

FIBER TO THE HOME: CAPITAL COSTS AND THE VIABILITY OF VERIZON'S FIOS

The Telmarc Group, WHITE PAPER
No 11

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1 INTRODUCTION

The deployment of fiber to the home, FIOS, as called by Verizon, has commenced and there are many prognostications in the press and in the financial analysts reports. In this paper we present our firsthand direct market priced results from 150 markets in New England. From 2002 through 2005 we had performed detailed field studies and designs for 150 markets and targeted 35 for initial deployment. In fact we were successful obtaining USDA Rural Utilities Services financing for these systems. However, due to the excessively high costs of the franchise process and irrational behavior of some of the towns, we had to withdraw.

The results contained herein, however, clearly point to the true costs of deploying a FIOS or FTTH system. Our result clearly shows that the Verizon projections are, in our opinion, without merit and grossly underestimate the true costs of deploying what they seek to deploy. Further, in our opinion, Verizon, which is in the midst of a meltdown of astronomical proportions in the wireline market, as we had shown a year ago, may very well be underestimating the true costs of this market.

2 AN OVERVIEW OF FTTH AND THE VERIZON STRATEGY

Fiber to the home has been developing over the past twenty years plus. It is a simple technology and generally is a tree and branch type design with limited active elements in the field. The passive optical network (PON) designs, for example, are nothing more than splitter of the light and sharing bandwidth. Passive devices being simple and generally less expensive can provide easily a 1 Gbps access per residence. One still wonders what to do with 1 Gbps, but that is a secondary issue. In addition, it also begs the question of how to provide the last 100 feet in the home, from the connector at the side of the house to all of the devices which can connect to it, a problem FTTH does not readily answer, even with wireless.

Recently Verizon made certain announcement regarding their targeted CAPEX per sub for FIOS, namely \$717 per subscriber. In this paper we look at that number and raise several serious concerns. We do so, not as analysts, but as operators, operators who were there first, and Verizon followed behind us.

In June 2005, we terminated the Merton Group which was our investment and operating entity deploying FTTH in New England. This was done specifically for failure to reach a fair agreement with towns that we felt were financially viable markets. We sought parity with the incumbent cable company, but the towns demanded complete coverage, twice the cable requirement. On August 4, 2006 Verizon did the same¹. Specifically the press related the process:

"Before it even got in, Verizon Communications is pulling out of the New Hampshire cable television business....Since 2004, the telecommunications giant has spent billions of dollars across the country, ...Verizon.. has sent equipment and franchise negotiators intended for New Hampshire to New Jersey, "We're disappointed," said lawyer Robert Ciandella, ... "We were trying to ... conduct a very effective franchise negotiation." Ciandella's firm, Donahue, Tucker and Ciandella of Exeter, was negotiating on behalf of five other New Hampshire towns, as well, Ciandella said....Ciandella said the company does have a track record of seeking legislative solutions to the problem of negotiating town by town. "Verizon is exploring whether there's a political strategy that would allow it to avoid (local negotiations)," he

¹ See <http://www.freepress.net/news/16902>

said...Salem Town Administrator Henry LaBranche yesterday criticized Verizon's decision..“I find their strategy rather bewildering,” he said. “If, indeed, they’ve pulled out of the process, it’s a rather premature reaction on their part.””

The above statements clearly represent what we had experienced many times over. In fact with the same principals in many cases. The towns become in our opinion just greedy and the entire process became bogged down in local politics and legal game playing, which just raises the cost per subscriber by anywhere from \$500 to over \$1,500. In a bizarre move however, the New Hampshire Legislature granted the towns the rights to build their own municipal broadband and they have no commensurate duty to obtain a franchise.

The New Hampshire legislature, in my opinion, having been a member of the legislative committee reviewing the new legislation, had no idea what it enacted. A state like New Hampshire has clearly insured that it will never have a broadband network.²

From Cable Digital News of August 1, 2006 Verizon has stated³:

“In their second quarter earnings call with analysts this morning, Verizon executives indicated that they are rolling out FIOS faster than expected this year, at least partly because of heightened competition from Comcast and other cable operators plunging into IP telephony. With 4.5 million homes passed by their new fiber-to-the-premises (FTTP) plant by mid-July, up 1.5 million households from the close of 2005, Verizon officials are now shooting to exceed their target of 6 million homes passed by the end of the year. Verizon executives are also looking to drive up their FIOS Internet and TV take rates faster and further than before. Disclosing its FIOS data subscriber numbers for the first time, the company said 375,000 phone customers have signed up for the high-speed Internet service so far, which amounts to 12 percent of the 3.1 million customers who could get it during the second quarter. The telco netted 111,000 FIOS data subscribers in the spring quarter.

“Could we go higher?” says Verizon Chairman & CEO Ivan Seidenberg. “The answer to that is: I expect it to and that we drive our people to make it go higher.”

..... in roughly 60 markets scattered throughout seven states, including Florida, Texas, New York, and California. They also claimed that phone customers are increasingly signing up for the video packages....“We are seeing great initial acceptance by customers across our whole footprint, particularly in the more mature data markets,” says Doreen Toben, executive vice president and CFO of Verizon. “Our average video penetration rates are 7 percent at the three-month mark and 10 percent after six months.”

The FIOS moves come as Verizon's line losses continue to pile up. In the traditionally weak second quarter, the company shed 1 million total access lines, including 553,000 consumer retail lines, lowering its total to 47 million lines. Before that, it lost 837,000 overall lines in the first quarter, including 678,000 residential lines.. Although a good chunk of those losses are due to wireless substitution, cable broadband and VOIP products are stealing an increasing share of the pot. In a recent research report on cable VOIP's progress, Sanford C. Bernstein estimated that Verizon lost nearly 1.8 million lines to cable telephony last year, more than any other RBOC, largely because of aggressive VOIP rollouts by Time Warner Cable and Cablevision Systems in the telco's hometown New York market.

² See McGarty, The Hidden Cost of Broadband. www.telmarc.com

³ See <http://blog.cabledigitalnews.com/index.php?id=504>

*Bernstein projects that Verizon will lose an additional 2.8 lines this year, once again more than any other Bell...In response, Verizon seems focused on deploying FIOS in markets where cable operators are strongly pushing VOIP. In the New York market, for instance, the telco has been rolling out and heavily promoting both of its FIOS products to fight back against Cablevision and Time Warner.To make it easier to do so, Verizon is seeking to trim the expense of its pricey all-fiber network builds. The company, which is **now spending more than its target cost of \$717 per FIOS connection...***

The above quote raises several other issues. These issues then go the heart of the analysis in this paper.

1. The company has 4.5 million homes passed, 3.1 million activated, and 375,000 subscribers. That is the 12% penetration indicated. What is missing is who they are and what the ARPU is for this set. In our experience the early adopters, the initial 15% is easy to obtain, the next 15% is hard, and the remaining will be near impossible.
2. Verizon lost 1.8 million access lines last year and will lose 2.8 million this year. In our analysis done late last year, we concluded that it may likely be twice that number⁴. We further argued in our previous analysis that Verizon has a duty under FASB 121 to write off massive amounts of its capital plant and equipment as being impaired. It has not. We, in our opinion, believe that this is a great error.
3. The buy rate of telephony, by cable subscribers, will just continue to accelerate. The acceleration, in our opinion, will be massive. With the Adelphia markets now being Time Warner and Comcast operators, we estimate that they will soon dominate the voice business. This will put accelerated pressure on the FASB 121 issue and will drive up the cost of capital to Verizon. The base cost of capital is rising as the Fed increases its rate and with the loss of the core and the true costs of FTTH being seen, Verizon may see explosive costs of capital.
4. The CAPEX per sub is grossly over optimistic, in our opinion. We detail that in our paper. In fact we believe the CAPEX per sub to be three times greater than stipulated by Verizon, and possibly even more!

To preface our analysis it is useful to sketch out a “back of the envelope” analysis. Consider the following:

1. The fiber install is generally about \$25,000 per mile for aerial fiber with no make ready requirements. This is true for most residential suburban markets such as those which we have studied. To perform a make ready doubles the cost to \$50,000 per mile and if it is buried then it triples the cost to \$75,000 per mile. Assume that we have 50% aerial, 25% make ready and 25% buried. Then we have an average cost per mile of about \$45,000. Of course one could “assume” all aerials and no make ready.
2. Now assume we have 50 HH per mile. That means 25 HH on each side of the street or a frontage of 200 feet per HH. But, since there are intersections and other types of common land, this reduces the real frontage of a home to about 100 feet. Thus, this is a typical residential neighborhood, not an upscale multi acre zoned area, but just plain vanilla residential.
3. Now assume we penetrate that market, at 10%, we have 5 HH per mile or \$9,000 per HH for just the fiber on the pole. The fiber never touches a home. it just goes on the pole. At 30% penetration we have \$3,000 per HH! And this 30% is a good penetration number, above that things get hard! Even at 100% penetration the fiber all by itself is \$900! Remember that the Cable company is part of the make ready process, and they will fight it.

⁴ See McGarty, Evolutionary Process.

4. Now let us consider getting from the pole to the home. This is a two part process. First we need a drop, a cable extension, from the pole to the side of the house. This is a several hour process of a two man crew at a minimum and costs about \$400 fully loaded. Labor costs just keep rising. We can assume the fiber itself is free. Then we have the box on the side of the house, the optical network unit, ONU, for example. It is currently listed at about \$500 but we see it going down to \$200 plus install. Assume an hour to install, that makes it \$300. One must remember that the people who work poles do not work the house! Thus the 200 feet to the home is an added \$700.
5. Now there are the electronics on the fiber system such as PON, and the electronics in the headend to control, monitor, and manage. One can assume that that costs will be about \$200-300 per HH at a minimum.
6. Finally is the capital equipment in the home, such as a set top converter or likewise. That will be a minimum of \$150 per television set. Assume two sets per HH and we have another \$300.
7. Add these up; (i) say \$2000 for fiber, (ii) \$700 for drop and ONU, (iii) \$200 common electronics, (iv) \$300 converters. That is a total of \$3,200. This is almost five times the Verizon number! There are no scale economies in labor, one cannot outsource it to India, one must deal with the local environment.

We detail this result in a recent working paper.⁵

3 FINANCIAL MODELS

This section details the financial models for the capital deployment. The analysis is based upon the actual agreements entered into a dozen third party vendors. There was an RFP process, with over four dozen bidders, and detailed engineering analysis of each market. In fact this work preceded Verizon by a year or more in some cases. It was done by the author and the company that Telmarc had invested in, Merton. It was performed by an experienced team of professionals, all of whom had their own personal capital at risk, something that is not the case with Verizon.

The approach we had taken to reach these results were as follows:

1. Selection of Towns: A detailed process of town selection was performed. This meant personal visits and communications with the towns, their managers, local business, town meetings and various one on one discussions with local potential customers. This also included detailed market research studies of tens of thousands of potential customers. A large data base of research results was collected cross tabbed and analyzed.⁶
2. Detailed Engineering Studies: Each town had a detailed engineering study performed. The study entailed travelling every road and surveying every home and business. Detailed maps using GPS and photo records were obtained and detailed records on frontages, setbacks, telephone or utility pole status were recorded.
3. Preparation, Issuance, Evaluation of RFP: A detailed RFP was prepared and issued. Vendor conferences were held, vendor selections were made and vendor contract negotiations were performed. A selection of over a dozen vendors was made and agreements cut.

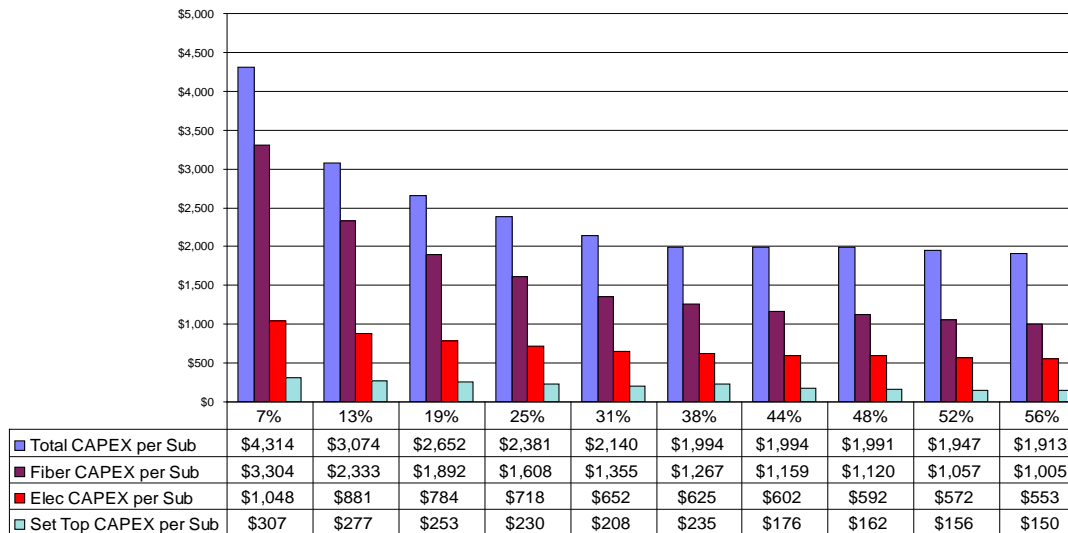
⁵ See Telmarc web site www.telmarc.com

⁶ See www.telmarc.com for many of these studies and their results.

4. Vendor Selection: The vendors were then chosen and brought into the process to revalidate all assumptions and review the design analysis process to ensure contract compliance.
5. RUS Finance Approval: Merton filed with USDA RUS and after extensive review and due diligence was awarded financing for New England, the only such company East of the Mississippi.
6. Detailed Strand Mapping and Cost Analysis: Teams were brought in to perform detailed computer based strand mapping of all streets, homes, business and municipal facilities. Detailed build maps were prepared and again capital costs were refined.
7. Franchise Negotiations and Award: Franchises were negotiated and finalized. However it was here that the process broke down, For example, in many of the towns, the selectmen demanded that the coverage be twice what the cable incumbent had to cover. The towns were informed that this would make it financially unacceptable. They held fast and Merton terminated the business, exactly what Verizon had done as of August 4, 2006. Ironically the team doing the negotiations with Verizon consisted of many of the same players and the result was the same. New Hampshire local politics, in our opinion, results in destruction of value to the citizens.
8. Investment: Additional investment was obtained contingent of the franchise remedy which could not be attained.
9. Operational Experience: The team doing all of this work included highly experienced individuals who have done this many times before including former senior NYNEX (now Verizon) executives.

The result for the towns is shown in the following Figure confirming the analysis we had given earlier. In reality these towns had less make ready and less buried and thus the financials were better.

CAPEX per Sub v Penetration of HH



4 OBSERVATIONS AND CONSIDERATIONS

This paper is based upon actual deployment costs of a FTTH system deployment in New England. The towns were identified, competitive bidding employed and actual detailed engineering completed. In

contrast to the Verizon numbers we arrive at dramatically higher costs. In addition certain costs have not been expressly included:

1. Franchise costs, as we have stated, are significant. In fact we concluded and have documented that they are the deal breakers in any deployment of FTTH in the United States. In fact the US is the only country in the world with such a process at the local level and as seen in the US position in FTTH it is lagging accordingly.
2. Home converters can dramatically add to the cost. IP video is most likely the way to proceed but such a method requires an IP Video set per TV per HH. At the current prices this is a great cost not included in toto.
3. The wiring of homes with CAT 5 wire is also not included. Wireless will not work as currently deployed and the wiring will be required as cable had to do years ago. This will add hundreds of dollars per HH.
4. Penetration is the key. It is no longer a monopoly and the cable companies will aggressively compete on services and price. Also cable is now a politically stronger force and they own and control content. To have any chance of survival the telco must get rapid and significant penetration. With identical service price will become the only factor. There will be a price war and this will lead to dramatic negative cash flows for the telcos. As with the end of the 1990s and the telco price wars this may lead to another collapse. This time of the large player.
5. Wireless has a great price advantage, albeit not with the bandwidth of fiber. Thus, wireless becomes an alternative competitor and a wild card.
6. Open networks cannot be achieved with the current designs of the telcos. Thus content is bottlenecked and demand will not grow. Open networks are critical for the development of true broadband service, however. The telcos abhor any form of open networking and this factor alone may doom them.
7. To build these networks a significant amount of capital will have to be raised. Debt has been the telcos means. With the decline in the wireline business and with the specter of FASB 121 hanging over their head we believe that their cost of capital will sky rocket and that they will have even less of a chance to obtain a return.

For these reason and many more we have little belief that success will ensue.

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