

# The Smart Shoppers Guide to Purchasing Home Internet Access

*From your friends in the Vail School District Technology Department*

**Welcome!** Home internet access has long been important for families, but in this age of online learning, it's an absolute must-have. This guide will show you what to look for, what questions to ask, and how to understand what you are really paying for.

## The Smart Shopper Questions

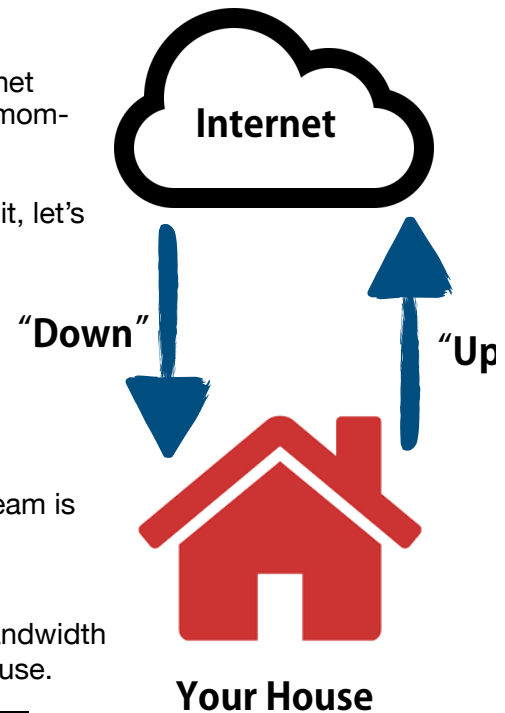
**“What’s an ISP?”** *Internet Service Provider* - the companies who bring Internet service to your house. These range from giant corporations like Cox to local mom-and-pop fixed wireless providers.

**“How much bandwidth do I need?”** This is the big question, and to answer it, let’s discuss a few basic concepts.

**Bandwidth** is measured in *megabits per second*. This measurement is commonly abbreviated as Mbps by ISP’s. Generally, the more you have, the more powerful your connection. Also generally, the more you have, the more you pay. FYI: the number promised by your ISP is a very optimistic number. Just be aware of this fact.

Most web and email traffic is minimal. But a typical Netflix or Disney+ HD stream is 3.5 Mbps. A Zoom call with video takes about 2 Mbps. Gaming requires little bandwidth, but is very sensitive to latency (more on that below).

**“Down/Up”** - ISP’s give bandwidth in two numbers. The first is how much bandwidth can *enter* your house. The second is how much bandwidth can *leave* your house.



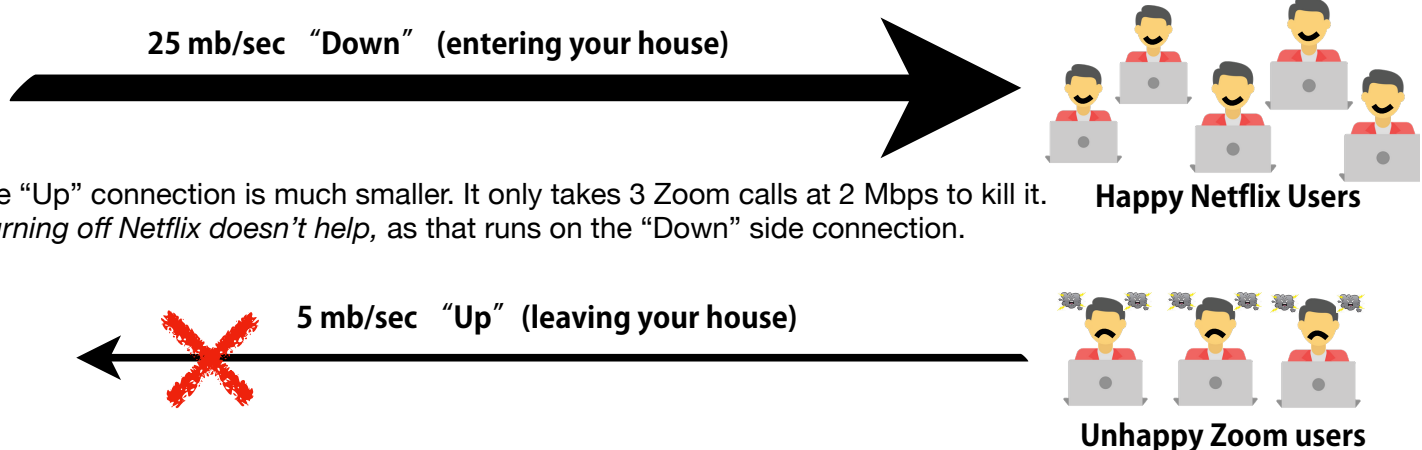
**The difference between “Down” and “Up” used to be no big deal. Now it’s a *really* big deal.**

**Here’s why.** Let’s say last year your family purchased internet service that promised 25 Mbps “Down” and 5 Mbps “Up”. These numbers are often abbreviated as 25/5 (or 100/10, 200/50, etc).

Last year the service was great. You could watch multiple Netflix streams, surf the web, and whatever else without a problem.

But this year you’ve started working from home, your kids started doing online classes, and it’s just *terrible*. Nothing works. You cut the kids off from Netflix and xBox...*and it’s still terrible. What is going on?*

Here’s what is going on. Since Netflix takes 3.5 Mbps, you could easily have 5 movies going at once.



But the “Up” connection is much smaller. It only takes 3 Zoom calls at 2 Mbps to kill it. *And turning off Netflix doesn’t help, as that runs on the “Down” side connection.*

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### The Bottom Line: make sure you're getting enough "Up" in your connection!

A few more things to think about...

**Latency** - How *responsive* your connection is. As in, when you click on something, does it happen right away? Latency is entirely different than bandwidth. Also called *high ping* by gamers. A high-latency connection will feel miserable regardless of how much bandwidth you have.

**Oversubscription** - the unfortunate fact that ISP's sell more bandwidth in a given area than they can actually provide. Their hope is that all their customers won't get on at the same time and discover this fact...which of course they do. Just read the online forums.

**WiFi from the ISP or provide your own?** Some ISP's will provide the WiFi service as well. Others require you to provide your own base station. The "Panoramic WiFi" from Cox is not marketing spin, by the way. It's really good. Worth considering if available and you can afford it.

### Time to go shopping! The options, ranked in level of performance.

**Fiber to the home** - The absolute best option if it's available in your area and you can afford it. Available from Cox and Century Link. **Pros:** Very high bandwidth. Stable and extremely low-latency. **Cons:** Limited service area, expensive.

**Cox** - The technology used by Cox provides the best performance for most residential customers. Available in nearly all residential developments in the Vail area. **Pros:** Many bandwidth and price options. Fairly stable and low-latency. "Panoramic" WiFi is a superb option. *An entry-level service is available at very low cost to families who qualify for free or reduced lunch* **Cons:** Cox is prone to oversubscription (see definition above), leading to poor performance at various times of day in certain neighborhoods. Can be expensive depending on service levels.

**CenturyLink DSL**- Using existing copper phone lines, CenturyLink delivers Internet service that is generally good, but can be highly variable. Available in nearly residential developments in the Vail area. **Pros:** Many bandwidth and price options. **Cons:** The quality of the service depends on the age of the phone lines, and in some locations they are many decades old, making the service almost unusable in more remote areas of the District.

**Fixed Wireless** - Using a series of wireless repeater stations, several companies offer home Internet service in the Vail area. A small signal receiver station is attached to the outside of the home and then wired to the inside. **Pros:** Multiple companies with many bandwidth and price options **Cons:** Service areas vary widely. Service quality depends on the distance from your home to the repeater station, and the number of other users on the station. Adverse weather can affect performance. Fixed wireless providers are prone to oversubscription (see definition above). Potential high-latency can be a problem for gamers.

**Providers:**, Bluespan 520.207.0549, DakotaPro 520.745.3900, Rincon Wireless 520.477.6301, Simply Bits 520.545.0400, Wi-Power (Mescal, J-6) 877.877.6861

**Cellular "Hotspot"** - All the major mobile phone providers will sell you a small device that connects to their cellular network and then creates a WiFi network that devices can connect to. **Pros:** Many options, easy to move from place to place, and does not require installation. **Cons:** Performance is highly variable, depending on your distance from mobile phone towers and how many users are on that tower. Coverage is also highly variable, depending on who your provider is. Generally Verizon is the best, followed by AT&T. T-Mobile/Sprint has poor coverage in rural areas. Connections are high-latency, unsuitable for gaming and even video conferencing at times.

**Satellite Internet** - HughesNet and Viasat offer Internet service that can reach just about every home in America. A receiver dish is placed on your home and aimed at their satellites in low-earth orbit. **Pros:** wide coverage **Cons:** Extremely high-latency connection (as the signal has to travel from your home to the satellite in orbit, then back to the ISP to get to the Internet. Then the response has to come back the same way.). Gaming and video conferencing are difficult on these systems. Widely variable performance. Expensive. *Satellite internet should be considered only if no other options are available.*