect in Palo, by CTC in a similar study in San Francisco and by other fiber-to-the-premises project. As detailed in Table 3.1, it was estimated that one mid-sized node could serve seven residential neighborhood blocks, with an average of 33 homes per block.

In this perfect case, the \$1,600 contributions of 8 subscribing homes would pay for the cost of a block's share of building a node. Eight homes in a 33-home block would be a 23% take-rate.

In a perfect user-financed case, eight subscribing households contributing \$3,000 each would cover the cost of building the fiber and electronics necessary to serve them.

Unfortunately, perfection is difficult to achieve in the real world. Even if a tight, contiguous cluster of homes signed up for a user-financed proposition, it would be inefficient and costlier in the long run to install only the minimum amount of fiber necessary. Per foot estimates of fiber costs are based on assumptions about efficient planning and execution, in order to maximize the utility of fixed costs such as closing a street, dispatching a crew and doing engineering and design work, to name just three examples.

It also be inefficient and ultimately costlier to install nodes based on initial, ad hoc concentrations of subscribers. A network that could scale to eventually serve the entire City would necessarily be based on careful selection of node locations, so as to minimize both capital and operating costs, and to efficiently and rationally operate the system.

4.2. The “Average” case

To answer the key question of how many subscribers are required to make a realistic user-financed model work, perfect assumptions have to be replaced by average ones. The market research conducted by CPAU holds out little hope of a significant number of tight, contiguous subscriber clusters. A better assumption would be that on any given block, subscribers would be more or less scattered at random.

It would also be more realistic to assume that the node would be some distance away, requiring yet more fiber to be installed. Using the straight assumptions in Table 3.1, wiring an average 33 home block would require just over 1,700 feet of fiber to be installed, at a cost of just under \$50,000.

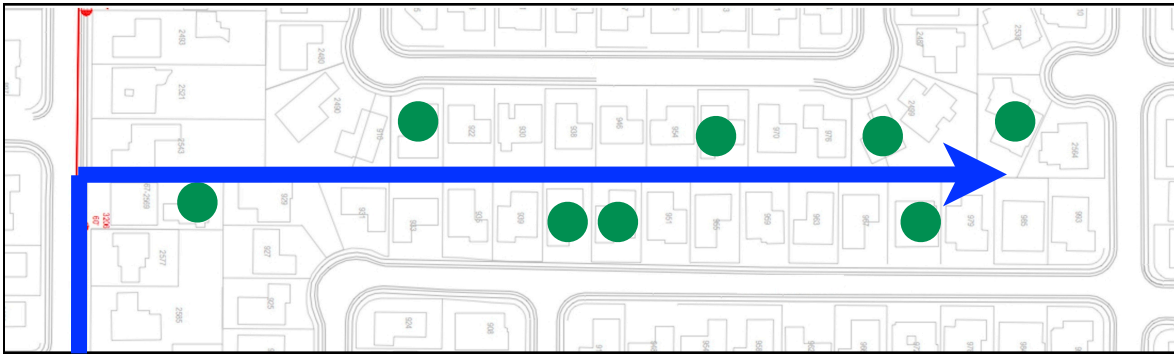


Figure 4.2 If only eight homes in a typical neighborhood block opt in to a user financed model, a more or less random distribution is likely. A \$3,000 upfront payment would cover less than half the cost.

Eight homes paying \$3,000 each wouldn't pay for even half the cost of the fiber alone. Adding in a one-seventh share of a node, the per-user price would be closer to \$8,000. At \$3,000 each in user-financing, it would take 26 subscribers out of a possible 33 – a 79% take rate – to pay the cost of the necessary node, system fiber, drop and subscriber equipment.

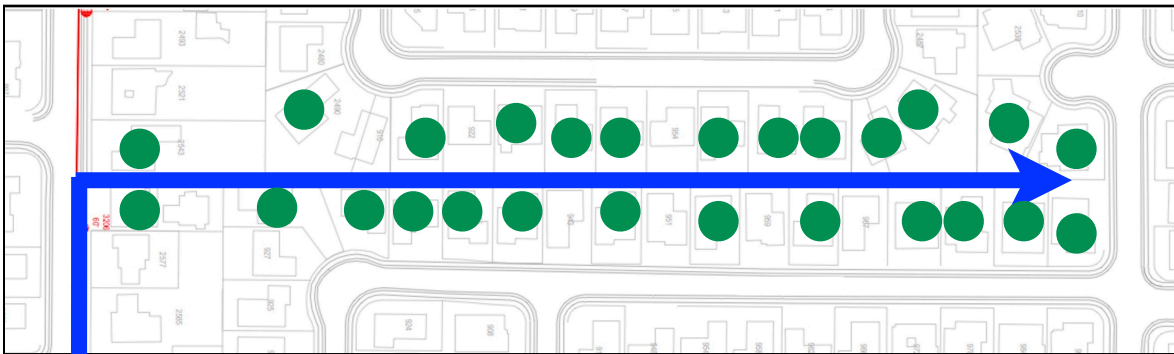


Figure 4.3 In an “average” case, 79% of homes would have to opt in to cover the cost of the fiber run from the node to end of the block, as well as a share of the node and home connection costs.

It would be difficult to try to aggregate user-financing subscribers on any other basis than by linear neighborhood block. Although it could be argued that subscribers could be clustered in a variety of different configurations, the only efficient way to reach them is to use existing utility pole and conduit routes, and those routes are generally linear. Any other assumption about subscriber patterns would lead to higher costs, making recovering construction costs even more unlikely.

To cover the cost of extending an FTTP system to an average Palo Alto neighborhood block, 79% of households would have to agree to pay a \$3,000 upfront fee. Even under the most optimistic interpretation and assumptions, the maximum projected demand at that price point would be less than 18%.

4.3. Citywide base model

The next step is to apply the “average” case assumptions on a citywide basis, using the pricing and subscriber levels predicted by the primary, quantitative market research conducted for the City by RKS.

The business parameters picked (more or less arbitrarily) as a starting point for the Base Model were:

1. Base demand case (raw subscription rate projections discounted by 20%).
2. \$3,000 upfront fee.
3. \$100 monthly fee.
4. 15% subscriber concentration factor (i.e. only 85% of the City would be built out).
5. The cost estimates described in Section 3 above.

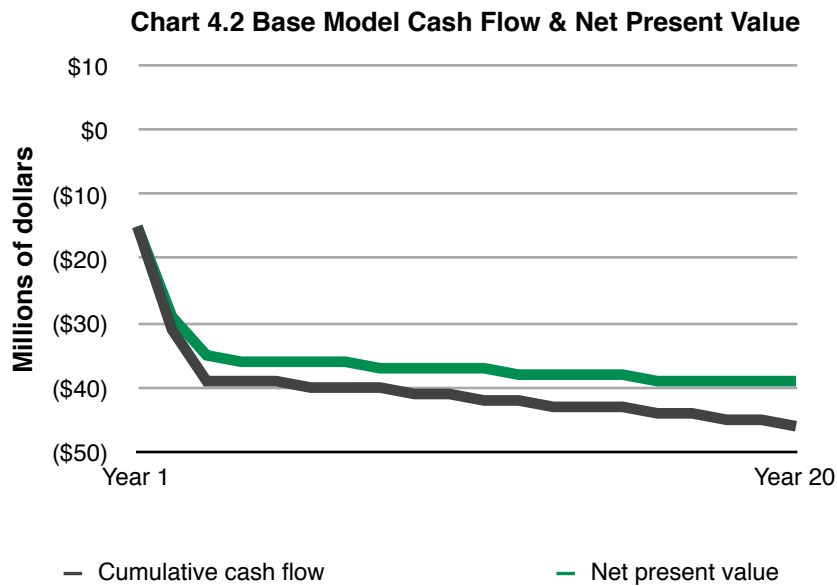
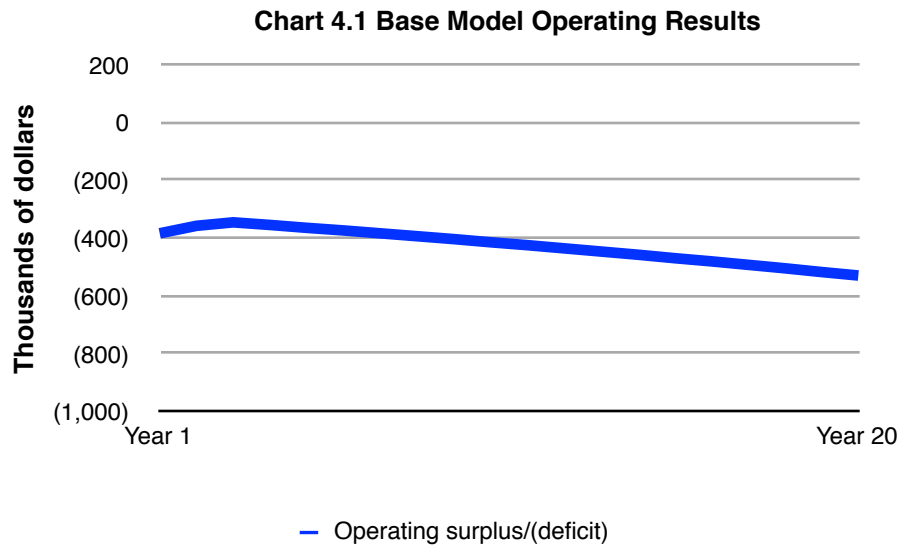
Other assumptions made included an initial three year construction time line, a 5% cost of capital (based on typical California municipal bond rates) and moderate assumptions regarding increases in fixed operating costs if subscriber levels grew significantly.

With two exceptions, all dollar values are figured at a constant rate, with no allowance for inflation. Doing so provides a fixed point of reference, allowing "apples to apples" comparisons between scenarios and over time. Inflation is an important factor in business planning, particularly the tendency for inflation-driven revenue growth to lag behind cost increases. However, for analytical and comparison purposes, inflation adjustments can mask critical differences: “flat” results show up as an increasing line on a graph, while a flat line on a graph actually means deteriorating results.

From an analytical standpoint, keeping dollar values constant allows for a cleaner first cut analysis. A flat line on a graph means flat results.

The two exceptions are equipment maintenance and personnel costs. Those line items are assumed to increase at a rate 2% faster than inflation; maintenance costs because of aging equipment and personnel costs because of historical experience. The subscription rate for a given upfront and monthly fee combination does not change over time. Increasing subscription rate scenarios are discussed below, but a decreasing rate is also possible.

Year to year operating results, cumulative cash flow (including capital contributions and expense) and the net present value⁶ of the system were calculated over twenty years. Summary spreadsheets for the base model and scenarios are in Appendix B.



⁶ Net present value (NPV) is one of the building block calculations for finance. It provides a methodology for evaluating and pricing securities and projects. It is a form of calculating discounted cash flow, in other words the value of money expected in the future discounted by either the cost of borrowing that money or the amount of interest that would have been earned if it had been kept in a bank account. In this model, NPV provides a way to take into account the cost of borrowing money to cover losses.

At a \$3,000 upfront cost and \$100 a month, the projected base case subscription rate is 4.3%. The result is increasing operating losses over twenty years, and a steadily decreasing negative system value. Under these assumptions, a user-financed FTTP system would be a financial failure.

5.Scenarios

The parameters used in the first run of the base model, as described above, are:

- Upfront cost of \$3,000, monthly fee of \$100.
- Raw subscription rate numbers discounted by 20%.
- System will only have to be built out to 85% of the City.
- Operating and capital cost estimates from the low end of possible ranges.
- No year-to-year subscriber gain or loss.
- No subsidies from the CPAU dark fiber system except use of fibers.

The result is a system that generates increasing operating losses over twenty years, with a negative net value of almost \$40 million at the end of that period. The next step is to run the model with different parameters, to see the potential effect.

Two parameters were not tested: cost estimates and the percentage of the City to be built out. Both are estimated using the most plausibly optimistic figures possible. Using more pessimistic assumptions would make a bad case even worse.

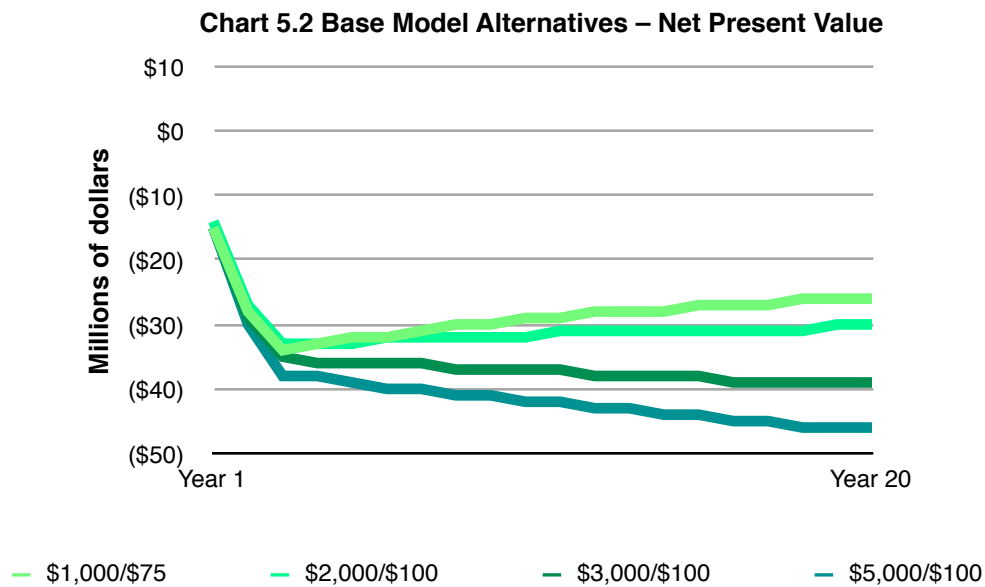
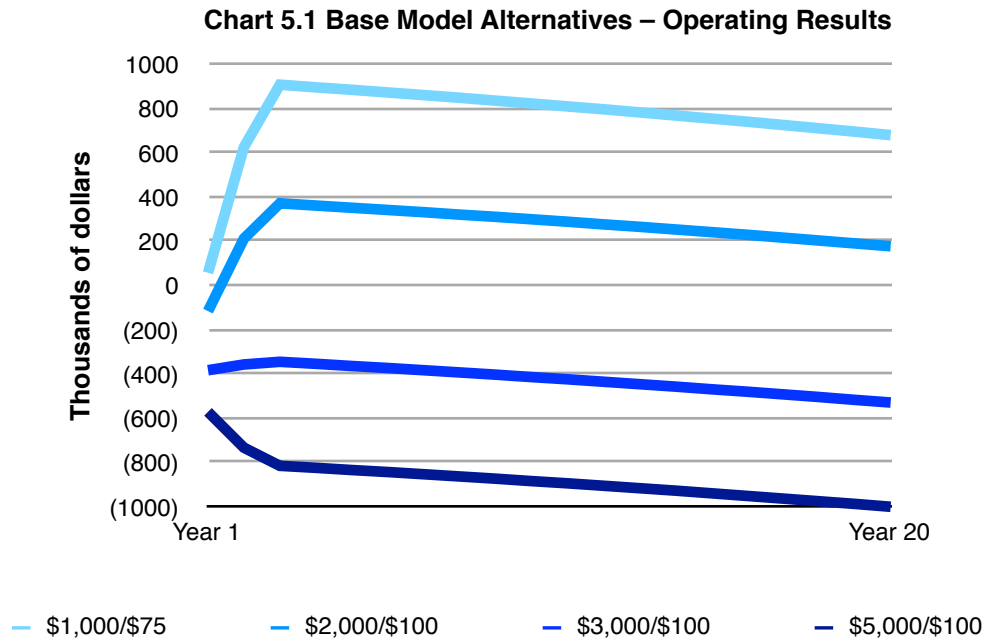
The five scenarios that were tested are:

1. Base model using four different price point combinations: \$1,000 upfront and \$75 monthly, \$2,000/\$100, \$3,000/\$100 and \$5,000/\$100. These points bracket the high and low demand figures, other price points (e.g. \$3,000/\$75) would fall within the boundaries of this range.
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3. Optimistic demand projections at the four price point combinations.
4. Increasing subscription rate scenarios using 2% and 5% annual growth rates.
5. Effect of using the surplus generated by the existing CPAU dark fiber system.

A full set of spreadsheets showing operating results and capital budgets is in Appendix B.

5.1. Base model alternatives

Testing the base model using different upfront/monthly price point combinations resulted in positive operating costs, but did not come close to producing a positive net system value.

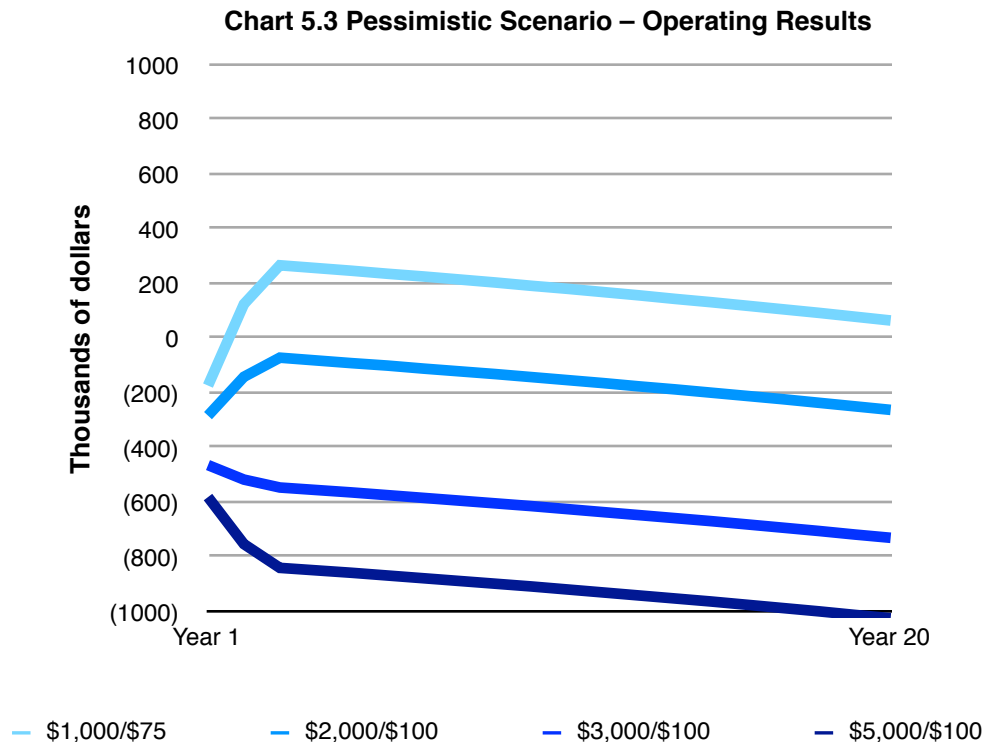


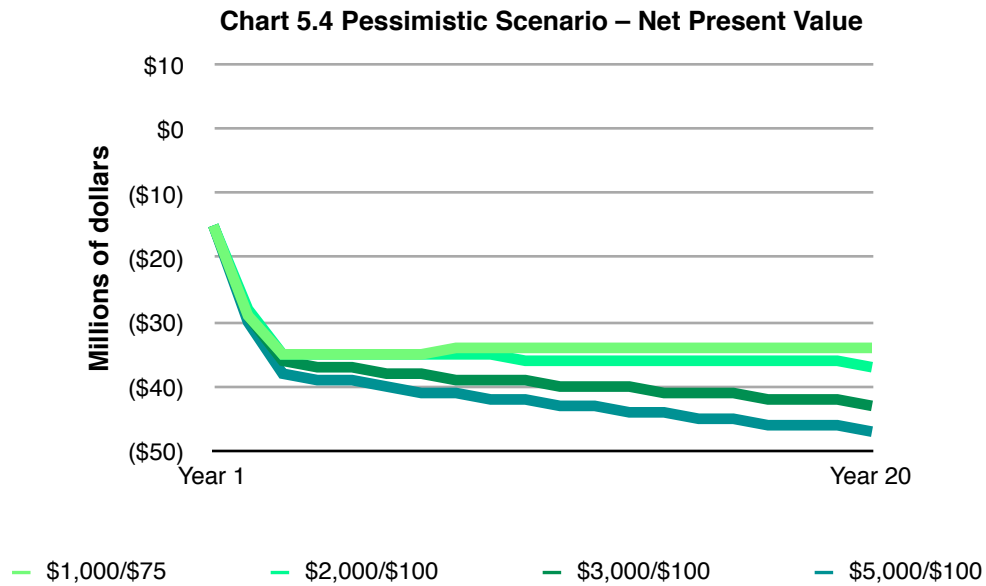
The annual operating surplus peaks at \$905 thousand in Year 3 and then declines because personnel and maintenance costs are assumed to grow at 2% per year, with no offsetting increases in revenue. This surplus is not sufficient to pay back the cost of construction within 20 years.

5.2. Pessimistic scenarios

The pessimistic scenario uses the assumptions in the base model, with the exception of the subscription rate projections. The pessimistic demand figures discount the raw RKS numbers by 50%.

Not surprisingly, the results are worse than the base case for both operating results and system value. As discussed above, it can be argued that the pessimistic demand scenario is a likelier outcome than the base case and should be factored into risk evaluations.





5.3. Optimistic scenarios

The optimistic scenarios assume that demand will be 50% greater than RKS's raw numbers, and consequently nearly twice that (88% greater) of the base case.

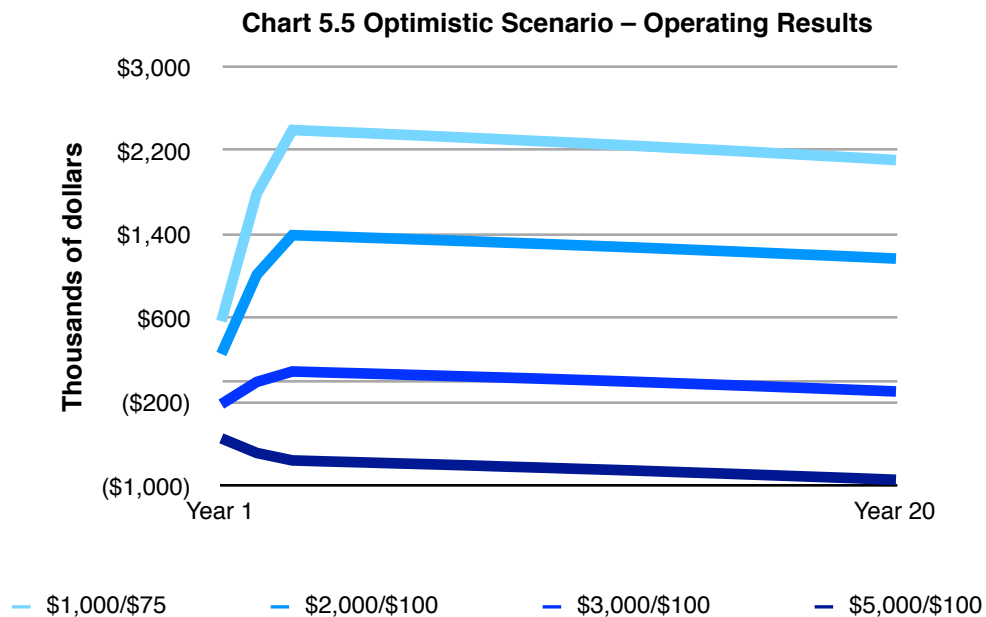
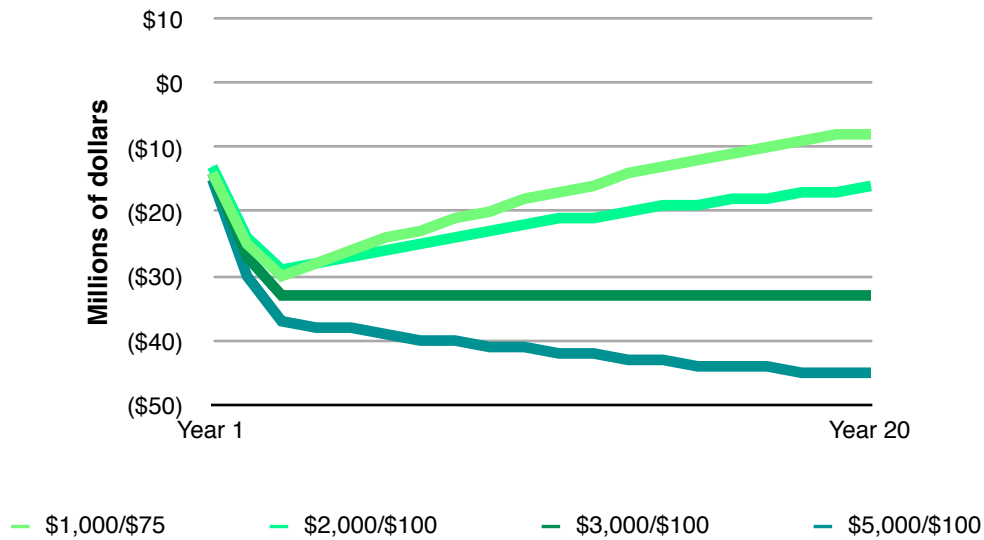
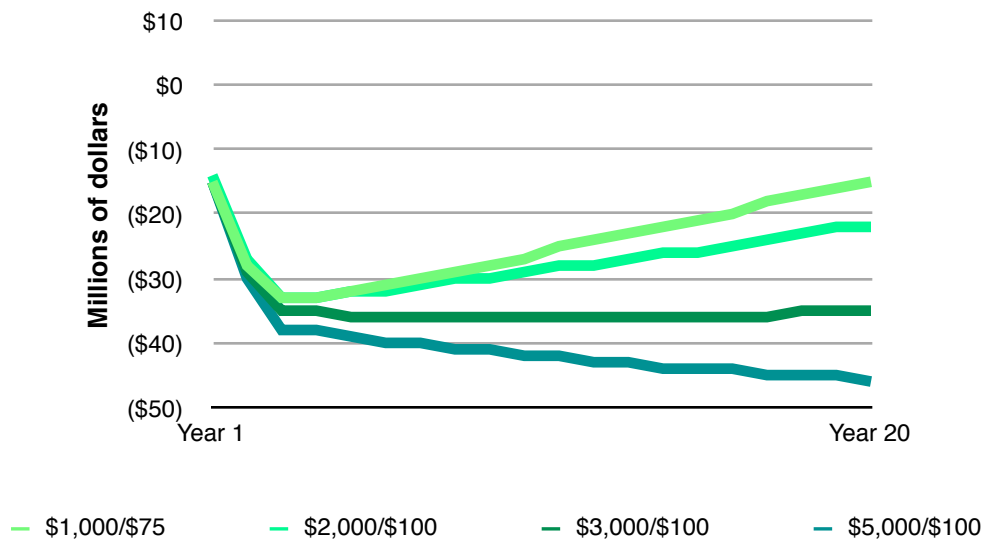


Chart 5.6 Optimistic Scenario – Net Present Value

Although the operating results are significantly improved, even this surplus is not sufficient to pay back the cost of construction over 20 years.

5.4. Increasing subscription rate scenarios

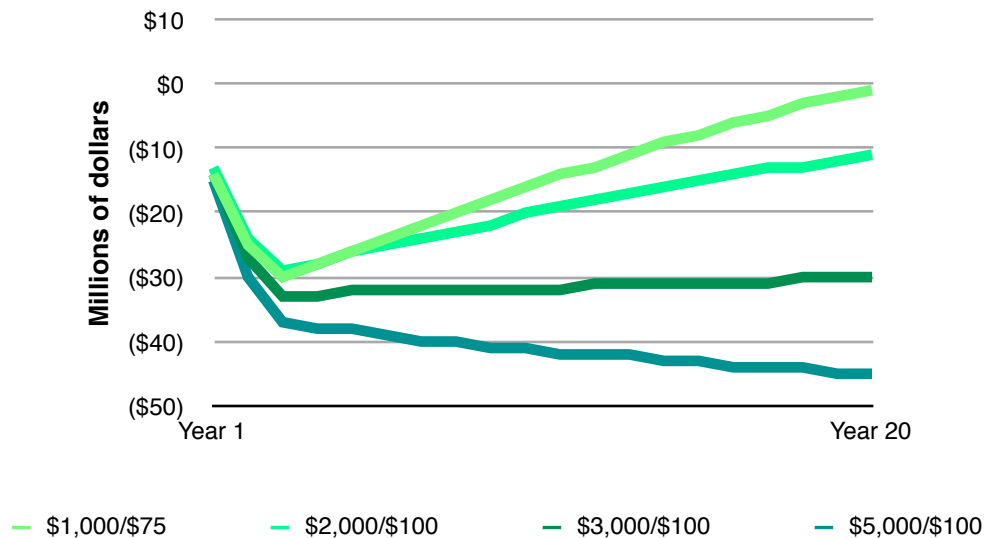
Chart 5.7 Base Case with 5% Annual Subscriber Growth – Net Present Value

Taking the base model and adding the assumption that the subscription rate will grow by 5% per year produces a result similar to the optimistic demand scenario. Operating revenue increases and turns positive in some cases, but isn't enough to pay back the initial cost of

the system. The net value of the system after 20 years is still significantly negative under any demand assumptions.

A 5% growth rate brings the system's market share to nearly 50% over 20 years, which is a very aggressive target given the level of existing competition and results obtained by municipal systems elsewhere.

Chart 5.8 Optimistic Scenario with 2% Annual Subscriber Growth – Net Present Value



It would be difficult to justify a higher ultimate market share. However, taking the optimistic demand scenario and adding a 2% annual subscription rate increase produces a similar market share but generates greater operating surpluses more quickly, with the result that the net value of the system after 20 years rises close to zero in the best scenario.

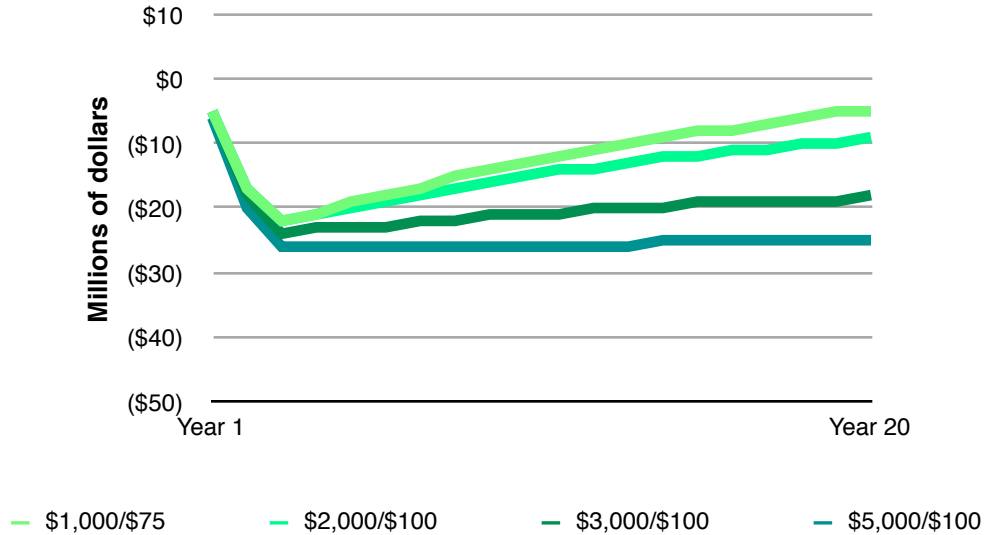
5.5. Effect of subsidies

Another potential option is to use the surpluses generated by the existing CPAU dark fiber system to subsidize the cost of building and operating a user-financed FTTP system. Currently, the dark fiber system generates a surplus of approximately \$2 million per year and has an accumulated surplus of about \$12 million.

If \$10 million of the accumulated surplus is used to help pay for the initial construction costs (leaving a \$2 million reserve) and \$1 million per year in future surpluses are used to pay down the system's debt, the net value of the system would be significantly less negative. Adding this subsidy to the base model brings the net value of the system after 20

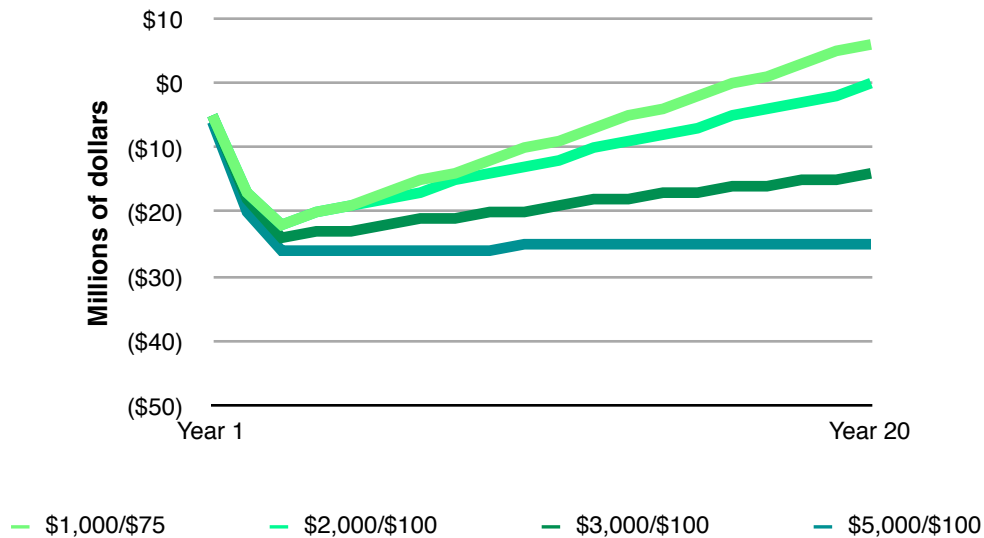
years to somewhere between –\$25 million and –\$5 million, depending on the demand assumptions used.

Chart 5.9 Base Model with \$10M/\$1M Subsidies – Net Present Value

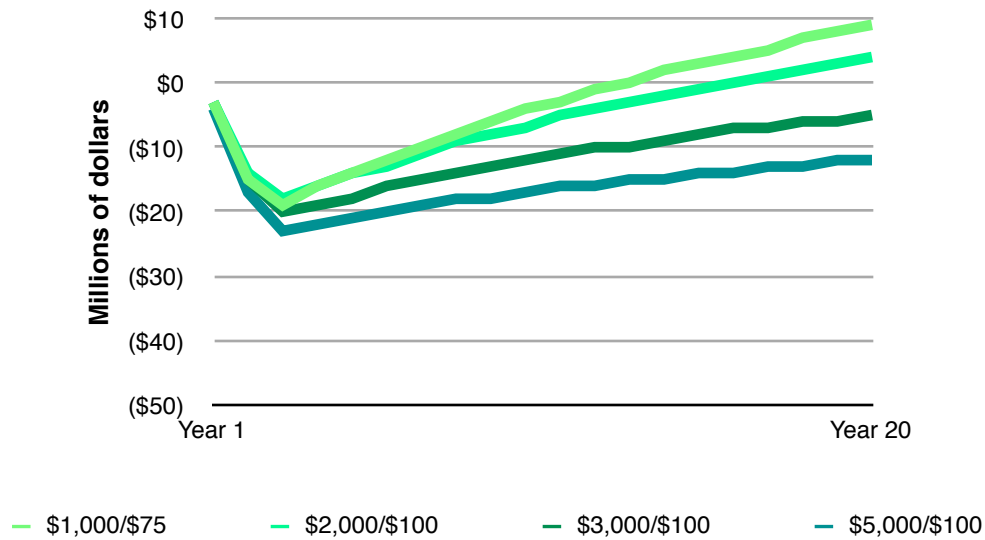


The picture further improves if the base model is modified by assuming that the subscription rate will increase by 5% annually.

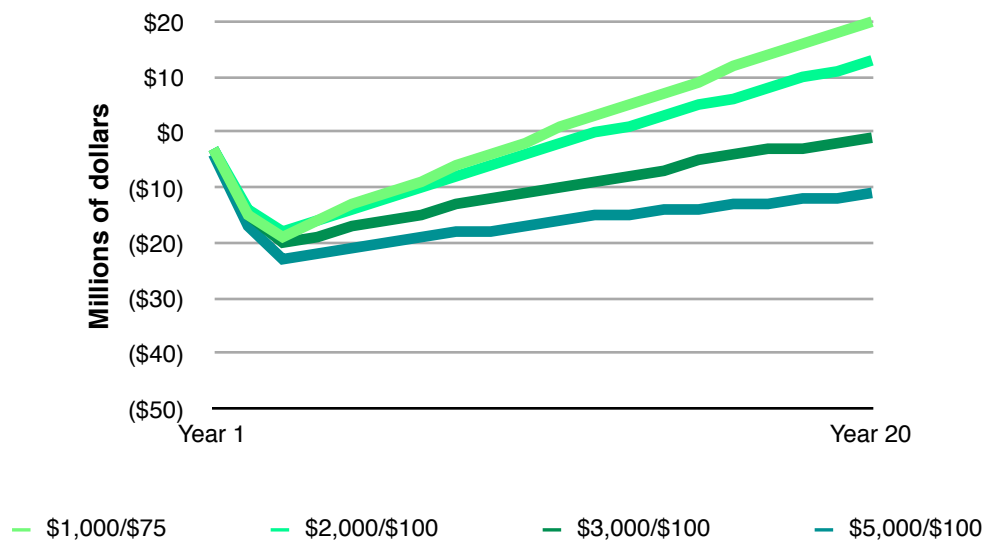
Chart 5.10 Base Model with \$10M/\$1M Subsidies & 5% Annual Growth – Net Present Value



In this scenario, using the most optimistic demand assumptions, the net system value is a positive \$6 million after 20 years. Under other demand assumptions, though, the net system value after 20 years ranges from –\$25 million to zero.

Chart 5.11 Base Model with \$12M/\$2M Subsidies – Net Present Value


Higher subsidies produce higher net values. If the entire \$12 million accumulated surplus is contributed toward construction costs and the assumption is made that the dark fiber system can contribute at least \$2 million in subsidies for the following 20 years, then the more optimistic demand assumptions show a positive net value of up to \$9 million after 20 years. At the lower end of the demand assumption range, though, net 20-year values are still negative, ranging from –\$12 million to –\$5 million.

Chart 5.12 Base Model with \$12M/\$2M Subsidies & 5% Annual Growth – Net Present Value


Adding in an assumption that subscriber growth will continue at a 5% annual rate for 20 years improves the actual numbers but doesn't change the pattern: optimistic subscriber assumptions show a positive value after 20 years, less optimistic assumptions do not. The most optimistic case assessed – \$12 million in upfront subsidies, \$2 million in ongoing annual subsidies, high initial demand and continual subscriber 5% growth – takes 11 years to cross the line into positive net value territory.

6. Conclusions

The primary reason to implement a user-financed model is just that: the people who use it bear the cost of building it. A lower upfront fee will likely attract more users, but it also means each user initially contributes less towards construction costs. Under every scenario considered, even with the most aggressively optimistic assumptions, the initial upfront user fees would never come close to paying for those costs.

It is possible to imagine scenarios where, in the course of 20 years, a user-financed FTTP system could pay for itself, or at least come close. However, those optimistic scenarios are at the hypothetical extremes and are unlikely to be achieved under real world, competitive market conditions.

Using mid-range assumptions, the base model predicts that the system will require tens of millions of dollars in bond financing or other outside sources of capital, with no realistic prospect of repaying those obligations out of operating revenue. Using surplus dark fiber revenue to subsidize the FTTP system helps, but does not solve the problem.

A user-financed FTTP system might even require annual operating subsidies. Under our initial pricing assumptions – a \$3,000 upfront cost and a \$100 per month fee – the system will lose several hundred thousand dollars a year. The market research conducted by RKS shows that the demand for a user-financed FTTP system is sensitive to price and it is possible to model conditions where lower prices would produce better results.

However, as discussed above, other research suggests that the “true” demand figures for Palo Alto are at the lower end of RKS’s range, significantly raising the risk of annual operating losses, even with lower prices. Operating losses will lead to additional borrowing requirements, possibly in the tens of millions of dollars range, with no immediate source of repayment.

A fully user-financed citywide fiber-to-the-premise system is not possible to achieve in Palo Alto. An opt-in FTTP system can be built using a combination of upfront user fees and City financing, but there is very little probability of the debt incurred being repaid through operations. Ongoing subsidies would be required, very likely in excess of the surpluses currently generated by the CPAU dark fiber system.

7. Appendix A - Market Demand Research

Base case

Decrement (-) 20%

Monthly subscription cost	Maximum one-time investment					
	\$0	\$1,000	\$2,000	\$3,000	\$4,000	\$5,000
\$0	65.6%	60.3%	37.4%	9.3%	3.3%	1.0%
\$10	56.8%	53.2%	32.8%	8.8%	2.8%	1.0%
\$15	56.5%	53.0%	32.8%	8.8%	2.8%	1.0%
\$18	56.3%	52.7%	32.8%	8.8%	2.8%	1.0%
\$20	56.3%	52.7%	32.8%	8.8%	2.8%	1.0%
\$25	54.8%	51.2%	32.1%	8.8%	2.8%	1.0%
\$30	51.0%	48.2%	30.8%	8.6%	2.5%	0.8%
\$35	48.5%	45.7%	29.5%	8.6%	2.5%	0.8%
\$40	46.7%	43.9%	28.8%	8.6%	2.5%	0.8%
\$45	43.2%	40.6%	27.0%	8.6%	2.5%	0.8%
\$49	42.6%	40.1%	26.8%	8.6%	2.5%	0.8%
\$50	42.4%	39.9%	26.5%	8.6%	2.5%	0.8%
\$55	28.0%	26.8%	17.9%	7.1%	2.0%	0.8%
\$60	27.5%	26.2%	17.4%	6.8%	2.0%	0.8%
\$65	24.2%	23.0%	16.2%	6.6%	1.8%	0.5%
\$70	23.7%	22.5%	15.9%	6.6%	1.8%	0.5%
\$75	22.5%	21.2%	15.4%	6.3%	1.8%	0.5%
\$80	18.9%	17.9%	12.9%	5.8%	1.8%	0.5%
\$99	16.7%	15.6%	10.9%	4.3%	1.5%	0.5%
\$100	16.4%	15.4%	10.6%	4.3%	1.5%	0.5%
\$125	5.8%	5.3%	3.8%	2.0%	1.3%	0.5%
\$150	5.3%	4.8%	3.8%	2.0%	1.3%	0.5%
\$175	2.8%	2.8%	2.3%	1.5%	0.8%	0.0%
\$200	2.8%	2.8%	2.3%	1.5%	0.8%	0.0%
\$250	0.8%	0.8%	0.8%	0.8%	0.5%	0.0%
\$300	0.5%	0.5%	0.5%	0.5%	0.3%	0.0%
\$1,000	0.3%	0.3%	0.3%	0.3%	0.0%	0.0%
\$3,000	0.3%	0.3%	0.3%	0.3%	0.0%	0.0%

Pessimistic demand case

Decrement (-) 50%

Monthly subscription cost	Maximum one-time investment					
	\$0	\$1,000	\$2,000	\$3,000	\$4,000	\$5,000
\$0	41.0%	37.7%	23.3%	5.8%	2.1%	0.6%
\$10	35.5%	33.3%	20.5%	5.5%	1.7%	0.6%
\$15	35.3%	33.1%	20.5%	5.5%	1.7%	0.6%
\$18	35.2%	33.0%	20.5%	5.5%	1.7%	0.6%
\$20	35.2%	33.0%	20.5%	5.5%	1.7%	0.6%
\$25	34.2%	32.0%	20.0%	5.5%	1.7%	0.6%
\$30	31.9%	30.1%	19.2%	5.4%	1.6%	0.5%
\$35	30.3%	28.5%	18.5%	5.4%	1.6%	0.5%
\$40	29.2%	27.4%	18.0%	5.4%	1.6%	0.5%
\$45	27.0%	25.4%	16.9%	5.4%	1.6%	0.5%
\$49	26.7%	25.1%	16.7%	5.4%	1.6%	0.5%
\$50	26.5%	24.9%	16.6%	5.4%	1.6%	0.5%
\$55	17.5%	16.7%	11.2%	4.4%	1.3%	0.5%
\$60	17.2%	16.4%	10.9%	4.3%	1.3%	0.5%
\$65	15.1%	14.4%	10.1%	4.1%	1.1%	0.3%
\$70	14.8%	14.0%	9.9%	4.1%	1.1%	0.3%
\$75	14.0%	13.2%	9.6%	3.9%	1.1%	0.3%
\$80	11.8%	11.2%	8.0%	3.6%	1.1%	0.3%
\$99	10.4%	9.8%	6.8%	2.7%	0.9%	0.3%
\$100	10.3%	9.6%	6.6%	2.7%	0.9%	0.3%
\$125	3.6%	3.3%	2.4%	1.3%	0.8%	0.3%
\$150	3.3%	3.0%	2.4%	1.3%	0.8%	0.3%
\$175	1.7%	1.7%	1.4%	0.9%	0.5%	0.0%
\$200	1.7%	1.7%	1.4%	0.9%	0.5%	0.0%
\$250	0.5%	0.5%	0.5%	0.5%	0.3%	0.0%
\$300	0.3%	0.3%	0.3%	0.3%	0.2%	0.0%
\$1,000	0.2%	0.2%	0.2%	0.2%	0.0%	0.0%
\$3,000	0.2%	0.2%	0.2%	0.2%	0.0%	0.0%

Optimistic demand case

Increment (+) 50%

Monthly subscription cost	Maximum one-time investment					
	\$0	\$1,000	\$2,000	\$3,000	\$4,000	\$5,000
\$0	100.0%	100.0%	70.0%	17.5%	6.2%	1.9%
\$10	100.0%	99.8%	61.5%	16.6%	5.2%	1.9%
\$15	100.0%	99.4%	61.5%	16.6%	5.2%	1.9%
\$18	100.0%	98.9%	61.5%	16.6%	5.2%	1.9%
\$20	100.0%	98.9%	61.5%	16.6%	5.2%	1.9%
\$25	100.0%	96.1%	60.1%	16.6%	5.2%	1.9%
\$30	95.6%	90.4%	57.7%	16.1%	4.7%	1.4%
\$35	90.9%	85.6%	55.4%	16.1%	4.7%	1.4%
\$40	87.5%	82.3%	53.9%	16.1%	4.7%	1.4%
\$45	80.9%	76.2%	50.6%	16.1%	4.7%	1.4%
\$49	80.0%	75.2%	50.2%	16.1%	4.7%	1.4%
\$50	79.5%	74.8%	49.7%	16.1%	4.7%	1.4%
\$55	52.5%	50.2%	33.6%	13.2%	3.8%	1.4%
\$60	51.6%	49.2%	32.6%	12.8%	3.8%	1.4%
\$65	45.4%	43.1%	30.3%	12.3%	3.3%	0.9%
\$70	44.5%	42.1%	29.8%	12.3%	3.3%	0.9%
\$75	42.1%	39.7%	28.9%	11.8%	3.3%	0.9%
\$80	35.5%	33.6%	24.1%	10.9%	3.3%	0.9%
\$99	31.2%	29.3%	20.3%	8.0%	2.8%	0.9%
\$100	30.8%	28.9%	19.9%	8.0%	2.8%	0.9%
\$125	10.9%	9.9%	7.1%	3.8%	2.4%	0.9%
\$150	9.9%	9.0%	7.1%	3.8%	2.4%	0.9%
\$175	5.2%	5.2%	4.3%	2.8%	1.4%	0.0%
\$200	5.2%	5.2%	4.3%	2.8%	1.4%	0.0%
\$250	1.4%	1.4%	1.4%	1.4%	0.9%	0.0%
\$300	0.9%	0.9%	0.9%	0.9%	0.5%	0.0%
\$1,000	0.5%	0.5%	0.5%	0.5%	0.0%	0.0%
\$3,000	0.5%	0.5%	0.5%	0.5%	0.0%	0.0%

Unadjusted (raw) RKS data

Monthly subscription cost	Maximum one-time investment					
	\$0	\$1,000	\$2,000	\$3,000	\$4,000	\$5,000
\$0	82.0%	75.4%	46.7%	11.7%	4.1%	1.3%
\$10	71.0%	66.6%	41.0%	11.0%	3.5%	1.3%
\$15	70.7%	66.2%	41.0%	11.0%	3.5%	1.3%
\$18	70.3%	65.9%	41.0%	11.0%	3.5%	1.3%
\$20	70.3%	65.9%	41.0%	11.0%	3.5%	1.3%
\$25	68.5%	64.0%	40.1%	11.0%	3.5%	1.3%
\$30	63.7%	60.3%	38.5%	10.7%	3.2%	0.9%
\$35	60.6%	57.1%	36.9%	10.7%	3.2%	0.9%
\$40	58.4%	54.9%	36.0%	10.7%	3.2%	0.9%
\$45	53.9%	50.8%	33.8%	10.7%	3.2%	0.9%
\$49	53.3%	50.2%	33.4%	10.7%	3.2%	0.9%
\$50	53.0%	49.8%	33.1%	10.7%	3.2%	0.9%
\$55	35.0%	33.4%	22.4%	8.8%	2.5%	0.9%
\$60	34.4%	32.8%	21.8%	8.5%	2.5%	0.9%
\$65	30.3%	28.7%	20.2%	8.2%	2.2%	0.6%
\$70	29.7%	28.1%	19.9%	8.2%	2.2%	0.6%
\$75	28.1%	26.5%	19.2%	7.9%	2.2%	0.6%
\$80	23.7%	22.4%	16.1%	7.3%	2.2%	0.6%
\$99	20.8%	19.6%	13.6%	5.4%	1.9%	0.6%
\$100	20.5%	19.2%	13.2%	5.4%	1.9%	0.6%
\$125	7.3%	6.6%	4.7%	2.5%	1.6%	0.6%
\$150	6.6%	6.0%	4.7%	2.5%	1.6%	0.6%
\$175	3.5%	3.5%	2.8%	1.9%	0.9%	0.0%
\$200	3.5%	3.5%	2.8%	1.9%	0.9%	0.0%
\$250	0.9%	0.9%	0.9%	0.9%	0.6%	0.0%
\$300	0.6%	0.6%	0.6%	0.6%	0.3%	0.0%
\$1,000	0.3%	0.3%	0.3%	0.3%	0.0%	0.0%
\$3,000	0.3%	0.3%	0.3%	0.3%	0.0%	0.0%

8. Appendix B - Spreadsheets

8.1. Base model - Charts 4.1 & 4.2

Base Case	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Revenue (000)																				
Monthly CPAU connect charge	\$25	\$53	\$66	\$70	\$73	\$77	\$81	\$85	\$89	\$93	\$98	\$103	\$108	\$114	\$119	\$125	\$131	\$138	\$145	\$152
Total revenue	\$25	\$53	\$66	\$70	\$73	\$77	\$81	\$85	\$89	\$93	\$98	\$103	\$108	\$114	\$119	\$125	\$131	\$138	\$145	\$152
Operating Expense (000)																				
Fiber plant																				
Fiber plant maintenance	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182
Subtotal	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182	\$182
Network																				
Network maintenance	\$82	\$167	\$209	\$213	\$217	\$222	\$226	\$231	\$235	\$240	\$245	\$250	\$255	\$260	\$265	\$270	\$276	\$281	\$287	\$293
Inside plant maintenance	\$4	\$4	\$4	\$4	\$4	\$4	\$5	\$5	\$5	\$5	\$5	\$5	\$5	\$5	\$5	\$5	\$6	\$6	\$6	\$6
Site operations	\$92	\$92	\$92	\$92	\$92	\$92	\$92	\$92	\$92	\$92	\$92	\$92	\$92	\$92	\$92	\$92	\$92	\$92	\$92	\$92
PAIX	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30	\$30
Subtotal	\$208	\$294	\$335	\$340	\$344	\$348	\$353	\$358	\$362	\$367	\$372	\$377	\$382	\$387	\$393	\$398	\$403	\$409	\$415	\$421
Operations																				
OCC	\$24	\$48	\$60	\$60	\$60	\$60	\$60	\$60	\$60	\$60	\$60	\$60	\$60	\$60	\$60	\$60	\$60	\$60	\$60	\$60
Interconnect bandwidth	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Leased backhaul	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
CPE maintenance	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1	\$1
Subtotal	\$24	\$48	\$61	\$61	\$61	\$61	\$61	\$61	\$61	\$61	\$61	\$61	\$61	\$61	\$61	\$61	\$61	\$61	\$61	\$61
Administration																				
Personnel	\$298	\$243	\$248	\$253	\$258	\$263	\$268	\$273	\$279	\$284	\$290	\$296	\$302	\$308	\$314	\$320	\$327	\$333	\$340	\$347
Software	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Growth driven opex increase	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Subtotal	\$298	\$243	\$248	\$253	\$258	\$263	\$268	\$273	\$279	\$284	\$290	\$296	\$302	\$308	\$314	\$320	\$327	\$333	\$340	\$347
Total operating cost	\$598	\$785	\$880	\$894	\$903	\$913	\$923	\$933	\$943	\$954	\$964	\$975	\$986	\$997	\$1,009	\$1,021	\$1,033	\$1,045	\$1,057	\$1,070
Operating Results (000)																				
Operating surplus/(deficit)	(\$573)	(\$732)	(\$814)	(\$824)	(\$830)	(\$836)	(\$842)	(\$848)	(\$854)	(\$860)	(\$866)	(\$872)	(\$878)	(\$884)	(\$890)	(\$895)	(\$901)	(\$907)	(\$912)	(\$918)
Cumulative operating cash flow	(\$573)	(\$1,305)	(\$2,119)	(\$2,943)	(\$3,774)	(\$4,610)	(\$5,452)	(\$6,300)	(\$7,154)	(\$8,014)	(\$8,880)	(\$9,753)	(\$10,630)	(\$11,514)	(\$12,404)	(\$13,299)	(\$14,201)	(\$15,108)	(\$16,020)	(\$16,938)
Operating cash flow NPV	(\$546)	(\$1,729)	(\$3,560)	(\$5,982)	(\$8,938)	(\$12,378)	(\$16,253)	(\$20,517)	(\$25,128)	(\$30,049)	(\$35,241)	(\$40,672)	(\$46,309)	(\$52,125)	(\$58,091)	(\$64,184)	(\$70,380)	(\$76,657)	(\$82,997)	(\$89,380)
Capital Expense (000)																				
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$1	\$1	\$1	\$1	\$1	\$2	\$2	\$2	\$2	\$2	\$2	\$2	\$2	\$2	\$2	\$2	\$3
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$26	\$26	\$13	\$3	\$3	\$4	\$4	\$4	\$4	\$4	\$5	\$5	\$5	\$5	\$6	\$6	\$6	\$6	\$7	\$7
Construction services	\$1,376	\$1,376	\$688	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$688	\$688	\$344	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$15,827	\$15,827	\$7,913	\$5	\$5	\$5	\$6	\$6	\$6	\$6	\$7	\$7	\$7	\$8	\$8	\$9	\$9	\$10	\$10	\$11
Cumulative capex	\$15,827	\$31,654	\$39,567	\$39,572	\$39,577	\$39,583	\$39,588	\$39,594	\$39,600	\$39,607	\$39,614	\$39,621	\$39,628	\$39,636	\$39,644	\$39,653	\$39,662	\$39,672	\$39,682	\$39,692
Cash Flow (000)																				
User construction contribution	\$211	\$211	\$105	\$26	\$28	\$29	\$30	\$32	\$34	\$35	\$37	\$39	\$41	\$43	\$45	\$47	\$50	\$52	\$55	\$58
Subsidy	\$12,000	\$12,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Capital expense	(\$15,827)	(\$15,827)	(\$7,913)	(\$5)	(\$5)	(\$5)	(\$6)	(\$6)	(\$6)	(\$6)	(\$7)	(\$7)	(\$7)	(\$8)	(\$8)	(\$9)	(\$9)	(\$10)	(\$10)	(\$11)
Cash flow	(\$4,189)	(\$14,346)	(\$26,160)	(\$23,963)	(\$22,770)	(\$21,583)	(\$20,400)	(\$19,222)	(\$18,049)	(\$16,880)	(\$15,716)	(\$14,556)	(\$13,401)	(\$12,249)	(\$11,102)	(\$9,959)	(\$8,820)	(\$7,684)	(\$6,552)	(\$5,423)
Cumulative cash flow	(\$4,189)	(\$16,538)	(\$25,160)	(\$23,963)	(\$22,770)	(\$21,583)	(\$20,400)	(\$19,222)	(\$18,049)	(\$16,880)	(\$15,716)	(\$14,556)	(\$13,401)	(\$12,249)	(\$11,102)	(\$9,959)	(\$8,820)	(\$7,684)	(\$6,552)	(\$5,423)
Net present value	(\$3,990)	(\$17,004)	(\$22,725)	(\$21,740)	(\$20,805)	(\$19,919)	(\$19,079)	(\$18,281)	(\$17,525)	(\$16,808)	(\$16,127)	(\$15,481)	(\$14,868)	(\$14,287)	(\$13,735)	(\$13,211)	(\$12,714)	(\$12,242)	(\$11,794)	(\$11,369)
Cost of capital	5%																			

8.2. Base model alternatives - Charts 5.1 & 5.2

Scenario Parameters

Demand case	Base
User construction contribution	\$1,000
Monthly cost	\$75
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$797	\$1,593	\$1,992	\$1,992	\$1,992	\$1,992	\$1,992	\$1,992
Total revenue	\$797	\$1,593	\$1,992	\$1,992	\$1,992	\$1,992	\$1,992	\$1,992
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$33	\$66	\$82	\$82	\$82	\$82	\$82	\$82
Administration	\$425	\$432	\$440	\$448	\$455	\$497	\$543	\$594
Total operating cost	\$739	\$937	\$1,039	\$1,051	\$1,063	\$1,128	\$1,200	\$1,279
Operating Results (000)								
Operating surplus/(deficit)	\$55	\$623	\$905	\$893	\$882	\$820	\$752	\$677
Cumulative operating cash flow	\$55	\$678	\$1,583	\$2,477	\$3,359	\$7,586	\$11,486	\$15,026
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$1,101	\$1,101	\$551	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,484	\$1,484	\$742	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$742	\$742	\$371	\$0	\$0	\$0	\$0	\$0
Total	\$17,063	\$17,063	\$8,532	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$17,063	\$34,126	\$42,658	\$42,658	\$42,658	\$42,658	\$42,658	\$42,658
Cash Flow (000)								
User construction contribution	\$1,770	\$1,770	\$885	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	\$55	\$623	\$905	\$893	\$882	\$820	\$752	\$677
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$17,063)	(\$17,063)	(\$8,532)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$15,238)	(\$14,669)	(\$6,742)	\$893	\$882	\$820	\$752	\$677
Cumulative cash flow	(\$15,238)	(\$29,907)	(\$36,649)	(\$35,755)	(\$34,873)	(\$30,646)	(\$26,746)	(\$23,206)
Net present value	(\$14,512)	(\$27,818)	(\$33,641)	(\$32,906)	(\$32,215)	(\$29,343)	(\$27,267)	(\$25,789)

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Scenario Parameters

Demand case	Base
User construction contribution	\$2,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$531	\$1,062	\$1,328	\$1,328	\$1,328	\$1,328	\$1,328	\$1,328
Total revenue	\$531	\$1,062	\$1,328	\$1,328	\$1,328	\$1,328	\$1,328	\$1,328
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$28	\$57	\$71	\$71	\$71	\$71	\$71	\$71
Administration	\$340	\$345	\$351	\$357	\$363	\$395	\$431	\$470
Total operating cost	\$649	\$841	\$940	\$950	\$960	\$1,015	\$1,076	\$1,144
Operating Results (000)								
Operating surplus/(deficit)	(\$118)	\$210	\$369	\$359	\$349	\$297	\$239	\$175
Cumulative operating cash flow	(\$118)	\$92	\$461	\$820	\$1,169	\$2,760	\$4,073	\$5,078
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$551	\$551	\$275	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,429	\$1,429	\$714	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$714	\$714	\$357	\$0	\$0	\$0	\$0	\$0
Total	\$16,430	\$16,430	\$8,215	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$16,430	\$32,860	\$41,075	\$41,075	\$41,075	\$41,075	\$41,075	\$41,075
Cash Flow (000)								
User construction contribution	\$1,770	\$1,770	\$885	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$118)	\$210	\$369	\$359	\$349	\$297	\$239	\$175
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$16,430)	(\$16,430)	(\$8,215)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$14,778)	(\$14,450)	(\$6,961)	\$359	\$349	\$297	\$239	\$175
Cumulative cash flow	(\$14,778)	(\$29,227)	(\$36,188)	(\$35,829)	(\$35,480)	(\$33,889)	(\$32,576)	(\$31,571)
Net present value	(\$14,074)	(\$27,180)	(\$33,193)	(\$32,898)	(\$32,624)	(\$31,541)	(\$30,841)	(\$30,419)

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Scenario Parameters

Demand case	Base
User construction contribution	\$3,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$215	\$430	\$537	\$537	\$537	\$537	\$537	\$537
Total revenue	\$215	\$430	\$537	\$537	\$537	\$537	\$537	\$537
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$26	\$52	\$64	\$64	\$64	\$64	\$64	\$64
Administration	\$293	\$298	\$303	\$308	\$313	\$339	\$369	\$402
Total operating cost	\$600	\$788	\$884	\$894	\$903	\$953	\$1,008	\$1,069
Operating Results (000)								
Operating surplus/(deficit)	(\$385)	(\$359)	(\$347)	(\$356)	(\$366)	(\$416)	(\$471)	(\$531)
Cumulative operating cash flow	(\$385)	(\$743)	(\$1,090)	(\$1,447)	(\$1,812)	(\$3,788)	(\$6,029)	(\$8,562)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$223	\$223	\$111	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,396	\$1,396	\$698	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$698	\$698	\$349	\$0	\$0	\$0	\$0	\$0
Total	\$16,053	\$16,053	\$8,027	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$16,053	\$32,106	\$40,133	\$40,133	\$40,133	\$40,133	\$40,133	\$40,133
Cash Flow (000)								
User construction contribution	\$1,075	\$1,075	\$537	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$385)	(\$359)	(\$347)	(\$356)	(\$366)	(\$416)	(\$471)	(\$531)
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$16,053)	(\$16,053)	(\$8,027)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$15,363)	(\$15,337)	(\$7,836)	(\$356)	(\$366)	(\$416)	(\$471)	(\$531)
Cumulative cash flow	(\$15,363)	(\$30,700)	(\$38,536)	(\$38,892)	(\$39,258)	(\$41,234)	(\$43,474)	(\$46,008)
Net present value	(\$14,631)	(\$28,542)	(\$35,311)	(\$35,605)	(\$35,891)	(\$37,228)	(\$38,416)	(\$39,469)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$5,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$25	\$51	\$63	\$63	\$63	\$63	\$63	\$63
Total revenue	\$25	\$51	\$63	\$63	\$63	\$63	\$63	\$63
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$24	\$48	\$61	\$61	\$61	\$61	\$61	\$61
Administration	\$293	\$298	\$303	\$308	\$313	\$339	\$369	\$402
Total operating cost	\$598	\$785	\$880	\$890	\$899	\$949	\$1,004	\$1,065
Operating Results (000)								
Operating surplus/(deficit)	(\$573)	(\$735)	(\$817)	(\$826)	(\$836)	(\$886)	(\$941)	(\$1,002)
Cumulative operating cash flow	(\$573)	(\$1,308)	(\$2,125)	(\$2,951)	(\$3,787)	(\$8,114)	(\$12,707)	(\$17,591)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$26	\$26	\$13	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,376	\$1,376	\$688	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$688	\$688	\$344	\$0	\$0	\$0	\$0	\$0
Total	\$15,827	\$15,827	\$7,913	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$15,827	\$31,654	\$39,567	\$39,567	\$39,567	\$39,567	\$39,567	\$39,567
Cash Flow (000)								
User construction contribution	\$211	\$211	\$105	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$573)	(\$735)	(\$817)	(\$826)	(\$836)	(\$886)	(\$941)	(\$1,002)
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$15,827)	(\$15,827)	(\$7,913)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$16,189)	(\$16,351)	(\$8,625)	(\$826)	(\$836)	(\$886)	(\$941)	(\$1,002)
Cumulative cash flow	(\$16,189)	(\$32,540)	(\$41,165)	(\$41,992)	(\$42,828)	(\$47,155)	(\$51,747)	(\$56,632)
Net present value	(\$15,418)	(\$30,249)	(\$37,700)	(\$38,380)	(\$39,035)	(\$41,967)	(\$44,406)	(\$46,438)

8.3. Pessimistic scenarios - Charts 5.3 & 5.4

Scenario Parameters

Demand case	Pessimistic
User construction contribution	\$1,000
Monthly cost	\$75
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$498	\$996	\$1,245	\$1,245	\$1,245	\$1,245	\$1,245	\$1,245
Total revenue	\$498	\$996	\$1,245	\$1,245	\$1,245	\$1,245	\$1,245	\$1,245
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$30	\$59	\$74	\$74	\$74	\$74	\$74	\$74
Administration	\$361	\$367	\$373	\$380	\$386	\$421	\$459	\$501
Total operating cost	\$672	\$865	\$965	\$975	\$986	\$1,044	\$1,107	\$1,177
Operating Results (000)								
Operating surplus/(deficit)	(\$174)	\$124	\$266	\$256	\$246	\$191	\$131	\$64
Cumulative operating cash flow	(\$174)	(\$50)	\$217	\$473	\$719	\$1,786	\$2,563	\$3,020
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$688	\$688	\$344	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,442	\$1,442	\$721	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$721	\$721	\$361	\$0	\$0	\$0	\$0	\$0
Total	\$16,588	\$16,588	\$8,294	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$16,588	\$33,177	\$41,471	\$41,471	\$41,471	\$41,471	\$41,471	\$41,471
Cash Flow (000)								
User construction contribution	\$1,107	\$1,107	\$553	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$174)	\$124	\$266	\$256	\$246	\$191	\$131	\$64
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$16,588)	(\$16,588)	(\$8,294)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$15,655)	(\$15,358)	(\$7,475)	\$256	\$246	\$191	\$131	\$64
Cumulative cash flow	(\$15,655)	(\$31,013)	(\$38,488)	(\$38,232)	(\$37,986)	(\$36,918)	(\$36,141)	(\$35,685)
Net present value	(\$14,910)	(\$28,840)	(\$35,297)	(\$35,086)	(\$34,893)	(\$34,166)	(\$33,749)	(\$33,556)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Pessimistic
User construction contribution	\$2,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$332	\$664	\$830	\$830	\$830	\$830	\$830	\$830
Total revenue	\$332	\$664	\$830	\$830	\$830	\$830	\$830	\$830
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$27	\$54	\$67	\$67	\$67	\$67	\$67	\$67
Administration	\$308	\$313	\$318	\$323	\$329	\$357	\$389	\$423
Total operating cost	\$615	\$805	\$902	\$912	\$921	\$973	\$1,030	\$1,093
Operating Results (000)								
Operating surplus/(deficit)	(\$284)	(\$142)	(\$72)	(\$82)	(\$92)	(\$143)	(\$200)	(\$263)
Cumulative operating cash flow	(\$284)	(\$425)	(\$497)	(\$579)	(\$671)	(\$1,281)	(\$2,166)	(\$3,352)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$344	\$344	\$172	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,408	\$1,408	\$704	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$704	\$704	\$352	\$0	\$0	\$0	\$0	\$0
Total	\$16,193	\$16,193	\$8,096	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$16,193	\$32,385	\$40,481	\$40,481	\$40,481	\$40,481	\$40,481	\$40,481
Cash Flow (000)								
User construction contribution	\$1,107	\$1,107	\$553	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$284)	(\$142)	(\$72)	(\$82)	(\$92)	(\$143)	(\$200)	(\$263)
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$16,193)	(\$16,193)	(\$8,096)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$15,370)	(\$15,228)	(\$7,615)	(\$82)	(\$92)	(\$143)	(\$200)	(\$263)
Cumulative cash flow	(\$15,370)	(\$30,597)	(\$38,213)	(\$38,294)	(\$38,386)	(\$38,997)	(\$39,881)	(\$41,068)
Net present value	(\$14,638)	(\$28,450)	(\$35,028)	(\$35,095)	(\$35,167)	(\$35,578)	(\$36,045)	(\$36,537)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Pessimistic
User construction contribution	\$3,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$134	\$269	\$336	\$336	\$336	\$336	\$336	\$336
Total revenue	\$134	\$269	\$336	\$336	\$336	\$336	\$336	\$336
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$25	\$50	\$63	\$63	\$63	\$63	\$63	\$63
Administration	\$293	\$298	\$303	\$308	\$313	\$339	\$369	\$402
Total operating cost	\$599	\$787	\$883	\$892	\$901	\$951	\$1,006	\$1,067
Operating Results (000)								
Operating surplus/(deficit)	(\$465)	(\$518)	(\$547)	(\$556)	(\$565)	(\$615)	(\$670)	(\$731)
Cumulative operating cash flow	(\$465)	(\$983)	(\$1,530)	(\$2,086)	(\$2,652)	(\$5,627)	(\$8,867)	(\$12,399)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$139	\$139	\$70	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,388	\$1,388	\$694	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$694	\$694	\$347	\$0	\$0	\$0	\$0	\$0
Total	\$15,957	\$15,957	\$7,979	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$15,957	\$31,914	\$39,893	\$39,893	\$39,893	\$39,893	\$39,893	\$39,893
Cash Flow (000)								
User construction contribution	\$672	\$672	\$336	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$465)	(\$518)	(\$547)	(\$556)	(\$565)	(\$615)	(\$670)	(\$731)
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$15,957)	(\$15,957)	(\$7,979)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$15,750)	(\$15,804)	(\$8,189)	(\$556)	(\$565)	(\$615)	(\$670)	(\$731)
Cumulative cash flow	(\$15,750)	(\$31,554)	(\$39,743)	(\$40,299)	(\$40,865)	(\$43,840)	(\$47,080)	(\$50,612)
Net present value	(\$15,000)	(\$29,334)	(\$36,409)	(\$36,866)	(\$37,309)	(\$39,324)	(\$41,044)	(\$42,513)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Pessimistic
User construction contribution	\$5,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$16	\$32	\$40	\$40	\$40	\$40	\$40	\$40
Total revenue	\$16	\$32	\$40	\$40	\$40	\$40	\$40	\$40
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$24	\$48	\$60	\$60	\$60	\$60	\$60	\$60
Administration	\$293	\$298	\$303	\$308	\$313	\$339	\$369	\$402
Total operating cost	\$598	\$785	\$880	\$890	\$899	\$949	\$1,004	\$1,065
Operating Results (000)								
Operating surplus/(deficit)	(\$582)	(\$754)	(\$841)	(\$850)	(\$859)	(\$909)	(\$964)	(\$1,025)
Cumulative operating cash flow	(\$582)	(\$1,336)	(\$2,177)	(\$3,027)	(\$3,886)	(\$8,331)	(\$13,040)	(\$18,043)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$16	\$16	\$8	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,375	\$1,375	\$688	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$688	\$688	\$344	\$0	\$0	\$0	\$0	\$0
Total	\$15,816	\$15,816	\$7,908	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$15,816	\$31,631	\$39,539	\$39,539	\$39,539	\$39,539	\$39,539	\$39,539
Cash Flow (000)								
User construction contribution	\$132	\$132	\$66	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$582)	(\$754)	(\$841)	(\$850)	(\$859)	(\$909)	(\$964)	(\$1,025)
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$15,816)	(\$15,816)	(\$7,908)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$16,266)	(\$16,438)	(\$8,683)	(\$850)	(\$859)	(\$909)	(\$964)	(\$1,025)
Cumulative cash flow	(\$16,266)	(\$32,704)	(\$41,387)	(\$42,237)	(\$43,096)	(\$47,541)	(\$52,250)	(\$57,253)
Net present value	(\$15,492)	(\$30,401)	(\$37,901)	(\$38,601)	(\$39,274)	(\$42,286)	(\$44,787)	(\$46,868)

8.4. Optimistic scenarios - Charts 5.5 and 5.6

Scenario Parameters

Demand case	Optimistic
User construction contribution	\$1,000
Monthly cost	\$75
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$1,494	\$2,988	\$3,735	\$3,735	\$3,735	\$3,735	\$3,735	\$3,735
Total revenue	\$1,494	\$2,988	\$3,735	\$3,735	\$3,735	\$3,735	\$3,735	\$3,735
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$41	\$81	\$101	\$101	\$101	\$101	\$101	\$101
Administration	\$574	\$584	\$595	\$606	\$617	\$675	\$740	\$811
Total operating cost	\$896	\$1,105	\$1,214	\$1,229	\$1,244	\$1,326	\$1,416	\$1,515
Operating Results (000)								
Operating surplus/(deficit)	\$568	\$1,789	\$2,395	\$2,380	\$2,366	\$2,288	\$2,203	\$2,108
Cumulative operating cash flow	\$568	\$2,357	\$4,752	\$7,132	\$9,498	\$21,097	\$32,285	\$43,019
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$2,065	\$2,065	\$1,032	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,580	\$1,580	\$790	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$790	\$790	\$395	\$0	\$0	\$0	\$0	\$0
Total	\$18,171	\$18,171	\$9,086	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$18,171	\$36,343	\$45,428	\$45,428	\$45,428	\$45,428	\$45,428	\$45,428
Cash Flow (000)								
User construction contribution	\$3,320	\$3,320	\$1,660	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	\$568	\$1,789	\$2,395	\$2,380	\$2,366	\$2,288	\$2,203	\$2,108
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$18,171)	(\$18,171)	(\$9,086)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$14,283)	(\$13,063)	(\$5,031)	\$2,380	\$2,366	\$2,288	\$2,203	\$2,108
Cumulative cash flow	(\$14,283)	(\$27,346)	(\$32,378)	(\$29,997)	(\$27,632)	(\$16,032)	(\$4,844)	\$5,889
Net present value	(\$13,603)	(\$25,452)	(\$29,798)	(\$27,840)	(\$25,986)	(\$18,111)	(\$12,159)	(\$7,685)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Optimistic
User construction contribution	\$2,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$996	\$1,992	\$2,490	\$2,490	\$2,490	\$2,490	\$2,490	\$2,490
Total revenue	\$996	\$1,992	\$2,490	\$2,490	\$2,490	\$2,490	\$2,490	\$2,490
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$32	\$65	\$81	\$81	\$81	\$81	\$81	\$81
Administration	\$414	\$421	\$429	\$436	\$444	\$484	\$529	\$578
Total operating cost	\$728	\$925	\$1,027	\$1,039	\$1,051	\$1,114	\$1,184	\$1,262
Operating Results (000)								
Operating surplus/(deficit)	\$255	\$1,013	\$1,390	\$1,379	\$1,367	\$1,307	\$1,240	\$1,166
Cumulative operating cash flow	\$255	\$1,268	\$2,658	\$4,036	\$5,403	\$12,060	\$18,397	\$24,379
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$1,032	\$1,032	\$516	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,477	\$1,477	\$738	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$738	\$738	\$369	\$0	\$0	\$0	\$0	\$0
Total	\$16,984	\$16,984	\$8,492	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$16,984	\$33,968	\$42,460	\$42,460	\$42,460	\$42,460	\$42,460	\$42,460
Cash Flow (000)								
User construction contribution	\$3,320	\$3,320	\$1,660	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	\$255	\$1,013	\$1,390	\$1,379	\$1,367	\$1,307	\$1,240	\$1,166
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$16,984)	(\$16,984)	(\$8,492)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$13,410)	(\$12,651)	(\$5,443)	\$1,379	\$1,367	\$1,307	\$1,240	\$1,166
Cumulative cash flow	(\$13,410)	(\$26,061)	(\$31,503)	(\$30,125)	(\$28,758)	(\$22,101)	(\$15,765)	(\$9,782)
Net present value	(\$12,771)	(\$24,246)	(\$28,948)	(\$27,814)	(\$26,742)	(\$22,222)	(\$18,850)	(\$16,355)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Optimistic
User construction contribution	\$3,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$403	\$806	\$1,008	\$1,008	\$1,008	\$1,008	\$1,008	\$1,008
Total revenue	\$403	\$806	\$1,008	\$1,008	\$1,008	\$1,008	\$1,008	\$1,008
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$27	\$55	\$68	\$68	\$68	\$68	\$68	\$68
Administration	\$319	\$324	\$330	\$335	\$341	\$371	\$404	\$440
Total operating cost	\$628	\$818	\$916	\$925	\$935	\$988	\$1,047	\$1,111
Operating Results (000)								
Operating surplus/(deficit)	(\$224)	(\$12)	\$88	\$78	\$69	\$19	(\$39)	(\$103)
Cumulative operating cash flow	(\$224)	(\$237)	(\$149)	(\$71)	(\$2)	\$193	\$118	(\$267)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$418	\$418	\$209	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,415	\$1,415	\$708	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$708	\$708	\$354	\$0	\$0	\$0	\$0	\$0
Total	\$16,277	\$16,277	\$8,139	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$16,277	\$32,555	\$40,693	\$40,693	\$40,693	\$40,693	\$40,693	\$40,693
Cash Flow (000)								
User construction contribution	\$2,015	\$2,015	\$1,008	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$224)	(\$12)	\$88	\$78	\$69	\$19	(\$39)	(\$103)
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$16,277)	(\$16,277)	(\$8,139)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$14,486)	(\$14,274)	(\$7,043)	\$78	\$69	\$19	(\$39)	(\$103)
Cumulative cash flow	(\$14,486)	(\$28,760)	(\$35,804)	(\$35,726)	(\$35,657)	(\$35,461)	(\$35,537)	(\$35,922)
Net present value	(\$13,797)	(\$26,744)	(\$32,828)	(\$32,764)	(\$32,710)	(\$32,574)	(\$32,611)	(\$32,768)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Optimistic
User construction contribution	\$5,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$47	\$95	\$119	\$119	\$119	\$119	\$119	\$119
Total revenue	\$47	\$95	\$119	\$119	\$119	\$119	\$119	\$119
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$24	\$49	\$61	\$61	\$61	\$61	\$61	\$61
Administration	\$293	\$298	\$303	\$308	\$313	\$339	\$369	\$402
Total operating cost	\$598	\$786	\$881	\$890	\$900	\$949	\$1,005	\$1,065
Operating Results (000)								
Operating surplus/(deficit)	(\$551)	(\$691)	(\$762)	(\$772)	(\$781)	(\$831)	(\$886)	(\$947)
Cumulative operating cash flow	(\$551)	(\$1,242)	(\$2,004)	(\$2,776)	(\$3,557)	(\$7,610)	(\$11,927)	(\$16,538)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$49	\$49	\$25	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,379	\$1,379	\$689	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$689	\$689	\$345	\$0	\$0	\$0	\$0	\$0
Total	\$15,853	\$15,853	\$7,927	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$15,853	\$31,707	\$39,633	\$39,633	\$39,633	\$39,633	\$39,633	\$39,633
Cash Flow (000)								
User construction contribution	\$395	\$395	\$198	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$551)	(\$691)	(\$762)	(\$772)	(\$781)	(\$831)	(\$886)	(\$947)
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$15,853)	(\$15,853)	(\$7,927)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$16,009)	(\$16,149)	(\$8,491)	(\$772)	(\$781)	(\$831)	(\$886)	(\$947)
Cumulative cash flow	(\$16,009)	(\$32,158)	(\$40,650)	(\$41,421)	(\$42,202)	(\$46,255)	(\$50,573)	(\$55,183)
Net present value	(\$15,247)	(\$29,894)	(\$37,230)	(\$37,865)	(\$38,476)	(\$41,223)	(\$43,515)	(\$45,433)

8.5. Increasing subscription rate scenarios - Charts 5.7 & 5.8

Scenario Parameters

Demand case	Base
User construction contribution	\$1,000
Monthly cost	\$75
Annual subscriber growth rate	5%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$797	\$1,673	\$2,091	\$2,196	\$2,306	\$2,943	\$3,756	\$4,793
Total revenue	\$797	\$1,673	\$2,091	\$2,196	\$2,306	\$2,943	\$3,756	\$4,793
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$33	\$66	\$82	\$82	\$82	\$82	\$82	\$82
Administration	\$425	\$432	\$440	\$453	\$460	\$502	\$549	\$600
Total operating cost	\$739	\$937	\$1,039	\$1,056	\$1,069	\$1,134	\$1,205	\$1,285
Operating Results (000)								
Operating surplus/(deficit)	\$55	\$699	\$999	\$1,083	\$1,175	\$1,719	\$2,423	\$3,333
Cumulative operating cash flow	\$55	\$754	\$1,754	\$2,836	\$4,011	\$11,461	\$22,094	\$36,846
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$50	\$53	\$67	\$86	\$109
Nodes	\$2,732	\$2,732	\$1,366	\$8	\$8	\$11	\$14	\$17
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$1,101	\$1,101	\$551	\$138	\$145	\$184	\$235	\$300
Construction services	\$1,484	\$1,484	\$742	\$4	\$5	\$6	\$7	\$9
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$742	\$742	\$371	\$2	\$2	\$3	\$4	\$5
Total	\$17,063	\$17,063	\$8,532	\$202	\$213	\$271	\$346	\$442
Cumulative capex	\$17,063	\$34,126	\$42,658	\$42,860	\$43,073	\$44,306	\$45,880	\$47,888
Cash Flow (000)								
User construction contribution	\$1,770	\$1,770	\$885	\$221	\$232	\$297	\$379	\$483
Operating surplus/(deficit)	\$55	\$699	\$999	\$1,083	\$1,175	\$1,719	\$2,423	\$3,333
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$17,063)	(\$17,063)	(\$8,532)	(\$202)	(\$213)	(\$271)	(\$346)	(\$442)
Cash flow	(\$15,238)	(\$14,594)	(\$6,647)	\$1,102	\$1,195	\$1,744	\$2,455	\$3,374
Cumulative cash flow	(\$15,238)	(\$29,831)	(\$36,478)	(\$35,377)	(\$34,182)	(\$26,617)	(\$15,837)	(\$898)
Net present value	(\$14,512)	(\$27,749)	(\$33,491)	(\$32,585)	(\$31,648)	(\$26,553)	(\$20,860)	(\$14,676)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$2,000
Monthly cost	\$100
Annual subscriber growth rate	5%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$531	\$1,115	\$1,394	\$1,464	\$1,537	\$1,962	\$2,504	\$3,196
Total revenue	\$531	\$1,115	\$1,394	\$1,464	\$1,537	\$1,962	\$2,504	\$3,196
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$28	\$57	\$71	\$71	\$71	\$71	\$71	\$71
Administration	\$340	\$345	\$351	\$362	\$368	\$400	\$436	\$475
Total operating cost	\$649	\$841	\$940	\$954	\$965	\$1,020	\$1,081	\$1,149
Operating Results (000)								
Operating surplus/(deficit)	(\$118)	\$260	\$432	\$484	\$544	\$895	\$1,351	\$1,944
Cumulative operating cash flow	(\$118)	\$142	\$574	\$1,058	\$1,602	\$5,336	\$11,131	\$19,604
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$25	\$26	\$34	\$43	\$55
Nodes	\$2,732	\$2,732	\$1,366	\$4	\$4	\$6	\$7	\$9
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$551	\$551	\$275	\$69	\$72	\$92	\$118	\$150
Construction services	\$1,429	\$1,429	\$714	\$2	\$2	\$3	\$4	\$5
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$714	\$714	\$357	\$1	\$1	\$1	\$2	\$2
Total	\$16,430	\$16,430	\$8,215	\$101	\$106	\$136	\$173	\$221
Cumulative capex	\$16,430	\$32,860	\$41,075	\$41,176	\$41,283	\$41,900	\$42,688	\$43,694
Cash Flow (000)								
User construction contribution	\$1,770	\$1,770	\$885	\$221	\$232	\$297	\$379	\$483
Operating surplus/(deficit)	(\$118)	\$260	\$432	\$484	\$544	\$895	\$1,351	\$1,944
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$16,430)	(\$16,430)	(\$8,215)	(\$101)	(\$106)	(\$136)	(\$173)	(\$221)
Cash flow	(\$14,778)	(\$14,399)	(\$6,898)	\$604	\$670	\$1,055	\$1,556	\$2,206
Cumulative cash flow	(\$14,778)	(\$29,177)	(\$36,075)	(\$35,471)	(\$34,801)	(\$30,337)	(\$23,609)	(\$13,945)
Net present value	(\$14,074)	(\$27,134)	(\$33,093)	(\$32,596)	(\$32,072)	(\$29,069)	(\$25,519)	(\$21,521)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$3,000
Monthly cost	\$100
Annual subscriber growth rate	5%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$215	\$451	\$564	\$593	\$622	\$794	\$1,013	\$1,293
Total revenue	\$215	\$451	\$564	\$593	\$622	\$794	\$1,013	\$1,293
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$26	\$52	\$64	\$64	\$64	\$64	\$64	\$64
Administration	\$293	\$298	\$303	\$312	\$317	\$344	\$374	\$407
Total operating cost	\$600	\$788	\$884	\$898	\$907	\$958	\$1,013	\$1,074
Operating Results (000)								
Operating surplus/(deficit)	(\$385)	(\$337)	(\$320)	(\$305)	(\$285)	(\$163)	\$1	\$208
Cumulative operating cash flow	(\$385)	(\$722)	(\$1,042)	(\$1,347)	(\$1,632)	(\$2,708)	(\$3,052)	(\$2,450)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$10	\$11	\$14	\$17	\$22
Nodes	\$2,732	\$2,732	\$1,366	\$2	\$2	\$2	\$3	\$4
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$223	\$223	\$111	\$28	\$29	\$37	\$48	\$61
Construction services	\$1,396	\$1,396	\$698	\$1	\$1	\$1	\$2	\$2
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$698	\$698	\$349	\$0	\$0	\$1	\$1	\$1
Total	\$16,053	\$16,053	\$8,027	\$41	\$43	\$55	\$70	\$90
Cumulative capex	\$16,053	\$32,106	\$40,133	\$40,174	\$40,217	\$40,467	\$40,787	\$41,194
Cash Flow (000)								
User construction contribution	\$1,075	\$1,075	\$537	\$134	\$141	\$180	\$230	\$293
Operating surplus/(deficit)	(\$385)	(\$337)	(\$320)	(\$305)	(\$285)	(\$163)	\$1	\$208
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$16,053)	(\$16,053)	(\$8,027)	(\$41)	(\$43)	(\$55)	(\$70)	(\$90)
Cash flow	(\$15,363)	(\$15,315)	(\$7,809)	(\$212)	(\$187)	(\$38)	\$160	\$412
Cumulative cash flow	(\$15,363)	(\$30,678)	(\$38,488)	(\$38,700)	(\$38,887)	(\$39,394)	(\$39,013)	(\$37,484)
Net present value	(\$14,631)	(\$28,523)	(\$35,269)	(\$35,443)	(\$35,590)	(\$35,944)	(\$35,752)	(\$35,126)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$5,000
Monthly cost	\$100
Annual subscriber growth rate	5%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$25	\$53	\$66	\$70	\$73	\$93	\$119	\$152
Total revenue	\$25	\$53	\$66	\$70	\$73	\$93	\$119	\$152
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$24	\$48	\$61	\$61	\$61	\$61	\$61	\$61
Administration	\$293	\$298	\$303	\$312	\$317	\$344	\$374	\$407
Total operating cost	\$598	\$785	\$880	\$894	\$903	\$954	\$1,009	\$1,070
Operating Results (000)								
Operating surplus/(deficit)	(\$573)	(\$732)	(\$814)	(\$824)	(\$830)	(\$860)	(\$890)	(\$918)
Cumulative operating cash flow	(\$573)	(\$1,305)	(\$2,119)	(\$2,943)	(\$3,774)	(\$8,014)	(\$12,404)	(\$16,938)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$1	\$1	\$2	\$2	\$3
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$26	\$26	\$13	\$3	\$3	\$4	\$6	\$7
Construction services	\$1,376	\$1,376	\$688	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$688	\$688	\$344	\$0	\$0	\$0	\$0	\$0
Total	\$15,827	\$15,827	\$7,913	\$5	\$5	\$6	\$8	\$11
Cumulative capex	\$15,827	\$31,654	\$39,567	\$39,572	\$39,577	\$39,607	\$39,644	\$39,692
Cash Flow (000)								
User construction contribution	\$211	\$211	\$105	\$26	\$28	\$35	\$45	\$58
Operating surplus/(deficit)	(\$573)	(\$732)	(\$814)	(\$824)	(\$830)	(\$860)	(\$890)	(\$918)
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$15,827)	(\$15,827)	(\$7,913)	(\$5)	(\$5)	(\$6)	(\$8)	(\$11)
Cash flow	(\$16,189)	(\$16,348)	(\$8,622)	(\$803)	(\$808)	(\$831)	(\$853)	(\$871)
Cumulative cash flow	(\$16,189)	(\$32,538)	(\$41,160)	(\$41,963)	(\$42,770)	(\$46,880)	(\$51,102)	(\$55,423)
Net present value	(\$15,418)	(\$30,247)	(\$37,695)	(\$38,355)	(\$38,988)	(\$41,775)	(\$44,018)	(\$45,817)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Optimistic
User construction contribution	\$1,000
Monthly cost	\$75
Annual subscriber growth rate	2%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$1,494	\$3,047	\$3,809	\$3,885	\$3,963	\$4,376	\$4,831	\$5,334
Total revenue	\$1,494	\$3,047	\$3,809	\$3,885	\$3,963	\$4,376	\$4,831	\$5,334
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$41	\$81	\$101	\$101	\$101	\$101	\$101	\$101
Administration	\$574	\$584	\$595	\$608	\$619	\$678	\$743	\$814
Total operating cost	\$896	\$1,105	\$1,214	\$1,231	\$1,247	\$1,328	\$1,419	\$1,518
Operating Results (000)								
Operating surplus/(deficit)	\$568	\$1,846	\$2,466	\$2,521	\$2,581	\$2,895	\$3,242	\$3,625
Cumulative operating cash flow	\$568	\$2,414	\$4,879	\$7,401	\$9,981	\$23,814	\$39,315	\$56,658
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$38	\$38	\$42	\$47	\$52
Nodes	\$2,732	\$2,732	\$1,366	\$6	\$6	\$6	\$7	\$8
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$2,065	\$2,065	\$1,032	\$103	\$105	\$116	\$128	\$142
Construction services	\$1,580	\$1,580	\$790	\$3	\$3	\$4	\$4	\$4
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$790	\$790	\$395	\$2	\$2	\$2	\$2	\$2
Total	\$18,171	\$18,171	\$9,086	\$151	\$154	\$171	\$188	\$208
Cumulative capex	\$18,171	\$36,343	\$45,428	\$45,580	\$45,734	\$46,554	\$47,459	\$48,459
Cash Flow (000)								
User construction contribution	\$3,320	\$3,320	\$1,660	\$166	\$169	\$187	\$206	\$228
Operating surplus/(deficit)	\$568	\$1,846	\$2,466	\$2,521	\$2,581	\$2,895	\$3,242	\$3,625
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$18,171)	(\$18,171)	(\$9,086)	(\$151)	(\$154)	(\$171)	(\$188)	(\$208)
Cash flow	(\$14,283)	(\$13,006)	(\$4,960)	\$2,536	\$2,595	\$2,911	\$3,260	\$3,645
Cumulative cash flow	(\$14,283)	(\$27,290)	(\$32,250)	(\$29,714)	(\$27,119)	(\$13,207)	\$2,381	\$19,820
Net present value	(\$13,603)	(\$25,400)	(\$29,685)	(\$27,599)	(\$25,565)	(\$16,148)	(\$7,880)	(\$632)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Optimistic
User construction contribution	\$2,000
Monthly cost	\$100
Annual subscriber growth rate	2%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$996	\$2,032	\$2,539	\$2,590	\$2,642	\$2,917	\$3,221	\$3,556
Total revenue	\$996	\$2,032	\$2,539	\$2,590	\$2,642	\$2,917	\$3,221	\$3,556
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$32	\$65	\$81	\$81	\$81	\$81	\$81	\$81
Administration	\$414	\$421	\$429	\$438	\$446	\$487	\$531	\$581
Total operating cost	\$728	\$925	\$1,027	\$1,041	\$1,053	\$1,116	\$1,187	\$1,264
Operating Results (000)								
Operating surplus/(deficit)	\$255	\$1,051	\$1,437	\$1,472	\$1,510	\$1,711	\$1,932	\$2,177
Cumulative operating cash flow	\$255	\$1,306	\$2,743	\$4,215	\$5,725	\$13,869	\$23,078	\$33,464
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$19	\$19	\$21	\$23	\$26
Nodes	\$2,732	\$2,732	\$1,366	\$3	\$3	\$3	\$4	\$4
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$1,032	\$1,032	\$516	\$52	\$53	\$58	\$64	\$71
Construction services	\$1,477	\$1,477	\$738	\$2	\$2	\$2	\$2	\$2
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$738	\$738	\$369	\$1	\$1	\$1	\$1	\$1
Total	\$16,984	\$16,984	\$8,492	\$76	\$77	\$85	\$94	\$104
Cumulative capex	\$16,984	\$33,968	\$42,460	\$42,536	\$42,614	\$43,025	\$43,478	\$43,979
Cash Flow (000)								
User construction contribution	\$3,320	\$3,320	\$1,660	\$166	\$169	\$187	\$206	\$228
Operating surplus/(deficit)	\$255	\$1,051	\$1,437	\$1,472	\$1,510	\$1,711	\$1,932	\$2,177
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$16,984)	(\$16,984)	(\$8,492)	(\$76)	(\$77)	(\$85)	(\$94)	(\$104)
Cash flow	(\$13,410)	(\$12,613)	(\$5,395)	\$1,562	\$1,602	\$1,812	\$2,044	\$2,301
Cumulative cash flow	(\$13,410)	(\$26,023)	(\$31,418)	(\$29,856)	(\$28,254)	(\$19,623)	(\$9,875)	\$1,105
Net present value	(\$12,771)	(\$24,212)	(\$28,872)	(\$27,587)	(\$26,332)	(\$20,490)	(\$15,320)	(\$10,758)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Optimistic
User construction contribution	\$3,000
Monthly cost	\$100
Annual subscriber growth rate	2%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$403	\$822	\$1,028	\$1,048	\$1,069	\$1,181	\$1,304	\$1,439
Total revenue	\$403	\$822	\$1,028	\$1,048	\$1,069	\$1,181	\$1,304	\$1,439
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$27	\$55	\$68	\$68	\$68	\$68	\$68	\$68
Administration	\$319	\$324	\$330	\$337	\$343	\$373	\$406	\$442
Total operating cost	\$628	\$818	\$916	\$927	\$937	\$990	\$1,049	\$1,113
Operating Results (000)								
Operating surplus/(deficit)	(\$224)	\$4	\$107	\$115	\$126	\$181	\$242	\$310
Cumulative operating cash flow	(\$224)	(\$221)	(\$114)	\$1	\$127	\$919	\$2,006	\$3,417
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$8	\$8	\$9	\$9	\$10
Nodes	\$2,732	\$2,732	\$1,366	\$1	\$1	\$1	\$2	\$2
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$418	\$418	\$209	\$21	\$21	\$24	\$26	\$29
Construction services	\$1,415	\$1,415	\$708	\$1	\$1	\$1	\$1	\$1
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$708	\$708	\$354	\$0	\$0	\$0	\$0	\$0
Total	\$16,277	\$16,277	\$8,139	\$31	\$31	\$35	\$38	\$42
Cumulative capex	\$16,277	\$32,555	\$40,693	\$40,724	\$40,756	\$40,922	\$41,106	\$41,309
Cash Flow (000)								
User construction contribution	\$2,015	\$2,015	\$1,008	\$101	\$103	\$113	\$125	\$138
Operating surplus/(deficit)	(\$224)	\$4	\$107	\$115	\$126	\$181	\$242	\$310
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$16,277)	(\$16,277)	(\$8,139)	(\$31)	(\$31)	(\$35)	(\$38)	(\$42)
Cash flow	(\$14,486)	(\$14,258)	(\$7,024)	\$185	\$197	\$260	\$329	\$406
Cumulative cash flow	(\$14,486)	(\$28,745)	(\$35,769)	(\$35,584)	(\$35,387)	(\$34,215)	(\$32,710)	(\$30,837)
Net present value	(\$13,797)	(\$26,729)	(\$32,797)	(\$32,645)	(\$32,490)	(\$31,700)	(\$30,903)	(\$30,126)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Optimistic
User construction contribution	\$5,000
Monthly cost	\$100
Annual subscriber growth rate	2%
Dark fiber subsidy Year 1	\$0
Dark fiber subsidy Year 2+	\$0
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$47	\$97	\$121	\$123	\$126	\$139	\$153	\$169
Total revenue	\$47	\$97	\$121	\$123	\$126	\$139	\$153	\$169
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$24	\$49	\$61	\$61	\$61	\$61	\$61	\$61
Administration	\$293	\$298	\$303	\$309	\$314	\$341	\$371	\$404
Total operating cost	\$598	\$786	\$881	\$892	\$901	\$951	\$1,007	\$1,068
Operating Results (000)								
Operating surplus/(deficit)	(\$551)	(\$689)	(\$760)	(\$769)	(\$776)	(\$812)	(\$853)	(\$898)
Cumulative operating cash flow	(\$551)	(\$1,240)	(\$2,000)	(\$2,768)	(\$3,544)	(\$7,531)	(\$11,714)	(\$16,113)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$1	\$1	\$1	\$1	\$1
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$49	\$49	\$25	\$2	\$3	\$3	\$3	\$3
Construction services	\$1,379	\$1,379	\$689	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$689	\$689	\$345	\$0	\$0	\$0	\$0	\$0
Total	\$15,853	\$15,853	\$7,927	\$4	\$4	\$4	\$5	\$5
Cumulative capex	\$15,853	\$31,707	\$39,633	\$39,637	\$39,641	\$39,660	\$39,682	\$39,706
Cash Flow (000)								
User construction contribution	\$395	\$395	\$198	\$20	\$20	\$22	\$25	\$27
Operating surplus/(deficit)	(\$551)	(\$689)	(\$760)	(\$769)	(\$776)	(\$812)	(\$853)	(\$898)
Subsidy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital expense	(\$15,853)	(\$15,853)	(\$7,927)	(\$4)	(\$4)	(\$4)	(\$5)	(\$5)
Cash flow	(\$16,009)	(\$16,147)	(\$8,489)	(\$752)	(\$759)	(\$794)	(\$833)	(\$876)
Cumulative cash flow	(\$16,009)	(\$32,156)	(\$40,645)	(\$41,398)	(\$42,157)	(\$46,056)	(\$50,143)	(\$54,436)
Net present value	(\$15,247)	(\$29,893)	(\$37,226)	(\$37,845)	(\$38,440)	(\$41,083)	(\$43,253)	(\$45,040)

8.6. Effect of subsidies - Charts 5.9 through 5.12

Scenario Parameters

Demand case	Base
User construction contribution	\$1,000
Monthly cost	\$75
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$10,000,000
Dark fiber subsidy Year 2+	\$1,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$797	\$1,593	\$1,992	\$1,992	\$1,992	\$1,992	\$1,992	\$1,992
Total revenue	\$797	\$1,593	\$1,992	\$1,992	\$1,992	\$1,992	\$1,992	\$1,992
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$33	\$66	\$82	\$82	\$82	\$82	\$82	\$82
Administration	\$425	\$432	\$440	\$448	\$455	\$497	\$543	\$594
Total operating cost	\$739	\$937	\$1,039	\$1,051	\$1,063	\$1,128	\$1,200	\$1,279
Operating Results (000)								
Operating surplus/(deficit)	\$55	\$623	\$905	\$893	\$882	\$820	\$752	\$677
Cumulative operating cash flow	\$55	\$678	\$1,583	\$2,477	\$3,359	\$7,586	\$11,486	\$15,026
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$1,101	\$1,101	\$551	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,484	\$1,484	\$742	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$742	\$742	\$371	\$0	\$0	\$0	\$0	\$0
Total	\$17,063	\$17,063	\$8,532	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$17,063	\$34,126	\$42,658	\$42,658	\$42,658	\$42,658	\$42,658	\$42,658
Cash Flow (000)								
User construction contribution	\$1,770	\$1,770	\$885	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	\$55	\$623	\$905	\$893	\$882	\$820	\$752	\$677
Subsidy	\$10,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Capital expense	(\$17,063)	(\$17,063)	(\$8,532)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$5,238)	(\$13,669)	(\$5,742)	\$1,893	\$1,882	\$1,820	\$1,752	\$1,677
Cumulative cash flow	(\$5,238)	(\$18,907)	(\$24,649)	(\$22,755)	(\$20,873)	(\$11,646)	(\$2,746)	\$5,794
Net present value	(\$4,988)	(\$17,387)	(\$22,347)	(\$20,789)	(\$19,314)	(\$13,050)	(\$8,315)	(\$4,755)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$2,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$10,000,000
Dark fiber subsidy Year 2+	\$1,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$531	\$1,062	\$1,328	\$1,328	\$1,328	\$1,328	\$1,328	\$1,328
Total revenue	\$531	\$1,062	\$1,328	\$1,328	\$1,328	\$1,328	\$1,328	\$1,328
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$28	\$57	\$71	\$71	\$71	\$71	\$71	\$71
Administration	\$340	\$345	\$351	\$357	\$363	\$395	\$431	\$470
Total operating cost	\$649	\$841	\$940	\$950	\$960	\$1,015	\$1,076	\$1,144
Operating Results (000)								
Operating surplus/(deficit)	(\$118)	\$210	\$369	\$359	\$349	\$297	\$239	\$175
Cumulative operating cash flow	(\$118)	\$92	\$461	\$820	\$1,169	\$2,760	\$4,073	\$5,078
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$551	\$551	\$275	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,429	\$1,429	\$714	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$714	\$714	\$357	\$0	\$0	\$0	\$0	\$0
Total	\$16,430	\$16,430	\$8,215	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$16,430	\$32,860	\$41,075	\$41,075	\$41,075	\$41,075	\$41,075	\$41,075
Cash Flow (000)								
User construction contribution	\$1,770	\$1,770	\$885	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$118)	\$210	\$369	\$359	\$349	\$297	\$239	\$175
Subsidy	\$10,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Capital expense	(\$16,430)	(\$16,430)	(\$8,215)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$4,778)	(\$13,450)	(\$5,961)	\$1,359	\$1,349	\$1,297	\$1,239	\$1,175
Cumulative cash flow	(\$4,778)	(\$18,227)	(\$24,188)	(\$22,829)	(\$21,480)	(\$14,889)	(\$8,576)	(\$2,571)
Net present value	(\$4,550)	(\$16,749)	(\$21,899)	(\$20,781)	(\$19,723)	(\$15,248)	(\$11,889)	(\$9,385)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$3,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$10,000,000
Dark fiber subsidy Year 2+	\$1,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$215	\$430	\$537	\$537	\$537	\$537	\$537	\$537
Total revenue	\$215	\$430	\$537	\$537	\$537	\$537	\$537	\$537
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$26	\$52	\$64	\$64	\$64	\$64	\$64	\$64
Administration	\$293	\$298	\$303	\$308	\$313	\$339	\$369	\$402
Total operating cost	\$600	\$788	\$884	\$894	\$903	\$953	\$1,008	\$1,069
Operating Results (000)								
Operating surplus/(deficit)	(\$385)	(\$359)	(\$347)	(\$356)	(\$366)	(\$416)	(\$471)	(\$531)
Cumulative operating cash flow	(\$385)	(\$743)	(\$1,090)	(\$1,447)	(\$1,812)	(\$3,788)	(\$6,029)	(\$8,562)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$223	\$223	\$111	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,396	\$1,396	\$698	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$698	\$698	\$349	\$0	\$0	\$0	\$0	\$0
Total	\$16,053	\$16,053	\$8,027	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$16,053	\$32,106	\$40,133	\$40,133	\$40,133	\$40,133	\$40,133	\$40,133
Cash Flow (000)								
User construction contribution	\$1,075	\$1,075	\$537	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$385)	(\$359)	(\$347)	(\$356)	(\$366)	(\$416)	(\$471)	(\$531)
Subsidy	\$10,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Capital expense	(\$16,053)	(\$16,053)	(\$8,027)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$5,363)	(\$14,337)	(\$6,836)	\$644	\$634	\$584	\$529	\$469
Cumulative cash flow	(\$5,363)	(\$19,700)	(\$26,536)	(\$25,892)	(\$25,258)	(\$22,234)	(\$19,474)	(\$17,008)
Net present value	(\$5,108)	(\$18,111)	(\$24,017)	(\$23,487)	(\$22,990)	(\$20,935)	(\$19,465)	(\$18,435)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$5,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$10,000,000
Dark fiber subsidy Year 2+	\$1,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$25	\$51	\$63	\$63	\$63	\$63	\$63	\$63
Total revenue	\$25	\$51	\$63	\$63	\$63	\$63	\$63	\$63
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$24	\$48	\$61	\$61	\$61	\$61	\$61	\$61
Administration	\$293	\$298	\$303	\$308	\$313	\$339	\$369	\$402
Total operating cost	\$598	\$785	\$880	\$890	\$899	\$949	\$1,004	\$1,065
Operating Results (000)								
Operating surplus/(deficit)	(\$573)	(\$735)	(\$817)	(\$826)	(\$836)	(\$886)	(\$941)	(\$1,002)
Cumulative operating cash flow	(\$573)	(\$1,308)	(\$2,125)	(\$2,951)	(\$3,787)	(\$8,114)	(\$12,707)	(\$17,591)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$26	\$26	\$13	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,376	\$1,376	\$688	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$688	\$688	\$344	\$0	\$0	\$0	\$0	\$0
Total	\$15,827	\$15,827	\$7,913	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$15,827	\$31,654	\$39,567	\$39,567	\$39,567	\$39,567	\$39,567	\$39,567
Cash Flow (000)								
User construction contribution	\$211	\$211	\$105	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$573)	(\$735)	(\$817)	(\$826)	(\$836)	(\$886)	(\$941)	(\$1,002)
Subsidy	\$10,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Capital expense	(\$15,827)	(\$15,827)	(\$7,913)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$6,189)	(\$15,351)	(\$7,625)	\$174	\$164	\$114	\$59	(\$2)
Cumulative cash flow	(\$6,189)	(\$21,540)	(\$29,165)	(\$28,992)	(\$28,828)	(\$28,155)	(\$27,747)	(\$27,632)
Net present value	(\$5,894)	(\$19,818)	(\$26,405)	(\$26,263)	(\$26,134)	(\$25,674)	(\$25,454)	(\$25,404)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$1,000
Monthly cost	\$75
Annual subscriber growth rate	5%
Dark fiber subsidy Year 1	\$10,000,000
Dark fiber subsidy Year 2+	\$1,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$797	\$1,673	\$2,091	\$2,196	\$2,306	\$2,943	\$3,756	\$4,793
Total revenue	\$797	\$1,673	\$2,091	\$2,196	\$2,306	\$2,943	\$3,756	\$4,793
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$33	\$66	\$82	\$82	\$82	\$82	\$82	\$82
Administration	\$425	\$432	\$440	\$453	\$460	\$502	\$549	\$600
Total operating cost	\$739	\$937	\$1,039	\$1,056	\$1,069	\$1,134	\$1,205	\$1,285
Operating Results (000)								
Operating surplus/(deficit)	\$55	\$699	\$999	\$1,083	\$1,175	\$1,719	\$2,423	\$3,333
Cumulative operating cash flow	\$55	\$754	\$1,754	\$2,836	\$4,011	\$11,461	\$22,094	\$36,846
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$50	\$53	\$67	\$86	\$109
Nodes	\$2,732	\$2,732	\$1,366	\$8	\$8	\$11	\$14	\$17
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$1,101	\$1,101	\$551	\$138	\$145	\$184	\$235	\$300
Construction services	\$1,484	\$1,484	\$742	\$4	\$5	\$6	\$7	\$9
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$742	\$742	\$371	\$2	\$2	\$3	\$4	\$5
Total	\$17,063	\$17,063	\$8,532	\$202	\$213	\$271	\$346	\$442
Cumulative capex	\$17,063	\$34,126	\$42,658	\$42,860	\$43,073	\$44,306	\$45,880	\$47,888
Cash Flow (000)								
User construction contribution	\$1,770	\$1,770	\$885	\$221	\$232	\$297	\$379	\$483
Operating surplus/(deficit)	\$55	\$699	\$999	\$1,083	\$1,175	\$1,719	\$2,423	\$3,333
Subsidy	\$10,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Capital expense	(\$17,063)	(\$17,063)	(\$8,532)	(\$202)	(\$213)	(\$271)	(\$346)	(\$442)
Cash flow	(\$5,238)	(\$13,594)	(\$5,647)	\$2,102	\$2,195	\$2,744	\$3,455	\$4,374
Cumulative cash flow	(\$5,238)	(\$18,831)	(\$24,478)	(\$22,377)	(\$20,182)	(\$7,617)	\$8,163	\$28,102
Net present value	(\$4,988)	(\$17,318)	(\$22,196)	(\$20,467)	(\$18,747)	(\$10,260)	(\$1,909)	\$6,357

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$2,000
Monthly cost	\$100
Annual subscriber growth rate	5%
Dark fiber subsidy Year 1	\$10,000,000
Dark fiber subsidy Year 2+	\$1,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$531	\$1,115	\$1,394	\$1,464	\$1,537	\$1,962	\$2,504	\$3,196
Total revenue	\$531	\$1,115	\$1,394	\$1,464	\$1,537	\$1,962	\$2,504	\$3,196
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$28	\$57	\$71	\$71	\$71	\$71	\$71	\$71
Administration	\$340	\$345	\$351	\$362	\$368	\$400	\$436	\$475
Total operating cost	\$649	\$841	\$940	\$954	\$965	\$1,020	\$1,081	\$1,149
Operating Results (000)								
Operating surplus/(deficit)	(\$118)	\$260	\$432	\$484	\$544	\$895	\$1,351	\$1,944
Cumulative operating cash flow	(\$118)	\$142	\$574	\$1,058	\$1,602	\$5,336	\$11,131	\$19,604
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$25	\$26	\$34	\$43	\$55
Nodes	\$2,732	\$2,732	\$1,366	\$4	\$4	\$6	\$7	\$9
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$551	\$551	\$275	\$69	\$72	\$92	\$118	\$150
Construction services	\$1,429	\$1,429	\$714	\$2	\$2	\$3	\$4	\$5
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$714	\$714	\$357	\$1	\$1	\$1	\$2	\$2
Total	\$16,430	\$16,430	\$8,215	\$101	\$106	\$136	\$173	\$221
Cumulative capex	\$16,430	\$32,860	\$41,075	\$41,176	\$41,283	\$41,900	\$42,688	\$43,694
Cash Flow (000)								
User construction contribution	\$1,770	\$1,770	\$885	\$221	\$232	\$297	\$379	\$483
Operating surplus/(deficit)	(\$118)	\$260	\$432	\$484	\$544	\$895	\$1,351	\$1,944
Subsidy	\$10,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Capital expense	(\$16,430)	(\$16,430)	(\$8,215)	(\$101)	(\$106)	(\$136)	(\$173)	(\$221)
Cash flow	(\$4,778)	(\$13,399)	(\$5,898)	\$1,604	\$1,670	\$2,055	\$2,556	\$3,206
Cumulative cash flow	(\$4,778)	(\$18,177)	(\$24,075)	(\$22,471)	(\$20,801)	(\$11,337)	\$391	\$15,055
Net present value	(\$4,550)	(\$16,704)	(\$21,799)	(\$20,479)	(\$19,171)	(\$12,776)	(\$6,568)	(\$487)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$3,000
Monthly cost	\$100
Annual subscriber growth rate	5%
Dark fiber subsidy Year 1	\$10,000,000
Dark fiber subsidy Year 2+	\$1,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$215	\$451	\$564	\$593	\$622	\$794	\$1,013	\$1,293
Total revenue	\$215	\$451	\$564	\$593	\$622	\$794	\$1,013	\$1,293
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$26	\$52	\$64	\$64	\$64	\$64	\$64	\$64
Administration	\$293	\$298	\$303	\$312	\$317	\$344	\$374	\$407
Total operating cost	\$600	\$788	\$884	\$898	\$907	\$958	\$1,013	\$1,074
Operating Results (000)								
Operating surplus/(deficit)	(\$385)	(\$337)	(\$320)	(\$305)	(\$285)	(\$163)	\$1	\$208
Cumulative operating cash flow	(\$385)	(\$722)	(\$1,042)	(\$1,347)	(\$1,632)	(\$2,708)	(\$3,052)	(\$2,450)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$10	\$11	\$14	\$17	\$22
Nodes	\$2,732	\$2,732	\$1,366	\$2	\$2	\$2	\$3	\$4
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$223	\$223	\$111	\$28	\$29	\$37	\$48	\$61
Construction services	\$1,396	\$1,396	\$698	\$1	\$1	\$1	\$2	\$2
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$698	\$698	\$349	\$0	\$0	\$1	\$1	\$1
Total	\$16,053	\$16,053	\$8,027	\$41	\$43	\$55	\$70	\$90
Cumulative capex	\$16,053	\$32,106	\$40,133	\$40,174	\$40,217	\$40,467	\$40,787	\$41,194
Cash Flow (000)								
User construction contribution	\$1,075	\$1,075	\$537	\$134	\$141	\$180	\$230	\$293
Operating surplus/(deficit)	(\$385)	(\$337)	(\$320)	(\$305)	(\$285)	(\$163)	\$1	\$208
Subsidy	\$10,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Capital expense	(\$16,053)	(\$16,053)	(\$8,027)	(\$41)	(\$43)	(\$55)	(\$70)	(\$90)
Cash flow	(\$5,363)	(\$14,315)	(\$6,809)	\$788	\$813	\$962	\$1,160	\$1,412
Cumulative cash flow	(\$5,363)	(\$19,678)	(\$26,488)	(\$25,700)	(\$24,887)	(\$20,394)	(\$15,013)	(\$8,484)
Net present value	(\$5,108)	(\$18,092)	(\$23,974)	(\$23,326)	(\$22,689)	(\$19,651)	(\$16,801)	(\$14,092)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$5,000
Monthly cost	\$100
Annual subscriber growth rate	5%
Dark fiber subsidy Year 1	\$10,000,000
Dark fiber subsidy Year 2+	\$1,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$25	\$53	\$66	\$70	\$73	\$93	\$119	\$152
Total revenue	\$25	\$53	\$66	\$70	\$73	\$93	\$119	\$152
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$24	\$48	\$61	\$61	\$61	\$61	\$61	\$61
Administration	\$293	\$298	\$303	\$312	\$317	\$344	\$374	\$407
Total operating cost	\$598	\$785	\$880	\$894	\$903	\$954	\$1,009	\$1,070
Operating Results (000)								
Operating surplus/(deficit)	(\$573)	(\$732)	(\$814)	(\$824)	(\$830)	(\$860)	(\$890)	(\$918)
Cumulative operating cash flow	(\$573)	(\$1,305)	(\$2,119)	(\$2,943)	(\$3,774)	(\$8,014)	(\$12,404)	(\$16,938)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$1	\$1	\$2	\$2	\$3
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$26	\$26	\$13	\$3	\$3	\$4	\$6	\$7
Construction services	\$1,376	\$1,376	\$688	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$688	\$688	\$344	\$0	\$0	\$0	\$0	\$0
Total	\$15,827	\$15,827	\$7,913	\$5	\$5	\$6	\$8	\$11
Cumulative capex	\$15,827	\$31,654	\$39,567	\$39,572	\$39,577	\$39,607	\$39,644	\$39,692
Cash Flow (000)								
User construction contribution	\$211	\$211	\$105	\$26	\$28	\$35	\$45	\$58
Operating surplus/(deficit)	(\$573)	(\$732)	(\$814)	(\$824)	(\$830)	(\$860)	(\$890)	(\$918)
Subsidy	\$10,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Capital expense	(\$15,827)	(\$15,827)	(\$7,913)	(\$5)	(\$5)	(\$6)	(\$8)	(\$11)
Cash flow	(\$6,189)	(\$15,348)	(\$7,622)	\$197	\$192	\$169	\$147	\$129
Cumulative cash flow	(\$6,189)	(\$21,538)	(\$29,160)	(\$28,963)	(\$28,770)	(\$27,880)	(\$27,102)	(\$26,423)
Net present value	(\$5,894)	(\$19,816)	(\$26,400)	(\$26,238)	(\$26,087)	(\$25,482)	(\$25,067)	(\$24,783)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$1,000
Monthly cost	\$75
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$12,000,000
Dark fiber subsidy Year 2+	\$2,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$797	\$1,593	\$1,992	\$1,992	\$1,992	\$1,992	\$1,992	\$1,992
Total revenue	\$797	\$1,593	\$1,992	\$1,992	\$1,992	\$1,992	\$1,992	\$1,992
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$33	\$66	\$82	\$82	\$82	\$82	\$82	\$82
Administration	\$425	\$432	\$440	\$448	\$455	\$497	\$543	\$594
Total operating cost	\$739	\$937	\$1,039	\$1,051	\$1,063	\$1,128	\$1,200	\$1,279
Operating Results (000)								
Operating surplus/(deficit)	\$55	\$623	\$905	\$893	\$882	\$820	\$752	\$677
Cumulative operating cash flow	\$55	\$678	\$1,583	\$2,477	\$3,359	\$7,586	\$11,486	\$15,026
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$1,101	\$1,101	\$551	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,484	\$1,484	\$742	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$742	\$742	\$371	\$0	\$0	\$0	\$0	\$0
Total	\$17,063	\$17,063	\$8,532	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$17,063	\$34,126	\$42,658	\$42,658	\$42,658	\$42,658	\$42,658	\$42,658
Cash Flow (000)								
User construction contribution	\$1,770	\$1,770	\$885	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	\$55	\$623	\$905	\$893	\$882	\$820	\$752	\$677
Subsidy	\$12,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Capital expense	(\$17,063)	(\$17,063)	(\$8,532)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$3,238)	(\$12,669)	(\$4,742)	\$2,893	\$2,882	\$2,820	\$2,752	\$2,677
Cumulative cash flow	(\$3,238)	(\$15,907)	(\$20,649)	(\$17,755)	(\$14,873)	(\$646)	\$13,254	\$26,794
Net present value	(\$3,084)	(\$14,575)	(\$18,671)	(\$16,291)	(\$14,033)	(\$4,376)	\$3,017	\$8,659

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$2,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$12,000,000
Dark fiber subsidy Year 2+	\$2,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$531	\$1,062	\$1,328	\$1,328	\$1,328	\$1,328	\$1,328	\$1,328
Total revenue	\$531	\$1,062	\$1,328	\$1,328	\$1,328	\$1,328	\$1,328	\$1,328
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$28	\$57	\$71	\$71	\$71	\$71	\$71	\$71
Administration	\$340	\$345	\$351	\$357	\$363	\$395	\$431	\$470
Total operating cost	\$649	\$841	\$940	\$950	\$960	\$1,015	\$1,076	\$1,144
Operating Results (000)								
Operating surplus/(deficit)	(\$118)	\$210	\$369	\$359	\$349	\$297	\$239	\$175
Cumulative operating cash flow	(\$118)	\$92	\$461	\$820	\$1,169	\$2,760	\$4,073	\$5,078
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$551	\$551	\$275	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,429	\$1,429	\$714	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$714	\$714	\$357	\$0	\$0	\$0	\$0	\$0
Total	\$16,430	\$16,430	\$8,215	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$16,430	\$32,860	\$41,075	\$41,075	\$41,075	\$41,075	\$41,075	\$41,075
Cash Flow (000)								
User construction contribution	\$1,770	\$1,770	\$885	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$118)	\$210	\$369	\$359	\$349	\$297	\$239	\$175
Subsidy	\$12,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Capital expense	(\$16,430)	(\$16,430)	(\$8,215)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$2,778)	(\$12,450)	(\$4,961)	\$2,359	\$2,349	\$2,297	\$2,239	\$2,175
Cumulative cash flow	(\$2,778)	(\$15,227)	(\$20,188)	(\$17,829)	(\$15,480)	(\$3,889)	\$7,424	\$18,429
Net present value	(\$2,645)	(\$13,938)	(\$18,223)	(\$16,282)	(\$14,442)	(\$6,574)	(\$557)	\$4,029

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$3,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$12,000,000
Dark fiber subsidy Year 2+	\$2,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$215	\$430	\$537	\$537	\$537	\$537	\$537	\$537
Total revenue	\$215	\$430	\$537	\$537	\$537	\$537	\$537	\$537
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$26	\$52	\$64	\$64	\$64	\$64	\$64	\$64
Administration	\$293	\$298	\$303	\$308	\$313	\$339	\$369	\$402
Total operating cost	\$600	\$788	\$884	\$894	\$903	\$953	\$1,008	\$1,069
Operating Results (000)								
Operating surplus/(deficit)	(\$385)	(\$359)	(\$347)	(\$356)	(\$366)	(\$416)	(\$471)	(\$531)
Cumulative operating cash flow	(\$385)	(\$743)	(\$1,090)	(\$1,447)	(\$1,812)	(\$3,788)	(\$6,029)	(\$8,562)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$223	\$223	\$111	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,396	\$1,396	\$698	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$698	\$698	\$349	\$0	\$0	\$0	\$0	\$0
Total	\$16,053	\$16,053	\$8,027	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$16,053	\$32,106	\$40,133	\$40,133	\$40,133	\$40,133	\$40,133	\$40,133
Cash Flow (000)								
User construction contribution	\$1,075	\$1,075	\$537	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$385)	(\$359)	(\$347)	(\$356)	(\$366)	(\$416)	(\$471)	(\$531)
Subsidy	\$12,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Capital expense	(\$16,053)	(\$16,053)	(\$8,027)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$3,363)	(\$13,337)	(\$5,836)	\$1,644	\$1,634	\$1,584	\$1,529	\$1,469
Cumulative cash flow	(\$3,363)	(\$16,700)	(\$22,536)	(\$20,892)	(\$19,258)	(\$11,234)	(\$3,474)	\$3,992
Net present value	(\$3,203)	(\$15,300)	(\$20,341)	(\$18,989)	(\$17,708)	(\$12,261)	(\$8,133)	(\$5,021)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$5,000
Monthly cost	\$100
Annual subscriber growth rate	0%
Dark fiber subsidy Year 1	\$12,000,000
Dark fiber subsidy Year 2+	\$2,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$25	\$51	\$63	\$63	\$63	\$63	\$63	\$63
Total revenue	\$25	\$51	\$63	\$63	\$63	\$63	\$63	\$63
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$24	\$48	\$61	\$61	\$61	\$61	\$61	\$61
Administration	\$293	\$298	\$303	\$308	\$313	\$339	\$369	\$402
Total operating cost	\$598	\$785	\$880	\$890	\$899	\$949	\$1,004	\$1,065
Operating Results (000)								
Operating surplus/(deficit)	(\$573)	(\$735)	(\$817)	(\$826)	(\$836)	(\$886)	(\$941)	(\$1,002)
Cumulative operating cash flow	(\$573)	(\$1,308)	(\$2,125)	(\$2,951)	(\$3,787)	(\$8,114)	(\$12,707)	(\$17,591)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$0	\$0	\$0	\$0	\$0
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$26	\$26	\$13	\$0	\$0	\$0	\$0	\$0
Construction services	\$1,376	\$1,376	\$688	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$688	\$688	\$344	\$0	\$0	\$0	\$0	\$0
Total	\$15,827	\$15,827	\$7,913	\$0	\$0	\$0	\$0	\$0
Cumulative capex	\$15,827	\$31,654	\$39,567	\$39,567	\$39,567	\$39,567	\$39,567	\$39,567
Cash Flow (000)								
User construction contribution	\$211	\$211	\$105	\$0	\$0	\$0	\$0	\$0
Operating surplus/(deficit)	(\$573)	(\$735)	(\$817)	(\$826)	(\$836)	(\$886)	(\$941)	(\$1,002)
Subsidy	\$12,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Capital expense	(\$15,827)	(\$15,827)	(\$7,913)	\$0	\$0	\$0	\$0	\$0
Cash flow	(\$4,189)	(\$14,351)	(\$6,625)	\$1,174	\$1,164	\$1,114	\$1,059	\$998
Cumulative cash flow	(\$4,189)	(\$18,540)	(\$25,165)	(\$23,992)	(\$22,828)	(\$17,155)	(\$11,747)	(\$6,632)
Net present value	(\$3,990)	(\$17,006)	(\$22,730)	(\$21,764)	(\$20,852)	(\$17,000)	(\$14,122)	(\$11,989)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$1,000
Monthly cost	\$75
Annual subscriber growth rate	5%
Dark fiber subsidy Year 1	\$12,000,000
Dark fiber subsidy Year 2+	\$2,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$797	\$1,673	\$2,091	\$2,196	\$2,306	\$2,943	\$3,756	\$4,793
Total revenue	\$797	\$1,673	\$2,091	\$2,196	\$2,306	\$2,943	\$3,756	\$4,793
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$33	\$66	\$82	\$82	\$82	\$82	\$82	\$82
Administration	\$425	\$432	\$440	\$453	\$460	\$502	\$549	\$600
Total operating cost	\$739	\$937	\$1,039	\$1,056	\$1,069	\$1,134	\$1,205	\$1,285
Operating Results (000)								
Operating surplus/(deficit)	\$55	\$699	\$999	\$1,083	\$1,175	\$1,719	\$2,423	\$3,333
Cumulative operating cash flow	\$55	\$754	\$1,754	\$2,836	\$4,011	\$11,461	\$22,094	\$36,846
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$50	\$53	\$67	\$86	\$109
Nodes	\$2,732	\$2,732	\$1,366	\$8	\$8	\$11	\$14	\$17
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$1,101	\$1,101	\$551	\$138	\$145	\$184	\$235	\$300
Construction services	\$1,484	\$1,484	\$742	\$4	\$5	\$6	\$7	\$9
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$742	\$742	\$371	\$2	\$2	\$3	\$4	\$5
Total	\$17,063	\$17,063	\$8,532	\$202	\$213	\$271	\$346	\$442
Cumulative capex	\$17,063	\$34,126	\$42,658	\$42,860	\$43,073	\$44,306	\$45,880	\$47,888
Cash Flow (000)								
User construction contribution	\$1,770	\$1,770	\$885	\$221	\$232	\$297	\$379	\$483
Operating surplus/(deficit)	\$55	\$699	\$999	\$1,083	\$1,175	\$1,719	\$2,423	\$3,333
Subsidy	\$12,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Capital expense	(\$17,063)	(\$17,063)	(\$8,532)	(\$202)	(\$213)	(\$271)	(\$346)	(\$442)
Cash flow	(\$3,238)	(\$12,594)	(\$4,647)	\$3,102	\$3,195	\$3,744	\$4,455	\$5,374
Cumulative cash flow	(\$3,238)	(\$15,831)	(\$20,478)	(\$17,377)	(\$14,182)	\$3,383	\$24,163	\$49,102
Net present value	(\$3,084)	(\$14,506)	(\$18,521)	(\$15,969)	(\$13,466)	(\$1,586)	\$9,423	\$19,772

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$2,000
Monthly cost	\$100
Annual subscriber growth rate	5%
Dark fiber subsidy Year 1	\$12,000,000
Dark fiber subsidy Year 2+	\$2,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$531	\$1,115	\$1,394	\$1,464	\$1,537	\$1,962	\$2,504	\$3,196
Total revenue	\$531	\$1,115	\$1,394	\$1,464	\$1,537	\$1,962	\$2,504	\$3,196
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$28	\$57	\$71	\$71	\$71	\$71	\$71	\$71
Administration	\$340	\$345	\$351	\$362	\$368	\$400	\$436	\$475
Total operating cost	\$649	\$841	\$940	\$954	\$965	\$1,020	\$1,081	\$1,149
Operating Results (000)								
Operating surplus/(deficit)	(\$118)	\$260	\$432	\$484	\$544	\$895	\$1,351	\$1,944
Cumulative operating cash flow	(\$118)	\$142	\$574	\$1,058	\$1,602	\$5,336	\$11,131	\$19,604
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$25	\$26	\$34	\$43	\$55
Nodes	\$2,732	\$2,732	\$1,366	\$4	\$4	\$6	\$7	\$9
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$551	\$551	\$275	\$69	\$72	\$92	\$118	\$150
Construction services	\$1,429	\$1,429	\$714	\$2	\$2	\$3	\$4	\$5
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$714	\$714	\$357	\$1	\$1	\$1	\$2	\$2
Total	\$16,430	\$16,430	\$8,215	\$101	\$106	\$136	\$173	\$221
Cumulative capex	\$16,430	\$32,860	\$41,075	\$41,176	\$41,283	\$41,900	\$42,688	\$43,694
Cash Flow (000)								
User construction contribution	\$1,770	\$1,770	\$885	\$221	\$232	\$297	\$379	\$483
Operating surplus/(deficit)	(\$118)	\$260	\$432	\$484	\$544	\$895	\$1,351	\$1,944
Subsidy	\$12,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Capital expense	(\$16,430)	(\$16,430)	(\$8,215)	(\$101)	(\$106)	(\$136)	(\$173)	(\$221)
Cash flow	(\$2,778)	(\$12,399)	(\$4,898)	\$2,604	\$2,670	\$3,055	\$3,556	\$4,206
Cumulative cash flow	(\$2,778)	(\$15,177)	(\$20,075)	(\$17,471)	(\$14,801)	(\$337)	\$16,391	\$36,055
Net present value	(\$2,645)	(\$13,892)	(\$18,123)	(\$15,981)	(\$13,889)	(\$4,101)	\$4,764	\$12,927

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$3,000
Monthly cost	\$100
Annual subscriber growth rate	5%
Dark fiber subsidy Year 1	\$12,000,000
Dark fiber subsidy Year 2+	\$2,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$215	\$451	\$564	\$593	\$622	\$794	\$1,013	\$1,293
Total revenue	\$215	\$451	\$564	\$593	\$622	\$794	\$1,013	\$1,293
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$26	\$52	\$64	\$64	\$64	\$64	\$64	\$64
Administration	\$293	\$298	\$303	\$312	\$317	\$344	\$374	\$407
Total operating cost	\$600	\$788	\$884	\$898	\$907	\$958	\$1,013	\$1,074
Operating Results (000)								
Operating surplus/(deficit)	(\$385)	(\$337)	(\$320)	(\$305)	(\$285)	(\$163)	\$1	\$208
Cumulative operating cash flow	(\$385)	(\$722)	(\$1,042)	(\$1,347)	(\$1,632)	(\$2,708)	(\$3,052)	(\$2,450)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$10	\$11	\$14	\$17	\$22
Nodes	\$2,732	\$2,732	\$1,366	\$2	\$2	\$2	\$3	\$4
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$223	\$223	\$111	\$28	\$29	\$37	\$48	\$61
Construction services	\$1,396	\$1,396	\$698	\$1	\$1	\$1	\$2	\$2
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$698	\$698	\$349	\$0	\$0	\$1	\$1	\$1
Total	\$16,053	\$16,053	\$8,027	\$41	\$43	\$55	\$70	\$90
Cumulative capex	\$16,053	\$32,106	\$40,133	\$40,174	\$40,217	\$40,467	\$40,787	\$41,194
Cash Flow (000)								
User construction contribution	\$1,075	\$1,075	\$537	\$134	\$141	\$180	\$230	\$293
Operating surplus/(deficit)	(\$385)	(\$337)	(\$320)	(\$305)	(\$285)	(\$163)	\$1	\$208
Subsidy	\$12,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Capital expense	(\$16,053)	(\$16,053)	(\$8,027)	(\$41)	(\$43)	(\$55)	(\$70)	(\$90)
Cash flow	(\$3,363)	(\$13,315)	(\$5,809)	\$1,788	\$1,813	\$1,962	\$2,160	\$2,412
Cumulative cash flow	(\$3,363)	(\$16,678)	(\$22,488)	(\$20,700)	(\$18,887)	(\$9,394)	\$987	\$12,516
Net present value	(\$3,203)	(\$15,280)	(\$20,298)	(\$18,828)	(\$17,407)	(\$10,977)	(\$5,469)	(\$678)

City of Palo Alto Market Analysis Report – User Financed FTTP Model

Scenario Parameters

Demand case	Base
User construction contribution	\$5,000
Monthly cost	\$100
Annual subscriber growth rate	5%
Dark fiber subsidy Year 1	\$12,000,000
Dark fiber subsidy Year 2+	\$2,000,000
Subscriber density factor	15%

Scenario Pro Forma

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20
Revenue (000)								
Monthly CPAU connect charge	\$25	\$53	\$66	\$70	\$73	\$93	\$119	\$152
Total revenue	\$25	\$53	\$66	\$70	\$73	\$93	\$119	\$152
Operating Expense (000)								
Fiber plant	\$73	\$146	\$182	\$182	\$182	\$182	\$182	\$182
Network	\$208	\$294	\$335	\$340	\$344	\$367	\$393	\$421
Operations	\$24	\$48	\$61	\$61	\$61	\$61	\$61	\$61
Administration	\$293	\$298	\$303	\$312	\$317	\$344	\$374	\$407
Total operating cost	\$598	\$785	\$880	\$894	\$903	\$954	\$1,009	\$1,070
Operating Results (000)								
Operating surplus/(deficit)	(\$573)	(\$732)	(\$814)	(\$824)	(\$830)	(\$860)	(\$890)	(\$918)
Cumulative operating cash flow	(\$573)	(\$1,305)	(\$2,119)	(\$2,943)	(\$3,774)	(\$8,014)	(\$12,404)	(\$16,938)
Capital Expense (000)								
Fiber optic cable installation	\$10,948	\$10,948	\$5,474	\$1	\$1	\$2	\$2	\$3
Nodes	\$2,732	\$2,732	\$1,366	\$0	\$0	\$0	\$0	\$0
Inside plant	\$56	\$56	\$28	\$0	\$0	\$0	\$0	\$0
Drops and CPE	\$26	\$26	\$13	\$3	\$3	\$4	\$6	\$7
Construction services	\$1,376	\$1,376	\$688	\$0	\$0	\$0	\$0	\$0
Environmental & right of way	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indirect costs	\$688	\$688	\$344	\$0	\$0	\$0	\$0	\$0
Total	\$15,827	\$15,827	\$7,913	\$5	\$5	\$6	\$8	\$11
Cumulative capex	\$15,827	\$31,654	\$39,567	\$39,572	\$39,577	\$39,607	\$39,644	\$39,692
Cash Flow (000)								
User construction contribution	\$211	\$211	\$105	\$26	\$28	\$35	\$45	\$58
Operating surplus/(deficit)	(\$573)	(\$732)	(\$814)	(\$824)	(\$830)	(\$860)	(\$890)	(\$918)
Subsidy	\$12,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Capital expense	(\$15,827)	(\$15,827)	(\$7,913)	(\$5)	(\$5)	(\$6)	(\$8)	(\$11)
Cash flow	(\$4,189)	(\$14,348)	(\$6,622)	\$1,197	\$1,192	\$1,169	\$1,147	\$1,129
Cumulative cash flow	(\$4,189)	(\$18,538)	(\$25,160)	(\$23,963)	(\$22,770)	(\$16,880)	(\$11,102)	(\$5,423)
Net present value	(\$3,990)	(\$17,004)	(\$22,725)	(\$21,740)	(\$20,805)	(\$16,808)	(\$13,735)	(\$11,369)