

Broadband MLP Costs With and Without Regionalization

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1 Introduction

This paper will explore what happens to the cost of operating a municipal broadband network when one moves from a single town network to a multi-town *regional* network. There seems to be some lack of real understanding about what happens to the cost of operating a municipal broadband network in the context of a regional network. It is my contention that for almost all of the unserved towns in Western Massachusetts, operating as single town networks is not really sustainable, at least not at an *affordable* price. Only one or two towns have any reasonable chance of operating as single town network in a sustainable way, but only at prices that are *barely* affordable.

I will be using some simple cost assumptions, to perform a simple set of cost analysis. It is not the intent of this paper to present actual cost projections or pricing models, since others have done that. I am simply going to present an analysis of what generally happens to the costs when one moves from a single town network to a multi-town regional network. I took the base numbers from the Wendell Sustainability Worksheet[2].

2 The Three “buckets” of Broadband MLP Costs

The first thing to understand about the Broadband MLP Costs is that the costs fall into three categories (or “buckets”):

1. Per subscriber costs. These are costs that are always the same per subscriber no matter how many subscribers there or how many miles of fiber there is. These costs relate mostly to the costs associated with billing and customer service. That is the cost to print and mail the bills, the costs of processing the payments. Also the costs for customer service and technical support.

2. Per overall network costs. These are one-of costs for the overall network and are the same for a small network or a large network. These are things like the cost for the accounting, legal, and general insurance fees.
3. Per mile costs. These are costs that depend on the number of miles of fiber¹. These include costs like outside plant maintenance costs and things like pole rental and pole bond, along with things like the depreciation reserve, since that is based on the cost on the fiber.

The first bucket is not affected by the size of the network. It is also a relatively small part of the monthly subscriber fee. I am going to ignore this cost in this paper, since regionalization has no effect on this part of the monthly subscriber fee.

The second bucket is most interesting, since it is generally unaffected by the size of the network, large or small. The portion of the subscriber fee that covers these costs goes down as the number of subscriber increases.

The third bucket is less interesting, but worth looking at. The portion of the subscriber fee that covers these costs goes down as the *density* of subscribers increases.

3 Typical “single town” Broadband MLP Costs

¹And also the number of poles. Since the pole spacing is more or less constant, I am using a constant conversion between number of poles and number of miles.

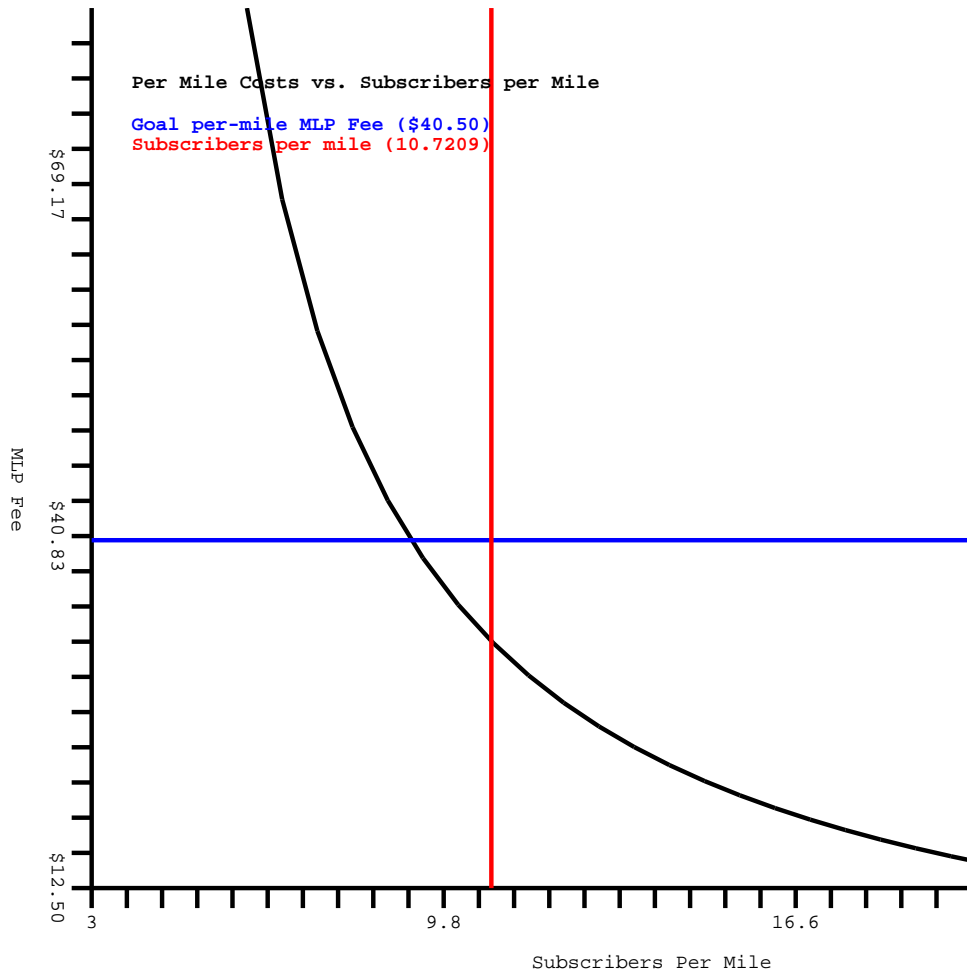


Figure 1: Wendell Per Mile costs

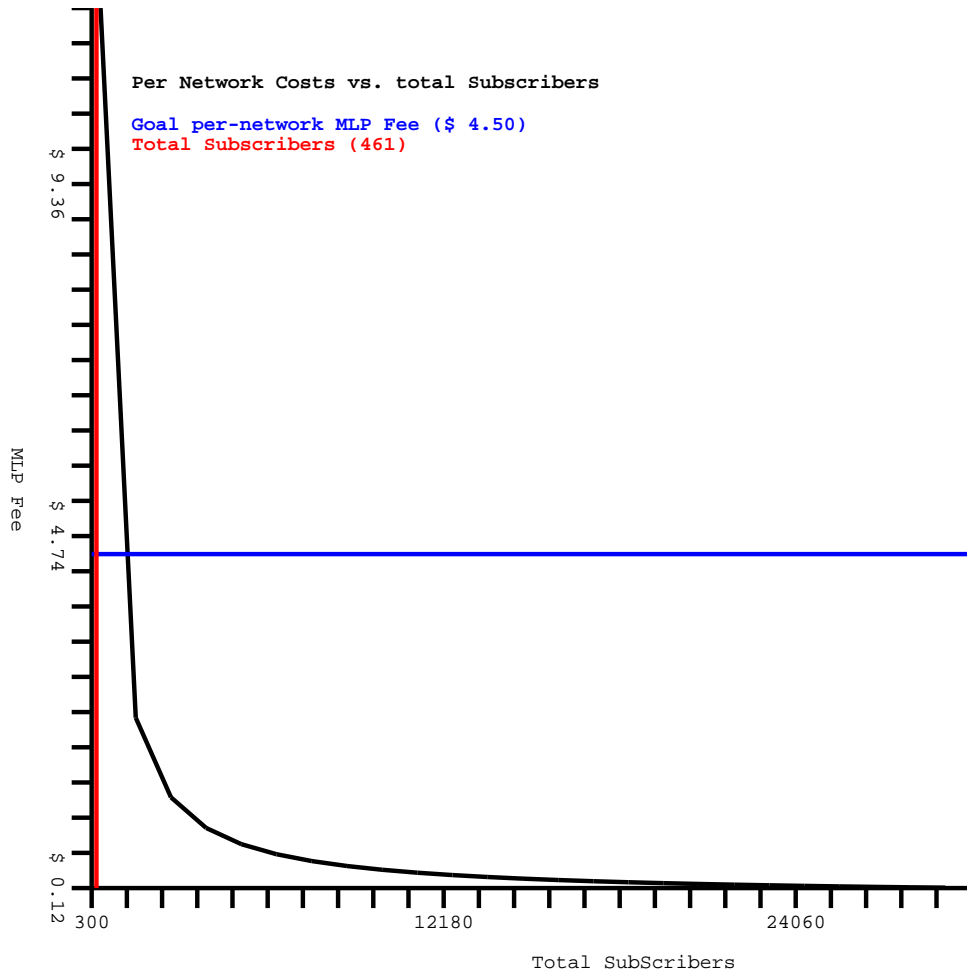


Figure 2: Wendell Per Network costs

Figures 1 and 2 show how the costs work out for the Town Of Wendell as a single town network. The vertical red lines show Wendell's total subscriber base and the average subscriber density. The black line on the graphs show the subscriber fee for a range of total subscriber count and subscribers per mile. The area above and to the right of the black line is "operating in the black" and represents excess revenue ("profits") and the area below and to the left of the black line is "operating in the red" and represents losses. Operating exactly on the black line is just breaking even. The blue line is a "goal" subscriber fee, what one might consider what the subscriber can afford for this cost. The red lines represent that actual total number of subscribers and the actual subscriber density. The intersection of the red and blue lines tell us where we are in terms of sustainability. We want that intersection to land somewhere so that we are at least breaking even, if not with a profit. The thing to note here is that at an *affordable* subscriber fee, Wendell just does not have enough subscribers to be sustainable².

²Effectively, Wendell "lied" (with the help of MBI!) on our readiness assessment by simply assuming that a higher subscriber fee was actually going to be affordable. I expect that most towns did this.

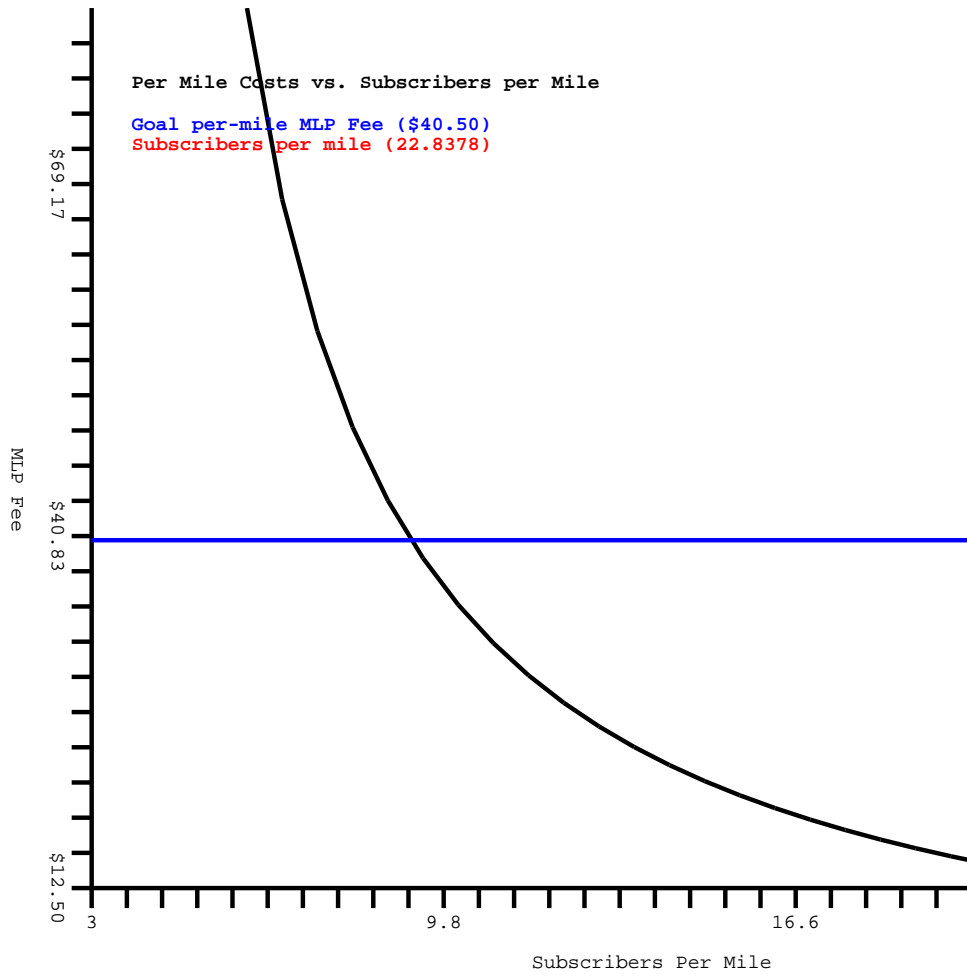


Figure 3: Shutesbury Per Mile costs

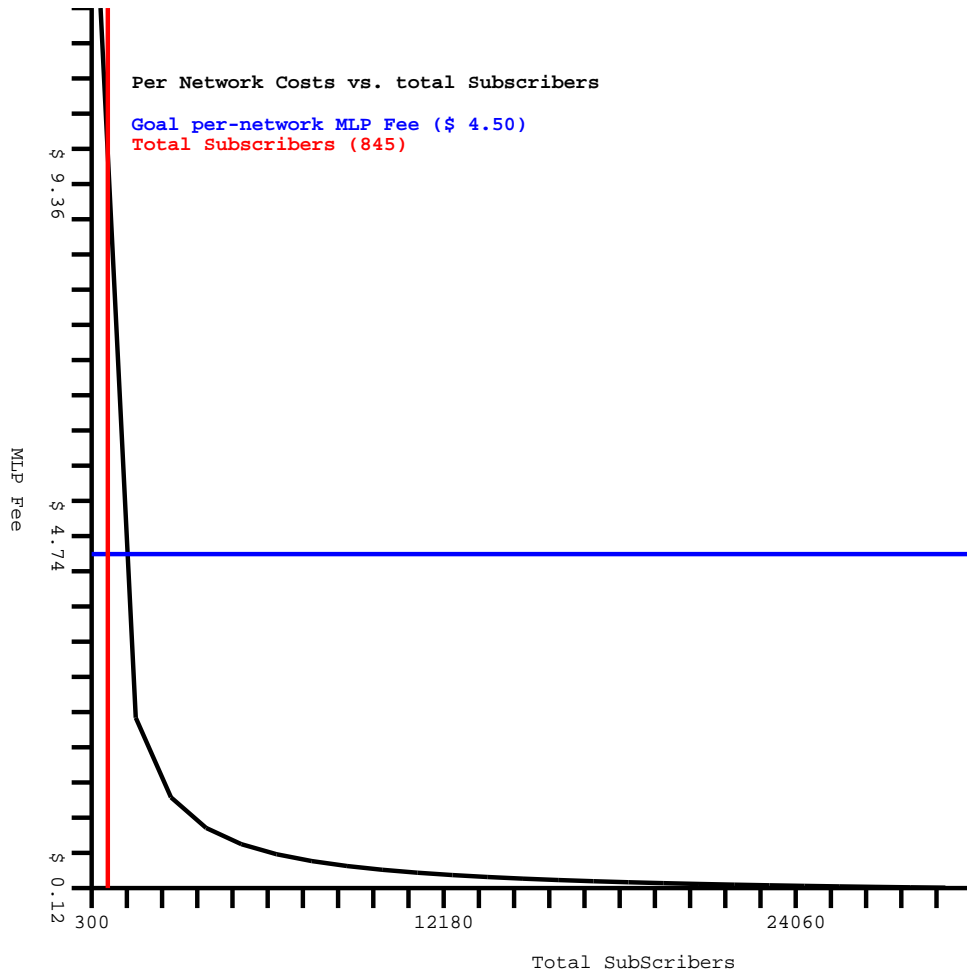


Figure 4: Shutesbury Per Network costs

Figures 3 and 4 show how the costs work out for the Town Of Shutesbury as a single town network. The vertical red lines show Shutesbury's total subscriber base and the average subscriber density. Shutesbury, being more populous does a lot better, but even Shutesbury is on the edge of not being sustainable. The much higher density helps a lot, but it is a little iffy.

4 What happens to the Broadband MLP Costs when the network is regionalized

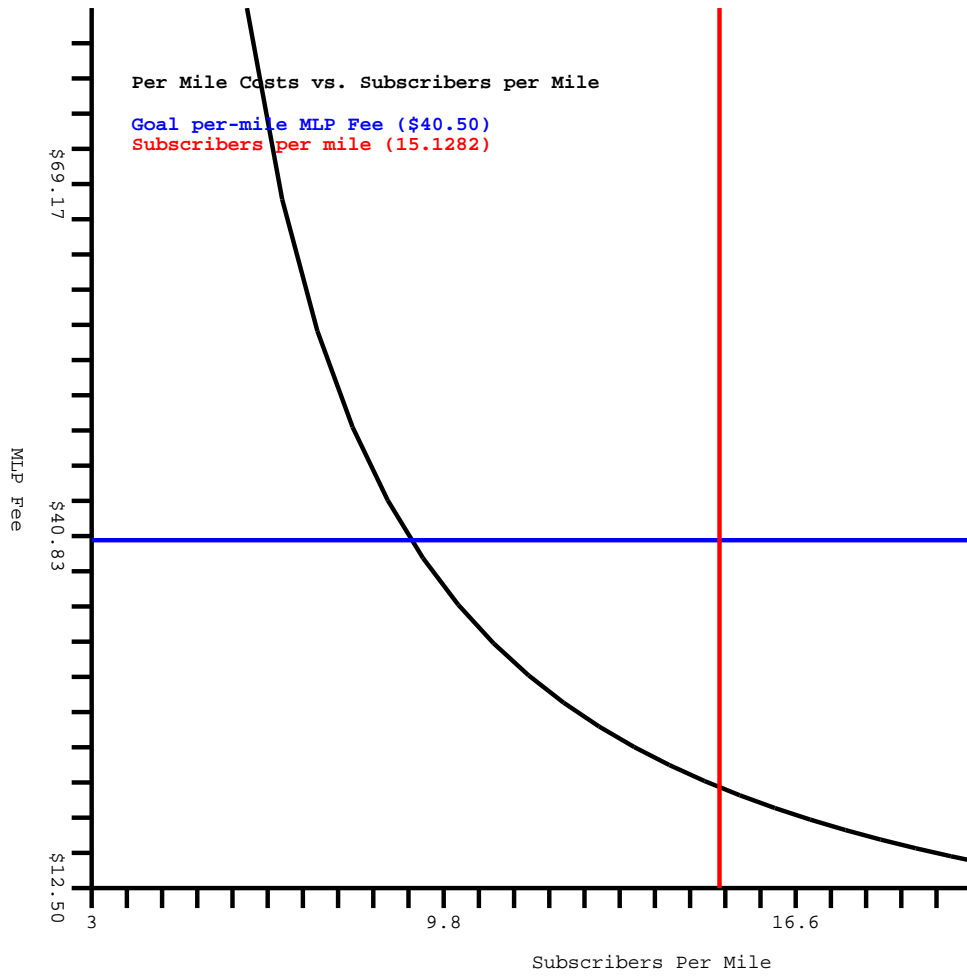


Figure 5: New Salem, Shutesbury, and Wendell Per Mile costs

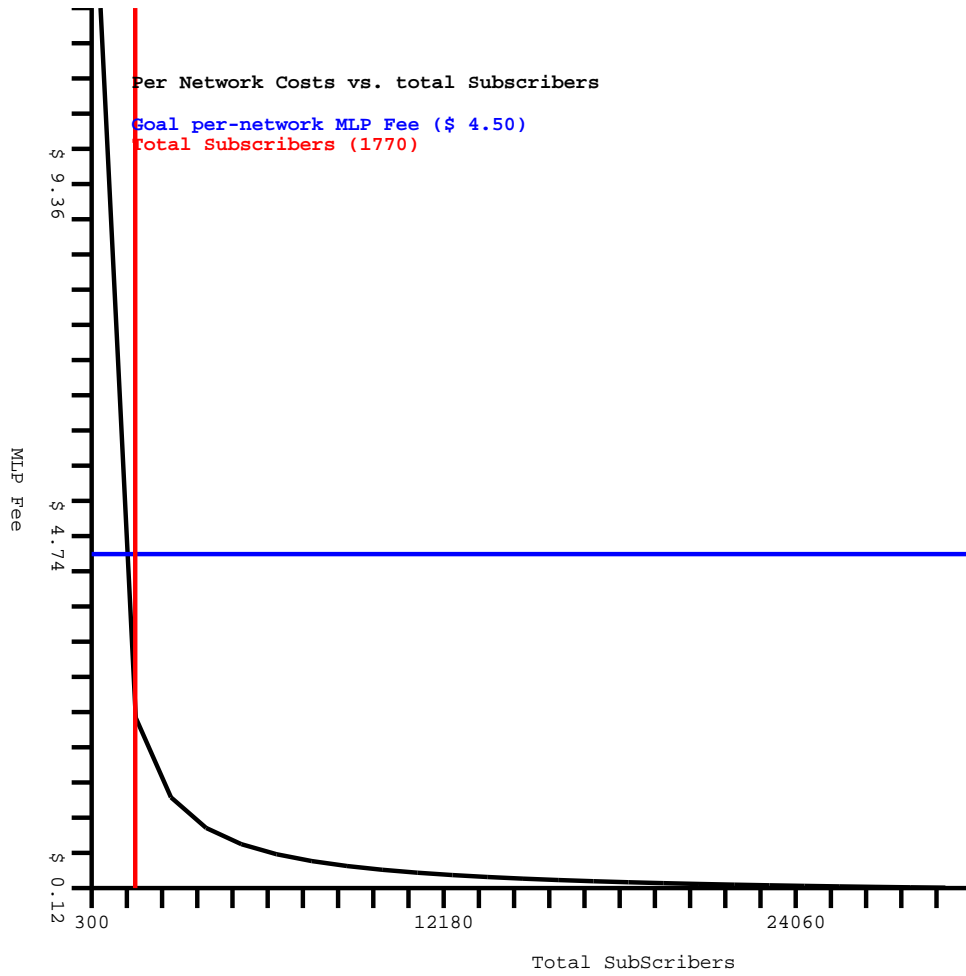


Figure 6: New Salem, Shutesbury, and Wendell Per Network costs

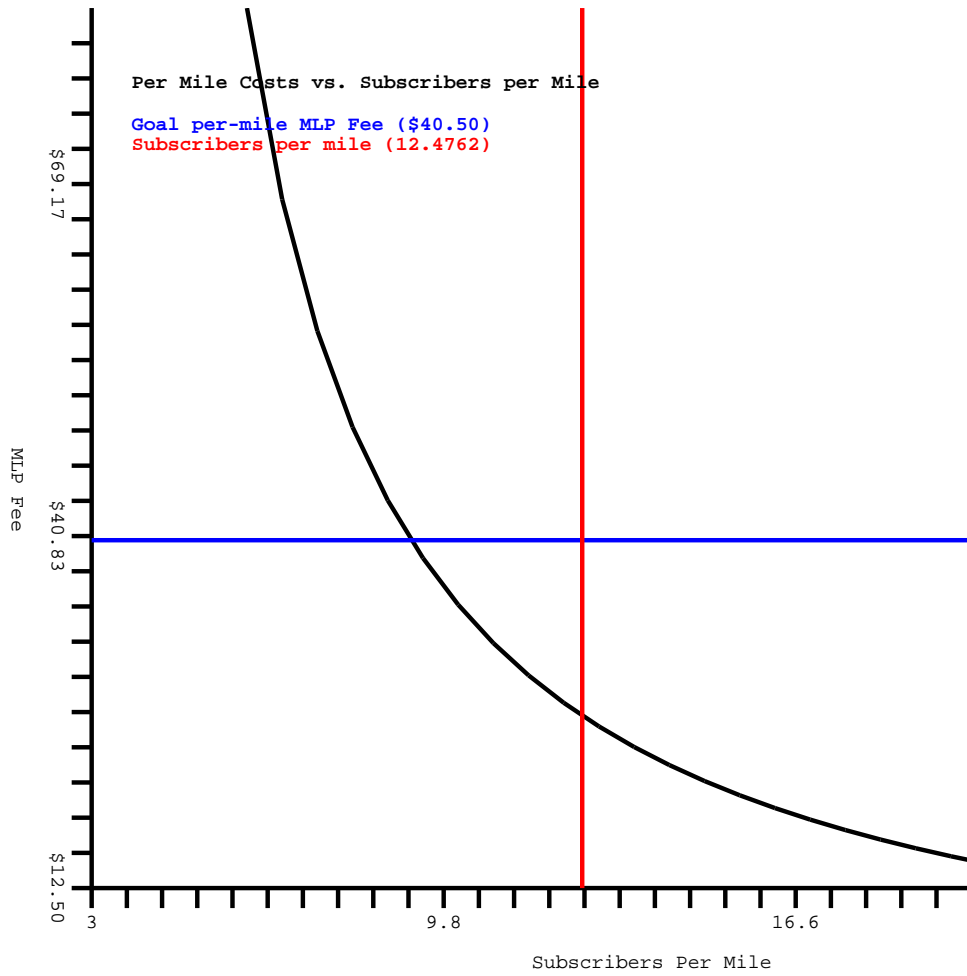


Figure 7: 11 town Per Mile costs

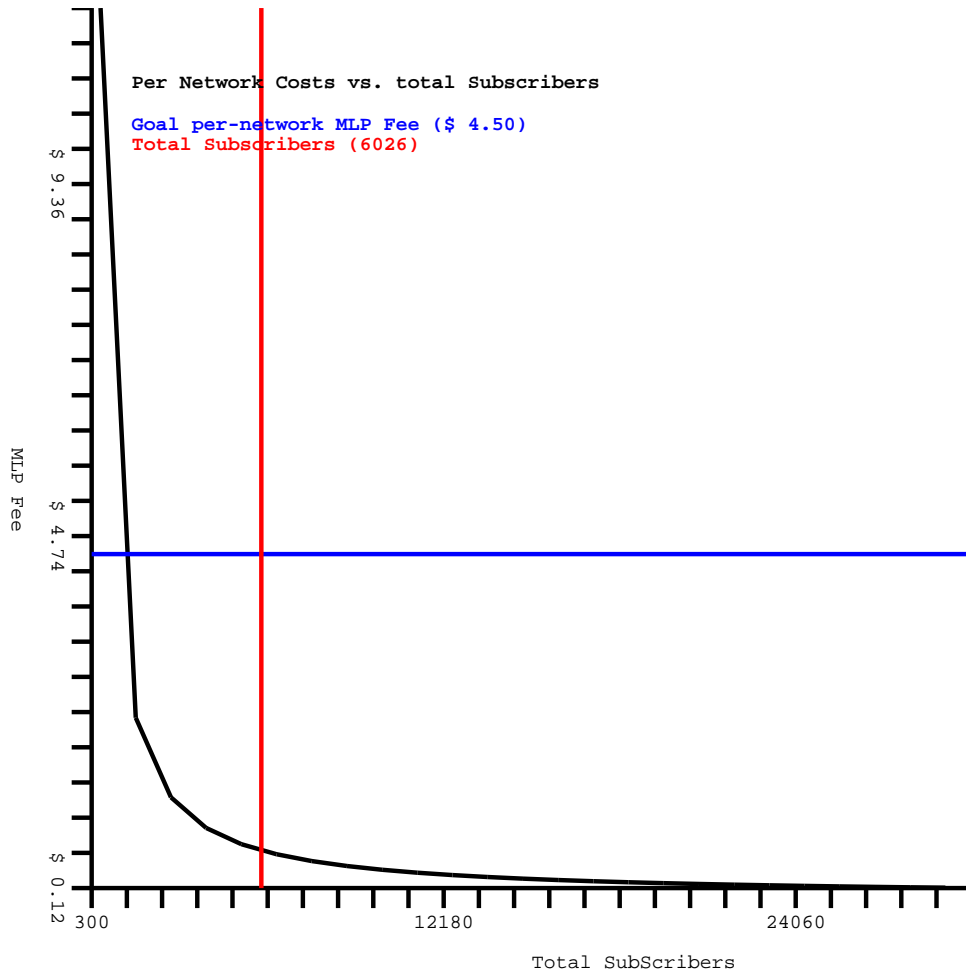


Figure 8: 11 town Per Network costs

But look what happens with a very modest 3 town regional network (New Salem, Shutesbury, and Wendell). Figures 5 and 6 show that merely increasing the total subscriber base moves the red line just into the profitable region, if only slightly. Going to an 11³ town network gives us a massive improvement, as shown in Figures 7 and 8.

5 Conclusions

The conclusion I have drawn from this exercise is that to achieve sustainability at an affordable price one needs to maximize the customer base and to work with as dense a customer base as possible, although density of the customer base is actually less of an issue. When the size of the customer base grows to the point of passing the “knee” of the graph, sustainability *and* affordability can be easily achieved and with a comfortable margin (allowing spare revenue for various sorts of “disasters”). Most of the small towns in our region are actually so small that getting past the knee is essentially impossible and the only way to cover the cost of most single town networks is to set the subscriber price so high as to make it unaffordable to most of the people in our region.

A Methodology

To generate the graphs used in this paper, I wrote a Tcl/Tk program[1]. I have uploaded the source code to a GitHub repository(<http://www.github.com/RobertPHeller/MLPCostGraphs>). I have also uploaded ready-to-run binaries of the program for various operating system to my company website at this web address: <http://www.deepsoft.com/all-downloads/download-category/mlpcostgraphs/>. People who are interested can download the program and use it to try it out with various parameter settings and various regional network scenarios.

³Becket, Goshen, Heath, New Ashford, New Salem, Plainfield, Rowe, Shutesbury, Washington, Wendell, and Windsor.

References

- [1] Robert Heller. Mlpcostgraphs program, 2017. [14](#)
- [2] MBI and Wendell Broadband Committee. Wendell sustainability worksheet, 2016. [2](#)

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Buckets, cost, [2](#)