

Broadband for Boxborough - Summary and Issues

What is Broadband

As used in the current sense, Broadband refers to having a high-speed data connection for Internet access. A broadband connection is differentiated from a normal dial-up one in that it is: 1) significantly higher speed than dial-up, and 2) always-on – always connected and ready to use.

Why is Broadband Useful

The higher speed of a broadband connection means that any single user can quickly access much larger files, for example pictures, movie clips, music, or software downloads to add to or enhance your system. It also allows a number of users to share the same connection. A broadband connection would normally run at something like 1 Mbps, 1 million bits per second, which is 20 times faster than the best dial-up at 50Kbps – 50 thousand bits per second. The always-on aspect means you can use the Internet just like any other utility in your house – phone, power, or cable TV – you can depend on it and weave it into your daily life.

Current Status (January, 2003)

For Town and business use, the standard high-speed data connection available in Boxborough is a T1 telephone circuit. It runs at a maximum speed of about 1.5Mbps and costs from \$300 to \$1000 per month depending on the speed. Because of the cost, this is not normally used by individual homes. Larger companies will use even higher-speed connections, some of which may require optical circuits, as the speeds are too high for normal copper wire circuits.

For the individual home, the picture is more complicated and it changes frequently. Although not broadband speed, many people in Boxborough use a second phone line and dedicate it for computer use. Various combinations of hardware and software allow the line to be shared among a small number of computers and to be dialed up automatically as needed.

The real broadband options available to Boxborough today are DSL and two-way satellite and these are only available to a small number of people (you need to be close to the Acton telephone central office for DSL or live high on a hill for 2-way satellite). Cable Modems should be widely available within Boxborough within the next two months.

A DSL (digital subscriber link) connection allows a standard telephone to be used for both voice and high-speed Internet access at the same time. Verizon will provide DSL service to Boxborough but you must be within 18,000 feet of the Verizon central office in Acton (corner of Route 111 and 27). You can use the Verizon web site (www.verizon.com) to check for availability to your house. There are other vendors that

will provide business-class DSL if you are within the required distance. Use www.dslreports.com or www.2wire.com to check.

If you check with Verizon and find that you are not currently eligible for service, you can register to be notified when it becomes available. You should do this or just call and indicate interest. There is DSL technology available that can reach any house in Boxborough. An expression of customer interest may provoke Verizon to move a bit faster in this area.

Residential DSL will cost about \$50 per month and the speed will vary from 200Kbps to 1.5 Mbps. The equipment is often provided at no cost with a one-year contract and the individual does the installation. Most homes in Boxborough cannot get DSL.

There are a growing number of satellite providers that offer a two-way Internet access, often in combination with normal television channels. An example is Starband (www.starband.com). You must have a clear view of the Southern sky from your house (or roof). The startup costs are about \$500 for equipment and \$200 for professional installation (required) and the monthly cost is \$70. The download (from the satellite to your computer) speed is about 3Mbps; the upload speed is much slower.

A cable modem allows you to use your cable television connection for high-speed Internet access and costs about \$50 per month in addition to buying or renting the cable modem unit. Cable systems must be capable of supporting cable modems and the current cable system in Boxborough does not have those capabilities. The good news for 2003 is that our new cable service provider, Comcast, has put Boxborough at the top of the list for rebuilds in 2003 and this will be completed by March.

If you currently use a national ISP (AOL, MSN, Earthlink) for dial-up Internet access, check with them to see if they provide other high-speed access methods. Most of them are looking at different alternatives.

There are a number of cellular telephone service providers active in Boxborough. The word cellular refers to the way the networks are designed. A fairly tall (100 ft) tower provides service in a roughly circular area around the tower – called a cell. If you are in a car, you are automatically handed off from one cell to the next as you travel along. The initial build out of the US cellular system was designed to provide a mobile phone service and concentrated on the Interstate highway system, airports, and cities. The current emphasis is in two areas. One is to provide cellular service over a much wider area so that you can use a cell phone as your only telephone. The second is to move to the next generation (3G or 3rd generation) which makes use of a higher frequency of operation in order to provide faster data rates. Both of these trends lead to a greater number of towers.

A fixed wireless connection is one that uses the cellular telephone system to provide a data circuit for Internet access. The current speeds are quite slow but will improve as cellular companies go to the next generation of their systems.

Future Plans (2002 - 2003)

There are small companies that are starting to provide DSL at extended distances (30,000 ft) and can make use of the Verizon substations to get even closer to the end user. We have talked with one such company that is working in Westford now. We will continue our efforts to get them interested in the Acton/Boxborough area.

Both DSL and cable modems are solutions to the “last mile problem.” That is, how do you get from the telephone central office or a high-speed Internet hub to all the individual homes within a town such as Boxborough? There is growing interest and capability in the use of a wireless connection for this.

As mentioned above, cellular providers will be increasing the speed of their networks. It will be possible for an individual to watch movies, listen to CD-quality music, and play interactive games on their “cell phones”. For example, Verizon has recently hinted that they are about to unveil a fixed wireless data system that will support 144 Kbps.

While the speed of 3G cellular systems will support one person for Internet access, it is not sufficient to support an entire house. There is another set of technologies that will take the current wireless computer networks used in business and increasingly in homes (variations of the IEEE 802.11a and b standards based systems) and allow them to operate over distances of several miles. These may operate in conjunction with the cellular companies or evolve as totally separate entities.

Boxborough is fortunate to have a municipal power company (Littleton Electric) for most of the town. Littleton electric is working with companies that provide fiber connections to large businesses. Developments in this area could lead to a town-wide fiber network for both municipal use or as a backbone for a wireless system. This could also lead to a “fiber to the home” system that would provide virtually unlimited bandwidth for all homes in Boxborough.

The two-way satellite systems will also improve in the next few years. Some providers will use satellite orbits that place them higher up in the sky from the horizon. This will allow more people to make use of this technology. Both download and upload speeds will increase. These new systems will initially be aimed at business use.

Political and Regulatory Issues

There is an existing and accepted infrastructure of telephone poles that support the current electrical, telephone, and cable systems. All new roads and developments require buried utilities. It would be possible to do this (buried utilities) for the entire town but the cost would be very high and would be paid for by the subscribers.

The cell tower situation in Boxborough is much more complicated. The current zoning laws in Boxborough allow cell towers in a small number of areas. It is not possible for some current and all next generation systems to provide universal service using just those

allowed areas. Federal law allows cellular providers to override local zoning laws if needed to provide universal service. In 2002, Boxborough did designate some new areas in the middle of the town for cell towers. We are working to interest cellular providers in these new areas.

There is an effort now underway with the FCC (Federal Communications Commission) to change the regulations that currently companies like Verizon to make available their systems for use by other companies. These changes may result in Verizon being a much more aggressive DSL provider.

Next Steps for Boxborough

One of the long-term goals of BITCOM is to see that all Boxborough residents have affordable Broadband access. We believe this is important for the future growth of the town. The 495 corridor has a concentration of high-technology companies and new growth will be driven by employees of those companies. Boxborough will need an infrastructure that supports broadband access as well as universal cellular coverage.

The important thing is for Boxborough to actively address this situation and work in conjunction with surrounding towns on some of these issues.