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I. Introduction

Los Alamos County (LAC) had entered the business case development process with the assumption that the local network would be open to all providers of retail video, Internet and telephone services. This met the definition of an open access network where retail providers would pay wholesale rates to access the LAC network and then provide services to end-users. Uptown Services, LLC (Uptown) has completed several municipal broadband studies that have shown that the open access approach does not perform well financially. This section describes the process that Uptown used to evaluate the primary business structure alternatives that LAC should consider. Results and recommendations are also provided.

II. Business Structure Alternatives

A. Wholesale vs. Retail

LAC could either be a wholesaler of broadband access to 3rd party retail services providers or it could take on the task of providing a full complement of LAC branded retail services. Each alternative brings with it advantages and disadvantages, but the bottom line financial impacts are assumed to be the most important for LAC. Once a wholesale vs. retail decision has been made for each line of business (LOB) there are more decisions related to “make vs. buy.” These are discussed next.

B. Make vs. Buy

LAC would need to determine whether it should insource or outsource the various infrastructure and operational aspects of the fiber business. Several municipal systems have chosen to purchase their head end video feeds from a 3rd party instead of building and operating their own facility. Others have utilized 3rd party providers of customer service for supporting their more complex services like telephone and Internet. Finally, LAC may want to consider contracting directly with some programming providers rather going through the National Cable Television Cooperative.

III. Broadband Value Chain

Using a value chain for each broadband service helps to illustrate the key differences between providing retail and wholesales services on a fiber network. The following sections describe the primary differences in scope and responsibility between the wholesaler and the retailer for each broadband LOB.

A. Video

1. Retailer

A video retailer is responsible for virtually all portions of the value chain with the exception of programming origination. The retailer is responsible for delivering a full line-up of analog and digital television services to end-users. The retailer is not required to own the network, but they are responsible for negotiating programming rights, developing packages, marketing, selling, provisioning, billing and customer service. The end-user receives a bill from the retailer and makes their payment out to it. A retailer would also be responsible for connecting the subscriber’s service from the network interface unit (NIU) into the home, including set top boxes and inside wiring.

2. Wholesaler

A video wholesaler has a much less customer-centric role in the delivery of video services. They would simply be responsible for providing a continuous pathway from the retailer point of presence to each subscriber location. The wholesale provider would only be responsible for operating the network and installing NIUs. They would not be involved in the any customer-facing activities in the business of providing video services.

B. Internet

1. Retailer

The retail provider of Internet services would be responsible for all customer-facing functions and processes. They would market, sell, provision and bill for all end-user Internet services. They would also be responsible for connecting each subscriber to the NIU with CAT5 cable. The retailer would develop all pricing and package levels and provide end-user help desk and customer service functions. Finally, they would be responsible for providing all Internet services including backbone access, email, news and web hosting.

2. Wholesaler

Much like video, the Internet wholesaler would sell local transport from the head end to each subscriber NIU. The wholesale provider would install the NIU and provide a 10/100Mbps port (on the NIU) to the retail provider at the subscriber location. The wholesale provider would also be responsible for managing the local network, such that each subscriber data stream was secure and delivered the level of bandwidth specified by the retail service provider. The wholesale provider would staff a network operations center (NOC) with data technicians. These technicians would interface with their counterparts in each retail provider operation and not end-users.

C. Telephone

1. Retailer

Any retail provider of telephone service on the fiber network would be required to secure a competitive local exchange carrier (CLEC) license from the state of New Mexico. Such a license would allow the CLEC to provide local dial-tone services in competition with Qwest. They would be responsible for all marketing, sales, provisioning and billing for switched and dedicated (transport) telephone services. The retailer would likely own a telephone switch and establish connections to all local and long distance providers. In the case of Los Alamos, the CLEC would need to interconnect to Qwest in Los Alamos and at the tandem switch for the 505 LATA. This would allow the provider to route 100% of local and long distance calls in and out of the fiber network. The CLEC would also provide all customer service for telephone customers.

2. Wholesaler

A wholesale provider of telephone services on the fiber network would provide pipes from the retail point of presence to the every residential and commercial NIU. They would operate a NOC and interface with the NOC technicians for each CLEC on the system. The wholesale provider would hand off bulk voice traffic to CLECs, who would then switch the traffic and route to the appropriate destination. Wholesale services would be delivered to the POTS port on the NIU.

IV. Financial Analysis

Uptown completed a detailed financial analysis for wholesale business structures in Los Alamos. The wholesale scenario showed LAC as a wholesale provider that sold access to multiple 3rd party retailers. The details for both views of the business are outlined next.

A. Scenario Assumptions

The primary assumption values for wholesale and retail operations are listed in Exhibit 1.

Exhibit 1 – Basic Assumptions for Wholesale and Retail Business Case Scenarios

Assumption	Scenario	
	LAC Wholesale	3 rd Party Retailer
Service Pricing		
Expanded Basic Cable	\$10.00	\$35.00
Internet Tier 1	\$20.00	\$40.00
Internet Tier 2	\$20.00	\$60.00
Internet Tier 3	\$20.00	\$100.00
Internet Tier 4	\$20.00	\$150.00
Residential Telephone	\$12.00	\$28.75
T1 Transport	\$100.00	\$150.00
Capital Costs		
Construction cost per meter	\$900	\$0
NIU materials	\$750	\$0
Per Internet sub (CAT5)	\$0	\$100
Per Video sub (set top box)	\$0	\$250
Staffing (Year 5 FTE)		
General Manager	0.5	1.0
Engineer	1.0	0.0
Marketing / PR	0.0	1.0
Field Techs	4.0	0.0
Head End Techs	0.0	1.0
Data Techs	1.0	1.0
Service Reps	1.0	4.0
Financing		
Bond Term	17	10
Bond Rate	5%	10%

As Exhibit 1 shows, the wholesale provider (LAC) is responsible for all common network construction from the head end to the subscriber NIU. Retailers would be responsible for providing all applications specific equipment for video, Internet and telephone services. Items not noted above include the actual video head end and telephone switch, which would be provided by the respective video and telephone retailers. Sales and marketing expenses were also modeled as the sole responsibility of the retail providers.

B. Financial Results

Uptown ran the Full Service Network Business Model (FSN Model) for the scenarios described in Exhibit 1. The results for each business structure are summarized in Exhibit 2 and Exhibit 3.

Exhibit 2 – Margin Analysis for Wholesale and Retail Business Case Scenarios

	Scenario (\$20 Internet Wholesale Rate)	
Profit Margin (Revenue - COGS - SG&A)	LAC Wholesale	3 rd Party Retailer
Video Service	1.8%	6.6%
Internet Service	1.8%	3.8%
Telephone Service	1.8%	24.1%
Transport Service	1.8%	-3.1%
All Services	1.8%	10.4%

Exhibit 3 – Financial Results for Wholesale and Retail Business Case Scenarios

	Scenario (\$20 Internet Wholesale Rate)	
Outcome (millions)	LAC Wholesale	3 rd Party Retailer
Bond requirement	\$15.7	\$3.9
Working capital	\$8.5	\$1.4
Revenue Year 5	\$2.0	\$5.0
Operating income Year 5	\$1.2	\$1.0
Cash flow with debt service Year 5	-\$0.4	\$0.4
Cash flow with debt service Year 15	-\$0.5	\$1.2
Cumulative Cash Year 15	\$0.1	\$7.6
Total debt Year 15	\$13.2	\$0.0
10 Year Internal Rate of Return (IRR)	-16.0%	12.3%
15 Year IRR	-2.2%	18.4%

Exhibit 2 shows the profit margin for each service. This was calculated by subtracting the COGS and SG&A allocation from revenues for each service. SG&A expenses were allocated according to the percentage of total revenues that each service generated. For example, if there were \$10

million in total service revenues and video accounted for \$2 million, then video would be assigned 20% of the total SG&A costs in that year.

As the results in Exhibit 2 show, the profit margins are heavily skewed in favor of the retail provider. Given the fact that COGS is \$0 for all wholesale services, the actual profit margin is simply calculated using the allocation of SG&A for each service. This is why the margins are all the same in the case of the wholesaler. In any case, it is clear that the price levels needed to generate a positive case for the retailer do not produce a healthy case for the wholesaler. The financial results listed in Exhibit 3 tell the rest of the story in this side-by-side comparison.

Exhibit 3 clearly shows that the retail business case is much better than the wholesale case. The retailer business plan generates positive cash flow with debt service by the third year of operation and manages to generate over \$7.6 million in cash reserves by the end of the 15-year plan. The wholesaler (LAC) loses money every year and requires continuous cash infusions totaling \$8.5 million over the course of the 15-year plan.

Uptown chose the wholesale rates based on data gathered from other wholesale municipal networks that are either in development or have already been launched. However, it appears that this rate structure would not work in Los Alamos. Uptown increased the wholesale Internet price to \$25, leaving all other values in the business case unchanged. The results of this adjustment are listed in Exhibit 4 and Exhibit 5.

Exhibit 4 – Margin Analysis for Modified Wholesale and Retail Business Case Scenarios

Profit Margin (Revenue - COGS - SG&A)	Scenario (\$25 Internet Wholesale Rate)	
	LAC Wholesale	3 rd Party Retailer
Video Service	8.6%	6.3%
Internet Service	8.6%	-6.0%
Telephone Service	8.6%	23.8%
Transport Service	8.6%	-3.4%
All Services	8.6%	6.6%

Raising the wholesale Internet price by \$5.00 improved the wholesale case slightly, but damaged the retail plan significantly. The increase in wholesale pricing sent the retail Internet margin into negative territory, which would not be acceptable for such a large volume service. While transport services margins are negative, those services make up a very small piece of the overall revenue total. Internet services account for over one-third of total revenues, so marginal losses for every Internet service sold would not be acceptable in any scenario.

Exhibit 5 shows the financial outcomes for both operations when the wholesale Internet price is increased by \$5.00. The wholesale case improves, but still does not reach positive cash flow. As a result, at least \$200,000 per year in cash is required to maintain minimum cash reserve levels. In addition, the returns for the retail business plan (7.8% IRR in year 10) would fall below most lender thresholds given the level of risk involved in the business. The only remedy for the retail provider would be to raise price on one or more Internet tiers to make up the loss. Uptown ran several scenarios showing retail price increases, which showed that the impact on revenue was minimal. This was because the higher prices drove down penetration, which lowered revenue to levels generated by lower retail prices. This phenomenon is called “unitary price elasticity.”

Exhibit 5 – Financial Results for Modified Wholesale and Retail Business Case Scenarios

Outcome (millions)	Scenario (\$25 Internet Wholesale Rate)	
	LAC Wholesale	3rd Party Retailer
Bond requirement	\$15.7	\$3.9
Working capital	\$5.6	\$1.5
Revenue Year 5	\$2.2	\$5.0
Operating income Year 5	\$1.4	\$0.9
Cash flow with debt service Year 5	-\$0.2	\$0.2
Cash flow with debt service Year 15	-\$0.2	\$0.9
Cumulative Cash Year 15	\$0.2	\$4.4
Total debt Year 15	\$10.4	\$0.0
10 Year Internal Rate of Return (IRR)	-12.1%	7.8%
15 Year IRR	0.0%	14.5%

V. Recommendation

Based on the results of the aforementioned financial analysis, Uptown does not recommend that LAC pursue a wholesale strategy. Such a strategy would needlessly split a finite level of profit between two or more providers. The analysis has shown that the prevailing wholesale rates will not support a LAC fiber business (without significant subsidization) and higher wholesale rates would essentially ruin the retail business plan. See the Financial Analysis section of this report for the business case results of the proposed retail business structure for the LAC fiber network.