

## **Results of the Shaftsbury Broadband Survey**

### **Environmental Issues Committee 03/25/2010**

#### **Background information:**

The results of the survey on Broadband recently completed by the Environmental Issues Committee (EIC) are now available. The basic idea we are investigating is whether we can get broadband extended throughout Shaftsbury by collaborating with Comcast, the cable company that services parts of Shaftsbury. The purpose of this survey was to see if Shaftsbury residents would be interested in joining such a collaboration, and if so, how much they would be willing to pay to get cable service.

The collaboration would work as follows: Not all of Shaftsbury can be serviced economically at current cable fees, but Vermont State has a requirement that Comcast make network extensions available to neighborhood groups if the groups are willing to pay an additional charge. According to Comcast's published fees for cable extensions, the base fee is \$25,000 per pole-mile<sup>1</sup>, but this is reduced by \$2081.60 for each subscriber/pole-mile. At 12 subscribers per pole-mile the base fee is essentially zero. Recently, new figures have become available for a proposed cable extension along Horton Hill Road and Cold Spring Road. For this extension, the base fee averages to \$29,294 per pole-mile and the fee is reduced by \$2349.16 for each subscriber per pole-mile.

The intent is to bring universal broadband access to Shaftsbury by creating a neighborhood group of all currently unserved residences who would like to subscribe. From the 911 maps used by our emergency service providers and from maps of Comcast's current network, we infer that Shaftsbury has 436 residences without cable service along 55 pole miles of public utility lines. The average residential density is therefore about 8 residences per pole mile in the unserved areas. None of these unserved residences have access to broadband service other than satellite. DSL service, where available, is primarily in areas already receiving cable service. Wireless service is poor-to-nonexistent in most areas where cable is not available.

The cost of extending Comcast's network is not small. At a cost of \$25,000 per pole-mile, 55 pole-miles would cost just under \$1,400,000. If everyone in this extended network area subscribed, however, the cost to the Town would be just under \$500,000 and Comcast would pay the rest.

Since the charge per pole-mile for extending the cable network is determined by the number of subscribers per pole-mile, not the number of residences per pole-mile, a key variable is the "take-rate" or percentage of residences who would be likely to subscribe. The take-rate is, of course, highly dependent on the monthly fee needed to pay for the network extension.

In order to measure how take-rate varies with the fee for network extension, the EIC has been surveying Shaftsbury residents with an on-line survey at the Shaftsbury web site. More recently, EIC members have gone door-to-door in an effort to increase the survey response and reach those who do not use the Internet. As of 12/30/09, the survey was closed.

#### **Survey results and analysis:**

There were 167 respondents to the survey, of which 11 were duplicates. For duplicate entries only the

---

<sup>1</sup> A pole mile is approximately equal to 1.15 road miles.

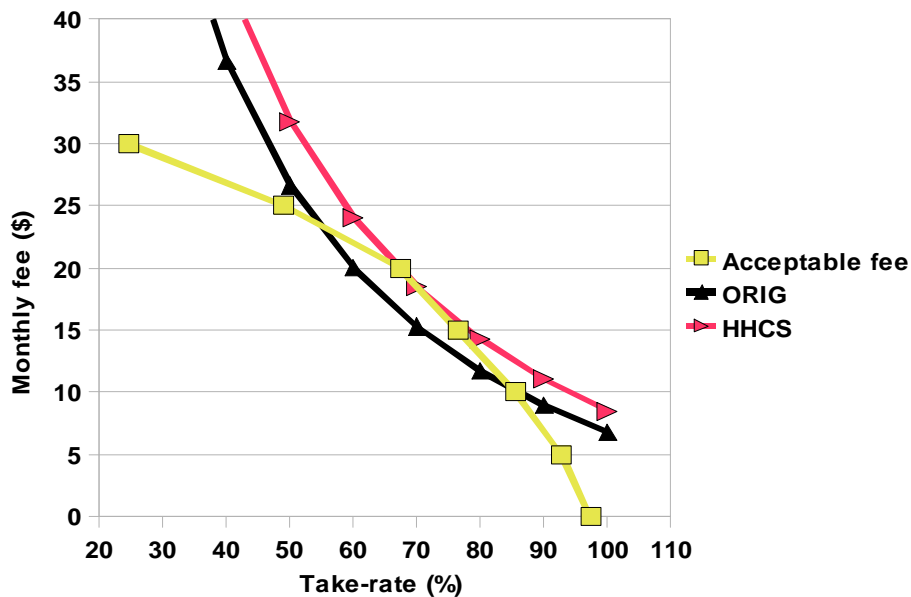
most recent entry was counted.

There are two categories of valid responses, from those who can get either cable or DSL service and from those who can get neither.

|   |     |
|---|-----|
| Number of survey respondents                      | 167 |
| Number of duplicate entries                       | 11  |
| Number with either cable or DSL service available | 46  |
| Number without cable or DSL service               | 110 |

Of the group that can get either cable or DSL, 43 have cable available and 25 have DSL available. However, of the 25 that can get DSL, 22 also can get cable, indicating that where DSL is presently available there is a great deal of overlap with cable services. Of the 46 with either cable or DSL (or both) available, 39 subscribe to cable and 2 subscribe to DSL, a take-rate of 92% for cable and 8% for DSL.

The feedback from the 110 respondents who can't get cable or DSL broadband is more relevant, as these residents might subscribe to an extended cable service. But, whether they subscribe or not depends on the fee charged for the network extension. The relationship between acceptable fees and take-rate for these survey respondents is plotted in yellow in Figure 1.



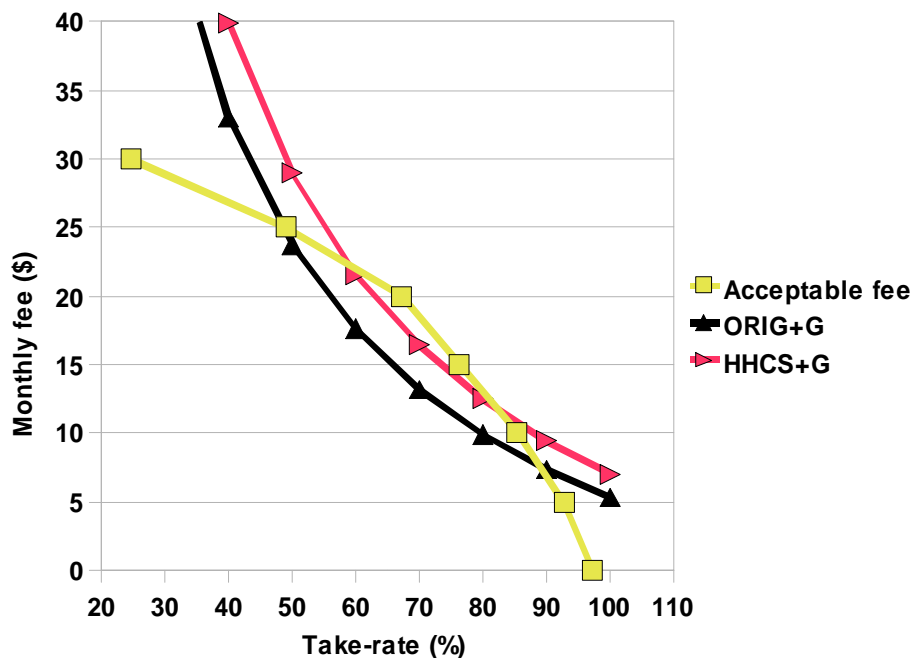
**Figure 1: Plot of Monthly fee versus Take-rate. The data in yellow show the range of acceptable fees for the 109 survey respondents unable to get either cable or DSL service. Not surprisingly, as the fee drops, the take-rate (percentage of residences subscribing) increases. The black and red curves are subscriber fees needed to meet bond payments; the black is for the original Comcast fee schedule and the red is for the Horton Hill/Cold Spring fee schedule.**

The black curve of Figure 1, calculated using the original fee schedule for network extension, crosses the curve of acceptable fees at about 55% and again at 85%, and this crossover must occur if the fee is

to be sufficient to cover bond payments. The fee, which in this case would be approximately \$10/month, is determined by the crossing point at 85% take-rate. Bond payments are calculated assuming a 20 year bond at 4.5% interest.

The red curve of Figure 1 is calculated using the Horton Hill/Cold Spring fees. The fee is increased enough to increase the monthly payment to about \$18 and reduce the take-rate to just below 70%. In this case uncertainty in the survey could easily prevent the curves from crossing.

A one-time grant of \$100K reduces bond payments enough to give clear overlap for both fee schedules, as is seen in Figure 2.



**Figure 2: Effect of a one-time \$100K grant on the required fee schedule. The acceptable fee curve now crosses the required fee curves for both network extension cost scenarios.**

**Questions and Comments:**

1. Exactly how would the network expansion be funded? Can an alternative funding source be identified that would be acceptable to the voters?
2. What areas would be covered by a network expansion? Would roads serving only camps be included? What about Glastenbury?
3. How would new subscribers join the network?
4. Would dissatisfied subscribers be able to leave the network and not continue to pay the network extension fee? (This fee would be paid to the Town, not to Comcast.)
5. At least one resident has recently paid a substantial amount to get cable extended to his residence. If cable is extended beyond his residence, he may be entitled to a refund. How would that be handled?
6. If property changes ownership, how are cable subscription and network extension fees transferred to the new owner?

7. Second home owners are undoubtedly under-represented in the survey. How do we address this problem?
8. While DSL currently has no impact on the cable network extension we are considering, two recently revealed DSL extensions will have a major impact. (Comcast has made it clear that they do not want to extend their cable network into areas where DSL is already available.)  
The two DSL extensions planned are:
  - Maple Hill Road: As part of the line reconstruction on Maple Hill Road, Fairpoint intends to extend DSL service to 375 exchange numbers along this road.
  - Western Shaftsbury: Fairpoint representative Roger Webster has indicated that in 2010 DSL fiber optic cables will be run to hubs near Peters flat and Bouplon Hollow Road.

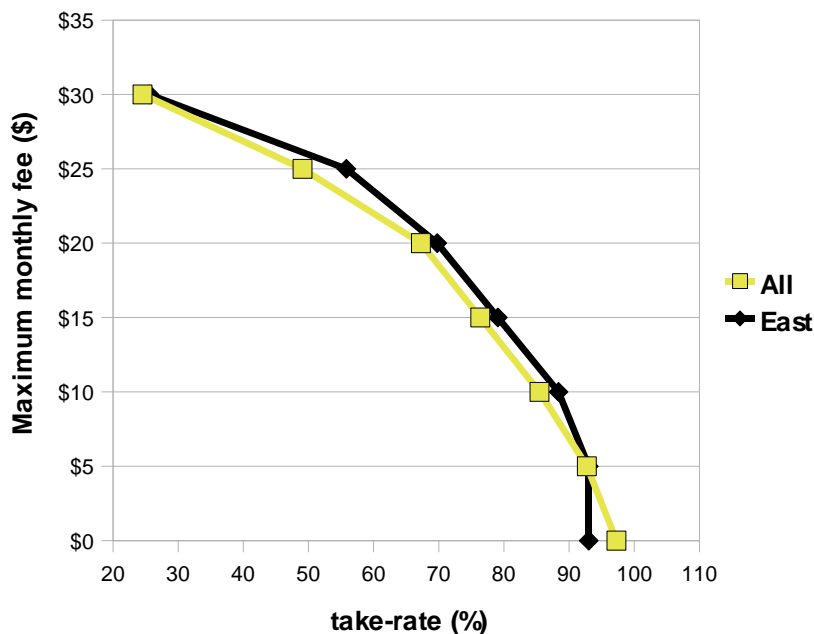
If these extensions happen, DSL service will become available to a small section of northeastern Shaftsbury and to virtually all sections of western Shaftsbury that currently do not have cable service.

### Network extension only in east Shaftsbury

If the analysis must be restricted to east Shaftsbury, two questions should be addressed:

1. Are there any differences in survey response for east Shaftsbury as opposed to all areas of Shaftsbury (currently without broadband service)?
2. Is there any difference in the cost per residence for network extension?

Figure 3 answers the first question - there is almost no difference. Since the two areas are demographically similar, this is not surprising.

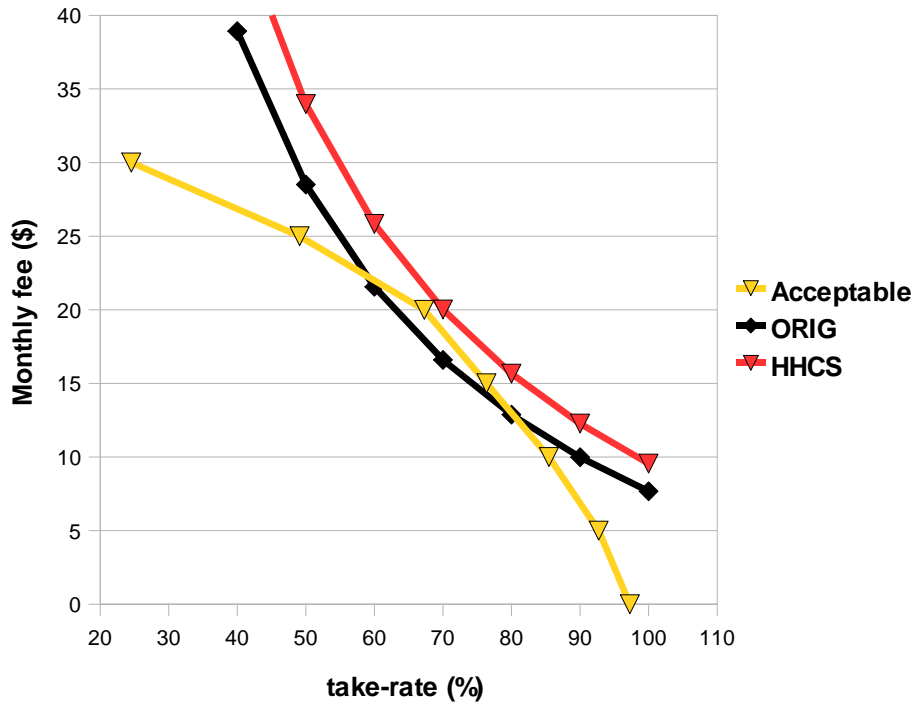


**Figure 3: Comparison of survey results for all unserved areas of Shaftsbury (yellow) versus responses from only east Shaftsbury (black).**

The answer to the second question required a new analysis of 911 maps to get the residential density in east Shaftsbury. This new analysis shows that there are 7.59 residences/pole-mile, which is slightly

lower than the 7.94 residences/pole-mile for all areas of Shaftsbury that are currently without broadband.

The modest drop in residential density is important, however, as it increases the fees required to meet bond payment. Figure 4 shows the effect of this.



**Figure 4: Acceptable versus required fees for east Shaftsbury, as a function of take-rate. The black curve is for the original Comcast fee schedule and the red curve is for the Horton Hill/Cold Spring Road fee schedule.**

Figure 4 tells us that while network extension appears to be feasible for the original Comcast charges, it is not feasible if Comcast charges rates comparable to those for the Horton Hill/Cold Spring Road extension. Only if there is substantial funding from a source other than subscriber fees can the network then be extended.

### Conclusions:

The survey results indicate that for the entire currently unserved areas of Shaftsbury, network extension is feasible even if funded solely by subscriber fees. For the original Comcast charges, the monthly fee would be about \$10.00 and take-rate would be about 85%. For the somewhat higher Horton Hill/Cold Spring charges, network extension is barely feasible and it would be unwise to proceed unless some funding from sources other than subscriber fees can be found.

The proposed DSL extensions change the picture significantly, since only a section of east Shaftsbury will then be without broadband service. Cable network extension in this area of Shaftsbury is just barely feasible for the original Comcast charges and not feasible for the Horton Hill/ Cold Spring Road payment charges. Therefore, the possibility of network extension in east Shaftsbury is very dependent

on the charges Comcast will require. Unless the charges are close to the original estimates provided by Comcast or unless an alternative source of funding can be found, cable network extension does not appear to be feasible in east Shaftsbury alone.

This leaves a few other alternatives to explore:

First, since network extension cost is a factor of three smaller for east Shaftsbury alone, alternative funding might not be as difficult to obtain. Even a \$50K grant might be enough to make the project feasible. Unfortunately, Comcast has made it very clear that they will not accept Federal funding. Therefore, under current Vermont rules which require stimulus funding to go directly to installers, stimulus funding is not an option. State grants are a possibility, since they can be awarded directly to Towns. Unfortunately, the State finances are in such dire condition that a grant is likely to be very difficult to obtain in the foreseeable future.

Second, it may be possible to get Fairpoint to further expand their DSL network. There is fiber optic cable to the radio antenna on Buck Hill, and it might (according to Fairpoint) be possible to use this as a DSL hub. At some point DSL service might also be available from Arlington for 375 exchange numbers along 7A. Roger Webster of Fairpoint has told me he will look into this. Even though Fairpoint is not in great financial shape, the funding for DSL expansion comes from annual payments from Verizon – therefore, funds may be available.

Finally, the VTA is planning (when they get funding) to deploy a series of antennas to improve both cell-phone service and wireless service. If this happens, some areas of east Shaftsbury might be able to receive wireless broadband.