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I. Introduction

This section of the Los Alamos County (LAC) business case report describes the process used by Uptown to complete the financial analysis for the proposed fiber optic operation. The assumptions used in the business model are detailed first, followed by a discussion of the business case results. Key business drivers are also identified as part of this evaluation.

II. Business Model Overview

The financial analysis for the LAC fiber network was completed using the Uptown Full Service Network Business Model (FSN Model). This model contains more than 200 independent variables whose combined values determine the ultimate outcomes for the myriad scenarios that are created during a business case development exercise. Uptown uses a combination of sources to complete each assumption set including secondary research, primary research, firsthand experience and client input. The following sections provide a description of the assumptions for the LAC FTTP business case.

III. Demand and Revenue

A. Market Assumptions

Uptown assumed that the LAC FTTP system would pass 7,500 potential residential customers and 900 potential business customers in Los Alamos and White Rock. It was assumed that the business market comprises small to very large sized enterprises.

B. Service Offerings

1. Video Services

Uptown recommended that LAC should offer retail video services on their FTTP system. Details regarding service descriptions, pricing plans and penetration projections for the proposed line of video services can be found in the Market Assessment and Product Strategy sections of this report. Pricing and penetration assumptions used in the FTTP business case are outlined next.

a) Pricing

Video services pricing assumptions used in the LAC business case are summarized in Exhibit 1.

Exhibit 1 – Proposed Video Pricing

Service	Monthly Price
Basic Cable	Not Offered
Expanded Basic	\$34.95
Digital Cable	\$5.00
Premium Cable (ala carte)	\$10.00

b) Penetration

The results of Uptown's primary market research study for the Los Alamos market were used to derive the projected penetration rates for all services. A detailed discussion of these results and

the method Uptown used to develop penetration estimates is provided in the Quantitative Research section of this report. Exhibit 2 contains the projected penetration estimates for video services at 10% less than Comcast's current pricing in Los Alamos. These estimates also assume that video would be sold in a three-product bundle along with Internet and telephone services.

Exhibit 2 – Projected Video Penetration for 10% lower price

Service	Year 1	Year 2	Year 3	Year 4	Year 5
Basic Cable	0%	0%	0%	0%	0%
Expanded Basic	22%	27%	32%	34%	36%
Digital Cable	11%	15%	20%	24%	27%
Premium Cable	11%	14%	16%	17%	18%

2. Internet Services

Uptown recommended that LAC should provide retail Internet services on their FTTP system. A detailed description of the four-tiered line of Internet services is provided in the Product Strategy section of this report. Pricing and penetration assumptions used in the LAC business case are outlined next.

a) Pricing

Exhibit 3 shows the pricing levels used for the four tiers of Internet service in the LAC business. The prices listed apply to both residential and business accounts.

Exhibit 3 – Proposed Internet Pricing (Residential and Commercial)

High Speed Internet Service	Bandwidth	Monthly Price
Tier 1	2Mbps	\$39.95
Tier 2	4Mbps	\$59.95
Tier 3	6Mbps	\$99.50
Tier 4	10Mbps	\$149.95

b) Penetration

Uptown described the method for calculating residential and commercial Internet penetrations in the Quantitative Research section of this report. Total Internet penetration is assumed to grow over the first five years of the plan to 36% and 20% for residential and commercial services respectively. This penetration must then be spread across the four tiers of Internet service, which is defined as product dispersion. Uptown developed dispersion estimates based on the results of the primary market research and the expected movement of the market into higher tiers over time. It was also assumed that the commercial market would demand higher performance tiers over the course of the plan, so Uptown weighted the commercial dispersion percentages higher in Tier 3 and Tier 4 and lower in Tier 1. The dispersion and penetration assumptions used in the business case are shown in next four exhibits.

Exhibit 4 –Internet Dispersion Assumptions for Residential Internet Services

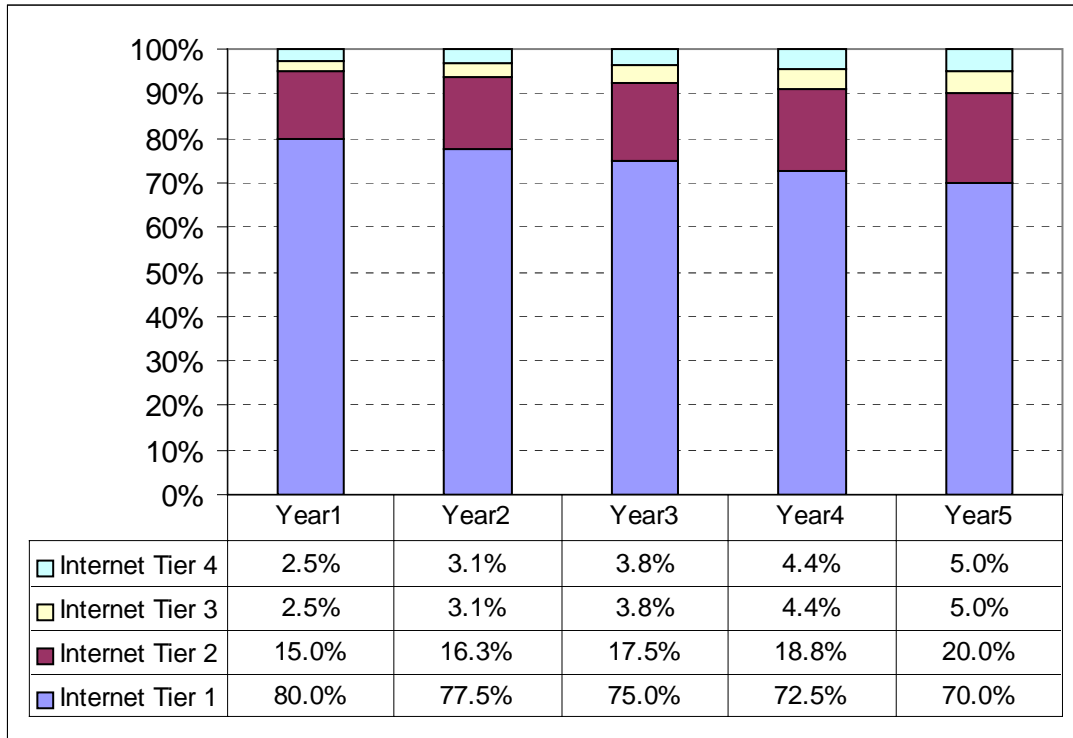


Exhibit 5 –Internet Dispersion Assumptions for Commercial Internet Services

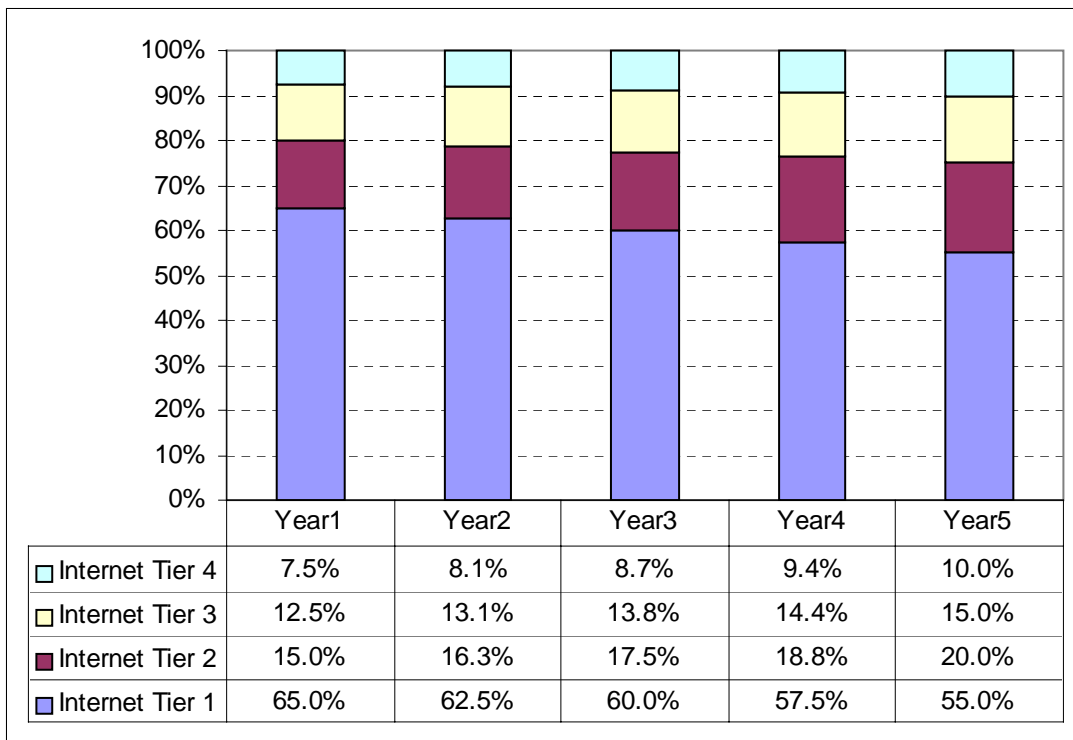


Exhibit 6 – Projected Internet Penetration of Households for Residential Internet Services

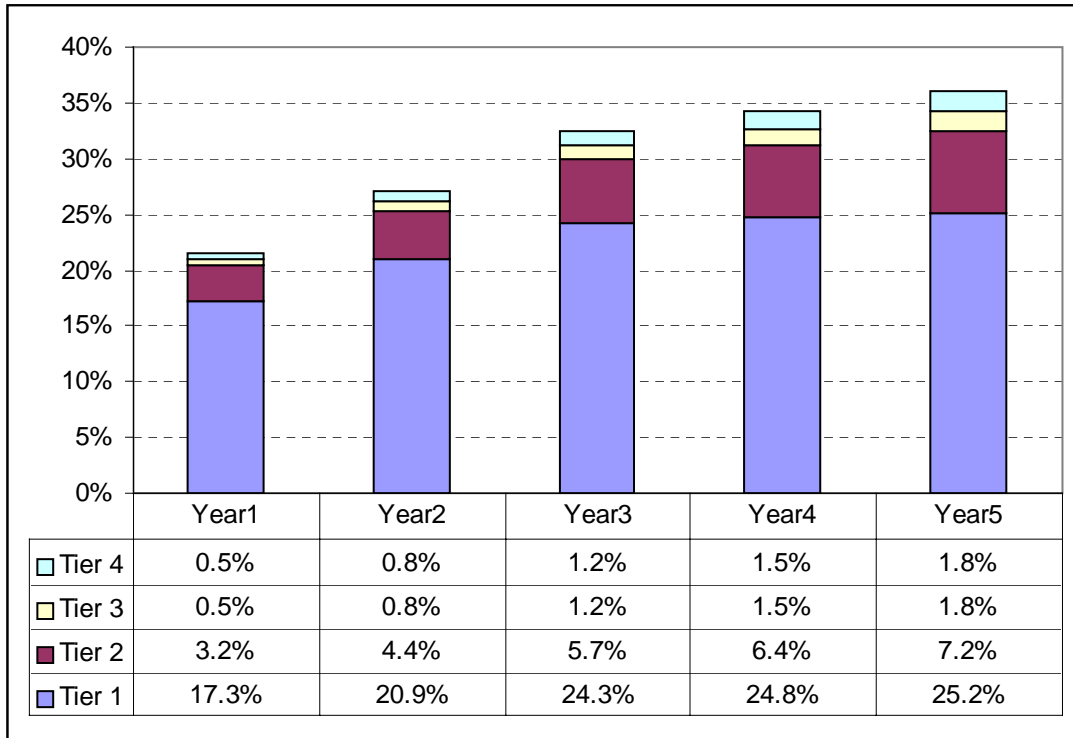
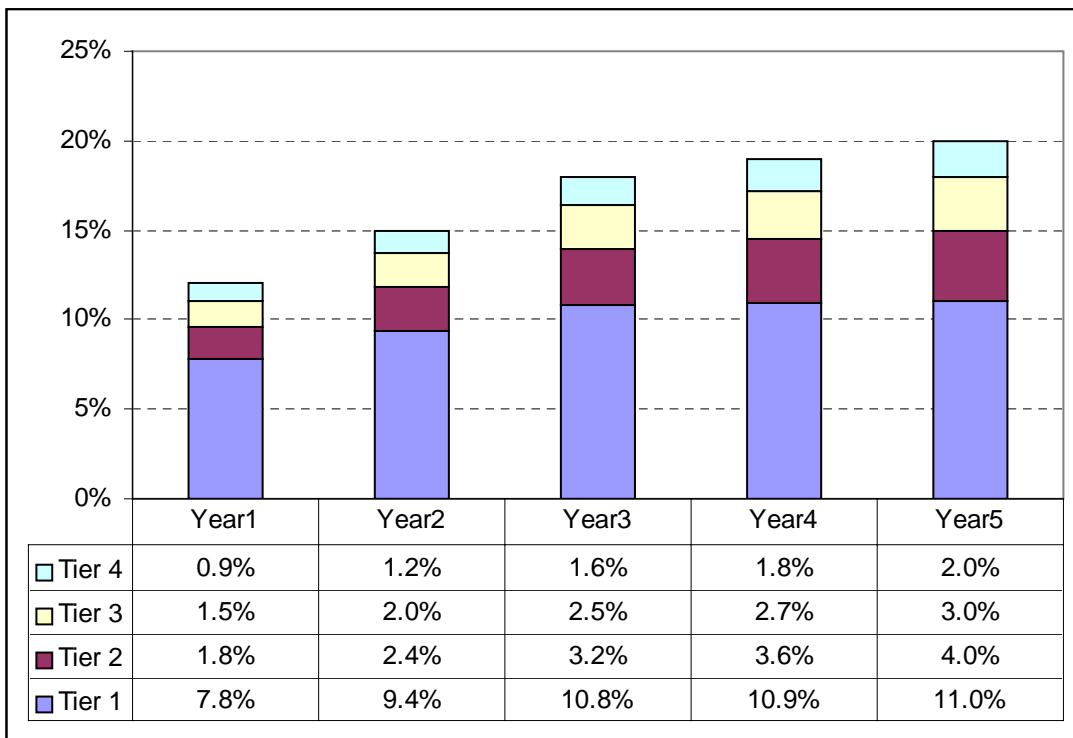


Exhibit 7 – Projected Internet Penetration of Businesses for Commercial Internet Services



3. Residential and Small Business Telephone Services

Uptown recommended that LAC offer retail telephone services to the residential and commercial markets in Los Alamos and White Rock. Detailed service descriptions, pricing plans and penetration estimates are provided in the Quantitative Research, Market Assessment and Product Strategy sections of this report. Business case assumptions for telephone pricing and demand are outlined next.

a) Pricing

Uptown's telephone pricing assumptions were based on the spending expected for the average residential telephone customer. For example, an average telephone subscriber would be expected to purchase a basic phone line with one or more calling features. As a CLEC, LAC will also be eligible to collect FCC line charges (\$6.50 - \$7.00) on each residential and commercial telephone line. Specific pricing assumptions for residential telephone services are listed in Exhibit 8.

Exhibit 7 – Pricing and dispersion assumptions for residential telephone service

Telephone Component	Price	Dispersion ¹	Weighted Average
Access Line	\$12.00	100%	\$12.00
Additional Line	\$12.00	20%	\$2.40
Phone Package	\$18.00	33%	\$6.00
Calling Feature	\$5.00	40%	\$2.00
FCC Line Charge Per Line	\$6.50	100%	\$7.80 ²
Average Revenue per User (ARPU):			\$30.20

b) Penetration

Penetration projections for residential and small business telephone services were developed using methods described in the Quantitative Research section of this report. The projected penetration rates for residential and commercial markets are listed in Exhibit 8. Penetration remains at year 5 levels for the remaining years of the plan.

Exhibit 8 – Penetration assumptions for residential and small business telephone service

Service	Year 1	Year 2	Year 3	Year 4	Year 5
Residential	22%	27%	32%	34%	36%
Commercial	15%	19%	23%	24%	25%

¹ Dispersion is defined as the number of components sold per residential phone account.

² Line charge applies to each line at the residence including additional lines.

4. Transport Services

Uptown has recommended that LAC also offer transport services on the FTTP system. This section describes the transport services pricing and penetration assumptions used in the LAC business case. A detailed service description is provided in the Product Strategy section of this report.

a) Pricing

Transport services are typically priced on an individual case basis. This is because they require some level of design and may call for special construction of fiber facilities (beyond a standard fiber drop from a pedestal or pole). However, the business case includes an average retail price of \$150 (including all mileage on the LAC FTTP system).

b) Penetration

Uptown completed in-depth interviews with over ten local large businesses in an effort to determine the demand for complex telephone services like high capacity transport. The results of those interviews were used to compile a market-wide revenue forecast for complex services (transport and switched services). The details of this analysis can be found in the Large Business Market Assessment section of this report. Penetration assumptions for high capacity transport services are provided in Exhibit 9.

Exhibit 9 – Projected T1 Equivalent Penetration

Service	Year 1	Year 2	Year 3	Year 4	Year 5
T1 Transport Service	4.2%	5.2%	6.3%	6.6%	7.0%

IV. Operating Expenses

This section outlines the primary drivers of operating expenses in the LAC business case. Cost of goods sold is covered followed by sales, general and administrative expenses.

A. Cost of Goods Sold

Cost of goods sold (COGS) are defined as those costs that are directly related to producing or delivering a given product or service. The following sections describe the COGS for each proposed service.

1. Video

The COGS for video would be limited to programming expenses for each tier of service. Programming fees are paid per subscriber to content providers like CNN and ESPN. Programming cost assumptions were developed based on the video packages described in the Product Strategy section of this report. The programming costs used in the business case are listed in Exhibit 10.

Exhibit 10 – Projected Video Programming Costs

Service	Cost per Subscriber
Basic Cable	\$1.00
Expanded Basic	\$13.50
Digital Cable	\$3.00
Premium Cable	\$7.40

2. Internet

Internet backbone bandwidth is the only Internet specific cost in the business case. The prevailing wisdom of cable modem and DSL providers has been that a single T1 (1.544 Mbps) connection to the Internet would support 80 to 100 subscribers (averaging 512 Kbps service). If backbone access were purchased for \$350 per Mbps, the average cost per cable modem or DSL subscriber would be in the range of \$5.25 to \$6.57.

Uptown has recommended that LAC offer a four-tiered line of Internet services ranging from 2Mbps up to 10Mbps. There is little historical data available related to the actual usage patterns of a group of residential subscribers that have access to this type of bandwidth. So, for the purposes of this business case it was assumed that the average bandwidth utilization per FTTP Internet subscriber would be triple that of current DSL/cable modem subscribers. This results in a projected Internet COGS of \$17.06 in 2005.

3. Telephone (POTS)

There are no telephone specific COGS for LAC. It is assumed that LAC would connect to Qwest over facilities provided as part of an interconnection agreement. This type of arrangement is referred to as “bill and keep”, because neither party would charge the other for connecting facilities or for terminating each other’s traffic.

4. Transport Services

There are no transport specific expenses for LAC.

B. Sales, General and Administrative (SG&A) Expenses

Sales, general and administrative (SG&A) costs are defined as all non-COGS expenses for the business. SG&A expenses can be allocated to each service or line of business or they can simply go to the bottom line of the venture. Uptown has not allocated SG&A expenses for the proposed retail scenario. The following sections describe the remaining primary expense assumptions in the LAC business case.

1. Marketing Expenses

As the retail provider of video and Internet services, LAC will be responsible for their related marketing expenses. Marketing budgets for each service were developed using actual cable operator results from the past several years. The business case includes a marketing budget per feature sold of \$50 for video and \$75 for Internet. This budget is expected to cover the cost of direct marketing and advertising campaigns for the retail business.

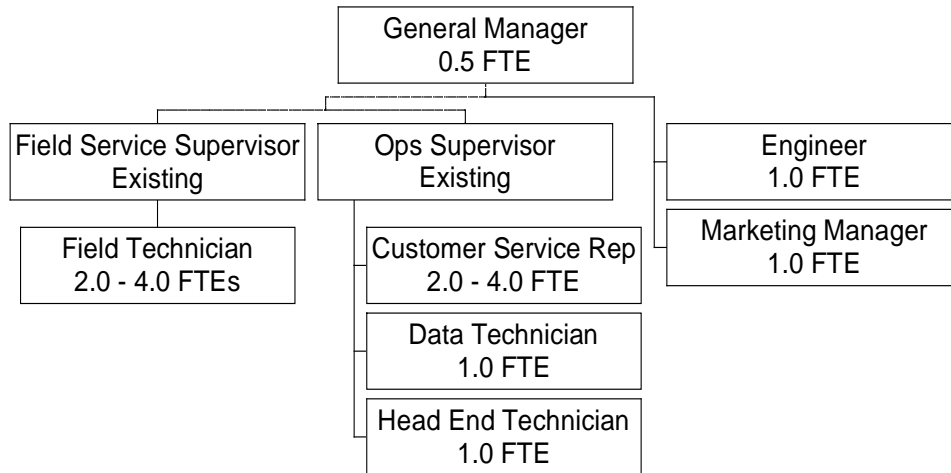
2. Sales Expenses

LAC will also need to budget for sales efforts. The business model includes assumptions that drive the number of sales personnel needed based on annual sales volume. This sales channel is modeled as an inbound call center arrangement that is tied to the direct marketing campaigns. It was assumed that a full time sales person could sell up to 300 features per month during the start-up phases of the business. This budget could be used in an outsourcing arrangement in actual deployment. The concern at this stage is to account for the dollars in the business case.

3. Staffing Plan

Based on past engagements, industry-wide standards and discussions with Buck Monday and Jim Hall, Uptown developed an initial staffing plan for the LAC FTTP business case. The following organizational chart gives a graphical representation of this plan.

Exhibit 11 – Proposed LAC Staffing Plan



Per discussions with Messrs Monday and Hall, Uptown developed a staffing plan that included members of the existing LAC management team. It was assumed that 50% of one executive’s time would be dedicated to oversight of the business (General Manager). It was also assumed that existing supervisors for outside plant operations and information services would absorb the additional headcount required for the FTTP operation. Finally, given the “rough and tumble” competitive environment of a retail operation, it was assumed that LAC would hire a marketing expert to support the marketing and sales efforts for FTTP.

The business case also includes budget for a full time engineer. This person would be responsible for managing the initial build-out and ongoing expansion of the system. They would also be responsible for developing preventative maintenance plans and supporting the continuing effort to develop better, faster and cheaper new products and services for the FTTP business.

It was assumed that the business would require four additional field techs to maintain and service the FTTP system outside plant. LAC will need at least two inside technicians (head end and data) to manage and administer the various FTTP systems. These technicians would set up and administer all required systems related to video, voice and data services. They would also be responsible for configuring and managing the systems in the FTTP network operations center.

The business case includes \$250 in labor for contracted installation of each new NIU. Once the initial crush of installation activities has passed, it could be assumed that LAC's field technicians could take on the role of installing new subscriber NIUs.

An overhead loading of 33% was added to all salaries to account for management, benefits, utilities, rent and other support services (computers, cubicles, telephone, etc.).

4. Right of Way Fees

It was assumed that LAC would not be required to pay cash for access or use of any rights of way for the FTTP system.

5. Network Powering

Uptown did not include the cost of electricity for field and/or subscriber electronics. If LAC deploys an active FTTP system, it can be assumed that each field electronics enclosure would be served by a metered electric service, but it is not currently known what the ultimate power consumption would be (if any) at these sites. Subscribers will provide the power for each NIU and all other premises equipment. The business case includes enough capital for battery back up units for each NIU.

6. Billing Expenses

LAC will need to issue cable, Internet and telephone bills for each subscriber. This would require the upgrade of the current utility billing system or the implementation of a broadband standalone system. Uptown budgeted \$150,000 for billing system upgrades for cable television, Internet and telephone services. The exact nature of the upgrade or new system would be determined during the business planning phase (if required).

7. Implementation Support, Legal and Accounting Expenses

Uptown has budgeted some start-up expenses in the formative years of the plan. It is recommended that LAC contract with a qualified development firm with experience in launching broadband services and businesses. Tasks would include product development, vendor selection, process audits, process implementation, product implementation and launch sequence management. The business case includes \$250,000 and \$75,000 respectively for the first and second years for these services.

The business case also includes expenses for legal and accounting services. The model includes \$75,000 for these expenses in the first year and \$10,000 annually thereafter for the remainder of the plan.

V. Capital Expenditures

The key assumptions related to the network build-out and NIU installation costs are listed in Exhibit 12. These assumption values are discussed in the following two sections.

Exhibit 12 – Key Network Construction and Subscriber Capital Assumptions

Assumption	Value	Description
Construction cost per meter passed	\$900	Cost to construct network passing every home and business in Los Alamos and White Rock.
Special construction to White Rock	\$281,932	Cost to construct a fiber route from Los Alamos to White Rock (from BDEC design).
Material cost per new subscriber	\$750	Cost for NIU, fiber drop and termination materials for each new subscriber.
Labor cost per subscriber installation	\$250	Cost to install NIU and connect to network and inside home wiring.

A. Network Construction

Uptown reviewed the construction estimates compiled by Brunetti DEC (BDEC) and determined that they could not be applied to this FTTP business case. The penetration assumption used to generate the design was 84% of homes passed. This is much higher than the projections developed as part of Uptown's study. BDEC also recommended that LAC build a fiber ring to serve dark fiber and large business needs first, then place laterals from the ring into neighborhoods to serve residential customers. The cost to construct the backbone was lower than most projects that Uptown has studied, but the incremental cost per new subscriber was more than double that seen in other studies. It appears that BDEC was pursuing a strategy to limit initial costs, which significantly increased the variable cost for each new subscriber installation. Based on the issues with the BDEC design, Uptown chose to use a combination of recent construction estimates from other projects that were similar in size and scope to LAC.

Uptown did use the BDEC estimate for building a fiber route from Los Alamos to White Rock. The cost of this fiber line was projected to be \$281,932.

B. Network Interface Unit and Fiber Drop Expenditures

The NIU budget of \$750 would cover the cost of the NIU, fiber drop and mechanical splicing supplies. It was assumed that the NIU would be environmentally hardened and mounted on the outside of the subscriber's home or business. Some suppliers like World Wide Packets (WWP) offer non-hardened NIUs (must be placed indoors) for less, but the operational issues associated with having to gain access to a subscriber's premises make this a last resort alternative. Finally, it was assumed that LAC would contract the installation of their subscriber drops and NIUs. The \$250 per installation could be used to hire a full-time staff of LAC employees, but the need for these resources would go away after the initial crush of installation activity wanes.

C. Head-End Capital Expenditures**1. Building and Facilities**

Uptown has not included any budget for a new building to house the new head end equipment. It was assumed that there would be adequate space (30' x 30') in an existing LAC facility for this equipment and the technicians responsible for managing it.

2. Video Applications Equipment

Uptown has budgeted \$1.9 million for head end video equipment. This includes \$1.5 million for satellite, analog and digital video equipment. The remaining \$400,000 is needed for the video on demand system.

3. Internet Services Equipment

Internet switches and routers will also be required at the LAC head-end location. The business case includes a budget of \$175,000 for this equipment.

4. Telephone Services Equipment

LAC will need to invest in a telephone switch capable of routing local calls to and from Qwest and long distance carriers. The model includes \$500,000 for a voice switch and ancillary T1 cross-connects.

D. Variable (Subscriber) Capital

1. Video Capital Requirements

Uptown has assumed that all homes in Los Alamos and White Rock already have sufficient coaxial inside wiring. Therefore, no additional inside wiring would be required from the NIU to any set top box (STB) or cable ready television. It is assumed that each digital cable household would require 1.5 STBs. The model includes \$250 for each digital STB.

2. Internet Capital

LAC would be responsible for installing the required inside wiring (CAT5) to connect the Ethernet port on the NIU to the main computer or network location in the home or business. The business case includes \$100 for each new Internet subscriber for each of these installations. This is in addition to the cost of mounting the basic NIU.

3. Telephone (POTS) Capital

There are no specific capital costs for providing telephone service to a small business or residential subscriber. Once the NIU has been mounted, the POTS port simply needs to be connected to the main telephone interface on the home or business.

4. Transport Services Capital

It was assumed that the proposed FTTH system would be capable of delivering T1 transport services to businesses. Vendors differ in their approach to serving the complex market, so Uptown has assumed that the average CPE cost per T1 connection would be \$2,000.

E. Vehicle Capital

It was assumed that LAC would invest in new trucks for FTTP outside plant technicians. The business case includes a total of \$150,000 for pick-up and bucket trucks. The business case also includes an annual maintenance budget equal to 15% of the initial purchase price of the trucks.

F. Engineering

The business case includes a loading percentage that is applied to all capital expenditures. This loading (engineering, furnish and install "EF&I") was set to 5% in the LAC case. Such a loading

generates over \$850,000 over the first five years of the plan. This fund would also be used to fund other outsourced start-up activities.

G. Build Out Schedule

It was assumed that the network construction would take place over a two-year period. It was assumed that the 50% of the network would be completed in the first year with the remaining 50% completing in the second year. The network would be constructed in a manner that would allow for subscriber activation on a rolling schedule. Once the head end and backbone connections are in place, subscribers would be added as soon as possible. Marketing efforts would be planned to coincide with the construction schedule.

H. Upgrade Strategy

The business case includes budgets for network and NIU upgrades in the 10th year of the plan. The network upgrade budget was set at \$100 per meter passed, while the cost for upgrading NIUs was set at \$150 per paying subscriber. It is not known what these future improvements would entail, but it should be assumed that the upgrades would be limited to field electronics only.

VI. Financing

A. Long Term Financing

The primary funding vehicle for the FTTP project is assumed to be long-term revenue bonds. These bonds would be backed by LAC Utilities and paid off using revenues generated by the FTTP business. The model includes three one-year drawdowns (bond anticipation notes) with a rollover to a 17-year debt (modeled as a simple interest loan). The bond interest rate is assumed to be 5%.

The model also includes allowances for issuance costs and bond reserve requirements. Issuance costs of 2% are applied to all bond proceeds. A bond reserve of 10% is also maintained in an interest bearing account until the bond debt has been paid off. The reserve requirement is reduced with each principal payment. These reductions are reflected as cash transfers from the bond reserve account to the normal cash account.

B. Short Term Financing

It is assumed that revenue bond proceeds cannot be used to fund operating losses for the FTTP business. The model assumes that LAC will fund operating losses by depositing the required amounts of cash into the FTTP business account. These infusions are tracked and the running total earns interest at market rates (3.5%). The FTTP business starts making principal payments on this debt starting in the sixth year of the plan. The term of this payment plan has been set to 10 years for this case.

All operating losses incurred during the first five years of the plan are funded by the LAC loan that starts a payment schedule in the sixth year. Any cash infusions required after the fifth year would accumulate in a line of credit (assumed to be from LAC). This line of credit would earn interest for LAC, but a payment plan would not be initiated in the business case.

C. Equity Investment

The model includes inputs for equity investments, but the LAC business case does not include any at this time.

VII. Business Case Analysis

A. Base Case Scenario

Uptown ran the FSN Model for a scenario based on the aforementioned assumption values. The primary results for this Base Case scenario are listed in Exhibit 13.

Exhibit 13 – Results for Base Case Retail Scenario

Outcome (millions)	Value
Bond requirement	\$19.3
Working capital	\$2.9
Revenue Year 5	\$5.0
Operating income Year 5	\$2.5
Cash flow with debt service Year 5	\$0.5
Cash flow with debt service Year 15	\$0.9
Cumulative cash Year 15	\$7.6
Total debt Year 15	-\$7.4
Net cash Year 15	\$0.2
Years to positive net cash	15
10 Year Internal Rate of Return (IRR)	-2.6%
15 Year IRR	6.4%

The results listed in Exhibit 13 are typical for a municipal FTTP deployment. Operating income is strong starting in the third year and cash flow with debt service becomes positive in the third year after \$2.9 million in operating losses (working capital requirement). The case is self-funding for the remainder of the plan, even with significant capital expenditures for upgrades (\$1.8 million) in the 10th year. The business requires \$19.3 million in long-term financing along with \$2.9 million in short-term loans from LAC. Cash flow with debt service grows to \$0.9 million by the 15th year along with cash reserves of \$7.6 million. Total debt at the end of the plan is still \$7.4 million.

Net cash is a term Uptown uses to describe the net worth of the venture. It is calculated by subtracting total debt from total cash reserves. Net cash for the base case becomes positive in the 15th year (\$0.2 million). This straightforward means of valuation does not include the value of the infrastructure or future value of cash flows.

B. Sensitivity Analysis – Key Business Drivers

The Uptown business model is a complex web of independent variables and outcomes. More than 200 variables can be changed, depending on the scenario being processed. Uptown has used its proprietary Ambassador decision support software to bring some definition to the task of sensitivity analysis for the LAC business case.

A model input variable is considered to be “sensitive” if its value’s range from best to worst case has a material effect on an important outcome. The outcome chosen for the first sensitivity analysis was Cash Flow with Debt Service – Year 5. This indicator goes positive in the third year at a value of \$711,827. If something were to happen that would drive this outcome into negative territory, LAC would be required to fund such losses. The top five most sensitive variables related to this outcome are listed in Exhibit 14.

Exhibit 14 –Most Sensitive Variables for Cash Flow w/ Debt Service – Year 5

Variable	Variable Value			Cash Flow with Debt Service – Year 5 (000s)		
	Worst	Median	Best	Worst	Median	Best
Residential Telephone Penetration	30.0%	36.0%	40.0%	\$367.7	\$526.9	\$631.5
Internet Tier 1 Monthly Price	\$32.00	\$40.00	\$42.00	\$319.2	\$526.9	\$580.2
Residential Telephone Monthly Price	\$25.00	\$30.20	\$32.00	\$344.2	\$526.9	\$592.1
Construction Cost per Meter Passed	\$1,000	\$900	\$750	\$422.2	\$526.9	\$669.2
Residential Internet Access Penetration	30.0%	36.0%	40.0%	\$396.9	\$526.9	\$615.3

As the results in Exhibit 14 show, it is unlikely that any single change in variable value would cause cash flow to become negative in the fifth year. This analysis has shown that the short-term prospects for the FTTP business case look positive. The long-term health of the venture is evaluated next.

Net cash goes positive in the last year of the business case, which means that the value of cash reserves exceeds the amount of total debt in the plan. Uptown ran the sensitivity analysis routine with Net Cash – Year 15 as the dependent variable. The results are listed in Exhibit 15.

Exhibit 15 –Most Sensitive Variables for Net Cash Year 15

Variable	Variable Value			Net Cash Year 15 (000,000s)		
	Worst	Median	Best	Worst	Median	Best
Construction Cost per Meter Passed	\$1,000	\$900	\$750	-\$1.8	\$0.2	\$3.2
Residential Internet Access Penetration	30.0%	36.0%	40.0%	-\$2.8	\$0.2	\$2.0
Internet Tier 1 Monthly Price	\$32.00	\$40.00	\$42.00	-\$3.4	\$0.2	\$1.1
Residential Telephone Penetration	30.0%	36.0%	40.0%	-\$2.6	\$0.2	\$1.9
Residential Telephone Monthly Price	\$25.00	\$30.20	\$32.00	-\$2.9	\$0.2	\$1.3

Exhibit 15 shows the long-term impact of assumption variability on the FTTP business case. The base case scenario generated approximately \$200,000 in net cash by the end of the 15th year of operation. If any of the five variables listed above were to hit the projected “worst case” value, net cash would be significantly impacted. Four out of the top five variables in Exhibit 15 are related to either pricing or penetration. Uptown has completed a detailed market research study that has been used to derive penetration estimates, but many things are likely to change in the market before any FTTP service can be launched.

Pricing is another wildcard in the competitive world of broadband communications. FTTP offerings should hold a strategic advantage over HFC and telephone based services, so there is always the risk that incumbents may choose to compete on price. It is highly unlikely that pricing would fall below the worst case levels represented in this analysis, but the possible financial impacts still need to be understood.

Unlike pricing and penetration, construction costs *can* be identified with a high degree of accuracy prior to making a decision to move forward with FTTP. This could be done through the analysis of a qualified engineering firm with experience in designing and building FTTP systems. The process of competitive bidding by suppliers and construction firms will also help to whittle down the cost of building such a system.

C. Top Two Variable Scenario Analysis

Based on the results of the last sensitivity analysis, residential Internet and telephone pricing pose the largest downside risk for the venture. Construction cost and Internet penetration are more sensitive variables, but the worst case values for these assumptions generate better results for net cash than the worst case for either telephone or Internet price. Uptown ran FSN Model scenarios for the best and worst case values of residential telephone and Internet price. The results for these scenarios are provided in Exhibit 16.

Exhibit 16 – Results for Best and Worst Case Values of Most Sensitive Variables

Outcome (millions)	Base Case	Internet Tier 1 Price		Res. Telephone Price	
		Best (\$42.00)	Worst (\$32.00)	Best (\$32.00)	Worst (\$25.00)
Bond requirement	\$19.3	\$19.3	\$19.3	\$19.3	\$19.3
Working capital	\$2.9	\$2.9	\$3.0	\$2.9	\$3.0
Revenue Year 5	\$5.0	\$5.1	\$4.8	\$5.1	\$4.9
Operating income Year 5	\$2.5	\$2.5	\$2.3	\$2.5	\$2.3
Cash flow w/ debt service Year 5	\$0.5	\$0.6	\$0.3	\$0.6	\$0.3
Cash flow w/ debt service Year 15	\$0.9	\$1.0	\$0.5	\$1.0	\$0.6
Cumulative Cash Year 15	\$7.6	\$8.5	\$4.0	\$8.7	\$4.5
Total debt Year 15	-\$7.4	-\$7.4	-\$7.4	-\$7.4	-\$7.4
Net cash Year 15	\$0.2	\$1.1	-\$3.4	\$1.3	-\$2.9
Years to positive net cash	15	15	>15	15	>15
10 Year IRR	-2.6%	-2.1%	-4.5%	-2.0%	-4.3%
15 Year IRR	6.4%	6.8%	4.9%	6.9%	5.1%

As should be expected, the worst case values for telephone and Internet price hurt the base case in several areas. Net cash becomes negative at the end of the plan and cash flow with debt service is slashed by 33 to 44%. However, in both scenarios the business case still becomes self-funding in the third year and stays that way throughout the rest of the plan - including network and NIU upgrades in the 10th year.

D. Disaster Threshold Analysis

The final test of the FTTP business involved a threshold analysis for the most sensitive variables and their impact on long-term cash flow with debt service. The base case scenario calls for LAC to loan the venture \$2.9 million in working capital before the business becomes self-funding in the 3rd year. Some cases take longer to become self-funding, but any business that does not become self-sufficient by the 5th year of operation is in serious trouble. Uptown ran the business case for residential telephone and Internet pricing to determine how bad things could get before cash flow with debt service in year 5 hit \$0. The results of this analysis are provided Exhibit 17.

Exhibit 17 – Variable values to drive Cash with Debt Service – Year 5 to \$0

Outcome (millions)	Scenario		
	Base Case	Internet Tier 1 Price = \$19.81	Residential Telephone Price = \$15.40
Bond requirement	\$19.3	\$19.3	\$19.3
Working capital	\$2.9	\$4.4	\$4.4
Revenue Year 5	\$5.0	\$4.6	\$4.6
Operating income Year 5	\$2.5	\$2.0	\$2.0
Cash flow w/ debt service Year 5	\$0.5	\$0.0	\$0.0
Cash flow w/ debt service Year 15	\$0.9	\$0.0	\$0.0
Cumulative Cash Year 15	\$7.6	\$0.3	\$0.3
Total debt Year 15	-\$7.4	-\$9.0	-\$9.0
Net cash Year 15	\$0.2	-\$8.7	-\$8.7
Years to positive net cash	15	>15	>15
10 Year IRR	-2.6%	-7.8%	-7.8%
15 Year IRR	6.4%	2.4%	2.4%

Per the results in Exhibit 16, LAC could lower price significantly on its residential telephone and Internet Tier 1 services before cash flow would become negative in the 5th year. A 50% reduction in Internet Tier 1 pricing would push out the time it takes to generate positive net cash and require an additional \$1.5 million in working capital from LAC. A 49% reduction in the price for residential telephone services would have a similar impact on the FTTP business case. However, the venture is still self-funding starting in the 3rd year, with the exception of the 10th year, when an additional \$1.3 million is needed to pay for network and NIU upgrades.

VIII. Business Case Summary

The financial analysis has shown that the LAC FTTP business is strong and should be able to withstand most of the predictable variations related to pricing, penetration and construction costs. Cash flow with debt service in the 5th year does not appear to be in danger of becoming negative, so it is very likely that LAC would be able to cover debt service throughout the life of the plan. The most sensitive variables in the business case are related to price, penetration and network construction. Price levels and penetration estimates have been developed by Uptown using the most advanced research and investigative methods available. Construction estimates for this project were not based on actual engineering studies for Los Alamos, but the assumptions used in the business case were reasonably conservative.