

Fiber vs The Rest

Fiber speeds continue to be superior to every other broadband technology. There are two elements to consider when discussing speed - bandwidth and latency. Bandwidth is measured in download and upload speeds, usually megabits per second (Mbps). Latency is measured in milliseconds (ms).

Fiber connections are far better at achieving high bandwidth speed compared to other technologies. Fiber can easily achieve 1,000 Mbps (or 1 Gigabit per second, Gbps), for both the download and upload speeds. This is called synchronous speed when the down and up are the same. It's those uploads speeds that matter more and more for the uses we are making in our homes and business - most specifically anything involving two-way video, e.g., video meetings, video chats, telehealth, online school, etc. Video takes a lot of bandwidth, and with those uses it has to go both down and up.

Cable can achieve up to 1,000 Mbps down but is likely to be between 10-500 Mbps. Cable's upload speeds are not synchronous, and upload is what's needed when doing video meetings and chatting. Cable users also "share" their connection on a block, so speed slows during busy use times like evenings when everyone is trying to use it (or during a pandemic even during the day when many work from home folks are sharing it on their block, street, or apartment building). The typical cable upload speed range is between 5 and 50 Mbps.

Starlink has been reported to achieve 50-100 Mbps download speeds, and upload speeds between 20-40 Mbps. Starlink suggests that their speeds will improve with more satellites and ground stations, but each new station still requires a fiber connection which reinforces the argument in favor of more fiber, even if it is for the "backend" needs like this one.

Traditional DSL technology like that provided by Frontier or CenturyLink get download speeds around 10-20 Mbps, and upload speeds between 1-5 Mbps. These involve using the old copper lines from the telephone systems for Internet access. There have been newer types of DSL created, but the systems used in Door County are not those.

Fixed wireless providers like Door County Broadband have download speeds between 5-15 Mbps, and upload speeds between 1-3 Mbps. Newer fixed wireless technologies claim to be able to achieve up to 1 Gbps download speeds, and there may be truth to that. However, they have their own obstruction and range issues, just like satellite technologies.

Latency is the other measure that matters when using the Internet. High latency (i.e., slow response times) can make even fast connections feel slow. It's the wait time between screens refreshing. It also matters more as additional devices connect to the Internet like our appliances and other items in our homes. Slow responses mean poor and even completely lost signal connections. Video streaming, video meetings and chatting, and even web browsing are all impacted by latency. In a business, these can mean catastrophe when processing transactions such as those at a point of sale device. Latency of below 20 ms is great and above 150 ms is poor.

Fiber connections generally perform around 10-20 ms. That compares with cable at around 15-40 ms, and DSL at around 30-65 ms. Latency for high orbit satellites, like HughesNet, can be 200 ms or higher. Starlink users are reporting latencies between 30-90 ms, but that is expected to decrease to 20-40 ms as they expand their network.

The cost of fiber is indeed higher than other technologies, in particular fixed wireless. Cost per user is the main argument made against fiber. This has been the case under traditional commercial lending models and shareowner driven payback requirements. Markets work well, and the broadband market demonstrates that. The only way in which fiber becomes cost effective in rural and more sparsely populated areas like Door County is to subsidize the initial outlay needed to build the infrastructure network. In this regard, it is very similar to water treatment facilities or even the rural electrification efforts of the 20th Century. When treated as a public infrastructure asset, fiber networks make sense economically. A 20 to 30 year payback and return on investment is acceptable, just as it is for school buildings, fire stations, harbors, and roads. Fiber fits squarely into this realm. It's useful life can extend for 30, 50 or even 100 years. The public investments will be paid back over those horizons, and generations to come will reap the benefits.

In the end, the only completely future proof technology is fiber to every home and premise. Creating a partnership between the local governments and local private sector providers holds the greatest potential for ensuring high quality, affordable Internet access to every county resident and business. Furthermore, it creates high quality jobs right here in the county, both as the network is built as well as after with staff needed to run the business as well as the new workers the high speed broadband attracts to our community. Given the once in at least a generation investments being proposed today, now is the time. We can't let this one pass us by.