City of Eastport
22 Washington Street
Eastport, ME 04631

Fiber Connectivity Committee

Technology has come a long way since the advent of the internet and its exponential growth has fueled all sorts of broadband options.

Brief history

STEP ONE: __Dial Up:__ Remember the input\output of the old scratchy connection to the internet? **Modem: MO**dulate **DEM**odulate was the thrashing about sound connection between a customer and the internet to make a connection across your existing phone line. Slow, spotty, inconsistent and very frustrating. However, it WAS the first connection to others across the World Wide Web and was initially very exciting.

STEP TWO: __DSL:__ Phone companies found ways to get better connections across the internet with DSL on those same standard **copper** phone lines that were all across America. Speeds increased across those standard **copper** phone lines. Speeds were dependent on how far the customer was from the phone companies CO's'. (Centralized Offices across their footprint). The technology, based on the existing standard phone **copper** connections was able to give better speeds than dial up but that speed diminished as it spread 3 miles from the CO. The closer to the CO the faster the connection. The further away the more it degraded. It was step two in the internet's life. Better than Dial Up but increasingly not sufficient to handle the increasing data demands of the consumer.

STEP THREE: __Cable TV:__ The cable industry figured out how to deliver internet across their standard copper cable tv connections to millions of Americans. The industry really evolved in that the cable companies could now not only provide TV but could then offer faster internet than Dial Up or DSL. It was a boon to the cable industry and a step up to handle the ever increasing demands the consumer was now putting on internet connections. But their connection to the internet still depended on those **copper** based connections. Cable TV internet connections are what is referred to as "shared bandwidth" which means all users of that **copper** TV\Internet connection were sharing the same connection. More users, the slower the connection for each user. As the demands increased across **all of the cable network** the speeds and performance diminished. Also more dissatisfaction appeared as consumers realized that they were no longer interested in buying bulk channels from the cable companies, many of those channels were not of interest and bundling it all with internet was very expensive to the consumer.

Fiber Connectivity Committee

STEP FOUR: <u>**Satellite:**</u> Satellites are roughly 350 miles to 1000 miles above the earth. Satellite internet suffers from what is called "latency". That is the time it takes the signal to come from your computer up to the satellite and then back down to your computer. Computers send hundreds of thousands of commands a second that must travel through that latency. Satellite internet is also expensive and because only so many customers can connect to each satellite at
the same time the more customers the satellite company has the slower the connection as more consumers log-on. STARLINK, the latest satellite technology has tried to "solve" that issue by launching thousands of what are called low earth satellites. These thousands of satellites while providing more coverage they also need to be upgraded to keep up with the constant improvements in technology. Starlink while already having deployed thousands of satellites will need to launch thousands more year after year to keep up with improvements in technology. Starlink is already expensive. They increased their rates 11% in their first year and that cost which will continue to increase due to the need to launch new satellites in order to keep up with technology inevitably gets passed down to the consumer.

STEP FIVE: <u>**Fixed Wireless:**</u> Fixed wireless is similar to your cell signal. Towers deliver broadband across the airwaves to the consumer. The limitations of fixed wireless are obvious in states like Maine. Our beautiful mountains, forests and winding coastline are obstacles to this technology. A line of sight to the tower could provide an optimal connection but due to our topography fixed wireless is not an economical or efficient way to deliver broadband.

STEP SIX: <u>**Fiber:**</u> Transmission of data across **Fiber** (ultra-fast light) has been around since the late 1800's. Science long ago figured out that transmitting data at the speed of light outpaced any technology in existence. When thinking of the internet it helps to understand fiber's role. The very backbone (the heart of the internet) is all **fiber**. What is called "middle mile" that connection getting closer to the consumer is also **fiber**. The final connection to the consumer which is called "last mile" has so far been delivered across **COPPER**, via Dial Up (Step One), DSL (Step Two), Cable (Step Three) Satellite (Step Four) and Fixed Wireless (Step Five). Important to remember that Satellite, Fixed Wireless and Cell phone services cannot exist without an eventual connection to **Fiber.** The missing link has been not completing that final connection to the customer with

Fiber Connectivity Committee

fiber. Since the backbone of the internet is fiber, the middle mile is fiber the last mile should also be fiber.

Once we have established a complete fiber connection from the source (internet) directly to the consumer we will have solved our broadband problem. Fiber has proven to be the preferred data transport medium for all our internet service providers. They use fiber for their backbone connections to their networks. They also use fiber to get "closer" to their customers. Their failure has been resorting to using existing copper cables to our homes and businesses. Only completing a true fiber connection from the beginning of the internet directly to our homes and businesses will solve this problem for the next 60-75 years.

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FAQ

1. <u>I can get a 5G signal on my phone, why do I need anything more than that?</u>

   Cell coverage relates to mobile\phone devices and a fiber to the home connection are two different things. Cell tower antennas need to be constantly upgraded which is expensive and those costs are passed on to the consumer. Cell towers need a fiber connection in order to function. A wired fiber connection directly to a home or business is the least expensive, fastest and easily upgraded solution for home or business internet.

2. <u>I have Spectrum cable now and it seems to operate ok for me.</u>

   Cable connections like Spectrum are subject to slowdowns due to too many subscribers on the network. Cable technology has limitations where a fiber connection does not. A fast fiber connection is considered the best solution, at the least cost that will fulfill broadband needs for the next 60-75 years. Cable's copper connected system has limitations that will soon render that copper-based technology no longer viable.

3. <u>With all this new broadband money available why isn't everyone getting super-fast broadband for free?</u>

   Even with the billions of dollars earmarked to address rural broadband issues it is nowhere near enough to bring super-fast broadband to everyone. It is a start but not enough to finish the job.

4. W<u>hy haven't companies like Consolidated & Spectrum expanded their broadband to our rural areas?</u>

   Private companies state they can't make any money building to our more rural areas because there are not enough customers to make it worthwhile.

5. <u>What about satellite? I have heard that is a great solution.</u>

   Satellites are thousands of feet in the sky which leads to latency the main reason internet connections via satellite are slow and inconsistent. It is also expensive and, in many cases, subject to data caps on how much you can use. It is also not easily upgradeable and very expensive to upgrade that technology. New satellites have to be launched; more costs passed down to the consumer.

Fiber Connectivity Committee

6. **What is the Maine Connectivity Authority?**
   A board setup by Governor Mills to direct hundreds of millions of Federal dollars towards fixing Maine rural broadband issues. Towns, cities, broadband groups need to work with the MCA and apply for grants to help ease the cost of providing better broadband for Maine.

7. **Should we contact the current internet providers about upgrading their systems?**
   Yes, you should speak with all parties because there are multiple models out there. Some are privately funded, some are municipal utilities and some are corporate entities. Be knowledgeable about what can and connect be accomplished with Maine Connectivity Authority grants. Some companies are looking to be awarded grants and hoping municipalities will foot the balance of the costs but still allow them to own the infrastructure. That is not always the best solution.

8. **What is streaming?**
   With a super fast fiber connection you can now get all the channels presently offered by the cable companies and more across the internet. You are not hemmed in purchasing channels you don't want. With streaming you can get your local Bangor channels wherever you have that fast fiber connection as well as all the content available on the internet. Streaming also is at a lower cost.

9. **What is Asymmetrical and Symmetrical?**
   Asymmetrical means that the upload and the download speeds are different. **Symmetrical** means that they are equal. With a copper based interface, the upload speed is dramatically less than the upload speed. ISP's that offer copper will typically offer speeds of 200/20 Mbps or 500/35 Mbps. Fiber is the only solution that offers the same speed both download and upload. Whatever speed is offered at your price point you will get the same speed in both directions.

10. **Will my taxes be going up?**
    Depends on the approach a town decides to take. In almost all cases more money will needed to build better broadband infrastructure that what is available through the Maine Connectivity Authority. Some models do not raise taxes and are paid for by the people who subscribe for the service as a piece of their internet cost. Some companies will help write grants but will require the towns to fund the balance. In some cases a company may decide to build out on their own in combination with grant dollars.

Fiber Connectivity Committee

11. <u>**What is the big deal with fiber and why do I keep hearing about its benefits?**</u>

Fiber is the fastest medium we know of to transport data, images and video across the internet. The very backbone of the internet is a fiber connection. Unfortunately, many of our homes and businesses get our internet connection from cable, and DSL which are limited by the limitations of copper. Other methods like fixed wireless and satellite are limited by topography, trees, mountains etc. A complete connection to our homes and businesses that is fiber from beginning to end is the fastest, least expensive and most future proof connection technology can provide. All fiber networks are estimated to be viable for the next 60 to 75 years. No other technology can make that claim.

12. <u>**Why are internet costs expensive and so varied?**</u>

Demand, availability, and competition have complicated the broadband issue. Some companies charge a lot of money in many cases simply because they can. Lack of competition allows monopolies to take advantage. Systems like cable have very high costs they have to pay to the TV station providers. Those costs get passed along to the consumer. Other technologies like satellite can only make so many connections to a satellite facilitating the need to launch more satellites and pass those costs on to the consumer as well A true complete fiber connection eliminates a lot of this confusion and increased costs. Once it is in place the physical fiber won't need to be changed or upgraded for many years. A complete fiber connection from the heart of the internet to your home or business is the best option for a robust, economical and future proof connection.

13. <u>**What about my home equipment? Will that need to be upgraded?**</u>

Depends on how old it is. Technology is constantly changing, getting faster and more efficient. Home network equipment like routers and wireless access points should be upgraded via software updates and every three to four years checked for continued compatibility with the latest broadband signals. No matter how good the signal is to your home, if your internal equipment, router and wireless access points, computers and laptops are outdated they will not be able to take advantage of the new vastly faster network connections.