BRECKENRIDGE BROADBAND UTILITY

CHAMPIONS HANDBOOK

INTRODUCTION

Thank you for signing on as a champion of our Breckenridge Broadband Utility Project (BUP). As we enter the exploratory phase of this project, we will be collecting geographical data to determine the construction and implementation of fiber optics to every home in Breckenridge. Our goal in this project is to provide our residents with better and more reliable internet service at a more competitive price. We believe that building this network gives our community the chance to own its digital future and "cut the cord."

PARTICIPATION

To get the word out on this project, we need you. The viability of getting a fiber optic network in Breckenridge depends on the market assessment survey and if neighborhoods will have high enough take rates to justify the network. By engaging people who are excited about the broadband project, we hope to show other residents how a community-owned broadband network would have a myriad of benefits, aside from simply faster and more reliable internet service. Your efforts to answer questions about broadband and directing your neighbors to the survey ensures that we are building something that is focused on the needs of our citizens and serves as a critical utility as we prepare for the future of Breckenridge.

BROADBAND GLOSSARY

FIBER OPTICS

Optical fiber is a hair-thin strand of glass, specifically designed to trap and transmit light pulses. The fiber uses light instead of electricity to carry a signal. It is unique because it can carry high bandwidth signals over long distances without signal degradation and it can provide those signals simultaneously in both directions – upload and download.

COPPER WIRE

Copper wire can also carry high bandwidth, but only for a few hundred yards – after which the signal begins to degrade and bandwidth narrows.

FIBER TO THE HOME (FTTH)

When fiber optic cable connects directly into a residence, it is called Fiber To The Home (FTTH)

FIBER TO THE PREMISE (FTTP)

When fiber optics are connecting to a non-residential location it is called Fiber To The Premise (FTTP)

OPEN ACCESS

Open Access is the term used to describe a network where any Internet Service Provider (ISP) may provide service to the end-user (residence or business) over that network.

INTERNET SERVICE PROVIDER (ISP)

This is any entity who is selling services over the network such as Internet access, streaming video packages, and VoIP Phone services.

BROADBAND FAQS

Why is the Town of Breckenridge considering this broadband initiative?

The Town of Breckenridge began analyzing the benefits of a high-speed data network in 2016 to support the need and justification for upgrading the town's Broadband capable networks. As our business, residential, and visitor communities come to rely more and more on Internet-based solutions, it becomes clear that a municipal-owned infrastructure will best suit our needs now and in the future. We also see an opportunity for the network to better address the critical communication needs of the community. It's an important need that for-profit companies have not stepped up to meet; if we don't do it, it's not going to get done.

When will the broadband service be available?

We're still studying the feasibility of this project. Providing robust, expandable, and reliable broadband can be complicated and will take some time. If we do make the decision to move forward, we hope to begin providing service in late 2019.

What is an Open Access Network?

Fiber network that is open to be used by multiple service providers simultaneously and on equal terms, providing a real choice for the end consumer. This makes the network more attractive and delivers high take-rates, which is the number one value driver.

What is fiber-to-the-home?

Fiber-to-the-home (FTTH) is the delivery of a communications signal over optical fiber from the operator's switching equipment all the way to a home or business, thereby replacing existing copper infrastructure such as telephone wires and coaxial cable. Fiber-to-the-home is a relatively new and fast-growing method of providing vastly higher bandwidth to consumers and thereby enabling faster access to content, high-speed internet, and voice services.

BROADBAND FAQS

What is the Fiber-to-the-Home Council?

The Fiber-to-the-Home Council is a non-profit organization consisting of companies, organizations and municipalities engaged in advancing FTTH solutions. Our members are manufacturers who build equipment used in FTTH deployments, residential developers that install fiber in their housing developments, public utilities and local governments that have built their own FTTH systems, and independent and rural telephone carriers who have gotten into the business of providing fiber-to-the-home. Among the Council's activities are providing ways for our members to share their knowledge and build industry consensus on fiber-to-the-home.

What is optical fiber?

Optical fiber uses light instead of electricity to carry a signal. It is unique because it can carry high bandwidth signals over long distances without degradation. Copper can also carry high bandwidth, but only for a few hundred yards – after which the signal begins to degrade and bandwidth narrows. Optical fiber has been used in communications networks for more than 30 years, mostly to carry traffic from city to city or country to country.

Why is fiber optic cable now being connected directly to homes?

Connecting homes directly to fiber optic cable enables enormous improvements in the bandwidth that can be provided to consumers. While DSL and cable modems generally provide transmission speeds of up to five megabits per second on the download (and are generally slower when uploading), current fiber optic technology can provide two-way transmission speeds of up to 100 megabits per second. Further, while cable and DSL providers are struggling to squeeze small increments of higher bandwidth out of their technologies, ongoing improvements in fiber optic equipment are constantly increasing available bandwidth without having the change the fiber. That's why fiber networks are said to be "future proof."

BROADBAND FAQS

But it was only a few years ago that I upgraded from dial-up to DSL. Are you telling me I'm going to have to upgrade again?

The evolution of dialup, to DSL, to cable modem made online video streaming a reality. We have no reason to believe these innovations will stop. This trend will continue into high-

definition video, telemedicine, distance learning, telecommuting and many other broadband applications that have thus far been limited only by the amount of high-bandwidth connections into people's homes. Only fiber-to-the-home can deliver the bandwidth we are going to need in the future. Fiber-to-the-home providers are now providing this higher capacity at competitive prices.

Why can't I get these high-bandwidth applications with DSL or cable modem?

DSL and cable modem rely on copper wire to deliver signals to your home – and copper can deliver high bandwidth only over very short distances. That's fine if you happen to live a few hundred yards from your provider's switching station, but most people don't. Optical fiber does not have this limitation and thus is able to carry high bandwidth signals over great distances to homes and businesses. Only fiber-to-the-home can deliver the immense bandwidth that the applications of the future will require.

I've heard that wireless technologies like Wi-Fi and WiMAX can deliver the same kind of service as fiber-to-the-home without having to go through the trouble of installing new wires into homes. Is this true?

No. Wireless broadband is subject to spectrum availability – the cost of which limits the bandwidth, and hence the applications it can provide. The wireless technologies cannot deliver high definition television – and, in fact, they have trouble delivering standard television. And HDTV is only one of the many high-broadband applications now being developed for our broadband future.

BROADBAND FAQS

Isn't fiber-to-the-home just a Verizon activity?
While Tier 1 providers are the largest providers of fiber-to-the-home services and are making enormous investments in this technology, it is also true that about one-third of all FTTH subscribers (430,000) get their service from municipalities, small rural telephone companies, medium-sized telephone service providers, cable companies and competitive local exchange carriers. In fact, small rural telephone companies are leading the way in terms of penetration, with three percent of their combined customer base now connected via fiber-to-the-home.

What are the regulations on fiber-to-the-home? Do companies require government approvals to wire up homes and neighborhoods?
Yes. Because they typically carry video services and thereby compete directly with incumbent cable television providers, fiber-to-the-home providers normally comply with state and local regulations governing the cable television industry. Most states leave it to municipalities and/or county governments to issue video franchises. And, while federal law requires local governments to allow competition, in many cases the structures placed on new entrances are too burdensome to enable them to take the financial risk of building a new system.

What will the impacts of construction be to our community?
The technology for drilling and burying cable has changed a lot over the past decade. Contractors can now use horizontal drilling techniques, where underground conduits are installed at a single-entry point and special equipment runs them to their destinations without having to dig open trenches. Sometimes fiber can be put in existing ducts, water pipes, sewers, and gas lines.

How will this impact our local Internet Service Providers (ISPs)?
We are actively discussing with local service providers how we might work together as this project moves forward and we know many town inhabitants and residents value the relationship they have with a local ISP. We are working hard to determine how we can best meet these important needs for our community in a way that makes the most financial sense for our membership.

BROADBAND FAQS

Is fiber-to-the-home primarily a technology for getting high-definition movies on demand?

Not at all. While the vastly higher bandwidth and transmission speeds offered by fiber-to-the-home is certainly enabling video providers to offer a wider range of products and services, users of other applications will benefit as well. Gamers will get access to more powerful multi-player applications. Avenues will open for distance learning and telemedicine. Opportunities for telecommuting and working at home will increase. And, just as Internet applications and solutions have grown more sophisticated with the expansion of available bandwidth thus far, you can be sure that this leap into next-generation broadband will inspire further innovations that we cannot even imagine at this point.

Why do we need all that bandwidth? Aren't cable and DSL systems good enough for what most people want to do?

If all you want to do is surf web pages, download a few songs, send, and receive some photographs, or watch streaming video at current picture quality levels, then the bandwidth provided by today's cable modems and DSL lines is probably good enough. But the world is moving toward vastly higher bandwidth applications. Companies like Netflix, Amazon and Wal Mart are preparing to offer feature-length movies for download. More people are looking to upload their own home movies into emails or web pages. Consumer electronics companies are coming out with devices that connect televisions to the Internet. High-definition video is fast becoming the state-of-the-art – and one high definition movie takes up as much bandwidth as 35,000 web pages. These applications – and many others we haven't even dreamed of yet – are going to require much greater bandwidth than what is generally available today, even from so-called "broadband" providers.

How will this system help emergency services?

By providing connection to our network, we'll allow emergency services to fill in the many gaps in their radio coverage, thus finally providing communications for them throughout the County. Over time, we also expect that our data network will allow them to provide advanced services, such as transmitting detailed medical data directly from the scene to the hospital.

BROADBAND FAQS

What Smart City Applications will the Town implement using this network?
Don't go buy new autonomous cars just yet but the Town will create a Smart City strategy during this assessment that could bring these applications to a reality sooner than later. The Internet of Things (IOT) and Technology Age we are in has created a need for everything to be connected to the internet and then the only limits are how fast must applications talk to each other. For example, autonomous cars must have low latency to make immediate decisions so they must be connected to a network that will not fail. All applications require different bandwidth needs and there will be some applications that won't need a direct fiber or proximity wireless connection while others will. The Town will explore and work with the residents to implement applications that help with transportation (intelligent parking, traffic signals, waste trucks), security (dedicated first responder network, gunshot recognition, crowd management, urban lighting), industry (worker safety, retail engagement, location badges), agriculture (intelligent greenhouses, soil monitoring, connected livestock), health (patient monitoring, intelligent homes, online dr. "visits"), education (connected classrooms, school devices, online live instruction).

How does Fiber Connectivity Increase the Value of Physical Property?
A 2015 white paper by the Fiber to the Home Council Americas cites data from the University of Colorado at Boulder. The study concluded that a fiber connection adds an average of 3.1 percent to a property's value. Those valuations are increased by an additional 1.8 percent when comparing areas with connectivity speeds of 100Mb/s with those that support 1Gb/s or more.