



Municipal Broadband In Concord:

An In-Depth Analysis



BHI Policy Study

March 2004

Municipal Broadband in Concord:

An In-Depth Analysis



David G. Tuerck, PhD
John S. Barrett, MSc

The Beacon Hill Institute
at Suffolk University

8 Ashburton Place, Boston, MA 02108
Phone: 617-573-8750 Fax: 617-720-4272
Email: bhi@beaconhill.org Web: www.beaconhill.org

ISBN- 1-886320-21-7

©March 2004 by The Beacon Hill Institute at Suffolk University

Table of Contents

Executive Summary	4
I. Introduction.....	10
II. Cautionary Tales	16
Tacoma Public Utilities Click! Network	16
Ashland, Oregon.....	17
Lebanon, Ohio	20
Braintree, Massachusetts	22
RCN.....	23
III. Financial Analysis for Concord	25
Preparing a Financial Analysis	25
The Uptown Study Summarized.....	26
Sensitivity Analysis	29
Risk Analysis.....	32
Cross-Subsidization and Municipal Priorities	35
Tax Issues	38
IV. Other Policy Issues.....	43
Issue 1. Should Concord Taxpayers or Users Foot the Bill?	43
Issue 2. Is Public Provision Economically Efficient?.....	44
Issue 3. Is Public Provision Fair?	45
Issue 4. Is Public Provision Prudent?	47

Table of Tables

Table 1. Click! Network Performance Shortfalls	16
Table 2. Ashland Business Plan Comparison	19
Table 3. Market Share Rates (%).....	29
Table 4. Results of Contingencies in the Concord Telecom Market	32
Box 1. Risk Analysis	33
Figure 1. Net Present Value Distribution	34

Executive Summary

The town of Concord, Massachusetts is considering a proposal under which Concord Municipal Light Plant (CMLP) would provide broadband cable and Internet service. If the town meeting were to approve this proposal, CMLP would enter into competition with existing private-sector Internet service providers and cable and video providers, including Verizon, Comcast, DirecTV and EchoStar.

The entry of public entities into competition with private-sector entities raises important economic, ethical and financial issues at the municipal and the national level. The citizens of Concord will be compelled to address these issues at the town meeting scheduled for April 26, 2004 when it will consider Article 34. Article 34 would authorize CMLP to enter into the cable television, Internet and telecommunications business but does not seek an appropriation of money for that purpose.

The Beacon Hill Institute has conducted an economic analysis of CMLP's proposal and of the likely impact of that proposal on Concord. The principal findings of that analysis are:

- The project runs a substantial risk of losing money.
 - There is 60% probability that it will lose money.
 - The loss (in present-value terms) could range from \$362,000 to \$2 million.
 - The “expected” (in a statistical sense) loss is \$542,000.¹
- If the project does lose money, taxpayers and electric ratepayers will be responsible for covering the losses.
- The project is at risk because existing and entrenched providers already serve the markets being entered. There are over 30 Internet service providers offering service in the Concord area. Unlike most such projects nationwide, CMLP has no first-to-market advantage. On the contrary, it has substantial late-mover disadvantages.
- The project could be made redundant by the advent of broadband over power lines.

¹ Concord Municipal Light Plant commissioned Uptown Services, LLC to prepare a business plan for the broadband venture. We subjected the Uptown plan to sensitivity and risk analysis in order to gain a better perspective on the true probability that the venture would be profitable. We measure profit and loss by the “net present value” of projected cash flows. Sensitivity analysis shows how a single, unfavorable turn of events (e.g., higher than expected costs, lower than expected market share) could cause an enterprise to incur a loss. Risk analysis shows the profit or loss an enterprise could “expect,” in a statistical sense, given the risks applicable to various factors (e.g., costs and market share) that affect profits.

- In effect, if Article 34 passes, Concord taxpayers would be investing in a start-up company that will face stiff competition from entrenched providers.

Most municipalities that have entered or are considering entering the broadband industry have existing municipal electric utilities. These utilities provide electricity to their communities at reasonable prices and with good customer service. This leads light department superintendents to believe that a municipal broadband business could have a similar outcome. Of course, there are numerous differences between providing broadband and providing electricity to a municipality, but two differences are too important to ignore.

The first is that, unlike a municipal utility, a municipally-run broadband business will face fierce competition. Not only are the odds stacked against a municipal broadband overbuilder, but even large joint ventures between private electricity providers and private cable firms that attempt to overbuild have had a tough time in this highly competitive environment.

Recently, RCN Corporation, a cable company that competes by building networks on top of existing cable networks, has run into financial trouble. On January 15, 2004, the company missed a \$10.3 million interest payment as it negotiated with the holders of its \$1.67 billion in debt in an attempt to avoid bankruptcy.² However this effort was not sufficient, inasmuch as the company announced on February 17, 2004 that it plans to file for Chapter 11 bankruptcy.³ Other firms have suffered bankruptcies, buildout freezes and abandonments. These include WesternIntegrated Networks/WINFirst (bankrupt), Altrio (frozen), American Broadband (abandoned), Utilicom (frozen) and SNETamericast (abandoned).⁴

Broadband providers that attempt to compete with an existing provider in a community are finding survival difficult. Large private sector cable providers including Comcast, Time Warner and Cox, are fully engaged in the broadband battle. The competitive environment is increasingly

² Jon Chesto, "RCN Scrambles vs. bankruptcy: And investors race to dump it," *Boston Herald*, January 16, 2004, (accessed at <http://business.bostonherald.com/businessNews/business.bg?articleid=1328>).

³ "RCN to File for Chapter 11", *Wall Street Journal Online*, February 17, 2004. (accessed from Internet <http://online.wsj.com/article/0,,SB107706192913731999,00.html>)

⁴ Ryan Naraine, "WINfirst Files for Chapter 11 Bankruptcy," *ISP Planet*, March 15, 2002 (accessed from Internet http://www.isp-planet.com/news/2002/winfirst_020315.html); Linda Haugsted, "Overbuilder Altrio Could Sell Soon," *Multichannel News*, February 23, 2004 (http://web.lexis-nexis.com/universe/document?_m=a51c4c370fa68d87d3158dc2ae3b10c9&_docnum=1&wchp=dGLbVzz-zSkVb&_md5=8a7287b51ec96a5110f3a8b9a80e9bc2); Timothy C. Barmann, "Massachusetts Cable Company

intense as satellite TV providers such as DirecTV (recently purchased by Rupert Murdoch's News Corporation) and EchoStar successfully compete with cable operators for subscribers. According to *The BRIDGE*, the market research, data collection and reporting program for the satellite industry, there were 202,500 satellite subscribers in Massachusetts as of January 1, 2004, up 8% over the previous year. There were 1,752,666 cable subscribers in Massachusetts as of January 1, 2004, down 9.55% from the previous year.⁵

This trend is echoed by the Federal Communications Commission in its tenth *Annual Report on Competition in Video Markets*. From 1993 to 2003 satellite subscribers increased from 3.1 million to 22.7 million, representing growth of 632%.⁶ These large cable companies have seen their market share evaporate over the last decade, and there is no reason to believe that municipal providers will not experience the same trend, especially if they are the third broadband entrant (behind Verizon and Comcast) and the fourth video entrant (behind Comcast, DirecTV and EchoStar) as is the case in Concord.

The competitive landscape may even become more intense. Allan Tumolillo of Probe Financial Associates describes the future competition between satellite TV and cable providers: "There is the increasing likelihood of an all out subscriber war in 2004."⁷ Concord is thinking of entering a business that is losing market share and may face a 'subscriber war' that should favor the competitors with the resources to survive.

The second major difference between providing broadband and providing electricity, is the dynamics of the technology required. The technology needed for broadband deployment and its ever expanding features changes at a dizzying pace. The large initial investment needed to build out the system infrastructure is just the beginning of a never ending series of required investments. As we have noted, this constant need for capital investment can put a severe financial strain on large private companies such as RCN. For municipalities it can prove to be a harsh reminder that broadband provision is not like running a municipal water system.

Will Not Build Network in Rhode Island," *Providence Journal-Bulletin*, March 28, 2001 (http://web.lexis-nexis.com/universe/document?_m=feebcdc2a6721a97bfea4b75700895dc&_docnum=1&wchp=dGLbVlz-zSkVA&_md5=5ba733dc8a7d7009009b6be2381cddcd).

⁵ "The BRIDGE, Video Penetration by State as of January 1, 2004", Media Business Corporation (accessed from www.mbc-thebridge.com).

⁶ Federal Communications Commission, *Annual Assessment of the Status of Competition in the Market for the Delivery for the Delivery of Video Programming* (January 2004), FCC 04-5.

⁷ Thal Larsen, "Masters of the 'fat pipe': Cable Giant Comcast Flexes Its Muscles and Sends Shudders Through the US Media," *Financial Times*, Wednesday, February 11, 2004, p. 11.

The recent case of Braintree, Massachusetts mirrors what other municipalities can expect to face if they enter the broadband market. Initially the Braintree Electric Light Department (BELD) had success in attracting both cable and Internet users by offering a lower price than the incumbent cable provider. BELD's early success stemmed from the incumbent's failure to upgrade plant for broadband capability or to make service improvements. The existing cable provider, Cablevision, had not upgraded the Braintree system yet and Verizon had not undertaken a full rollout of DSL when BELD entered the market.

Now the private broadband provider, Comcast, has upgraded its system and BELD is being forced to keep pace. The pressures of cost increases for programming and new investment have recently forced BELD to announce substantial price hikes for their services. They include increases of 21% for BELD Basic, 20% for BELD Digital, 21% for BELD Complete, and 20% for the BELD Digital and BELD.net combination package.⁸ These price increases narrow BELD's price advantage over Braintree's private cable operator from an average of 33% to 11%.

BELD General Manager William Bottiggi explained the price increases, saying, "We've reached a point when we have to reinvest in equipment for the business. Technology is changing. Broadband is more of a high-tech business. In order to stay competitive, you have to invest in equipment."⁹ After only two years, BELD has learned what the private sector has known for quite some time, namely that the telecommunications business is extremely competitive and requires substantial capital spending in order to keep up with technological change and customer demands for new products.

The large, continual investments in infrastructure required to build a municipal broadband network may prove to be a financial albatross if newer technologies render that infrastructure obsolete. One example is especially pertinent to any electric utility that contemplates entering the cable and telecommunications business. Because nearly all U.S. homes are wired for electricity, power lines offer a universally available means of data transmission. Until recently, technical problems barred this option. But Ambient Corporation of Newton, Massachusetts has developed a device that steers broadband signals around transformers that regulate electrical transmission.

⁸ Robert Aicardi, "BELD Cable/Internet Rates Go up February 1", *Braintree Forum*, January 14, 2004.

⁹ Ibid.

Another Massachusetts company, Amperion Incorporated of Chelmsford, has developed a different method that jumps the signal from medium voltage lines directly to consumer homes.

Amperion has rapidly moved from the testing phase to offering commercial service. The company has partnered with utility provider PUC, Inc. to offer high-speed Internet service through the power grid in the Canadian town of Sault Ste. Marie.¹⁰ The service will allow residents to access the Internet through wireless or “Wi-Fi” technology as long as they are within 150 meters of an access point. In essence this will turn the densely populated city into one giant “hotspot,” allowing subscribers to access the Internet from all over the city.

The Federal Communications Commission (FCC) recognized the viability of broadband over power lines (BPL) when it proposed rules governing the technology.¹¹ Communities such as Braintree and Norwood, which rushed into overbuilding their broadband system, might, in light of this technology, have spent millions of dollars to get into the wrong business. Municipal utilities therefore need to take a long look at BPL. The wise course of action might be to wait until this technology is fully mature before entering the extremely competitive and already well-served broadband market.

Communities have entered the broadband market with differing degrees of success. All of them entered believing their system would bring the hoped-for advantages with none of the possible pitfalls. Many of them have been disappointed. We review three communities whose experience providing broadband has not yet met the expectations projected in the planning stage of their projects:

- Tacoma, Washington has yet to break even after beginning operations of its Click! Network in 1998. Costs have exceeded expectations, and during the 2001/2002 biennium the network incurred a deficit of over \$23 million.
- Ashland, Oregon’s municipal cable company encountered lower revenue and higher than expected costs. This contingency coupled with construction of the network falling 18 months behind schedule led to the appointment of an Ashland Fiber Network (AFN) advisory committee. The original business plan was

¹⁰ Tyler Hamilton, “Sault Ste. Marie makes high-speed power play”, *Toronto Star*, (accessed online http://www.thestar.ca/NASApp/cs/ContentServer?pagename=thestar/Layout/Article_Type1&c=Article&cid=1075936210031&call_pageid=968350072197&col=969048863851) February 5, 2004.

¹¹ Federal Communications Commission, “Notice of Proposed Rule Making, In the Matter of Carrier Current Systems, including Broadband over Power Line Systems”, ET Docket Nos 03-104 04-37 (rel. Feb. 23, 2004).

revised in October of 2001 with much more modest market share projections and heavier inter-departmental borrowing. These new numbers still proved too optimistic as AFN attempted to revise the plan again in 2003. However, the city council rejected the second revision and hired an outside consultant to study the system.

- Lebanon, Ohio has faced higher than anticipated programming costs forcing the city to continually raise the rates for their municipally provided cable service. The current prices are higher than prices projected for 2005. The city also faces a lengthy and expensive court battle with the incumbent Time Warner.

Our overall conclusion is that there are numerous pitfalls for Concord to consider as it takes the proposal under consideration. We hope that, by identifying these pitfalls, we can provide the citizens of Concord with a better understanding of the complexities of the enterprise they are being urged to undertake. The decision to go ahead, or not, rests with the citizens of Concord.

I. Introduction

The town of Concord, Massachusetts is considering a proposal under which Concord Municipal Light Plant (CMLP) would provide broadband cable and Internet service. Were Concord to approve this proposal, CMLP would enter into competition with several private sector Internet service providers and cable and video providers.

The entry of public entities into competition with private-sector entities raises important economic, ethical and financial issues at the municipal and the national level. *Caveat civitas* – let the townspeople beware! In this report we examine the questions facing Concord and other municipalities that contemplate entry into the cable business.

According to a survey conducted in 2001 by the American Public Power Association, 450 out of 2,008 municipal power systems offer at least some kind of broadband service.¹² The growing number of municipalities seeking to offer broadband services, whether limited commercial applications or full scale three-service facilities overbuilds, is in part the result of the Telecommunications Act of 1996, 47 U.S.C. §201 *et seq.* (the Act), which sought to spur competition in all communications markets.¹³

Whether the entry of municipalities into the cable business serves the purpose of the Act – or, more generally, the interests of the consumer – is open to question. Municipal efforts to offer communication services often surface as a reaction to perceived or actual consumer dissatisfaction with existing private providers. If the municipality has its own electric power utility, the managers of that utility may see an opportunity. The same managers may claim that the municipal utility has the infrastructure to make the new venture profitable for the town and the utility should take full advantage of its fiber-rich networks used to help operate the electrical grid. Cable service, like electric power, is characterized by economies of scale that favor a single

¹² American Public Power Association, “Public Power: Powering the 21st Century with Community Broadband Service,” accessed from http://www.appanet.org/pdfreq.cfm?PATH_INFO=/legislativeregulatory/broadband/CommunityBroadbandFact.pdf&VARACTION=GO; Internet.

¹³ Proponents of municipal cable cite Section 253(a) of the “Act”, which states that “no state or local statute or regulation, or other State or local requirement may prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service.” The presumption is that this section of the statute authorizes the entry of any provider – public or private – into the cable market.

provider. Some townspeople may feel that if there is to be only one provider, then it should be the municipality itself. Others may simply welcome the availability of a new choice.

Entry by a public provider gives rise to conflicting arguments about the proper role of the public sector in providing what, in many respects, is an entirely private service. Some argue that it is unfair for government to enter into a competition that puts a private provider at an inherent disadvantage. Municipal providers are exempt from property and corporate income taxes and, in many cases, can secure financing without having to turn to the open market. The result may be the substitution of a public monopoly for a private one or, worse, the substitution of a public monopoly for what would otherwise be (despite the economies-of-scale issue) robust competition between private providers. Recognizing these arguments, eleven states, including Florida and Texas, have passed legislation to ban or severely curtail municipalities from competing with the private sector in the telecommunications industry.¹⁴ Despite lawsuits brought by utility commissions, the Federal Communications Commission (FCC) in its governing capacity has failed to overturn these state laws.

Conversely, the very advantages that municipalities have over private providers can cause them to underestimate the risks of getting into a telecommunications business and then put the resulting consequences of a bad business decision onto taxpayers or onto the municipal utility's power users. When a private provider gets into financial trouble, the consequences fall mainly on its stockholders. When a municipal provider gets into trouble, the municipality itself suffers the consequences.

To a large degree, the argument for municipal cable rests on the assumption that the service offered by an existing provider is both poor and expensive and on the assumption that the municipality can invest in cable, assured of generating a large permanent cash flow. This argument collapses, however, if a private provider, whether new or existing, offers better service at a lower price in strong competition with the municipality or if technology and the market change in such a way as to render obsolete the municipality's investment.

¹⁴ American Public Power Association, "Public Power: Powering the 21st Century with Community Broadband Service," accessed from http://www.appanet.org/pdfreq.cfm?PATH_INFO=/legislativeregulatory/broadband/CommunityBroadbandF act.pdf&VARACTION=GO; Internet.

The competitive environment is increasingly intense as satellite TV providers such as DirecTV and EchoStar successfully compete with cable operators for video subscribers. According to *The BRIDGE*, the market research, data collection and reporting program for the satellite industry, as of January 1, 2004 there were 202,500 satellite subscribers in Massachusetts, growing at a rate of 8% last year. There were 1,752,666 cable subscribers in Massachusetts as of January 1, 2004, down 9.55% from the previous year.¹⁵ This trend is echoed by the FCC in its tenth *Annual Report on Competition in Video Markets*, “Ten years ago, cable operators served almost 100% of the nation’s subscribers. Today cable’s share has fallen to approximately 75%.”¹⁶ Satellite provider DirecTV has even linked up with Verizon Communications to offer subscribers television and high-speed Internet service on a single bill; taking advantage of Verizon’s marketing power. In the words of Mark May, an analyst at Kaufman Brothers, “Broadband growth is slowing; it has become a mature product and is now reaching the mass market stage of its development.”¹⁷

The competitive landscape may become even more intense. Allan Tumolillo of Probe Financial Associates describes the future competition between satellite TV and cable providers, “There is the increasing likelihood of an all out subscriber war in 2004.”¹⁸ Concord is thinking of entering a business that is losing market share and may face a ‘subscriber war’ that should favor the competitors with the resources to survive.

And technology is far from stagnant. For example, there is an emerging technology that may make any lack of broadband deployment moot. Power lines offer a universally available means of data transmission. Until recently, technical problems barred this option. But Ambient Corporation of Newton, Massachusetts has developed a device that steers broadband signals around transformers that regulate electrical transmission. Another Massachusetts company, Amperion Incorporation of Chelmsford, has developed a different method that jumps the signal from medium voltage lines directly to consumer homes.

¹⁵ “The BRIDGE, Video Penetration by State as of January 1, 2004,” Media Business Corporation (accessed from www.mbc-thebridge.com).

¹⁶ Federal Communications Commission, *Annual Assessment of the Status of Competition in the Market for the Delivery for the Delivery of Video Programming* (January 2004), FCC 04-5.

¹⁷ “Cox Posts a 4th Quarter Loss,” Reuters [newstory on-line] (New York, NY, accessed February 12, 2004) available from <http://money.cnn.com/2004/02/12/news/companies/cox.reut/index.htm>.

¹⁸ Thal Larsen, “Masters of the ‘fat pipe’: Cable Giant Comcast Flexes Its Muscles and Sends Shudders Through the US Media,” *Financial Times*, Wednesday, February 11, 2004, p. 11.

Amperion has rapidly moved from the testing phase to offering commercial service. The company has partnered with utility provider PUC Inc. to offer high-speed Internet service through the power grid in the Canadian town of Sault Ste. Marie.¹⁹ The service will allow residents to access the Internet through wireless or “Wi-Fi” technology as long as they are within 150 meters of an access point. In essence this will turn the densely populated city into one giant “hotspot,” allowing subscribers to access the Internet from all over the city.

The FCC sees broadband by utility companies over their existing wires (BPL) as a viable technology.²⁰ According to FCC Chairman Michael Powell, “This technology is very exciting.”²¹ He continued by saying, “It offers enormous potential for the kind of competition we seek.”²²

Ambient has tested its technology with the help of utilities in New York and Georgia and has predicted it would be available to the general public by 2004.²³ The prospective deployment of this technology may represent an opportunity for municipal cable: Municipal power utilities might be able to provide broadband service directly to their customers without having to install traditional cable modems.

It could represent a setback. In the homes being tested by Ambient, the system shows transmission speeds three times as fast as cable modem or digital-subscriber-line service. The technology thus threatens to render the existing cable infrastructure, whether publicly or privately developed, obsolete. What sense would it make now for a municipality to start placing cable modems in their customers’ homes, if they’ll be able to provide the same service in a few years through existing power outlets? This is just the kind of business question that the public sector is poorly equipped to answer.

Other technologies already in or entering the market will pose both competitive and investment challenges for municipal operators; these include Video on Demand, Voice Over Internet

¹⁹ Tyler Hamilton, “Sault Ste. Marie makes high-speed power play”, *Toronto Star*, February 5, 2004, (accessed from http://www.thestar.ca/NASApp/cs/ContentServer?pagename=thestar/Layout/Article_Type1&c=Article&cid=1075936210031&call_pageid=968350072197&col=969048863851).

²⁰ Federal Communications Commission, Notice of Proposed Rule Making, In the Matter of Carrier Current Systems, including Broadband over Power Line Systems, ET Docket Nos 03-104 04-37 (rel. Feb. 23, 2004).

²¹ Donny Jackson, “FCC OKs rules for BPL Technology”, February 13, 2004, (accessed from telephonyonline.com/ar/telecom_fcc_oks_rules/index.htm).

²² Ibid.

Protocol Internet telephone capability, and High Definition TV. Subscribers will demand these new services and put pressure on municipal providers to make the necessary significant additional capital expenditures. For example, in the home market of Comcast, Philadelphia, half of the 800,000 digital subscribers who have access to the video on demand service use it regularly, averaging about 13 requests per month for each user.²⁴ In this highly competitive marketplace, with ever-changing technology CMLP will not be able to just wire their network, sit back and let the money roll in, as we shall see in the case of Braintree, Massachusetts.

Proponents of municipally-owned broadband systems say that the increase in the number of such systems reflects the inability of the private sector to meet the needs of consumers. The facts do not support this assertion. As of April 2003, there were 106,641,910 television households in the United States.²⁵ Of these a stunning 96.7% have access to cable services.²⁶ Broadband deployment, while slightly lower, is still more than respectable, with over 90 million homes having access to cable modem service. Of the households with access to cable modem Internet service, about 15 million households took advantage of it.²⁷ About 8.4 million households have DSL service.²⁸

This report examines CMLP's proposed entry into the cable business and the financial, economic and political consequences for Concord. We attempt to offer a comprehensive examination of the issues that Concord should consider in deciding whether to give the project final approval, or not.

Many municipalities have had apparent success in their efforts to provide cable service and other broadband services. Others have not. Section II of the report offers some "cautionary tales" about the problems encountered by some municipalities as a result of their decision to enter the business.

²³ Andrew Manuse, "Outlets Promise to Hold Further Internet Power," *Boston Herald*, July 14, 2003, p.24.

²⁴ Ibid, p.11.

²⁵ National Cable & Telecommunications Association, accessed from http://www.ncta.com/industry_overview/indStat.cfm?indOverviewID=2; Internet; accessed on May 3, 2003.

²⁶ Ibid.

²⁷ National Cable & Telecommunications Association, accessed from <http://www.ncta.com/press/press.cfm?PRid=408&showArticles=ok>; Internet; accessed on February 25, 2004.

²⁸ "During the quarter ended Sept. 30, [2003,] cable companies accounted for 64 percent of the overall U.S. residential broadband market, while DSL garnered the remaining 36 percent." Given that there are 23.4 million subscribers to cable modem or DSL Internet service, that puts the number of DSL subscribers at 8.4 million. http://www.leichtmanresearch.com/research/notes12_2003.pdf

The economic basis for CMLP's proposed entry into the cable business is a network planning study commissioned by Concord and performed by Uptown Services, LLC (Uptown) of Colorado. Section III examines the Uptown study and submits the study's projections to risk and sensitivity analysis. Section IV examines the question of municipal participation in the cable business from a broader policy viewpoint.

Our overall conclusion is that there are numerous pitfalls for Concord to consider as it takes the proposal under consideration. We hope that, by identifying these pitfalls, we can provide the citizens of Concord with a better understanding of the complexities of the enterprise they are being urged to undertake. The decision to go ahead, or not, rests with the citizens of Concord.

II. Cautionary Tales

There is no guarantee that a town or company can successfully operate a broadband network. This is the central message from three municipalities that have entered the broadband market. These cases show some of the things that can go wrong when municipalities enter the business.

Tacoma Public Utilities Click! Network

In 1996, the city of Tacoma, Washington hired SRI Consulting to explore the possibility of entering the broadband market. The SRI report advised Tacoma to consider “playing a significant role in the advanced communications business.”²⁹ Tacoma Public Utilities (TPU) opted to enter the broadband market to seek new revenue because income from its core business of providing electricity had leveled off.³⁰

In April 1997, the Tacoma City Council gave TPU the authority to begin building the “Click! Network” for the purpose of providing cable TV, Internet and high-speed data transmission services. The plan initially called for issuing municipal bonds to finance the network, but ultimately TPU used existing cash reserves from its electricity business to build the network. Reserves that may have been better used lowering electric customers’ rates. Services were scheduled to be delivered beginning September 15, 1997. Table 1 below details the Click! Network’s projected versus its actual performance.

Table 1. Click! Network Performance Shortfalls

Goals	Projected Performance	Actual Performance
Start date	September 15, 1997	July 27, 1998
Customers	34,312 by end of 1998	21,000 at the beginning of 2003 ³¹
Revenue	\$22.7 mill. in 1999	\$22.2 mill. for the 2001/2002 biennium ³²
Capital budget	\$40 million	Over \$100 million to date
Profit	\$1.9 million by end of 1998	Has not yet reached break-even point

²⁹ SRI Consulting, “Telecommunications Strategy Assessment”, prepared for the Light Division of Tacoma Public Utilities, May 21, 1996.

³⁰ Paul Guppy, “When Government Enters the Telecommunications Market,” *Policy Brief*, (Seattle: Washington Institute Foundation, June 2001) Washington Institute Foundation, June 2001, p. 4.

³¹ Cecelia Nguyen, “University Place Ready to Go Online with Click!,” *Tacoma News Tribune*, accessed at <http://www.tribnet.com/news/local/v-printer/story/2402865p-2454295c.htm>; Internet; accessed January 28, 2003.

³² Tacoma Department of Finance, “City of Tacoma Summary of Revenues and Other Financing Sources by Fund December 2002” accessed at <http://www.cityoftacoma.org/default.asp?main=/54finance/default.asp>; Internet; accessed on June 25, 2003.

The Click! Network has continually fallen short of expected goals set forth in the consultant's study. The initial system was projected to have a capital budget of \$40 million. Currently, however, capital costs have risen to over \$100 million. The most recent published report of revenues and expenditures by fund by the City of Tacoma Department of Finance shows that, while the telecommunication fund, which receives and expends revenue on behalf of the Click! Network, projected \$27.2 million in revenue for the 2001/2002 biennium, it actually only garnered \$22.2 million. The network was only budgeted to spend the \$27.2 million in projected revenue, but by the end of the biennium, the network expenditures had reached \$45.5 million.³³

This led to a deficit of over \$23 million for the 2001/2002 biennium. In the private sector, losses of this nature would be covered from the pockets of private investors or would lead a company to fold or to seek acquisition by a more efficient competitor. In the public sector, the response instead is to hang on, shifting costs to ratepayers or taxpayers.

Ashland, Oregon

In 1998 the city of Ashland, Oregon believed that entering the broadband market would be a good way for the electric department to diversify its revenue stream in the face of deregulation of the electric utility industry. Lower revenue and higher-than-expected costs have, however, put Ashland's city-owned broadband system in a precarious state. The construction of the Ashland Fiber Network (AFN) fell 18 months behind schedule and led to the appointment of an AFN advisory committee. The committee was created at the suggestion of members of the Ashland Citizens Budget Committee, who were concerned with the financial state of AFN.

A large factor in the success projected in the city's original business plan, completed by the private consulting group R.W. Beck, was the belief that the incumbent cable provider, Charter Communications, was prohibited from dropping rates according to its franchise fee agreement with the city. On this assumption, Ashland believed the city's cable company would have a 20% price advantage. The city was mistaken in its assumptions. The creation of AFN resulted in Charter's lowering prices and increasing advertising. City Councilor Don Laws expressed concern that actual future revenues from AFN will differ greatly from the business plan

³³ Ibid.

predictions if competition is not considered. “The initial assumptions were there would be no price competition and obviously there’s been intense competition,” he said.³⁴

In December 2000, Pete Lovrovich, who left his position as Ashland’s Electric Department Director in April, 2001, projected the city would have 1,825 cable subscribers and 1,966 Internet subscribers by June 30. The actual June numbers were 1,483 cable subscribers, 19% below the original projections of December, and 1,403 Internet subscribers, 29% below the December projections.

In October 2001, Ashland was forced to revise its business plan as a result of several key miscalculations: Revenues were not meeting initial business plan projections, capital expenditures were outpacing the amount projected in the original business plan, construction of the network was taking longer than estimated and the underestimation of the competitive response of the incumbent cable company was threatening market share. Table 2 below compares the business plan as it appeared in April 2001 with the revised business plan of October 2001.

The largest discrepancy between the two business plans is the assumption about cumulative cash. The difference between the initial plan and the revised plan in year ten is an astounding \$10.8 million. According to the revised plan, the system will only have \$1.1 million in cumulative cash by year 15 of the plan.

The 2001 numbers still proved too optimistic as AFN attempted to revise the plan again in 2003. However, the city council rejected the second revision and hired an outside consultant to study the system. According to Dick Wanderscheid, the new Director of Ashland’s Electric Department and manager of AFN, “The 2001 Business Plan is no longer valid. We revised that plan and brought it to the city council in September. They were not comfortable with the revisions we made. So they hired an outside consultant, Navigant Consulting, to study the system and make revisions.”³⁵

The reasons for AFN to continue to plan incorrectly are two-fold: the failure of their commercial high-speed data product to achieve targets and continued rising costs. Mr. Wanderscheid blames the dotcom downturn and out of control fixed costs for getting little more than half of the

³⁴ Myles Murphy, “Mixed Reviews for AFN Report”, *Ashland Daily Tidings*, August 22, 2001.

³⁵ Steven Zimmerman, “Council to weigh in on lagging AFN”, *Ashland Daily Tidings*, February 2, 2004.

customers projected in the 2001 business plan. He adds, “...one of the biggest problems we face is we don’t have a lot of control over our costs. Most of them, like programming, are fixed costs.”³⁶

Table 2 Ashland Business Plan Comparison

Assumption	Initial Plan	Revised Plan
Financial		
Positive Net Income		
First Plan Year	Year 6	Year 9
Fiscal Year	2003-2004	2006-2007
10 Year Cumulative Gain/(Loss)	\$3,806,606	(\$6,985,671)
15 Year Cumulative Gain/(Loss)	N/A	\$1,133,810
Advertising Revenue – Total		
Years 1 – 10	\$998,460	\$293,407
Years 1 – 15	N/A	\$738,424
Telephony Revenue – Total		
Years 1 -10	\$507,821	N/A
Years 1 – 15	N/A	N/A
Peak Internal Borrowing	\$4,900,000	\$8,900,000
Plan Year	Year 5	Year 9
Fiscal Year	2002-2003	2006-2007
Operational		
Cable Rate Increases – Annual %	3.50%	3.00%
Frequency	Each Year	Each Year
Starting Plan Year	Year 3	Year 5
Fiscal Year	2000-2001	2002-2003
Cable Market Share		
Year 5	40%	30%
Year 10	40%	30%
Year 15	N/A	30%
Cable/Modem Monthly Rate Increases	0.00%	\$2/Account
Frequency	N/A	Every other year
Starting Plan Year	N/A	Year 4
Fiscal Year	N/A	2001-2002
Include Franchise Fee	N/A	2001-2002
ISP – Residential Market Share		
Year 5	52%	33%
Year 10	52%	33%
Year 15	52%	33%

Table reproduced as it appears in Ashland Fiber Network Quarterly Report 10/2001

Another area of concern is the internal borrowing of the network. Even after several rounds of multi-million dollar “borrowing” from other city agencies, the Ashland network still planned to

³⁶ Ibid.

borrow another \$8.9 million to finance its operations. Such funds, totaling nearly \$20 million in total, divert monies that could have been spent on more pressing municipal needs such as the sewer system, police department or schools.³⁷

A realistic business plan is a necessary first step, but reality rarely mirrors a business plan. Perhaps if Ashland had spent more time considering possible unfavorable contingencies the feasibility analysis would have helped to avoid the current situation. “While the effect of competition was positive for Ashland cable subscribers whichever service they use, if AFN does not succeed, all Ashland taxpayers will pay the price in the end,” according to Mayor Alan DeBoer.³⁸ The city fathers of Ashland were not prepared for the stiff competition in pricing and marketing from the incumbent provider, and as a result, they face a long struggle to make their city cable system solvent.

Lebanon, Ohio

By building its own cable system, the city of Lebanon, Ohio hoped to give its citizens a cheaper alternative to the incumbent provider, AOL Time Warner. But the system’s price tag rose from the \$5 million estimated in 1999 to \$9 million in December 2000, and the city has faced fierce price competition from AOL Time Warner. When the city signed up its first customers in February of 1999, AOL Time Warner responded by slashing its prices.

Initially the city cable system did bring lower rates to the citizens of Lebanon. But just 18 months after launching the system, city officials were talking about rate increases. In December of 2000, both AOL Time Warner and the city were charging \$5.99 for their lifeline analog package and \$14.99 for their standard analog package. In the same month, the city proposed raising the next year’s rate for the lifeline package to \$6.99 and the rate for the standard package to \$16.99. The new rates for digital service would be \$20.49 for basic digital and \$23.99 for deluxe digital in 2001. Projections showed that by 2005, Lebanon’s rates would be \$9.49 for the basic analog package, \$20.49 for the standard analog package, \$27.49 for the basic digital package and \$30.49 for the deluxe digital package.

³⁷ Rogue City, “Ashland Technology Evaluation Issues and Concerns,” accessed at <http://roguecity.com/Oregon/AFN%20Timeline.htm>; Internet; accessed on January 28, 2003.

³⁸ Myles Murphy, “AFN Panel Continues Inspection of Details”, *Ashland Daily Tidings*, August 24, 2001.

But these earlier projections were not accurate. Currently the city of Lebanon charges \$8.99 for basic analog service, \$29.98 for standard analog, \$34.73 for basic digital service and \$42.48 for deluxe digital service. The reason for the rate hikes is increases in programming costs. From 1999, when the city's system was launched, through 2001, programming costs, the price paid by cable providers for the right to carry such premium channels as HBO or ESPN, rose 28%, from \$9.66 per subscriber to \$12.37. Cable prices are likely to rise through 2005 as programming costs rise.³⁹

Afraid of the loss of customers due to the rate hikes, Lebanon officials threatened to use police officers to enforce a 36-year-old law, one that they have never used before, as a way to stop door-to-door sales by AOL Time Warner. In an attempt to prevent a competitor from gaining additional customers, city officials claimed they were just looking out for city residents. The head of the telecommunications system for the city claimed that 40 residents complained that AOL Time Warner employees would knock on their doors, pitch the company's services and offer to install them on the spot. However, no written records of these complaints exist, according to city attorney Mark Yurick.⁴⁰

By May 2001, Lebanon's broadband system was saddled with increased debt and stagnant revenues. The city-owned utility proposed an increase in electric rates after city officials agreed to borrow \$14.8 million in mortgage revenue bonds, part of which will be used to cover debt from the broadband department.

Previously, in 2000, the city council approved a 20% electric rate hike for residents served by the city-owned utility. Council Member Mark Flick said, "The 20% increase [in 2000] in electric is going to seem like nothing compared to what they'll see from this [May 2001 mortgage bonds mentioned above]." Flick stated the \$14.8 million would actually be in the neighborhood of \$22.5 million once interest was paid. But he doesn't see much of a choice: "We can back away and eat the mistake that was done [with the creation of telecom]. But the loss of money there is greater than this expenditure. Telecom will never pay for itself as it exists. Unless functions are added to it, it will not pay in 30 years. The bottom line is that, no matter what, you, the taxpayers, will pay for the failure. The ultimate outcome will be higher taxes."⁴¹

³⁹ Cindi Andrews, "Lebanon Cable Costs Up", *Cincinnati Enquirer*, November 28, 2000.

⁴⁰ Cheryl M. Harris, "Time Warner Resumes Sales Pitch", *Dayton Daily News*, December 16, 2000.

Officials who are experienced managing an electric utility that faces little or zero competition are not necessarily prepared to take on corporate giants such as Time Warner. In the case of Lebanon, Council Member Flick's comments lead one to believe that the city is in a position of throwing good money after bad.

Braintree, Massachusetts

The twin challenge of operating in a highly price competitive marketplace characterized by dynamic technological innovation that leads to new products that require almost constant new investment is exemplified in the case of Braintree, Massachusetts.

Braintree Electric Light Department (BELD) is a municipally owned public utility located five miles south of Boston, Massachusetts. BELD serves the 41.1 square mile Township of Braintree and has 14,500 electric customers. In October of 1999, Network Engineering Consultants, Inc. (NECI) began working with Braintree by performing a feasibility study to assess if BELD could be successful in offering cable TV services. On the recommendation of NECI, BELD officially launched its new cable TV services to the Braintree community on February 28, 2001.

Initially BELD had success in attracting both cable and Internet users by offering a lower price than the incumbent cable provider. The fact the BELD was first to market with new technologies, such as high-speed Internet service contributed to its early success. The existing cable provider, Cablevision had not upgraded the Braintree system yet and Verizon had not undertaken a full roll out of DSL when BELD entered the market. However, the pressures of cost increases for programming and new investment have forced BELD to recently announce substantial price hikes for their services. They included increases of 21% for BELD basic, 20% for BELD Digital, 21% for BELD Complete, and 20% for the BELD Digital and BELD.net combination package.⁴² These price increases narrow the BELD price advantage for these services over Braintree's private cable operator from an average of 33% to 11%.

BELD General Manager William Bottiggi explained the price increases by saying, "We've reached a point when we have to reinvest in equipment for the business. Technology is changing. Broadband is more of a high-tech business. In order to stay competitive, you have to invest in

⁴¹ Lisa Loveless-Manz, "Rising Electric Rates May Zap Residents", *Dayton Daily News*, May 19, 2001.

⁴² Robert Aicardi, "BELD Cable/Internet Rates Go up February 1", *Braintree Forum*, January 14, 2004.

equipment.”⁴³ BELD is upgrading because they fear that they will lose customers to the current private sector cable operator, Comcast, which already has digital TV, high-speed Internet, HDTV tiers, video on demand and local telephony.

Cost increases for programming is another reason cited by Mr. Bottiggi for the recent price increases. He alludes to the disadvantage BELD has over the competition in this area by saying, “we’re at a disadvantage because they have a huge operation while we have a small operation.”⁴⁴

BELD customers can expect further price increases as more investments in infrastructure and new products are planned. The firm plans to offer services that include high-definition television service (HDTV) and digital video recorders as well as video on demand. On the infrastructure side, BELD plans to install new monitoring software, a redundant Internet connection, a ‘peer to peer’ coordination system and additional features to its hosting service.⁴⁵ All of these new investments on top of programming increases may further erode BELD’s price advantage over its private competition.

RCN

Even large joint ventures between private electricity providers and cable firms that attempt to “over build” on top of existing cable providers have had a tough time in this highly competitive market. Recently, RCN Corporation (RCN), a cable company that competes by building networks on top of existing cable networks is in deep financial trouble. On January 15, 2004, the company missed a \$10.3 million interest payment as it negotiated with the holders of its \$1.67 billion in debt in an attempt to avoid bankruptcy.⁴⁶ However this effort was not enough as the company announced on February 17, 2004 that it plans to file for Chapter 11 bankruptcy.⁴⁷

RCN’s partners are bailing out as the shadow of bankruptcy looms. NSTAR, RCN’s electricity provider and partner in Boston, first exercised an option to get out of its 50/50 partnership with RCN a few years after it was launched in exchange for RCN stock, and recently was forced to

⁴³ Ibid.

⁴⁴ Ibid.

⁴⁵ Ibid.

⁴⁶ John Chesto, “RCN Scrambles vs. bankruptcy: And investors race to dump it,” *Bostonherald.com*, January 16, 2004, (accessed from Internet, <http://business.bostonherald.com/businessNews/business.bg?articleid=1328>).

⁴⁷ “RCN to File for Chapter 11”, *Wall Street Journal Online*, February 17, 2004. (accessed from Internet <http://online.wsj.com/article/0,,SB107706192913731999,00.html>).

write the stock off as a total loss. Pepco Holdings INC (PHI), a Maryland electric utility company and RCN's partner in cable provider Starpower, which bundles cable, phone, and Internet services, recently announced that it is selling its stake in Starpower. According to Pepco president and CEO Dennis R. Wrase the move is part of "an ongoing effort to redirect PHI investments to focus on energy-related businesses."⁴⁸ These events are not good signs for RCN specifically or for the 'over-builder' business model in general.

⁴⁸ Pepco to Unload Starpower Stake, Multichannel News, January 29, 2004, Internet.

III. Financial Analysis for Concord

When any entity undertakes a business venture, it should be reasonably assured that the venture will be a financial success. The overriding question for Concord as it contemplates entry into the broadband business must be, “Will it make money for Concord?”

Here we outline some of the pertinent issues that arise in the consideration of that question. We show that a proper financial analysis should consist of (1) determining the cash flow that the project can be expected to generate over its life; (2) discounting that cash flow to determine net present value; and (3) subjecting the estimated net present value to “sensitivity” and “risk” analysis. We further show how CMLP’s marginally profitable broadband project may turn out to be a money-loser for Concord.

Second, we consider the problem of cross-subsidization as it arises in public enterprise and, in particular, in the broadband business. We show how another Massachusetts town is apparently – and contrary to promises made to the municipality – using its electricity business to subsidize its broadband business.

Finally, we take up yet another consideration – the possibility that, by entering the broadband business, CMLP may be exposing itself to the Unrelated Business Income Tax. Should CMLP be required to pay taxes on profits or property of its broadband service then it would all the more likely become a money-loser for Concord.

Preparing a Financial Analysis

In this section we take Concord’s analysis of the financial consequences of its entering that market one step further and subject it to risk analysis. Concord offers a good example of what a thorough financial analysis can show about the broadband business.⁴⁹

⁴⁹ Although, as we show, Concord ignores some potentially fatal flaws in its financial plan, it is almost alone in its attempt to offer projections in any detail. Compare, for example, the town of Braintree, which has already entered the cable business. We obtained copies of three relevant documents: (1) Network Engineering Consultants, *Cable Television and Communications Market Research Study: Summary of Results*, Feb. 1, 2000; (2) Network Engineering Consultants, *An Analysis of the Potential Uses of the Hybrid Fiber Coaxial Network*, presented on Dec. 7, 1999; and (3) *Communications Business Plan*, presented to the Municipal Light Board, Nov. 13, 1997. None of these documents offered sufficient detail to make it possible to evaluate their accuracy or to determine the sensitivity of their findings to changes in market conditions.

Concord commissioned Uptown Services, LLC (Uptown) of Colorado in May of 2002 to perform a network planning study of the proposed entry by the CMLP into the telecommunications market. Uptown presented its findings to Concord's Telecommunication's Study Committee on October 11, 2002. In subsequent meetings of the Concord Municipal Light Board, members expressed concern about varying aspects of the plan. Among the concerns were the stability of the companies currently producing the fiber to the home (FTTH) technology, the possibility that other communication companies would pre-empt CMLP's attempt to provide cable service, the ability of the venture to pay its debts, and, if the venture failed, whether or not CMLP could legally cover the deficit or subsidize it.⁵⁰

Uptown voiced caution in their Network Planning Study. They stated that further research was needed in a number of areas before a decision to move forward with the project was made. These areas include:

- Market research above and beyond that done by the Center for Public Policy Research (CPPR) using a combination of both focus group (qualitative) and telephone based (quantitative) research methods for estimates on market penetration and product pricing.
- Completing a detailed engineering design and cost estimate study of the construction cost of the FTTH infrastructure.
- Perform due diligence on blown fiber technology to confirm its viability for a FTTH deployment in Concord.⁵¹

Despite these concerns and warnings, and a lack of thorough follow up on these areas identified by Uptown as requiring additional work, an article authorizing CMLP to provide telecommunications services to Concord was put on the ballot of the town meeting on April 29, 2003.

The Uptown Study Summarized

The main impetus for CMLP's decision to enter the broadband market is the financial analysis contained in the Uptown Network Planning Study. The following is a synopsis of the study's principal assumptions and conclusions for the baseline scenario:⁵²

⁵⁰ Minutes of the Concord Municipal Light Board meetings of October 22, and October 29, 2002, accessed at <http://www.concordnet.org/cmlp/minutes%2002-10-22.htm> and <http://www.concordnet.org/cmlp/minutes%2002-10-29.htm>; Internet: accessed on May 16, 2003.

⁵¹ Uptown Services, LLC, *Network Planning Study*, (Greenwood, Colorado: Uptown Services, LLC, October 11, 2002.

- A FTTH system architecture should be the blueprint for Concord's network. Specifically, Uptown recommended a blown fiber architecture which consists of deploying a tube infrastructure that passes every home and business initially, then as subscribers sign up CMLP would send a two-fiber bundle from a network node directly to the subscribers home or business. The estimated cost per subscriber is \$705.
- Uptown projected a market penetration rate, from year five onward, of 43% in the residential cable market, 46% in the residential Internet market and 37% in the commercial Internet market.
- The price charged for cable service was assumed to be as follows for the first year:

Package	CMLP Price
Basic Cable	\$10.00
Expanded Basic	\$30.00
Digital Basic	\$7.00
Digital Plus	\$7.00
Premium Multiplexes	\$12.00
Pay Per View	\$3.50

- The price of these packages is assumed to increase annually by 1% from the first year onward.
- The price charged for Internet service was assumed to be \$45.00 per month for residential service and \$75.00 per month for high-speed commercial service.
- The monthly price for basic telephone service was assumed to be \$15.00 for residential service and \$20.00 for commercial service.
- The primary research used to gauge the current competitive environment in Concord was conducted by the CPPR.
- The FTTH baseline calls for a total funding of \$12.3 million to be financed by issuing bonds for \$11.0 million and receiving \$1.3 million in utility cash (loan).

Concerning these findings, it is necessary to point out that they may already be substantially out of date. In light of the significant market changes that have taken place over the past few years, the Uptown report, which was completed in October 2002 and based on data drawn from earlier sources, may be substantially out of date and therefore unreliable as a guide to the project's financial viability. Every broadband market (cable, Internet, telephony) has become intensely competitive over the last two years. The "low hanging fruit" (early adopters of the technologies) has been "picked" and often locked in with their providers through attractively discounted

⁵² Ibid.

bundled service offerings. CMLP will have to work hard for every customer, increasing marketing costs and forcing price reductions to remain competitive.

Nevertheless, since the Uptown Report is the source on which Concord has chosen to rely for assessing the financial viability of the project, we draw on data from that report to estimate the cash flow that the project will generate over the next 15 years. Then, from the cash flow estimate, we computed the expected net present value (NPV) of the project. NPV gives a single measure of the entire profit made by the project throughout its life, after subtracting all costs. Future cash flows are discounted using a rate of 5%, the same rate as the interest rate on the bonds, in order to get the present value (today's equivalent value). An investor would not want to undertake a project for which the projected cash flows, when properly discounted, have a negative NPV.⁵³ The baseline NPV for the project, as calculated by Uptown, is \$836,077.

NPV is the value that the municipality could place on the project, given that the Uptown assumptions about price, market share, cost and other factors turn out to be true. But, as we have seen, the best-laid plans can go awry. It is therefore prudent, before entering into any business venture, to consider the possibility that not every such assumption will, in fact, turn out to be true. The best way to gain the proper perspective on this possibility is to conduct a "sensitivity analysis" and/or a "risk analysis."

The following two sections apply both a sensitivity analysis and a risk analysis to the Concord project. The sensitivity analysis consists of determining the effect on cash flow and on NPV of altering four different key assumptions made by Uptown. There are assumptions about market share, costs and price. In performing this analysis, we alter these assumptions one at a time to show how an adverse turn of events affecting each could turn NPV from positive to negative.

The risk analysis allows these same assumptions to vary simultaneously and randomly within a certain range. The range is constructed so that the assumptions can vary in a fashion that is both more favorable and less favorable to the project. We construct a probability distribution for each of several assumptions concerning price, cost and market share. We then use a computer program to conduct thousands of random trials and to determine thousands of randomly obtained NPVs. Using this program, we further construct a distribution of the NPVs, along with a mean

and other critical statistics pertaining to the distribution. From this distribution, we can assess the risk of success or failure.

Sensitivity Analysis

The Uptown baseline analysis provides a single “best-guess” estimate of NPV. This is not a guaranteed return, however. Before undertaking this project, an investor would also want to know how risky it is, including how likely it is that the project would actually lose money.

The first step in a risk analysis is to test the sensitivity of the results to the assumptions that are used to construct the future net cash flows. This serves as a useful preliminary to a full-blown risk analysis.

Sensitivity Analysis 1: Slower or Smaller Growth in Market Share Rates

The NPV of the project is highly sensitive to the assumptions about market share. What would happen if market share were to grow more slowly than anticipated? Table 3 below sets out Uptown’s assumptions based on the research by CPPR and a slightly less optimistic alternative, indicated by the shaded area of the table.

Table 3. Market Share Rates (%)

Service	Year One	Year Two	Year Three	Year Four	Year Five Onward
<i>Uptown’s assumptions</i>					
Basic Cable	32	36	41	42	43
Internet	34	38	43	45	46
Telephone	10	12	14	15	15
<i>Alternative Scenario</i>					
Cable	20	30	40	42	43
Internet	20	30	35	40	40
Telephone	10	12	14	15	15

For year five and beyond, Uptown assumes market shares of 43% and 46%, respectively, for residential cable and Internet subscribers. In the alternative scenario, the shaded area has

⁵³ We may think of NPV as the net gain to society of allocating resources to some public project *A*. If *A*’s NPV is positive, then the benefits to society of approving the project are greater than the costs. If *A*’s NPV is negative, the opposite is true. If *A*’s NPV is zero, then the benefits are just equal to the costs.

Concord beginning with less robust shares in the first three years in both markets and only gaining 40% of the market in years four through 15, in the more competitive Internet service market.⁵⁴

This change results in a NPV (at a discount rate of 5%) of -\$0.366 million. Should Concord's market share thus fall short of expectations or grow at a slower pace, the project would become a money-loser.

Sensitivity Analysis 2: Lower Prices due to Competition

We have seen that it is easy for municipal leaders to ignore the prospect of price competition. But consumers tend to forgo loyalty when it comes to their pocketbooks. The small town of Elbow Lake, Minnesota started a municipal cable system in December 1990. During a price war with the incumbent operator, the city needed to finance the system to keep it afloat. After four years, having achieved less than the expected market share and revenue, the city sold the system to a private provider. "I think we showed 85 to 90 percent of the people said they'd support the city [in an initial survey]. And then when we built it, we were at 60 to 65 percent," City Manager Jeff Holson said. "The almighty buck talks, I guess."⁵⁵

The Concord incumbent cable provider Comcast has upgraded its system at the time of this study. Comcast now offers residents analog cable, digital cable, high-speed Internet service, Video on Demand and HDTV. Uptown based its Concord prices on what Comcast would most likely be charging once it entered the market, but since Concord will now be the later entrant in the market they may need to lower those prices to lure customers away from Comcast. A price war similar to the one in Elbow Lake is a very real possibility.

If Comcast reduced its price, Concord would have to do the same to maintain its market share. If the cable price were reduced by only 10%, which would, for instance, bring the cost of an expanded basic package down from \$40.00 to \$36.00 a month, this would turn the Concord project into a money-loser. The NPV would be -\$0.476 million.

⁵⁴ Even this alternative scenario is highly optimistic. Verizon and Comcast are established providers of high-speed Internet service. Comcast, DirecTV and EchoStar are established providers of video service. CMLP is therefore a late entrant into a market already saturated by strong, well-entrenched providers.

⁵⁵ "Local Cable Company Out of Business", *Plain Dealer*, April 23, 1995.

The Internet services market is even more competitive than the cable market. At the time of the market research conducted by CPPR there were over 30 Internet Service Providers (ISPs) offering services in the Concord area. The top five ISPs in Concord, AOL, Verizon, EarthLink, Comcast and MSN, have captured over 80% of the total market for Internet services. Verizon, which owns the second largest market share behind AOL, already provides high-speed Internet services in Concord and Comcast now represents a new competitor offering high-speed Internet as part of its package.

According to the Uptown study, the prices for Internet access that CMLP would charge are \$45.00 a month for residential service and \$75.00 for commercial. Again, if CMLP is forced to drop its prices in order to compete this would severely hurt the viability of the project. If, in addition to lowering cable rates by 10%, CMLP also has to drop its Internet rates by 10% – i.e. to \$40.50 for residential service and \$67.50 for commercial service then the NPV for the project drops to -\$2.003 million.

Sensitivity Analysis 3: Higher than Anticipated Programming Costs

Uptown assumes that programming costs will rise by 1% each year for the fifteen years of the case study. This rise in programming costs is offset by a 1% rise in cable prices every year for the fifteen years of the analysis. While this might be practical if programming costs indeed rose by only 1%, it is not realistic if programming costs increase by the higher rates seen in the current marketplace. A mistake in the assumptions made in programming costs will have a disproportionately large effect on Concord's bottom line. "Programming is one of cable's biggest expenses, accounting for an average of 45% to 50% of total video operating costs," according to Salomon Smith Barney analyst Niraj Gupta. "At perennial increases of 11% to 13%, programming costs have put a major dent in industry video margins in recent years," he said in a recent report.⁵⁶

⁵⁶ "Comcast Squeezes Programmers," Penelope Patsuris, Forbes, February 14, 2003, (accessed at http://www.forbes.com/2003/02/14/cx_pp_0214comcast.html).

The FCC notes that from June 1999 to June 2000, programming expenses rose 16.2% and cable prices rose 4.8% as the volume of services increased.⁵⁷ Large cable providers such as Comcast can leverage their size to force content companies to reduce their programming fees. “When the deal with AT&T Broadband was announced, Comcast promised programming cost savings of between \$250 million and \$450 million within the first three years.”⁵⁸ CMLP, on the other hand, is poorly situated to hold down programming costs and therefore would need to pass on the increased costs to its customers.

Let us assume that CMLP finds itself faced with rising programming costs but to stay competitive, can only pass one third of the increase along to its customers, a realistic assumption given the recent history of the cable industry. Therefore if programming costs rise by 3% and CMLP passes along 1% of the increase to customers, the project’s NPV would drop to -\$0.362 million.

Table 4. Results of Contingencies in the Concord Telecom Market

	NPV
Baseline Scenario	\$836,077
Contingency	
Slower or Smaller Growth in Market Penetration Rates	-\$365,978
Cable rates reduced by 10% per month	-\$476,343
Both Internet and Cable rates reduced by 10% per month	-\$2,002,845
Programming costs rise by 3% each year	-\$361,885

Risk Analysis

A sensitivity analysis is helpful in identifying where the risks lie, but it does not really tell us how likely each of the risks are. For this, one needs a full risk analysis (see Box 1), which we have undertaken for Concord.

⁵⁷ Federal Communications Commission, “FCC Adopts Seventh Annual Report on Competition in Video Markets,” News Release, January 8, 2001, accessed from http://www.fcc.gov/Daily_Releases/Daily_Business/2001/db0108/nrcb0101.html; Internet. p. 3.

⁵⁸ Penelope Patsuris, “Comcast Squeezes Programmers,” *Forbes*, February 14, 2003, (accessed at http://www.forbes.com/2003/02/14/ex_pp_0214comcast.html).

We used most of the same assumptions as those made in the Uptown feasibility study, with the following modifications:

1. We assume that in any given year there is a 10% probability that the price will fall by 10% from the initial level; from that point on the price stays at the new, lower level. The lower price might be in response to a price cut by the existing cable supplier or made in order to boost market share.
2. The Uptown study assumes that monthly programming costs will rise by 1% a year and that monthly cable revenues will completely offset this by also rising by 1% a year. Instead we assume that programming costs will follow a triangular distribution – minimum of 0%, mode of 1% and maximum of 3%.
3. We use a discount rate of 5% as an appropriate “risk-free” cost of capital because we assume the interest charged on the bonds will be 5%. The appreciation of risk is then based on the distribution of net cash flow that emerges, after using this discount rate.

Box 1. Risk Analysis

The cost-benefit analysis undertaken by Uptown for Concord, MA, is based on their best estimate of each variable – programming costs, market share, etc. – for each of the next 15 years.

There are two weaknesses to this approach. First, it may give misleading results, and second, it does not give an adequate sense of the risks involved. To see this, consider a simple project that costs \$140; there is a 60% chance that revenue will be \$200, and a 40% chance that the revenue will be only \$100.

The best guess is that profit will be \$60 – i.e. $\$200 - \140 . This is because the most likely outcome is that revenue will be \$200. Some project appraisals present this figure as their best guess and leave it at that. However, the expected profit is really \$20: there is a 60% chance of a \$60 profit, and a 40% chance of a \$40 loss, which averages out to \$20. $(\$60 \times .6) + (-\$40 \times .4) = \$20$

Note that in this example the project is risky. There is a 40% chance that it will lose money. We might still want to do the project, but need to be aware of the high probability that we will lose substantially.

A better approach is to do a risk analysis. Sometimes termed a Monte Carlo simulation, the procedure is to:

- a. choose the distribution of future variables (e.g. 60% probability of \$200 in revenue, 40% probability of \$100 in revenue);
- b. using these distributions, randomly pick values for the future and compute the net present value and repeat the process many times.

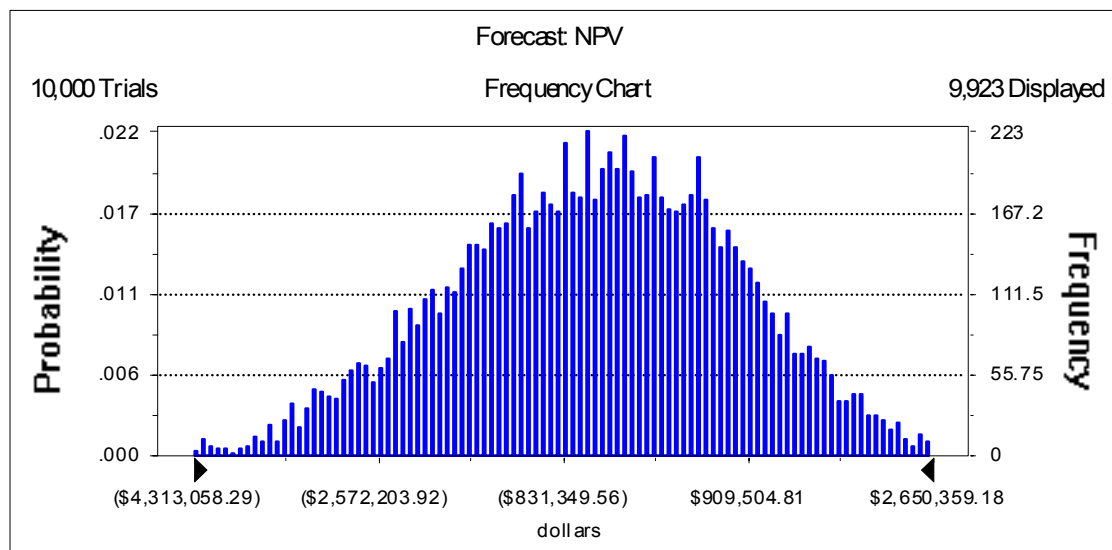
The result is a *distribution* of outcomes for NPV, which allows one to compute, among other things, the expected net present value, and the probability of a loss. Many risk analyses are done with the help of specialized software such as @Risk and Crystal Ball.

4. For market share, we assume:

- a. In year 1, a market share for cable, Internet and phone service following a triangular distribution with Uptown assumption serving as the mode, minimum of 90% of the mode and maximum 110% of the mode.
- b. In years 2 through 5, an *increase* in market share for cable, Internet and phone service following a triangular distribution with Uptown assumption serving as the mode, minimum of 90% of the mode and maximum 110% of the mode.
- c. In years 6 through 15, an increase in market share for cable, Internet and phone service following a normal distribution with mean 0% and standard deviation of 2%.

The analysis was programmed using Crystal Ball, an add-in program to Microsoft Excel.⁵⁹ Using this program, we obtained 10,000 computations of net present value, each associated with one of the above-described scenarios. We then determined the frequency distribution of net present value from which we were able to compute expected net present value and the probability that the project would lose money. See Figure 1.

Figure 1. Net Present Value Distribution



Specifically, we found:

- The expected net present value of the project is -\$541,628.
- There is over a 60% probability that the project will lose money.

⁵⁹ The spreadsheet and our assumptions about the risk parameters are available on request.

- There is a 10% chance that the losses will be at least \$5.2 million; and a 10% chance that the profit will be at least \$3.6 million.

In short, the project does not look as attractive; it is expected to lose money, and there is a substantial risk of high losses.

Losses cannot be willed away. They have to be financed in one way or another – either, in this instance, through subsidies from the CMLP (which would then have to increase what it charges for electricity) or directly from Concord (in which case property taxes would have to rise, or services be cut). In fact Uptown addressed the possibility of losses in their study, “However, in the event of a catastrophic failure of the venture, the revenue of the utility department will be expected to cover the bond payments. Only under this condition will CMLP be allowed to borrow at the low municipal interest rate.”⁶⁰ Either way, if losses were to appear they would have to be borne by the residents of Concord. This stands in contrast to the case of a private provider, where the losses would fall on the company’s shareholders.

Cross-Subsidization and Municipal Priorities

When municipalities take advantage of their tax-exempt status to enter into a business venture they want to use all the resources at their disposal and their tax-exempt status to maximize the return to the community. On the other hand, they do not want to put those resources or their tax-exempt status at risk. Below, we consider the question whether CMLP’s tax-exempt status might be put at risk, after all, by their entering the broadband business. Here we consider the risk to which other town resources and thus other programs are exposed by their entering that business.

This risk arises as a result of the possibility that Concord will (1) cross-subsidize its broadband business by diverting resources from some existing business, typically CMLP, to which its broadband business is linked or (2) strain its fiscal resources as it accumulates debt aimed at financing its broadband business.

For an object lesson concerning the first of these possibilities, consider Braintree, which through BELD, has already entered the broadband business. BELD constructed its broadband system at a

⁶⁰ Uptown Services, LLC, pp. 30-31.

cost of \$7 million. The fiber optic infrastructure of the broadband system was built using \$3.5 million of surplus BELD funds. When BELD asked the town for an additional \$3.5 million bond to buy equipment needed to capture the digital cable signal, some city officials raised the issue of cross-subsidization.

Fred Foley, a water and sewer commissioner and former finance committee chairman, said, in reference to the initial \$3.5 million of BELD funds, that the cable operation was essentially being subsidized by electric ratepayers. “The ratepayers are the shareholders,” he said. “At some point that money has to come back.”⁶¹

In May 2000 BELD distributed a *Fact Sheet* aimed at answering questions about its proposed entry into the broadband business. There, BELD posed the question, “Will the CATV launch be funded with electric ratepayer dollars?” The answer provided was:

No. State law prohibits BELD from using electric light plant revenues to fund anything not related to light plant operations, maintenance, repairs, expansion or depreciation. To do so would be considered unlawful “cross-subsidization” of cable operations by electric ratepayers.⁶²

Yet a BELD financial statement for 2000 shows a transfer of \$2,198,105 from the light division to the broadband division.⁶³ BELD explains this as an allowable, once-and-for-all transfer of equipment and insists that the broadband division now operates independently of the light division. Whatever the rhetoric, the transfer amounted to calling upon electricity consumers to subsidize cable and Internet users. Concord is only adding to these concerns by proposing to use \$1.3 million in CMLP funds as a “loan” to help build Concord’s broadband network.

There is the further concern that Concord will find itself sacrificing other priorities, as it tries to raise new money to provide cable service even as they find themselves unable to finance schools and other projects that compete for scarce municipal resources.

With the economy in a slowdown and municipalities across Massachusetts confronting the possibility of a shrinking tax base and less money being transferred from the state government,

⁶¹ Kevin Rothstein, “Braintree; Cable Competition is Coming to Town”, *The Patriot Ledger*, March 21, 2000.

⁶² Braintree Electric Light Company, *A Fact Sheet Regarding the Proposed Digital Cable Television Service Offering of the Braintree Electric Light Department*, prepared for the annual Braintree town meeting, May 1, 2000, p. 6.

⁶³ BELD Financial Statements, accessed from <http://www.beld.com/annual/statement.html>; Internet.

many municipalities find themselves forced to go to voters with requests to override Proposition 2 1/2 to fund municipal services.⁶⁴

Past experience puts certain municipalities in the position of starting up a risky new business venture even as they find schools and other needs going unattended. When Braintree residents were asked to approve two overrides totaling \$16 million on May 13, 2003, the two measures were rejected. The overrides were needed in part to cover a \$6.7 million town budget deficit for the current fiscal year. Superintendent of Schools Peter Kurzberg had said that if both overrides failed, he would have to eliminate 75 teaching and 23 staff positions throughout the school system. The Monatiquot and Eldridge schools would close. Class sizes would jump to an average of 20 to 25 students, while middle and high school classes would be 25 to 35 students.⁶⁵

Towns that want to have more money to provide cable and more money to fix schools and other buildings may be finding that they can't have their cake and eat it too. Voters may show reluctance to override Proposition 2 1/2 when they see the town entering into a new, costly business venture.

The nature of the bonds being issued by the municipalities also point to the risky nature of the projects. There are generally two types of bonds that a municipality can issue. General obligation bonds are backed by the full faith and credit (taxing ability) of the municipal issuer, and revenue bonds are issued to finance specific projects and are backed by the revenues from the project of the municipal agency operating the project.⁶⁶ In the past, these municipal broadband projects have been financed through issuing general obligation bonds that are backed by the towns' taxing authority. If these projects are such a good generator of cash why can't they be funded with revenue bonds? Municipal utilities can generally raise money through the use of revenue bonds because the bond buyers perceive an electric or water utility as having a safe and solid revenue stream. However, financing a broadband operation, as the RCN experience shows, is a much riskier proposition, one in which bondholders want the backing of the municipal taxing powers.

⁶⁴ Proposition 2 1/2 generally limits municipal property taxes to 2 1/2% of assessed value and prevents property taxes from growing by more than 2 1/2% a year. When voters approve a debt exclusion or override, they are essentially give the municipality the right to raise their property taxes above the annual 2.5% allowed under Proposition 2 1/2.

⁶⁵ Jeffrey White, "2 Braintree Requests Rejected, Putting Town in Cutting Mode," *The Patriot Ledger*, May 14, 2003.

⁶⁶ Zvi Bodie, Alex Kane, and Alan Marcus, *Investments*, (McGraw-Hill, Boston 1999) p. 40.

In the end, as Uptown suggested, Concord taxpayers would have to make good on bonds floated to fund a failed broadband business. Concord may thus impair its ability to fund school and other projects when it enters into a business venture that may well, as we have shown, end in failure.

Tax Issues

The foregoing analysis does not consider yet another risk faced by Concord and other municipalities that consider entering the cable and Internet business. This is the risk that the new business might be subject to federal or state income taxes and that, in addition, the existing electricity business might lose its tax-exempt status.

All municipal electrical utilities are organized as nonprofit entities.⁶⁷ These entities receive several tax benefits not available to for-profit companies. They are, for example, exempt from federal income tax. In addition, they may be exempt from state income tax, sales taxes, and property taxes. They also receive discounts on postage rates. These are significant competitive advantages.

The underlying rationale for tax-exemption is that the organization serves some type of common good and that the net earnings do not benefit private individuals.⁶⁸ The organization should also not exert political influence and it should be a not-for-profit entity. A public utility that engages in a for-profit activity, such as the cable TV business, may violate one or more of these characteristics.

If CMLP engages in a section 503 prohibited transaction (such as, possibly, the cable TV business) there are several negative results that can occur. First, part of CMLP's income may be subject to Federal income tax (the Unrelated Business Income Tax or UBIT). Second, the utility may lose its tax-exempt status, which will cause all its income to be taxed, including the electric division profits. Finally, sanctions may be imposed on management.

Obviously, loss of tax-exempt status would have severe financial consequences for CMLP ratepayers, due to the imposition of federal and state income taxes, local property taxes (on what

⁶⁷ Section 501(c)(12) of the Internal Revenue Code or section 115.

⁶⁸ See section 501(c)(3) and (4) for example.

turns out to be a capital intensive business), as well as sales taxes.⁶⁹ All these taxes would add to the CMLP's cost structure, reducing NPV or forcing higher rates on customers. The sanctions consist of excise taxes that are imposed on disqualified persons who are in a position to exercise substantial influence over the affairs of the organization and who engage in transactions they know are improper.⁷⁰

If an organization does not lose tax-exempt status it can still be subject to the imposition of income taxes if it engages in a prohibited transaction, if it acts as a *feeder organization* or if it generates unrelated business taxable income. A feeder organization is one that carries on a trade or business, such as cable television, and remits its profits to the exempt organization. A feeder organization is subject to federal income tax.

Therefore, the key issues with regard to CMLP is whether the cable television business constitutes a prohibited transaction, whether UBIT can be imposed, and when and under what circumstances CMLP can lose its tax-exempt status altogether.

A tax-exempt utility engages in a prohibited transaction when it:

- 1) lends any part of its income or corpus, without the receipt of adequate security and a reasonable rate of interest, to;
- 2) pays any compensation, in excess of a reasonable allowance for salaries or other compensation for personal services actually rendered, to;
- 3) makes any part of its services available on a preferential basis to;
- 4) makes any substantial purchase of securities or any other property, for more than adequate consideration in money or money's worth, from;
- 5) sells any substantial part of its securities or other property, for less than an adequate consideration in money or money's worth, to; or
- 6) engages in any other transaction which results in a substantial diversion of its income or corpus to; the creator of such organization;⁷¹

⁶⁹ In Massachusetts corporations pay a tangible property tax of \$2.86 per thousand dollars on the cost of machinery and equipment, fixtures, machinery, etc. They also pay a 9.5% income tax on earnings.

⁷⁰ Section 4958.

⁷¹ Section 501(b).

An organization engages in a prohibited transaction when it lends any part of its income or corpus without receiving adequate security and a reasonable rate of interest.⁷² In the case of BELD the transfer of \$2,198,105 that was made from the light division to the broadband division may constitute a prohibited transaction, since no security was pledged or interest charged.

The UBIT was created to prevent tax-exempt organizations from engaging in prohibited transactions, which would create unfair competition because of the tax exemptions they enjoy. The tax rates used are the regular corporate tax rates. Unrelated business income is created from activities that are unrelated to the exempt purpose of the organization. It is assessed when the organization engages in *substantial commercial activities*.⁷³ Whether or not the conduct of a broadband business by CMLP constitutes a substantial commercial activity is a question of fact. The regulation states that an exempt organization may be subject to the UBIT when:

- 1) The organization conducts a trade or business.
- 2) The organization or business is not substantially related (other than through the production of funds) to the exempt purpose of the organization.
- 3) The trade or business is regularly carried on by the organization.⁷⁴

While there are certain exceptions to these rules, clearly, the operation of a broadband business is a trade or business, one that competes with for-profit entities. It also is not substantially related to the exempt purpose of CMLP, which is to provide electrical power. Broadly defined, a trade or business includes any activity conducted for the production of income through the sale of merchandise or the performance of services.⁷⁵ Examples in the regulations include travel services marketed by university alumni associations or other exempt organization, and priced to produce a profit. These travel services compete with for-profit travel services and are not related to the entity's exempt purpose.⁷⁶

To be related to the exempt purpose of CMLP, the broadband operation must be causally related and contribute importantly to the exempt purpose. Causality and importance are determined by the facts. For example, The Supreme Court has ruled that a tax-exempt medical organization's

⁷² IRC Sec. 503(b); Reg. Sec. 1.503(b)-1, Para. 5032.01, *RIA U.S. Tax Reporter*.

⁷³ Section 511(a)(1).

⁷⁴ Section 513(a) and Reg. 1.513-2(a).

⁷⁵ Reg. 1.513-1(b).

⁷⁶ *RIA Tax Reporter*, paragraph 5132.05 and Reg. 1.513-7.

activity of selling commercial advertising space in its professional journal doesn't *contribute importantly* to the journal's educational purposes and therefore the earnings from those activities are taxable.⁷⁷

The biggest tax-related threat to CMLP from entering the broadband business is the loss of its tax-exempt status. This would mean the utility would be subject to federal and state income taxes on *all* of its income, not just the broadband business profits as in the case of the UBIT. CMLP would also be subject to property taxes, sales taxes and higher postal rates. This would mean higher bond and operating costs and higher electrical rates for customers.

To maintain exempt status the organization must satisfy *both* an organizational test and an operational test. The organizational test means that the organization of the entity is, at least on paper, still meeting the requirements for tax exemption. The addition of a for-profit broadband business may cause CMLP to fail the organizational test. The operational test looks to the operations of the utility to make sure that, in fact, the requirements for tax-exemption are met. Therefore, even if CMLP looks tax-exempt on paper it may not actually be tax-exempt when its operations are scrutinized. However, the IRS will usually require that the prohibited business is the *primary* purpose of the organization, which may not initially be the case for a utility, but could be if the broadband business grows in relation to the size of the electric division, which is a distinct possibility with the smaller CMLP.

While the loss of exempt status has not occurred on for a utility entering the broadband business, more state governments are putting restrictions or banning municipal utilities from competing against private sector business in the provision of broadband services. Many state legislatures believe that it is unfair for a tax exempt entity, such as CMLP, to compete against private companies. The loss of tax exempt status may be the next measure state government uses to level the playing field.

In summary, in addition to the moral and equity issues inherent in public utilities engaging in for-profit businesses, there are several very important tax issues that should not be ignored. At the very least, CMLP's broadband division's profits will almost certainly be subject to federal and state income taxes. At the worst CMLP may lose its tax-exempt status and be subject to taxation

⁷⁷ See U.S. v American College of Physicians (1986, S Ct) 57 AFTR 2d 86-1182, at Para. 5135.01(5) *RIA Tax Reporter*.

on all its profits, in all divisions, as well as property and sales taxes. This very real threat should not be ignored as the IRS is stepping up enforcement in this area.

IV. Other Policy Issues

Not all the issues confronting CMLP's possible entry to the broadband business are narrow financial issues of the kind examined in the preceding section. There are issues also of whether its entry into that business constitutes a good and efficient use of Concord taxpayer resources and a fair and prudent action on its part. We consider some of these issues here.

Issue 1. Should Concord Taxpayers or Users Foot the Bill?

A private supplier of cable or Internet services knows that the business is risky, as do the firm's shareholders. There is no coercion: households sign up for service if it is in their interest, the supplier provides service if it believes it will be profitable, and shareholders volunteer their capital, hoping for a handsome return but willing to take their lumps if the business loses money.

The case of CMLP is somewhat different. If it loses money, the shareholders – in effect, the taxpayers as Uptown points out – will have to shoulder the burden whether they voted in favor of the enterprise or not. It is not clear why any Concord townspeople should ever have to be coerced into covering the losses (if any) for a service that could be provided in the private sector voluntarily and that they themselves may not use.

While authorizing CMLP to enter the broadband market, Article 34 does not seek an appropriation of money for that purpose. Unless the current Article is determined to be broad enough to support a motion from the town meeting floor for an appropriation, it appears a future Town Meeting must vote to authorize the issuance of debt to create the cable television system.

It is consideration of possible taxpayer burdens that once compelled the public sector to limit itself to a regulatory role. Regulatory agencies took upon themselves the job of assessing costs and setting price, leaving the job of innovating, taking risks, controlling costs and serving consumers to the private entities they regulated. With government shunning its role as a regulator in the broadband industry to become an active player, questions arise about the consequences for the industry, for the economy and for government.⁷⁸

⁷⁸ Jeffrey A. Eisenbach, "Does Government Belong in the Telecom Business?" *Progress on Point, Periodic Commentaries on the Policy Debate*, (The Progress and Freedom Foundation, Release 8.1, January 2001), accessed from <http://www.pff.org/POP8.1GovtTelecom011001LOGO.pdf>; Internet.

Issue 2. Is Public Provision Economically Efficient?

The profit motive is central to bringing about economic efficiency in the private sphere. Profits motivate firms to enter an industry where existing firms are earning profits and to leave an industry where the average cost per unit exceeds the price per unit, that is, where profits are negative. As firms leave an unprofitable industry and remaining firms cut back on production, supply of the product decreases, resulting in an increase in price and a drop in average cost. This profit motive works to induce firms to go out of business whenever price is less than average cost.⁷⁹ In the end, price will just equal average cost, so that the firm just covers all of its costs, including the value of owner-provided labor and capital services. Where average cost equals the marginal cost of producing the last unit, then price will equal marginal cost and firms will operate “efficiently.”

The profit motive also compels owners and managers to be alert to new technologies and opportunities to reduce costs and increase market share. The for-profit system of private enterprise rewards alertness and punishes complacency. The firm that gets a leg up on its rivals enjoys at least temporary prosperity and staves off the possibility of failure.

The entry of public entities into this private, competitive sphere where profit is the goal poses two potential problems for economic efficiency: (1) public entities, accustomed to the rules governing the provision of public goods, are often unwilling to submit to the rules of the for-profit system of private enterprise and (2) public enterprises can sometimes operate at artificially low costs. Let us first address the problem that arises as public entities encounter the rules of the road that govern the private, for-profit world.

Public entities – even those specifically empowered to operate at a profit – are unlikely to view the prospect of profits or losses in the same manner as their private-sector counterparts. Private entities have a single objective: maximizing profits, which, in the end, means survival in the industry.⁸⁰ Public entities can embrace any manner of (sometimes conflicting) objectives: for example, providing high-quality cable service at low prices and, at the same time, maximizing profits. In the words of Rhonda Davis, chief financial officer for the Paragould, Arkansas Light

⁷⁹ And by “average cost,” we mean the average of *true* costs, not the artificially lower costs at which publicly owned utilities operate. See the section on Fairness below.

⁸⁰ In the end, by the foregoing logic, economic profits are zero, making it necessary to maximize profits merely to break even.

and Water Commission, “We didn’t go into it [cable business] to make money. People wanted to pay a reasonable rate and have good service.”⁸¹ This may make sense where the incumbent operator refuses to upgrade its infrastructure and service. In Concord, however, existing providers already offer both.

Looking out for the welfare of consumers seems like a loftier motive than maximizing profits, but under competition, maximizing profits means making just enough revenue to cover all economic costs.⁸² Private entities go out of business when they fail to maximize profits. Indeed, one purpose of the for-profit system is to force firms that cannot cover their costs to go out of business, since their continued operation merely wastes resources.

Public entities, on the other hand, have an indefinite lease on life. They can survive protracted losses by claiming that they serve some purpose (high quality cable at low prices) other than “merely” making profits and by utilizing their access to public funds. Thus they can go on “wasting” economic resources long beyond the time that they would have been driven out of business had they been privately rather than publicly organized.

These are not merely philosophical points. In an industry like broadband, in which technology is constantly changing, losses are a real possibility. If CMLP manages to hang on despite recurrent losses, the resulting inefficiencies will manifest themselves in borrowing and raiding utility or Concord’s funds, which will in turn endanger Concord’s bond rating and the funding of other services from which those funds were diverted.

Issue 3. Is Public Provision Fair?

CMLP, like other government agencies, are entitled to tax and financial advantages that private companies do not enjoy. CMLP is able to issue low-interest, tax-free and government-backed debt to finance their ventures. CMLP, like other utilities, uses no-interest electric utility profit surpluses to finance their operations.⁸³ These surpluses should be used to lower electric rates or to improve the electric utility’s plant. CMLP is not subject to property taxes or state, federal and

⁸¹ Steve Bennish, “Cable Data Suspect,” *Dayton Daily News*, April 13, 1998.

⁸² If the firm made positive economic profits, some other firm would enter the market to compete those profits away until price and average cost were just equal again.

⁸³ Ronald J. Rizzuto and Michael O. Wirth, *Costs, Benefits, and Long Term Sustainability of Municipal Television Overbuilds* (Denver: GSA Press, 1998), p. 44.

local corporate taxes. It has access to public rights of way, including utility poles, which private companies often have to pay a fee or endure lengthy negotiations to acquire.

By entering the broadband market Concord, and by extension CMLP itself, is put in the peculiar position of being both competitor and regulator in the broadband industries. Concord grants cable franchise licenses, settles right-of-way issues and sets property tax rates. In effect, Concord will end up regulating its own competition. The incentives for the municipality change as it moves from a regulator to a competitor. The incentive as a competitor is to tilt the regulatory playing field to favor its own entity and to restrict and hinder competitors. For example, will CMLP pay a pole fee as the private provider must? This is the wrong incentive for government, which should be to increase competition and innovation in an attempt to get the best value for its citizens.

The unfairness with which CMLP will compete with its private sector counterparts has implications for economic efficiency. Said Rizzuto and Wirth, “Because these hidden subsidies permit public utilities to undercut prices charged by private competitors, they distort the marketplace, deter entry by real competitors, and thus prevent the marketplace from setting cost-based prices.”⁸⁴ Thus as we anticipated above, the cost advantages that CMLP enjoys will allow it to ignore the profit motive rules in the competitive market. It can expand production beyond the point at which price just equals marginal cost; this expansion has a “social cost.” This social cost of is the value of other things whose production is sacrificed in order to produce that unit. With its ability to raise capital more cheaply than its private-sector counterparts, CMLP will distort the allocation of resources and thus violate the price-equals-marginal-cost rule.

While this, in and of itself, may seem of no great consequence to the Concord broadband user who gets a break on his rate, it can also portend unpleasant, hidden consequences. Just as there is no free lunch, there is no free broadband service.

The real-world consequences are much as we described them above. Enjoying artificially low borrowing costs, CMLP might forget that funds diverted from its usual line of business – say, providing electricity – are funds diverted from investment in that line of service, as the experience of Tacoma, Washington, shows. It might forget that CMLP and Concord have limited bonding capacity and that bonds issued to provide broadband ultimately compete with the schools and

other public construction projects for bonding. The reliance on debt financing puts Concord ratepayers and taxpayers at risk for any and all losses.

Issue 4. Is Public Provision Prudent?

Proponents of government ownership of broadband services claim that they are as essential as sewer systems, police stations or highways, and that, no matter the loss or gain, government should provide them. Speaking about Concord's possible entry into the broadband market Concord Telecommunications Study Committee Chairman Bob Kusik said "We view the LibertyNet in much the same way as our town roadway network, the public water supply and distribution, and the municipally-owned electricity system."⁸⁵

There is an important difference, however: Unlike roads, water and electricity, Concord does not have a monopoly in the provision of cable and Internet service. Nor, therefore, does it provide this service to essentially all Concord's residents. If the roads wear out, Concord can legitimately compel residents to pay for repairs through higher taxes and fees. But if Concord's broadband service is rendered obsolete through technical change or if competition pushes it into the red, it cannot, with the same legitimacy, compel all of its residents, including those who do not use that service, to pay the bill. By Chairman Kusik's logic, all of Concord's residents should be financially liable for the failure of a system that benefits as few as 30% of its residents.

Such is not the case with broadband service. Entering this competitive business is not like taking over trash collection or even the distribution of electric power. Today, broadband is more a model for Darwinian selection than for the quiet life of the typical town hall.

Consider the broadband business as it stands today: In the broader video programming market, there is competition among cable distributors and between cable and noncable distributors. In its tenth *Annual Report on Competition in Video Markets*, the FCC found that "the vast majority of Americans enjoy more choice, more programming and more services than any time in history." While "cable television remains the predominant technology for the delivery of video programming...cable's share has fallen to approximately 75%."⁸⁶

⁸⁴ Eisenbach, p. 15.

⁸⁵ Betsy Levinson, "New Concord Telecom," *Concord Journal*, November 11, 2002.

⁸⁶ Federal Communications Commission, p 4.

While cable serves 75% of the market now, the growth of noncable service far exceeds that of cable. “In the last several years, however, cable subscribership has declined such that as of June 2003, there was approximately the same number of cable subscribers as there were at year-end 1999.”⁸⁷ The principal source of growth in noncable service is Direct Broadcast Satellite (DBS). From 1993 to 2003 satellite subscribers increased from 3.1 million to 22.7 million, representing growth of 632%.⁸⁸ Even more telling is the DBS growth rate which “has exceeded the growth rate of cable by double digits in every year except in the past year, when DBS growth exceeded cable growth by 9.16 percentage points.”⁸⁹ This represents a competitive threat to cable. DBS “appears to attract former cable subscribers and consumers not previously subscribing to an MVPD.”⁹⁰

No single municipal cable service faces competition from all these sources all of the time. But Concord, as research by CRRP points out in the Uptown report, has a very healthy competitive market in video and particularly Internet service.

Prudence therefore requires that Concord develop a careful financial plan that pays adequate attention to risk – along the lines of our sensitivity and risk analysis.

⁸⁷ Ibid p 2.

⁸⁸ Federal Communications Commission, *Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming* (January 2004), FCC 04-5.

⁸⁹ Ibid p. 3.

⁹⁰ Ibid.

About the Authors

David G. Tuerck is Executive Director of the Beacon Hill Institute and Chairman of the Economics Department at Suffolk University. He holds a PhD in Economics from the University of Virginia.

John S. Barrett is Director of Research at the Beacon Hill Institute. He holds an MSc in Economics from New Mexico State University.

©2004, Beacon Hill Institute at Suffolk University, ISBN- 1-886320-21-7

