Understanding the Tilson Engineering *Islesboro Broadband Study*

Islesboro residents and businesses have below-average broadband Internet access when compared with what is available in nearby mainland Maine and other island communities.

This is the #1 conclusion from the Tilson Engineering *Islesboro Broadband Study* of Internet access on Islesboro. It is not good news.

Our situation is made worse when we see in the *Maine Sunday Telegram*, January 8, 2014, that Maine ranks 49th of 50 states in Internet access quality. We are below average in a below average state. If we dare look at the U.S. national Internet access averages compared to other countries, we will feel even worse. For example the average South Korean household gets twice the Internet access speed that the average U.S. household gets.

We can't escape the fact that we are behind in access to the digital world and falling further behind by the minute.

It seems to me that this is a big negative when it comes to attracting young families to live, work or start businesses on the island. While we may be relatively satisfied with the current speed of our email and Web browsing, we will be increasingly behind when it comes to new uses of the Internet like Skype-calling your friends or streaming a high-def movie. While we may be happy waiting minutes or hours to download a TV show, that same download takes only seconds in many nearby mainland communities. While we may be happy that one member of our household can stream a music video, we simply do not have the bandwidth to have several kids streaming different tunes at the same time. While we may be OK that some of our community can't purchase enough Internet access speed to Skype-call their business in Boston, over time this will be a significant reason not to spend a summer week on the island and a far greater deterrent to having a business here.

Way back in 1996, I spoke to a full house at the Historical Society about the importance of the Internet connecting islanders to the larger world. I was connected with a 56Kbps dialup modem. I remember telling people that I could foresee the Internet changing the way we shopped and how we communicated with our extended families. I could never have foreseen the emergence of social media like Facebook--Mark Zuckerberg of Facebook fame was in grade school that day!

Today we are on the threshold of the *Internet of Things* where every electric-powered device will be connected to the Net. The new Nest thermostat available at the home center is a great example of this *all connected world*.

Now, setting aside the privacy issues and "why would I want that?" we only need to know that connection speed or bandwidth is the fuel that makes these new uses possible. One thing I did tell everyone in 1996 was: "No bandwidth, no Internet bandwagon."

How much of a negative is insufficient bandwidth? Is it as important as other island issues like affordable housing or a full-time restaurant? Or, new island businesses? This is a worthy topic for us as we pick our priorities for making it as attractive as possible to enjoy living, visiting and working here.

Last spring the Selectmen became seriously concerned that people were unable to live or work on the island because they could not obtain the type of Internet access they needed. They needed far more bandwidth to operate in today's socially connected world or run their business requiring real-time collaboration. Indeed the Selectmen had received at least one departing resident letter as well as many informal discouraged comments. Page Clason, our *go-to-guy* for making your Internet work, reported at a board meeting that several residents were unable to buy access of any kind at any price from any of the Fairpoint DSL or GWI/Midcoast wireless, satellite vendors.

So, in the fall, our Town Selectmen concluded that we had a problem, but insufficient information to understand how big or decide what to do about it. So, with equal financial help from the Town technology budget and from several dozen concerned island residents and businesses the Town contracted with Tilson Engineering to study the quality of Internet access on Islesboro. Tilson is an engineering firm based in Portland with expertise in showing communities how to move into the modern connected world.

The Selectmen asked Tilson to: 1) Take a census of what residents and businesses actually had for Internet access quality; 2) Compare these results to the near-by mainland, islands, and other rural areas of the country; 3) Specify what reasonable quality might be expected for a town like Islesboro now and in the future; 4) Describe what other towns like Islesboro have done; 5) Outline what steps might be taken to assure Islesboro was not falling behind neighboring towns.

The final Tilson study is now available to everyone at the Town Office. Frankly, the report makes interesting reading for the nerd in your family (Page Clason and I read it several times!). After all this is a big and technically complex problem so the study is necessarily long and technically complex. It may be difficult for some readers to tease out the essential take-aways. By all means, if you are interested get a copy for yourself.

So that we all can get up to speed quickly to consider the implications and discuss what, if anything, we should do, here is my summary analysis of the study and the state of affairs-Internet on the island. I ask your forgiveness in that some of this is me "Just sayin'."

For us to come to a community consensus about the importance of this topic and what our best choice might be, it's not necessary for you to understand a *PON* network or an *FTTH* network or what *Tier 6* bandwidth means. But it is critical for us all to understand what the study says about our current situation and the importance of high-quality Internet access as the foundation of a vibrant economic future for Islesboro.

When I use the term *Access Quality* here I am lumping several things together. Can I get high-speed Internet at my home or business? Is it available, up and running at least as much as my electricity? Can I do email, Facebook, browse the web, play an online game, stream a high-def movie, Skype my friends, upload my report effectively? Is it affordable? Is my Internet provider responsive when I call for an upgrade, support or a repair?

Tilson took a broad look at our Internet situation. They surveyed our actual access speed and asked about our level of satisfaction. They identified several island net providers, for example, Fairpoint, GWI/Midcoast or satellite dish. (They did not focus on cellular data access.) Response from residents,

businesses and the school kids was solid.

The average actual Internet download speed (i.e., Netflix to you) on the island is 3.84Mbps (millions of bits per second). This is more than enough for email and Web browsing, but not enough to effectively stream a high-def movie. It is effectively 100 times faster than my connection was at the Historical Society in 1996. Actual upload speed (you toward the Internet) was only 0.62Mbps - not nearly enough to do mainland-like video conferencing. Neither of these numbers is enough to be part of the emerging *Internet of Things*.

The FCC in its wisdom rates Internet access speed in *Tiers* 1 to 7 today and they are adding tiers as technology progresses. Our actual average puts us in Tier 2 or 3, though Fairpoint reports to the state and feds that we have Tier 6-8 island-wide - 10 times faster than we actually have. The Tilson survey found no one on the island getting Tier 6 service at any location or price. In Fairpoint's defense, the state and feds may not be asking the right question. Is the question what we actually have or what the max capability is? One reason that the Tilson report is so valuable is that we can now say what we actually have. And don't have.

Our average 3.84Mbps speed today is close to what is available in Lincolnville and Northport, but 3-times slower than the average in Camden or Northhaven. Be aware that 91% of the U.S. has speeds at the Camden-level or higher. Tilson believes that we should be at least at Tier 5 today (like Camden) and that we need physical cabling to support getting to 1Gbps (GigaBitPerSecond – 100 times faster than what Camden has today) in the near future. It is not unusual to have 1Gbps speed available in a large U.S. city. Businesses that depend on the Internet require such speeds.

What about our level of satisfaction with our providers? Some 40% of us were satisfied with our Internet service, 25% were neutral and 35% unsatisfied.

Do we care? How much do we care? Should we do something? If so, what? Can we ignore the Tilson study explaining the negative economic impact of sub-par Internet access? Can we survive as a community with perpetually below average Internet access? If we accept the current state of affairs, how can we position our children to be full-fledged members of this emerging connected world?

As a community we need to ask and answer these questions.

You may disagree with me that this is a problem worth fixing. You may feel that other issues are much more important. That's OK, but let's talk.

The Tilson report speaks to the question, "OK, so what now?" The report explains that getting our island Internet competitive with, say, Camden or built for the coming digital age will take money. A lot of money. $1,000,000 to $2,500,000 in rough terms. Given our population of roughly 500 to 900 households and businesses this is a lot of investment on a per connection basis. Tilson goes into great detail on the various investment levels.

Where this money could possibly come from is a darn good question. Tilson gives examples of communities across the U.S. that have combined individual investment, grants, donations and tax

expenditures in order to finance these installations. There are hundreds of possible combinations of Federal and state economic development grants, non-profit contributions, corporate investment, private investment, town tax dollars or bonds and so forth. Not all would be available to Islesboro because we have some broadband capability and are considered somewhat affluent. It is super-critical that we don't jump to the conclusion that raising property taxes is a realistic approach for Islesboro. Our property taxes are already high. Just sayin'. However, it is critical that we look to the Town to continue providing leadership and help in getting to any solution.

In Tilson's analysis they prove that there is absolutely no rational business case that would compel an incumbent for-profit provider like Fairpoint, Time-Warner, TideWater, etc. to invest in a better solution for us. Our 500 or so customer market is too small for a company like Fairpoint to invest more. For them it's just business.

Tilson goes into great detail on possible next steps. You might list even more, but I want to introduce just three.

1. Do nothing. Continue to be satisfied with what the free-enterprise marketplace offers for Internet service. Sure some people will not want to live here, but after all, it has never been easy to live on Islesboro. Focus our money on other priorities.
2. Incent Fairpoint, Time-Warner, etc. to invest in our future. Here we contract with Tilson to help us bid out to commercial providers for a network upgrade. According to Tilson, given our small market, if we ask a for-profit commercial provider they will want our community to fund much of the cost to build the network as an incentive for them to own and operate it. Think $1M more or less. This is not altogether different from a company asking for a tax break to build a factory in your town. Essentially the companies are saying, "We can do that, but you need to offset our costs for the cable, trucks, labor and equipment." The rub then is raising the incentive money from among the sources I mentioned above. We can only guess how much money this will require. Getting to a more detailed answer means working with Tilson to approach these companies in earnest.
3. Start an *Islesboro Broadband Company*. In this option a community group forms a private company (maybe not-for-profit), seeks investors and contracts with a cable construction company to build a fiber network alongside the Fairpoint DSL network. There are many variations. What's different here is that the company and investors own the result and focus on Islesboro needs.

    Our country has a long history of co-ops and private enterprises forming to build out electric or phone services for small locales. According to Tilson, we see this more and more as a solution for small, underserved broadband markets. Often several communities (or islands) band together to maximize their market potential.

    Tilson estimates approximately $2.5M to construct such a network. The company would then have to generate enough revenue to maintain and operate the network for the long term. However examples exist where a partner is found to run the day-to-day, do the maintenance, billing and so forth. Given our community size this company can never be profitable, but there are corporate structures, partnerships etc. that might make this a financially viable enterprise.

    A got'cha is that there is no viable high-capacity Internet connection to the mainland other than the

Fairpoint fiber across the bay. Tilson reports that they have asked CMP about the availability of a high-capacity fiber along with our new power cable in 2015 – leasing some of that fiber would be essential to a local solution. And before we get comfortable, Fairpoint and CMP own the poles so they would have to agree to lease access. The good news to this solution might be that the *Islesboro Broadband Company* would just be interested in bettering Islesboro. It might provide essentially free basic Internet access to island residents. Residents and businesses paying extra for high-speed access would then cover the operating cost.

Either #2 or #3 would be a significant improvement over our current fate. What distinguishes #2 and #3 is not just the level of money involved – it's big in either case. It's not even the resulting bandwidth – both can provide modern, mainland-like bandwidth. Rather the difference is who owns the result, what their priorities are and how difficult the path forward is. Both work, but there are pros and cons to discuss.

In summary, the Tilson study does a great job telling us where we are now so that we can have a conversation with a solid common set of facts and vocabulary. They explain the economic downside of being left off of the Internet bandwidth bandwagon. They outline several approaches we might consider and at what cost. Likely any next step for us will require a Tilson study Phase 2 that will guide our implementation.

What do we know for sure?

1. We are too small a market for the incumbent providers to invest in us. As a result we are behind and falling further behind in Internet access quality compared to the near-by world.
2. Any solution we consider may require several million dollars of investment from our community. There are many potential sources for this money – grants, donations, investments, bonds, or tax expenditures. How much we can tap each of these sources is a good question. We need to be realistic about what our community can afford given all our other priorities. It is a lot of money and a big job to raise it.
3. Given we decide we should raise the money, we can consider several alternatives to upgrade our Internet: Incent a commercial partner, Form a local enterprise to lead an effort.
4. We need to have a community-wide discussion very soon.

What do you think?

I'd recommend that the Selectmen convene a public meeting or two so that the community can weigh in and debate our post-Tilson study strategy.

Roger Heinen, RHeinen33040@gmail.com Wednesday, February 5, 2014