



# The Need for Speed

*Internet options are improving to bring faster service to rural and remote areas.*

Story by  
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Whether you rely on e-mail and the Web for work or simply like to surf the Internet to browse headlines and shop on eBay, the speed of your Internet service provider (ISP) can mean the difference between a fruitful experience and a frustrating one.

Unfortunately for many country folks, the Internet can be a slow-going process because the sole ISP choice has been a dial-up connection through a phone line. In addition to difficulty in downloading large files, dial-up also ties up the existing phone line unless you have two lines.

But, there is some good news on the horizon: Broadband options — which allow users to access the Internet at significantly higher speeds than traditional modems — are making their way to rural areas. Facilitated by the Federal Communications Commission (FCC), Congress has called for affordable and universal broadband

for all Americans by 2007.

To that end, the FCC is working to establish policies that promote competition, innovation and investment in broadband services and facilities in rural areas. As a result, broadband access technologies that allow you to download large files and surf the Web quickly, as well as keep your Internet connection running 24/7 while freeing up your existing phone line, are coming of age.

## How does broadband work?

As you begin to sift through the high-speed Internet options, you'll hear about digital subscriber line (DSL), cable, satellite and even wireless. All of these high-speed data-processing capabilities are similar in that they are "digital," meaning they compress vast amounts of voice, video and data information that is broken down into what are called "bits." These bits become words, pictures, etc., on our computer screens. The transmission technologies that make high-speed Internet access

possible move these bits much more quickly than do traditional telephone connections.

While the methodology is similar, there are some distinctions between the different transmission technologies.

DSL is a wireline transmission that brings data and information over copper telephone lines already installed in homes and businesses.

Unlike traditional dial-up, the key to DSL's speed is that it accesses the local telephone company's central office where a DSL access multiplexer (DSLAM) has been installed and transmits the signal from the copper telephone line onto a network backbone and eventually to the Internet.

Although it is transmitted over the phone line, a high-speed DSL Internet connection does not require the need to "dial in" to a telephone number as with a traditional modem. Instead, this service allows consumers and businesses to have an "always-on" dedicated connection to the Internet.

In some locations, if DSL is not available, an integrated services digital network (ISDN) may be offered instead. It tends to be more widely available than DSL and still offers rapid access to the Internet. However, ISDN requires dialing into a service provider's network and may be slightly slower than DSL.

A cable modem (CM) allows connection to high-speed Internet using the same coaxial cables used for cable TV. So, if you are in a service area that gets cable TV, you may also be eligible for CM Internet. Like DSL, CM offers both always-on capability and speed.

Wireless access providers connect homes and businesses to the Internet using radio connection technology in place of coaxial cable used with a CM or twisted copper paired telephone lines used for DSL. Both fixed and mobile wireless options are available.

Fixed wireless technology employs a radio link from an antenna at the customer's location

to the antenna of the service provider. It requires a direct line of sight between the two antennas. The antenna at the customer's location is connected

by a cable that runs between the rooftop antenna and the local transmitting and receiving radio equipment, and is then connected to the user's computer network.

With mobile wireless Internet access, information is transmitted in basically the same way wireless phone calls are transmitted — by converting the information to radio waves. The radio waves travel through the air until they reach a receiver at a nearby base station, which then sends the information through the telephone network and Internet until it reaches its destination.

Through wireless technology, thousands of commercial locations across the country, such as restaurants, hotels, airports, bookstores and convention centers, are already successfully allowing customers to connect their

laptop computers and other portable computing devices to the Internet wirelessly.

Satellite high-speed Internet access provides consumers another wireless alternative and is often the only option for businesses and consumers who can't subscribe to traditional high-speed Internet access methods, such as people residing in remote areas.

Using satellites, companies are able to offer two-way Internet service that works both upstream and downstream. There is no need for a phone line for these services to work.

While a satellite connection is slower than many Internet access services provided using CM and DSL connections, it is about 10 times faster than a dial-up modem, says Steve Stephens, a telecommunications consultant with KT Connections Inc. in Rapid City, S.D. And, its major advantage is its ability to reach areas that other alternatives — DSL, CM and wireless — cannot.

But, be aware that the cost of satellite equipment and installation is higher than other alternatives.

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## Technology still to come

As advances are being made in existing high-speed Internet technology, new technology is also being developed to improve service and accessibility.

For instance, wireless carriers are planning to provide some measure of high-speed Internet access on cellular phones using what is called third-generation technology. This technology would give mobile phone users, with the appropriate digital phone, the ability for high-speed access to the Internet via phone.

Another high-speed Internet alternative in development is fiber to the home (FTTH), using a fiber optic connection for extremely fast service. Fiber optics are long, thin transparent fibers of glass or plastic about the diameter of a human hair and arranged in bundles called optical cables. They are enclosed by material in which light-emitting diodes send light through the fiber to a detector that turns the light into an electrical signal and can trans-

mit light signals over long distances. New equipment and techniques are making it feasible to add fiber to the home at a lower cost than ever before; however, its availability and use are currently limited.

Lastly, broadband over power lines (BPL) [also known as power line communications (PLC)] is in the works for the delivery of data communications over existing electric power lines. It would allow consumers to surf the Web and read their e-mails with speeds much faster than dial-up access, and comparable to the speeds of a digital subscriber line (DSL) and/or cable modem (CM). The major advantage of this technology is its ability to reach virtually every household in the nation, since power lines are installed almost everywhere. The service is anticipated to be gradually available to consumers at an affordable price in the coming years.



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Line of sight is required for a satellite dish to connect with the satellite. And, in extreme weather conditions (or even if you are just using the cordless phone or microwave), the service may be affected.

### Which one fits you?

So, should you switch from dial-up to a high-speed connection and, if so, which service is right for you? Most Internet experts say that will depend on whether you are a heavy online user or a mere dabbler. Because high-speed Internet options tend to be pricier than dial-up (from \$40 to \$100 a month), switching to broadband is impractical if you're online only once or twice a week.

Your broadband choice will also hinge on which service is available in your area. For instance, DSL may be available through a phone service provider like Qwest — if they have the proper lines laid in your area. Cable Internet may not even be an option if a local provider hasn't brought it to your rural area yet. If neither DSL nor cable are offered, satellite may be your only option.

If you decide high-speed Internet is worth the extra money, start by determining if you can get broadband at all. The Web abounds with sites that tell you what you can get and where you can get it. Start by visiting [www.cnet.com](http://www.cnet.com) (click on "Internet access"), pick the type of access you're interested in, plug in your area or ZIP code, and you'll instantly get a list of ISPs serving your area. You can find similar broadband search engines at [www.allinternetnow.com](http://www.allinternetnow.com).

These sites are helpful starting points, but they aren't 100% accurate. Once they provide you a list of available services, you'll need to contact the service provider to find out for certain if you can get broadband at your residence, what it will cost and what the procedures are. Most likely you'll have to pick from a local phone or cable company a

satellite vendor like StarBand or Direcway (which would require you to put a small dish on your house), or one of the big three: America Online (AOL), MSN or EarthLink.

Stephens says if a hardwire such as DSL or cable is available, choose it over satellite because it will be faster, have less interference, and have less equipment costs for start-up.

### Words of caution

Before you sign with an available provider, survey your friends and neighbors about the Internet providers they use and what they think of them. You'll also find some honest reviews on the Internet. Sites such as [www.broadbandreports.com](http://www.broadbandreports.com) offer ratings and discussions of ISPs from their customers.

Ask about speed, which can vary depending on the provider and the technology. For instance, speed of cable connections will depend on the number of people on the network. With DSL service, the performance usually depends on the distance between the end user and the phone company's central office. Also, ask about the frequency of service disruptions.

And, most importantly, consider customer service. The odds are pretty good that, someday, you will have to deal with your ISP's customer support department. Be sure your provider has the ability to get a live person on the phone or even to send someone to your house to help you out. (AOL and EarthLink typically can't offer that.) Test them out by calling the service's customer support number to see if a person answers, or if you are stuck with an automated response system. Or, send the company an e-mail message and see how long it takes them to reply — if they reply at all.



## Broadband benefits

The advent of high-speed Internet to rural communities will open doors for new opportunities as well. Here are some examples:

**Education.** Distance learning and Internet research through high-speed broadband connections will allow students anywhere to access resources and obtain real-time instruction from qualified educators that might not otherwise be available in their local community.

**Health care.** Remote or small clinics can be connected to experts and medical centers throughout the country, broadening access to medical expertise and specialties.

**Jobs and productivity.** The availability of broadband access is critical to attracting new businesses and giving existing businesses the ability to compete. With broadband access, worker productivity increases, jobs are created, and wages and the tax base grow.

**Homeland security.** Local public safety officials can get timely access to the information they need to assess and act on threats. In times of crisis or natural disaster, informed citizens are better prepared to help themselves and their neighbors.

**Source:** Federal Communications Commission.

