Cheaper, Faster, Better Internet

The Facts About Internet Fiber

There is no question that Internet access is playing a larger role in our lives every day, and that its positive impacts will continue to grow. At times we seem bombarded with terms not clearly defined, such as “broadband,” “fiber,” “DSL,” “wireless,” “satellite” – but what do these terms mean and what do we *really* need to know about them?

It comes down to this: Experts agree that fiber (bundles of tiny strands of glass which transmit data via light) is the key link to all modern communication systems – the only question is how do we get it to every home and business throughout the nation, and particularly to everyone in Maine and the Midcoast region?

The amount of data that travels through the internet every day is difficult to comprehend. In 2021, a million minutes of video will stream over the internet *every* second. No technology except fiber is capable of carrying this amount of data. In fact, 196 fiber strands, each thinner than a human hair, can fit into a bundle no bigger around than a pencil and yet can carry all of the world’s internet traffic!

Landline telephones and internet connections called “DSL” or “cable,” are made of copper wires. But copper is not capable of transmitting the amount or speed of data that flows across today’s internet. Likewise, basic physics teaches us that the speed of light is much faster than the speed of sound – meaning that the light which travels across fiber strands will always be faster than the sound waves that travel through wireless or satellite communication. Fiber makes it possible to transmit millions of times more data than in a cable or DSL system.

This is the reason that fiber has formed the backbone of international communications for decades, through sub-marine cables buried underneath the ocean floors connecting our continents, underground connecting one end of our nation to the other, and through the State of Maine in a network referred to as the “3 Ring Binder.”

But when the fiber gets close to homes and businesses, particularly here in Maine, it has traditionally connected to copper. Imagine this – fiber is like the interstate in which cars can travel at 70 mph. But when the data hits copper, it is akin to hitting a poorly maintained dirt road, reducing the speed and our ability to connect to the internet. The final step for 21st century communication involves extending the existing fiber right into our homes and businesses, called Fiber to the Home (FTTH).

In this series we will explore how we might be able to achieve FTTH in Camden and Rockport and the benefits it would provide in terms of economic development; educational opportunities; telecommuting; support for home-based businesses;

healthcare delivered via the Internet; attracting younger generations; increasing home values and marketability; and overall ease, convenience and quality of daily living.

This is the first in a series of articles generated by a joint ad hoc working group of Camden and Rockport elected officials, staff and volunteer residents exploring the options for cheaper, faster, better internet service. This series is intended to generate dialogue, initiate questions, and help residents and policymakers determine what is best for our respective communities. Please contact your respective Town Managers with comments or questions: Bill Post (Rockport Town Manager) wpost@rockportmaine.gov or Audra Caler-Bell (Camden Town Manager) ACaler-Bell@camdenmaine.gov.

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Understanding Fiber Bandwidth (Speed)

Bandwidth is the ability of a communications network to carry information. As today's bandwidth requirements are exploding – whether for tele-healthcare, remote home monitoring, video streaming, photo storage, virtual assistants (Siri), advanced TVs and more – we will need access to increasing amounts of bandwidth in our daily lives.

Most large telecommunications companies focus on "download" speeds but offer very slow "upload" speeds. When we download, we are typically obtaining or consuming information from the internet, whether it's a video from Netflix, a recipe from Food Network, or directions from Google. But when we are sending information over the internet, upload speeds matter a great deal.

For example, home businesses rely on uploading – think about the local wedding photographer sending photos to her client. Telecommuters must have the ability to videoconference with clients and business colleagues. Educational classes and telehealth all require fast upload speeds. Many of us today use the iCloud to back-up our computers, to store photographs and videos, or to Skype or Facetime with our family and friends. All of these actions require high upload speeds or bandwidth.

Bandwidth is measured in megabits per second, called "Mbps." Internet speed measurement can be complicated by the fact that although you may have a high-speed link to your Internet Service Provider (e.g., Spectrum, Verizon, Century Link), you will then have to share the bandwidth with other users. This is why the internet is often slower after work /school hours or on weekends and also the reason why Internet Service Providers advertise "up to" internet speeds – more often the speeds you actually experience are far less than those advertised.

Another reason for slow internet speeds is the distance between your home or business and the place where the copper meets fiber. Recall that in our first article we likened the trunks of fiber that connect towns in Maine to the interstate at which cars can travel 70 mph. But when they hit copper wire it's like hitting a poorly maintained dirt road in terms of internet speed. The further your home or business is down this technological dirt road, the slower your internet speeds will be.

Only fiber *always* delivers the same upload speed as download speed. And fiber speeds are not slowed down by the use of your neighbors or the distance of your home or business from the fiber / copper connection because *there is no copper connection*. With fiber, bandwidth is reliable and consistent right to your home or business.

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Sidebar

Case In Point

hearstudios Makes Music In Camden

Our hope as a community is to have our young people stay, build careers and families, and enjoy and contribute to life here in the Midcoast. Jason Hearst is one of those people who chose to come back to Maine, bringing his family and creating a business in Camden.

Jason's business, hearstudios, is a professional audio recording facility, located in downtown Camden. Locating his business (which started in his home) depended on reliable, high-speed internet to move large digital audio files around the world. Finding a location that could house both his family and his business while providing the technical infrastructure was not an easy task. In the end, he found a home close to Route 1 and the 3-Ring Binder dark fiber route. He then contracted with a local provider to run the necessary connections to his business.

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How Much Speed Do We Need?

High speed Internet is referred to as “broadband.” In order to be called Broadband, there is a minimum bandwidth required. How much bandwidth do we need? It depends on what you use the internet for, how many devices are connected in your home or business, and how many users are connected

Although the Federal government defines broadband as 25 Mbps download and 3 Mbps upload (often noted as “25/3”)– these speeds are far less than what most households need today and what will be needed tomorrow. As of August 2019, Speedtest.com ranked the United States as 7th globally in terms of internet speed, and that was based on an average speed of 120 Mbps download and 47.27 Mbps upload – far more than the Federal minimum and far more than most homes and businesses in Maine experience.

Although some FCC commissioners argued in favor of a Federal minimum requirement for Broadband to be at least 100 Mbps, large telecommunications companies and their trade associations opposed even the 25/3 Mbps minimum that was adopted.

To explain in a bit more detail, if you have a 25/3 Mbps connection, you can think of it as a pie. Each user gets a slice of the pie along with their various devices. Essentially your total potential speed is split across all devices connected to your network. Even though Netflix recommends at least a 5 Mbps connection to download a standard video and 25 Mbps to download 4K high-quality content, your pie may only be able to allot 5-10 Mbps to Netflix if your children are doing their homework or you spouse is watching a YouTube video. Add to this the fact that a seemingly endless list of household devices are sharing your household bandwidth. Examples may include: washers/dryers, CPAP machines, medical monitors, refrigerators, Fitbits, iWatches, virtual assistants (e.g., Amazon Echo and Siri), televisions, wireless headphones, Bluetooth speakers, computers, cellphones and tablets.

As technology advances so do bandwidth requirements. For example, our cellphones are now capable of taking photos that require from 30 to 100 Mbps per image. While internet video used to be a novelty, now it’s the standard way of accessing news, information and entertainment. Today most new computers, tablets and smartphones come with free iCloud storage where most users now store their data and programs. Families stay in touch via Facebook, Skype and Twitter. New TVs are almost all high definition or even ultra 4K, all of which require large amounts of bandwidth.

There are links on the internet where you can test your internet speed, as well as assess your own household’s bandwidth needs, knowing that they will likely steadily increase each year.

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Sidebar

Case In Point

Working From Home In Rockland

Living in a state with a shrinking population is not always top of mind for those of us who live in the Midcoast, a busy area with visitors from away sharing in our enjoyment of the region. But maintaining a healthy, economically sustainable community depends on our attracting working families. And increasingly, one or more of the family members will be working remotely from their home.

Paula and Karlo Apro had wanted to move to Maine for a long time. They finally found an opportunity to do so and chose to move to Rockland, building their "dream house" from which to run their respective businesses. Moving from an area with significant high-tech infrastructure, they assumed that their new home would have access to the high-speed internet that was crucial to both their businesses. Paula is a graphic designer who constantly moves large digital video files, and Karlo is an engineer who works for a company back in Connecticut.

In contacting local providers, they found their new home was quite a distance to the nearest fiber cable, and the cost of accessing the service they needed was prohibitive. Luckily for them, as they considered their options for the future (renting office space downtown, moving from their new home, etc.) one of our local providers needed access to high-speed services in a nearby location to service an infrastructure facility. In the end, the Apros were able to connect into this new service, but others in their neighborhood have not been so lucky. In a future story, we'll tell of a house sale that nearly wasn't and a family that is considering moving away because of the cost of accessing service.

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