Community Technology Plan

Our Katahdin

Submitted by:

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Study Background and Structure

The Our Katahdin group is an impressive assembly of passionate volunteers committed to the Katahdin Corridor, a 15-mile stretch that begins when you leave the interstate at the Medway Exit 244, and continues through the towns of Medway, East Millinocket and Millinocket. With the impact of the mill closure and persistent economic and social stresses threatening the region's long-term viability, the Our Katahdin non-profit was formed with three main focus areas of development:

- ✓ Community
- ✓ Entrepreneur
- ✓ Industry

It was against this backdrop of a historic and heroic revitalization effort that Axiom was chosen as the planning partner for a Broadband Planning grant to assist the region meet its Broadband goals, which are directly related to the three focuses of development.

Before Axiom arrived on the scene, the Our Katahdin group had already identified one major asset in the region… The Three Ring Binder, an 1100-mile dark fiber, high capacity middle mile backbone that stands ready to deliver high-speed Broadband to the region.

To create that plan we followed a Rural Broadband Deployment Kit that Axiom has developed to help regions move through the process of decision-making and ultimately deploying. The steps are described below.

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Axiom is a pioneer in rural broadband deployment and we are sensitive to rural citizens' desire to be both digitally connected but geographically remote. We have developed the Axiom Rural Broadband Deployment Kit to do just that.

1. **Assess**- Evaluate community needs and assess assets
   Before Axiom makes any recommendation to a community, we do a thorough investigation of the assets that are in the community that could be leveraged.

   - Meetings with current service providers to determine if these assets can be leveraged
   - Investigation of current Broadband infrastructure
     o Location of fiber-optics
     o Locations of towers that might serve the community with wireless technology
   - Review of any community barriers
     o Right of way laws
     o Moratoriums or height restrictions

2. **Define Goals**- Collaborate with leadership and citizens to define needs and goals
   Through a series of meetings with community, business and civic organization leaders as well as strong community input, define what the community specifically wants to achieve and begin to define roadmap to achieve goals.

   - Engage the Broadband committee made up of diverse group of town/city/regional officials and community leaders
   - Reach out to community with a survey to understand community concerns, cost of current service and where service gaps are present
   - Business surveys and meetings- work with Broadband group to identify key businesses for interviews and identify larger list of businesses through Chamber or other organizations to send a business specific survey

3. **Plan**- Develop the strategic and tactical plan for community
   Once goals are defined, develop a gap analysis that describes what the community has for existing assets that can be leveraged, articulates the goals of the community and defines what needs to occur to reach their goal through a step-by-step roadmap that can become part of a communities' Comprehensive Plan.

   - Develop gap analysis
   - Road map that can be implemented over time in phases, or all at once
   - Identify resources to help community be ready for implementation
   - Discuss private-public partnerships and other implementation models

4. **Implementation**- Our planning model provides a roadmap to implementation and works with the region to help them weigh their options for deployment by focusing on Public-Private partnership strategies that include:

   - Revenue Sharing models
   - Shared risk and responsibilities
   - Recognizing and eliminating deployment obstacles
   - Strong, ongoing participation by communities

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Executive Summary

When Axiom came to the region for the first time, we listened carefully to what the Our Katahdin group wanted to accomplish and we came away with these observations, which ultimately formed the basis of our recommendations:

- Downtown Millinocket needed to build on the energy and commitment of the Design Lab and the strategic importance to the region- Fiber to the Premises in the downtown
- All three communities- Millinocket, E Millinocket and Medway presented their own unique opportunities and challenges
- This corridor was a gateway to the Baxter State Park region and needed to capitalize on tourism opportunities
- Some type of mesh network that might serve remote camps, second homes and areas difficult to reach with current internet service

Hotspots

Hotspots are an inexpensive way to provide service in a downtown or gathering spot for people interested in access to the Internet, without using cellular data. These devices also allow for customized interface where the user can be directed to regional amenities and information to make their visit or stay easier to navigate or for people locally to connect for homework, business or other applications such as social media and email.

In the Our Katahdin region we proposed 4 hotspot locations that would allow for a contiguous experience for those driving along the route from Medway to Millinocket and into the Lake Region of Baxter and Katahdin.

Millinocket-
Millinocket has the most defined downtown with a mix of shops, restaurants and businesses, as well as the Court House, post office and the town office. It serves not only as the gathering place for locals and tourist but also is a regional hub for local activity and gathering. While much of the business district has sprawled down Route 11, back toward E Millinocket, leaving parts of the downtown in disrepair, it still stands as a strong asset that can and should be revitalized. Free or low-cost downtown hotspots give another reason for those passing through to stop and perhaps visit. They also give the community a progressive flair that they then can market and leverage.

Our proposal is to create a mesh network in the downtown that will cover all of Penobscot Avenue from the corner of Rt.11/157 to the corner of Penobscot and Katahdin Avenue.

East Millinocket-
In East Millinocket we propose a downtown hotspot the sits atop the Town Hall that covers the area around the town hall and the small downtown that includes a pharmacy, a seasonal hotdog stand and other places to gather or conduct business.

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Medway-

In Medway we proposed a hotspot in Medway Park, which is home to a number of ball fields and courts and a portage and river beach area frequented by both visitors and the local community in the warmer months.

The Lakes Region-

We were also asked to extend the potential for a hotspot location to the intersection of Golden Road and Millinocket Lake Road, which merge as a primary location and intersection of those camping and using seasonal homes surrounding a series of lakes and water bodies.

Total cost for the equipment for these hotspots, less than $18,000.00. (does not include cost of monthly cost of Broadband or yearly maintenance fee) As of this report, several sponsors have stepped up to begin to fund this proposal.

Fiber Optic Solutions

Downtown Millinocket-

Fiber optics has a number of attributes that are important in helping to meet the goal of revitalizing the downtown. Because it is extremely reliable, can bring symmetrical speeds and be upgraded inexpensively as the needs of the downtown grow, we agree with the committee that this is an important investment for the future of the region. In addition, once a foothold of fiber is put in, it can be expanded to homes and other important business and civic buildings throughout the community, slowly and methodically over time, or as funds are available. The system we are proposing would bring a fiber connection to all of the building along the downtown district (which we estimate at 50 or so) giving them a different level of connectivity that can attract businesses and investment such as the Design Lab and an engineering business located just off of Rt. 11 and Penobscot Avenue. These are the types of businesses that have higher wages, attract skilled workers and keep or appeal to families who might consider moving for the quality of life, while maintaining a level of employment that can support their lifestyle.

Total Cost to the Curb to connect the Downtown: $159,000.00 (does not include customer drops), customer drop costs will depend on how many businesses or homes along the route we would serve, estimate in Appendix A-2.

East Millinocket-

Also in East Millinocket is an industrial park that we recommend fiber connections to attract park development. It is possible that existing fiber that connects a tower site at the end of the park might be available but much of Industrial Drive and Dirigo Drive currently do not have fiber connectivity.

Total cost to bring fiber throughout the Industrial Park: $26,000.00

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<u>Medway-</u>
Very close to the entrance of Medway Park, is the old Nissan Building. This warehouse type building is being offered for development. It is not overly costly would not be very costly to extend fiber into the Nissan Building as an additional incentive for a potential developer of that site.

Total cost to bring fiber to the Old Nissan Building: $5,000.00

Wireless Solution

<u>Lakes Region-</u>

As a beginning to extend the coverage area we have proposed a hotspot at the intersection of Golden and Katahdin Road. In order to bring a solution to that area, we identified a tower that is either owned or operated by Premium Choice Broadband, a wireless Broadband provider in the region. This is a strategically located tower in the region that, if we were able to use, would bring coverage to a good part of the lakes region. It might be important to ask Premium Choice Broadband about their coverage in that area and begin discussions with them about additional coverage, off of that tower or the possible construction of another tower.

Total cost of equipment and end user radios: $251,600.00 (includes Hotspot)

Digital Inclusion

As part of our plan we also include a section on Digital Inclusion. A Digital Inclusion plan allows for access and educational investments to be made strategically and affectively to help bridge the Digital Divide. When businesses or citizens learn new skills or barriers are reduced to help people get connected, the whole community benefits. The plan will allow the Our Katahdin region to invest directly in its people's future. A Digital Inclusion Plan includes these four elements:

- Public Access to Computers
- Subsidized or reduced cost Internet
- Low cost computers
- Digital Literacy

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Our Conclusion
This plan, taken in whole or in steps is:

➢ Cost effective
➢ Achievable
➢ Allows for short term wins and long term investments
➢ Can grow as additional funds become available

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The Steps

Step 1: Assess

Axiom assembled and spoke with a number of providers that provided service in the area to discuss their current operational footprint, what service levels they provided and what plans, if any they might have for the region.

The providers we spoke with included:

FairPoint Communications
Charter Communications/Spectrum (formally Time Warner Cable)
Bee Line Cable
Premium Choice Broadband

FairPoint Communications (FPC) is the largest provider of Internet and phone services across the region. They offer a variety of home and business solutions at different price points and speeds. Because they are copper to the home or business, their speeds are typically limited by the distance from their equipment that is located in what they call a central office (its not really an office, just a place where their equipment is located) or a remote terminal (a smaller box on the side of the road), typically approximately 3 miles from the central office that pushes the signal beyond the 3 mile limit to more remote coverage areas. FPC is in the midst of upgrading a number of facilities in the area that will allow speeds of up to 25Mbps within a mile or so of these connection points and up to 10Mbps as you get closer to the 3-mile limit of the technology. These upgrades are a substantial increase in speeds that FPC was previously unable to achieve.

In addition to the upgraded service in many parts of the Our Katahdin region, FPC also offers what they call Carrier Ethernet Service; this is a product that delivers up to 10Gigs of service (1 Gigabyte= 1000Mbps) through a direct fiber connection. This type of service is reserved to businesses requiring this type of connection and the fiber that FPC has (and it is extensive) is not used for residential service. CES costs are priced on a competitive, case-by-case basis and vary depending on a number of factors and are difficult to estimate.

Charter Communications/Spectrum is the cable provider in Medway and covers the majority of town. They are open and interested in expanding service by working with the community to meet their deployment revenue numbers or applying for ConnectME grants that helps expand grants to unserved areas. Because Charter Communications is a cable company first, they deliver their signal to the home through coax cable that can deliver higher speed internet, as well as video and phone from longer distances. Charter Communications has recently upgraded its system and will offer only two packages to customers, a 60/5Mbps connection and a 100/10Mbps for $64.95 and $104.95 a month respectively. Charter Communications will also be rolling out a low cost option for families on reduced lunch programs or receive Supplemental Security Income (SSI) that will offer a 30/5 connection for $14.95 a month.

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Bee Line Cable holds the franchise agreements for East Millinocket and Millinocket and provides its service to customers with the same coax cable that Charter Communications does in Medway. They offer 1Mbps/4Mbps/10Mbps Internet coverage as well as triple play service that bundles their Internet service with phone and television packages. Bee Line is locally owned and operated and works closely with the towns it has agreements with to meet their obligations as part of their franchise agreements and is accessible for conversations about potential expansions and solutions.

Premium Choice Broadband is a rural broadband carrier that primarily delivers service via microwave link that allows them to broadcast a signal (internet) to homes in the area that can accept that signal through a receiver mounted to the home. Premium Choice Broadband typically offers enhanced service for customers that have line-of sight (can see the tower that is broadcasting the signal) of up to 10Mbps. For non-line-of-sight customers, a typical connection might be 3Mbps or less with pricing starting at $49.95 to $103.95 a month. The majority of their packages limit your usage by restricting the amount of bandwidth you can use in a month. However, Premium Choice Broadband serves customers in difficult to reach areas where coverage would be challenging or non-existent but for a wireless connection. Premium Choice Broadband typically works in areas and with partners by applying for ConnectME grants or other money that can help defray the cost of deploying equipment in a new or expanded coverage area.

All providers are open and willing to work with the three communities to expand service, should they choose to do so.

Step 2: Goals

The Our Katahdin group had done extensive community engagement and surveying before Axiom was asked to be their planning partner. The leaders of the Our Katahdin group were driven to give the region better connectivity and believed that the connectivity was going to be the underpinnings to the economic growth plan that was already in place and had funded a number of local and regional initiatives.

Early conversations focused on Gig networks for all three communities and a mesh network that would serve the Lakes Region. Through a series of conversations and meetings, we believe we have struck proper balance for achieving their goals through a phased approach.

Hotspots- Phase I

Hotspots are an easy way to demonstrate how much people use the Internet. In places like Machias, Greenville and South Portland 1000s use this free service on a monthly basis in the warmer months and 100s in the colder months. They are relatively low cost, can be engineered and installed quickly and create a buzz in the community as the coverage areas are discovered and people begin to use them.

The Our Katahdin group and Axiom have identified sponsors willing to support this effort and we expect to have the downtown Millinocket plan implemented in the Spring of 2017. In remote wilderness areas there is always a tendency to be skeptical about the importance of better connectivity as communities grapple with competing priorities and the belief that visitors to the

region come to "unplug." While that may have been true in the past, most desire connectivity, if not for simple safety reasons, but to stay connected to work and other ongoing priorities.
Hotspot Goals

- ❖ Demonstrate how important connectivity is to visitors and locals
- ❖ Helps all three communities capture tourism opportunities
- ❖ Creates opportunities for a ribbon cutting and celebration of another Our Katahdin accomplishment
- ❖ Sets the stage for other connection investments that are more costly but needed
- ❖ Supports Digital Inclusion

Fiber to the Premise- Phase II

The goal of the Our Katahdin group is to have a Gig to every home in all three communities. After looking at all three communities closely and understanding more fully the upgrades that both FairPoint Communications and Charter Communications are making, we advise a phased approach to build out as these types of investments are difficult for a provider to make a return on investment.

Three other fiber investments are recommended:

Millinocket is also home to the former Great Northern Paper facility. The Our Katahdin group has taken ownership of the site. Without a full understanding of the goals and development plans for the site, we do not feel we can give them an accurate proposal for fiber build out and it is not part of this report.   However, once Our Katahdin fully develops plans for the site, Axiom will support a plan a fiber cost analysis to the site.

In East Millinocket, an industrial park with several businesses and many site opportunities would be enhanced with a fiber connection.

And in Medway, as we described earlier in this report, as we connect the Medway Park to a Hotspot, it makes sense to run a fiber connection to the old Nissan building which is very close to help the development prospects of that site.

We agree that fiber connections will be an important part of the region's growth and livability strategies. These strategies will create foothold toward its goal of a Gigabyte to every home.

Fiber Goals

- ❖ Attract downtown development investment in Millinocket
- ❖ Build on and support an entrepreneurial hub
- ❖ Focus on marketing downtown to businesses that can use this type of connection, typically higher skilled and higher wage businesses
- ❖ Attract investments in Medway, E Millinocket and Millinocket

The Lakes region- Phase III

For many, the Lakes region is a key component of an investment strategy aimed at capitalizing on seasonal camp owners and visitors. The opportunity for hiking fishing, camping and other outdoor recreational opportunities in a breathtakingly beautiful and pristine place has attracted visitors to the

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Our Katahdin region for well over a century. Like many other places in Maine, the Our Katahdin group is focused on keeping people in the region longer when they are here. Having amenities that allow people to easily access what is available (through a hotspot), gives them a vibrant downtown with shops, restaurants and thriving businesses (fiber) and allows them access to the internet from their cabin or campsite is a smart, strategic and deliberate attempt to attract and keep people in the region for longer periods.

Extended Wireless Connectivity Goals

'Three Ring Binder' route

A 1,100-mile fiber network providing high-speed Internet service to rural communities has been completed six months ahead of schedule and under budget. The $31.7 million project, which included $25.4 million in federal stimulus money, creates a high-speed core network that telecommunications companies can link to as they expand broadband service.

Source: Maine Fiber Company, Inc.

STAFF GRAPHIC | MICHAEL FISHER
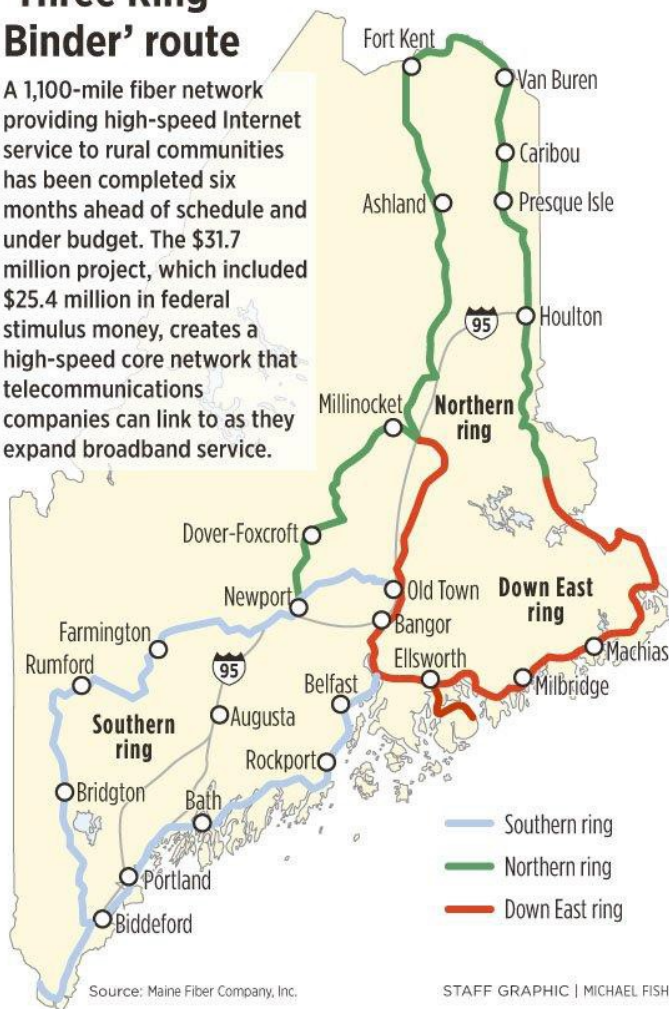
❖ Keep visitors in the region for longer periods
❖ Perhaps give people a daily or weekly pay for service option
❖ Demonstrate remote coverage and financial viability that can be replicated to continue to extend mesh network

Step 3: The Plan- 3 Phases

Backhaul (getting internet capacity to the Our Katahdin region)
Backhaul in the Internet Service Provider vocabulary refers to the total amount of Broadband Internet that would need to be transported from the backbone or core network (think of the Three Ring Binder) to a point in the Our Katahdin region *before it is distributed to the homes and businesses in the community.* What is important about backhaul is the ability to increase the amount of Broadband Internet over time to keep up with community demand as Internet use exponentially increases.

The Three Ring Binder is one example of how your Broadband needs can be met and, importantly, it runs right through all 3 communities, so can be leveraged. However, other providers in the area like FairPoint Communications and Charter Communications also have extensive fiber capabilities and should be explored for price and availability. Readers of this report should think of the Three Ring Binder or other fiber assets as off ramps that then need to be distributed to accomplish regional connectivity goals.

All of Axiom's planning solutions rely on having good backhaul connectivity to support the planning of our 3 Phase approach.

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Phase I- Hotspots

Hotspots are increasingly becoming popular across the U.S. giving citizens free or low cost connectivity options typically in a high traffic area where people tend to do business or hang out. These connections are not meant to replace Internet service to the home, but to address a community need or help visitors and locals get connected temporarily. Think about the library in your community or other places to connect, like a McDonald's or Dunkin Donuts. These are places that people will use, as they travel through or don't and often times can't get a robust connection at their home. Our Hotspot recommendations focus on three areas:

- Millinocket downtown
- East Millinocket town office area
- Medway Recreational Park

In the Millinocket downtown, we will create a mesh network that will allow the equipment to communicate with each other, creating a seamless experience for the user all along Penobscot Avenue.

In East Millinocket, the "downtown" is centered on the town office on Rt. 11 and the surrounding buildings, including the library, a pharmacy and a few other businesses and a seasonal food cart.

Medway Park is a different opportunity, and a bit more complicated, as fiber needs to be run into the park in order to create a hotspot. However, we envision 100s of daily users of the park, beach and portage, and this connectivity will bring a level of service there that will certainly enhance the park user experience.

All three plans, with pricing can be found in Appendix A-1

Phase II- Fiber

Fiber Optics is the best connection that is available. It provides the best reliability, speeds and low maintenance, however it is also the most expensive, costing anywhere between $20,000 and $30,000 a mile. Our recommendations call for very direct focused fiber connectivity to help achieve specific goals. We were not asked, nor would we recommend a fiber to the home solution in any of the three communities. Rather, we believe that targeted fiber, for specific economic reasons can start to build momentum for expanded connectivity that can be expanded as needed or wanted.

We focused our fiber efforts on three projects:

- Millinocket Fiber to the Premise in the downtown
- East Millinocket industrial park
- Former Nissan Building in Medway

The project descriptions and costs can be found in Appendix A-2

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Phase III- Wireless to serve the Lakes Region

Fixed wireless technology offers an affordable way to connect remote locations by serving multiple locations from a single position, typically a tower. This plan would reach remote cabins and sites along Spencer Cove and Millinocket Lake. We also believe that a Wireless Hotspot can be provided using the same tower. One of the suggestions of Our Katahdin was to potentially test service that can be provided on a daily or weekly fee system to help the regional entity derive revenue through this type of service. With that in mind all of the hotspots and potentially this fixed wireless service might be programmed to allow for that opportunity.

Our focus on the wireless system:

- Deliver service to difficult to reach unserved or underserved areas around the Lakes
- Test pay as you go service that derives revenue
- First step in targeted wireless system that can be expanded to other areas in Katahdin region

Project description and cost can be found in Appendix A-3

Next Step: Implement–Public-Private Partnership

Public private partnerships are a defined way for Our Katahdin, the 501©3, to take an active role and derive value for the region with this plan. While ongoing investments around better broadband are encouraging, they are based on a business model or federal grant funding that the communities don't have an active role. Axiom believes that working with potential provider should include:

- Revenue sharing models
- Shared risk and shared rewards
- Strong community or regional entity involvement on all aspects of build out
- Commitment to eliminate barriers to deployment

In addition, a law passed last year allows communities to form a municipally based Broadband Utility, over time, the communities could come together using a local agreement among the three (or more) communities to form, and define its usage, a set of by-laws and perhaps a charter.

Value Added Collaborations within the Katahdin Region

Expansion of high speed broadband internet service was identified as a core infrastructural component of Our Katahdin's Downtown Corridor Revitalization Plan that includes building improvements and broadband access as two key pillars of revitalization for the Katahdin region.

Our Katahdin has approached this planning process as a regional effort, engaging the three towns of Millinocket, East Millinocket, and Medway. We received strong support from the municipalities, each of whom have cited broadband access as a cornerstone of economic development for the Katahdin region. This regional approach was expanded throughout the planning process to include the towns, regional development corporations, small business owners, revitalization and citizen groups and the Millinocket library in the community broadband committee.

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Our Katahdin hosted the first of the committee meetings in September 2015, and continued to be the driving force behind the discussions throughout the planning process. This group worked closely with Axiom Technologies to catalyze the participatory process for broadband planning. These committee meetings helped strengthen and align broadband development goals within and between the three towns, which was a primary goal of value-added collaboration throughout the process.

In addition to strengthening the collaboration between the towns, this broadband community planning grant added value by strengthening bonds between economic development groups in the Katahdin region. Specifically, new collaborations – with value-added impacts to the region – have formed between Our Katahdin and several new organizations. First, the Northern Forest Center, a non-profit organization looking at development advances in rural, wooded, towns across New England has partnered with Our Katahdin to sponsor the installment of wifi hotspots as a direct result of the planning grant. Increased outreach and collaboration with entrepreneurial networks like UMaine Innovation Center and Maine Accelerates Growth has been fostered through the development of broadband access. We've looked into partnering with Axiom, Eastern Maine Community College and the Millinocket Memorial Library to increase access to Digital Literacy programming. We're also coordinating with the library to increase wifi broadband access in town by strategically staggering our placement of wifi signal boosters through an Our Katahdin and a library initiative.

Larger-scale economic development agencies and federal agencies have also increased their participation in the town in response to the broadband plan. We continue to be aligned with the Eastern Maine Development Corporation-led "Re-engineering our Region" components cited for the Eastern Maine region to position itself to move forward successfully is "Strengthening infrastructure and culture to create a digital region for the emerging economy." This speaks specifically to the industries of bio-science/healthcare/education, emerging technology, tourism/hospitality, forestry/wood products, composites/boat building, construction/skilled trades, and agriculture/food production. Broadband expansion is also aligned with the Comprehensive Economic Development Strategy that EMDC develops. This increased attention to broadband development has created interest by the Environmental Protection Agency to look at the region as a potential partner for their Cool and Connected program, which focuses on downtown revitalization and broadband access. On a more local level, Maine Department of Economic and Community Development has invested in downtown Millinocket as a part of providing broadband to entrepreneurs and small businesses.

Our Katahdin has already moved beyond the planning phase with Axiom Technologies and is beginning implementation of step one: wifi hotspot installation. Our Katahdin is collaborating with the Town Office of Millinocket and two small businesses to increase broadband capacity and locate wifi hotspots on their buildings to provide access to visitors along Penobscot Avenue. This alone will be a dramatic value-add venture for downtown Millinocket. These partnerships continue to guide our continued efforts to build out broadband infrastructure in accordance with the plan developed with stakeholder input, community partners and Axiom Technology.
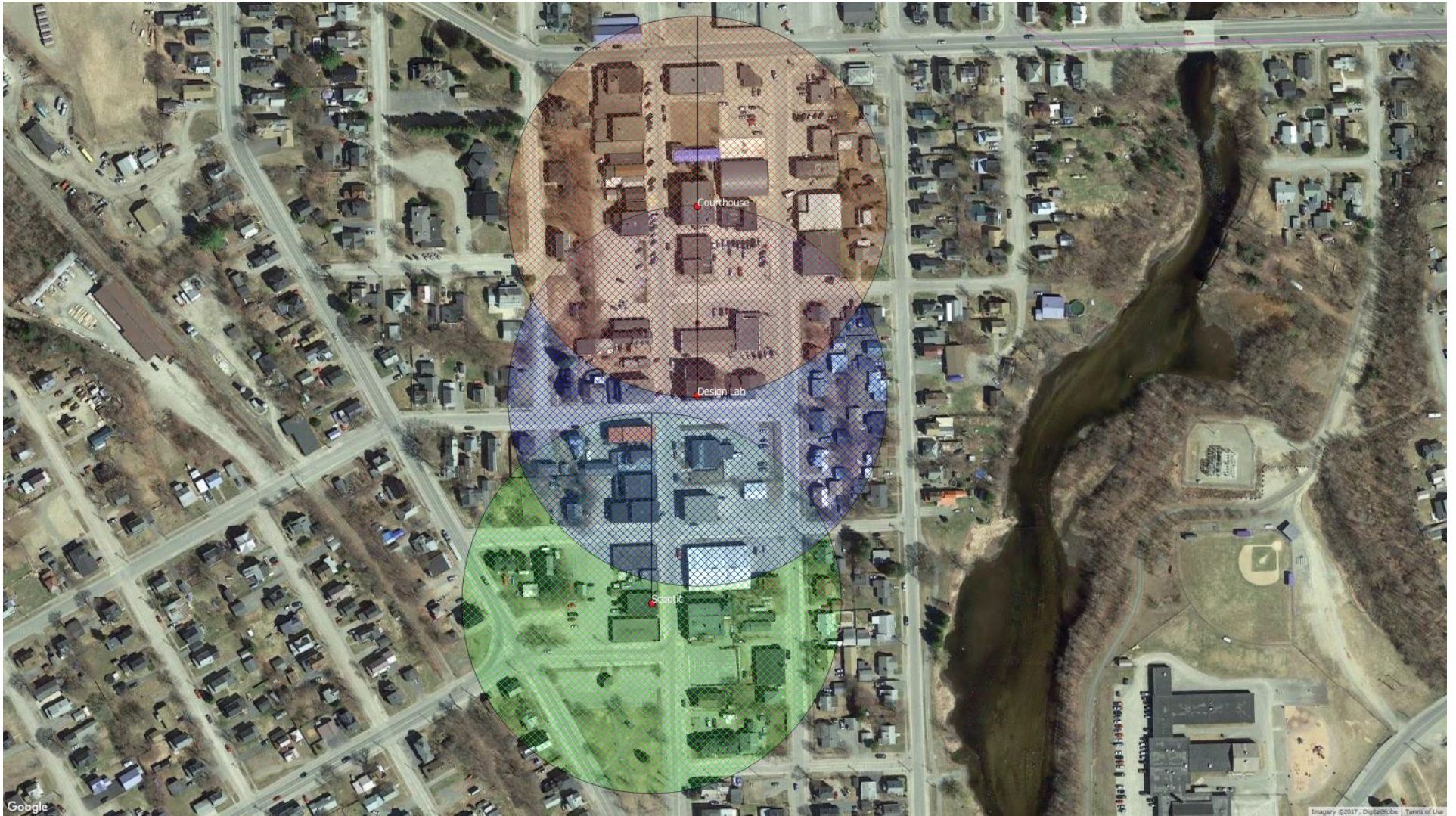
Appendix A-1

Wireless Hotspot pricing by Town

	Qty	Cost	Total
Millinocket (2,000/ea. After first)	3	$3,000.00	$7,000.00
- Annual Maintenance	1	$2,000.00	$2,000.00
- Bandwidth	12	$300.00	$3,600.00
Non-Recurring			**$7,000.00**
Recurring			**$5,600.00**
E. Millinocket	1	$3,000.00	$3,000.00
- Annual Maintenance	1	$1,000.00	$1,000.00
- Bandwidth	12	$300.00	$3,600.00
Non-Recurring			**$3,000.00**
Recurring			**$4,600.00**
Medway	1	$3,000.00	$3,000.00
- Annual Maintenance	1	$2,000.00	$2,000.00
- Bandwidth	12	$300.00	$3,600.00
Non-Recurring			**$3,000.00**
Recurring			**$5,600.00**
Total Non-Recurring		**$13,000.00**	
Total Recurring		**$15,800.00**	

The prices reflected in the chart above indicate the number of hotspot devices recommended for each location and the estimated annual costs to keep each running. The following four pages will show a rough overview map of each town with colored circles representing the location of each hotspot. The shaded areas indicate the potential coverage area of each hotspot.

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Millinocket Hotspot Locations

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East Millinocket Hotspot Location

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Medway Hotspot Location

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Appendix A-2

Fiber Optics Network Overview

	Qty	Cost	Total
Millinocket			
-Fiber Materials			$48,000.00
-Fiber Installation			$40,000.00
-Regen Site Cost			$71,000.00
Total			**$159,000.00**
E. Millinocket			
-Fiber Materials			$14,000.00
-Fiber Installation			$12,000.00
-Regen Site Cost			$0.00
Total			**$26,000.00**
Medway			
-Fiber Materials			$4,000.00
-Fiber Installation			$4,000.00
-Regen Site Cost			$14,000.00
Total			**$22,000.00**
Additional Services			
-Interconnection/drops			$21,000.00
Total			**$21,000.00**
Total Project Cost			**$228,000.00**

	Qty	Cost Per	Total
Customer Premise Installations (Millinocket)	280	$2,000.00	$560,000.00

Ongoing Costs (Annual)	
Estimated Bandwidth Cost	$32,388.00
Estimated Electrical Cost	$1,200.00
Fiber Backhaul Lease	$6,000.00
Pole Leasing	$500.00
Total	**$40,088.00**

The prices reflected in the charts above are estimated figures to bring a FTTX service into the downtown of Millinocket as well as feeding several locations in Medway.

Millinocket Fiber Map

In the above image, the magenta lines represent new fiber construction while the blue lines represent existing 3RB fiber that will be utilized to connect the various network elements together. This will reduce the overall build cost while incurring a small recurring cost.

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The green line represents the new fiber build into the industrial park in East Millinocket. The blue line represents existing 3RB fiber which will allow the Industrial Park to connect back to the head end in Millinocket.

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Medway Fiber Map

In the above image, the orange line represents new fiber construction while the blue line represents an existing 3RB fiber which will be used to transport broadband service from Millinocket to Medway. This plan is to provide service to the hotspot project outlined in Appendix A-1 and the currently vacant Nissen Building.

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Appendix A-3

Wireless/Hotspot Solution for Lakes Region

Materials			
Access Point Hardware			$28,800.00
Installation Hardware			$12,000.00
Customer Prem NRC	200	$360.00	$72,000.00
Total			**$112,800.00**

Installation			
Access Point & Bridge Installation			$4,800.00
Customer Prem NRC	200	$300.00	$60,000.00
Total			**$64,800.00**

Backhaul Cost	
Backhaul Radios (Licensed)	$50,000.00
Radio Bridge Installation	$5,000.00
Structural Analysis	$10,000.00
Total	**$65,000.00**

Hotspot	
Hotspot Installation	$3,000.00
Wireless Bridge & Installation	$6,000.00
Total	**$9,000.00**
Grand Total	**$251,600.00**

Ongoing Costs (Annual)	
Estimated Tower Rental	$6,000.00
Estimated Bandwidth Cost	$36,000.00
Hotspot Annual Lease	$2,000.00
Total	**$42,000.00**

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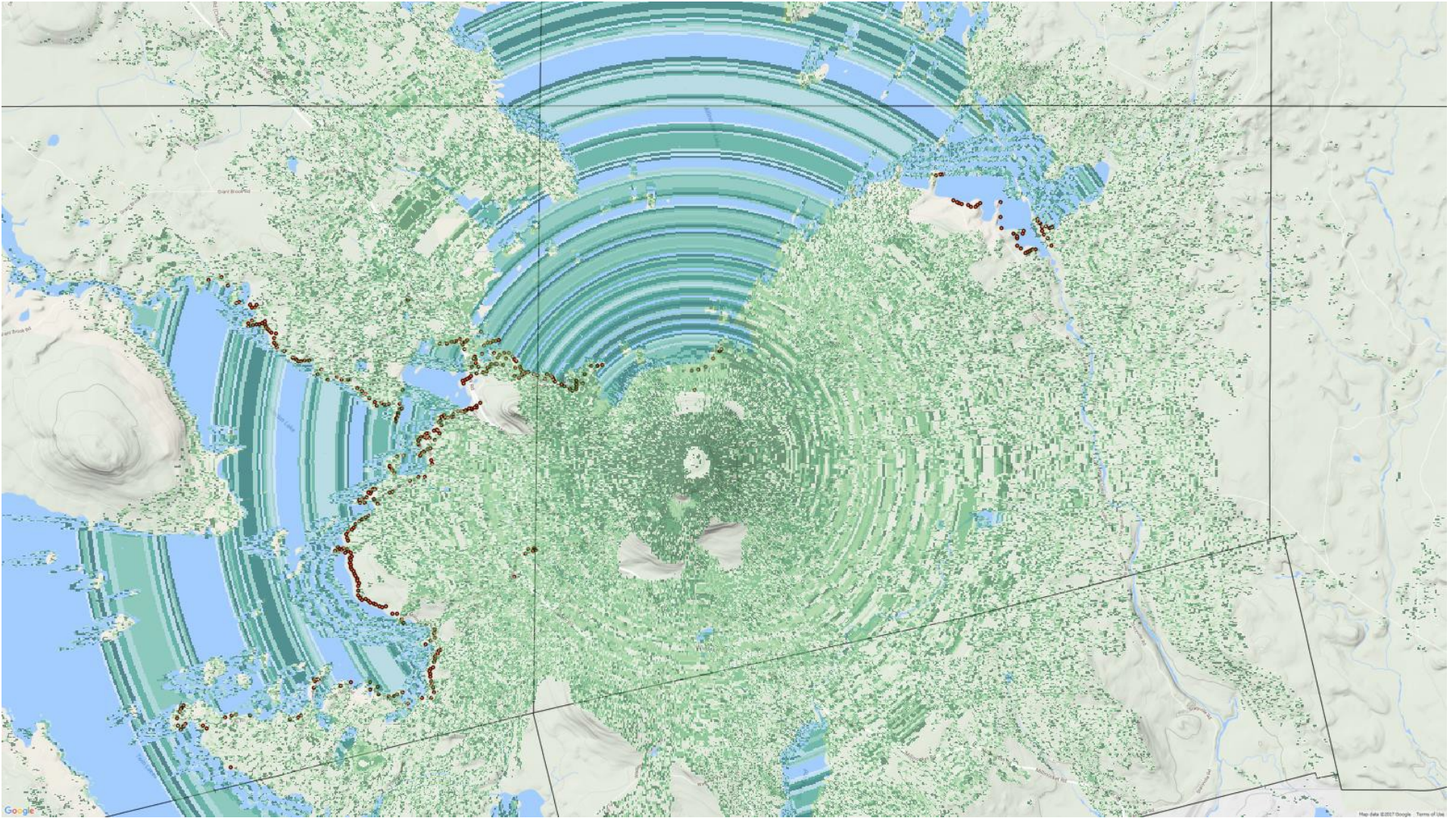
The maps shown above and below detail the potential coverage area of wireless service served off of a tower on a nearby high point. The red dots indicate address locations taken from the Next Generation 911 Database. The above map details terrain topography while the map below shows the coverage overlaid onto a satellite map.

3 Water Street
Machias, ME 04654
www.ConnectWithAxiom.com
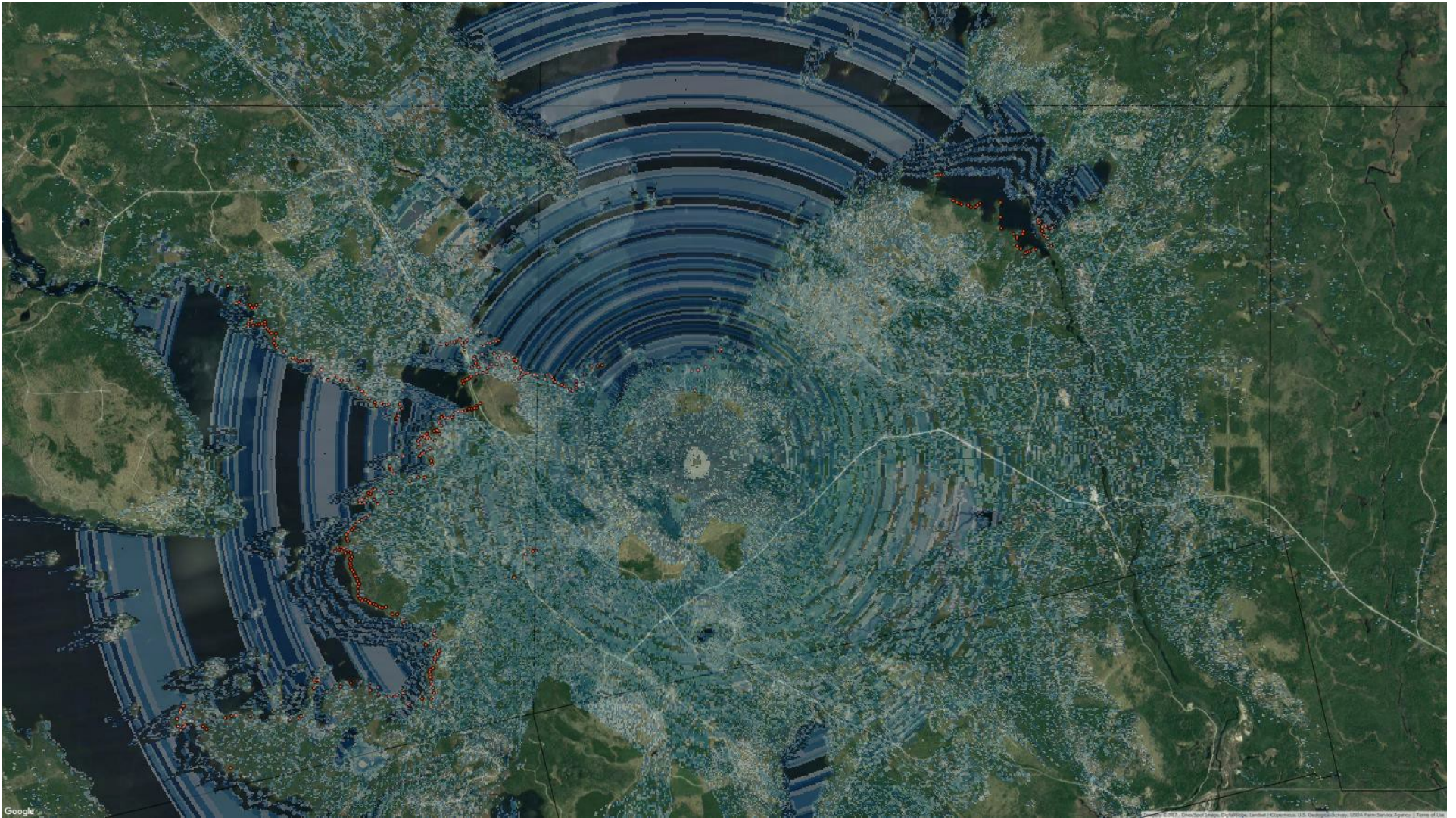
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Hotspot Coverage Map

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Appendix B

Grant Funding Resources- State Resources

The ConnectME Authority offers 2 types of grants- Infrastructure and Community Broadband Planning Grants. For the purposes of this report, the planning grant is not a consideration. We would recommend looking toward an Infrastructure grant, details can be found here: http://maine.gov/connectme/grants/

Axiom has extensive knowledge of these grants and have received many of these grants totaling over $1M.

❖ Grant proposals must meet the state standard of 10/10Mbps
❖ Grant limits are suggested, but typically $100,000, which must be matched 1 to 1 with a combination of cash and in-kind services
❖ Area targeted must be unserved or severely underserved (Service that is less than 1.5Mbps download

Typically grant is open for applications in the March- April timeframe, but is not clear this year when grants may be available.

The Maine Community Foundation has regional grants that can support initiatives up to $10,000 a year found here: http://www.mainecf.org/GrantsNonprofits/AvailableGrantsDeadlines/CommunityBuildingGrantProgram.aspx

❖ Grants available up to $10,000
❖ Local decision makers by county
❖ Various criteria that needs review
❖ Deadline February 15th of each new year

Northern Boarder Regional Commission Grants located here: http://www.nbrc.gov/
The Commission excepts grant applications from across the northern border regions of Maine, New Hampshire, Vermont and New York.

❖ Requires at least a 1 to 1 cash match
❖ Must be tied to quantifiable job creation
❖ Very competitive

Contact: Andrea Smith at (207) 624-9813 or andrea.smith@maine.gov for information on deadlines and program parameters.

Grant Funding Resources- Federal

U.S. Department of Commerce- Economic Development Administration (EDA) provides funding for economic development projects across the state of Maine. Maine projects are reviewed and administered by EDA's local representative, Alan Brigham at (215) 316-2965 or abrigham@eda.gov. Programs and eligibility can be found at www.eda.gov

- ❖ Various funding programs
- ❖ Guidelines encourage regions to incorporate BB investments in their regional strategies (CEDS)
- ❖ Funding requires match

U.S. Department of Commerce- Broadband USA is helping communities nationwide ensure they have the broadband infrastructure, digitally literate workforce and engaged citizens to thrive in the Digital Economy. Details can be found here: https://www2.ntia.doc.gov/

- ❖ Provides direct (one-to-one) assistance to communities
- ❖ Resource rich website- no direct grants
- ❖ Building a self-assessment tool for communities

U.S Department of Agriculture- Rural Development has a number of grant programs worth investigating. Local office in Bangor, contact Tommy Higgins, Acting State Director, (207) 990-9160. More information on programs in Maine can be found here: www.rd.usda/me

- ❖ Rural Broadband Access Loans and Loan Guarantees Program
    - o 2017 Program has not been announced
- ❖ Several other competitive grant programs to explore eligibility and criteria

U.S. Department of Treasury- New Markets Tax Credits (NMTC) has recently clarified the eligibility of broadband infrastructure and related activities are eligible for NMTC provided they meet certain criteria located here:
https://www.cdfifund.gov/Documents/2015%20NMTC%20Application%20QA%20FINAL.pdf

- ❖ Axiom is exploring the potential of NMTC funding
- ❖ Eligible census tracks are being reviewed
- ❖ It's unclear without investigation if Our Katahdin or parts of Our Katahdin may be eligible

Broadband Opportunity Council Funding Report- U.S. Dept. of Commerce and USDA released a report in January 2017 listing all federal broadband funding resources - See Addendum 2

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Addendum C-1
Digital Inclusion Report

Addendum C-2
Budget

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Attachment C-1
Our Katahdin
Digital Inclusion Report

This part of our report describes our work to better understand the needs of your community and includes an overview of our business surveys, the business interviews, an analysis of the community surveys, a catalog of available pubic access computers, and recommendations and pricing for a Digital Inclusion program. At Axiom, we believe that a strong Digital Inclusion program is an investment in community members and enhances a larger community connectivity effort such as what is being contemplated in Our Katahdin.

Benefits include:

- Higher Take-rates, as people understand the value of an internet connection to their lives, they are more likely to take service
- Reduces barriers to adoption and helps community members access learning tools for increased on-line presence
- People with service are more likely to upgrade service, again increasing the viability of a project being successful
- Helps businesses understand how to leverage on-line tools and cloud services to add value and productivity to their business
- Helps individual community members access life enhancing content, including e commerce, telemedicine services and educational opportunities
- Bridges the Digital Divide, helping teach disadvantaged members of the community to participate in what is increasingly an on-line world.

> *By removing barriers and exposing people and businesses to educational opportunities that improves their understanding of on-line benefits Axiom believes we can change the economic status of a region*

Surveys, Interviews and Meeting Results

Axiom interviewed businesses, community and municipal leaders, as well as residents to discuss Computer Skills/Digital Literacy Training and workforce development skills training.

Business

For the business community, an online survey was distributed, followed by interviews. The Our Katahdin Broadband Committee identified key businesses to target during this process. In addition to the survey being available to the general public, Axiom contacted 33 businesses via email or phone calls, the Chamber of Commerce sent out the business survey link, and it was posted on the Our Katahdin FaceBook page. A total of 11 businesses responded to the survey and/or interviews. (See Attachment A-2) – Our Katahdin Internet and Workforce Needs Business Survey

Business Survey Results:

- 88% of businesses state that broadband is extremely important for their business.
- 64% of businesses state that they could work and sell more efficiently online
- 18% of businesses are sole entrepreneurs; 25% have 2-5 employees; 9% have 5-10 employees; 9% have 10-25 employees; and 36% have over 25 employees
- 82% of businesses have a website
- 30% of businesses do not use a domain email address
- 55% of businesses do not use VoIP (Voice over Internet Protocol) telephone service
- 55% of businesses use the internet for online purchasing of inventory, webinars, skype, file and data sharing, data management, cloud-based operations, hosting own server and social media
- 45% of businesses state that internet speeds have not kept up with business needs over the past few years
- 72% of businesses state improved broadband will be critically important to their business in the next 1-2 years
- 60% of businesses do not offer telecommuting
- 60% of businesses that do offer telecommuting report that employees struggle with it
- 63% of businesses see a need for computer skills training

Residential

As with Business, Community & Municipal leaders, the residential community was invited to participate in a Community Broadband Survey in April 2016 by the Our Katahdin Broadband Team. It was the goal of the survey for residents to become engaged in providing better broadband to Millinocket, East Millinocket and Medway. A total of 346 residents completed the survey.

Community Our Katahdin Broadband Team results:

- 95% of homes have internet
- 62% of homes that do not subscribe state price is the reason, followed by limitation of service
- 39% of homes use the internet for work; 10% use the internet for telecommuting; 78% use the internet for social networking; 76% use the internet for email and web browsing; and 45% use the internet for internet TV/Videos
- 42% of homes state that their current internet service provider meets the level of advertised speed; 30% state they do not; and 28% are unsure
- 55% state that they would pay more for faster speed and reliable service
  - 44% pay $20-40; 48% pay $40-60; 10% pay $60-80; and 8% pay $80 or more
- 47% state they have children or adults that use the internet for homework – 62.5% are children and 37.5% are adults

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Community & Municipal Leaders – A series of meetings occurred to gauge the interest, as well as the skill level of the community. Discussions were facilitated to ensure that the community is aware of what is technologically possible to do when you have a broadband connection. Demonstrating distance learning education, telehealth, telecommuting, cloud-based services and software available begins the process of developing a Digital Literacy plan for a community.

What is Digital Inclusion?

Digital inclusion is a national priority in the United States, and increasingly a priority in Maine. High-speed Internet access is widely recognized as a necessity for full participation in today's society. Employers, educators, businesses, healthcare providers, and civic institutions expect people to have access to computers and broadband connectivity. However, accessible, reliable, and affordable broadband service continues to be out of reach for millions of Americans, many of whom live in low-income households. This gap in adoption of high-speed Internet and the lack of skills needed to use broadband-enabled tools in meaningful ways continue to be significant problems that policymakers, researchers, and practitioners need to focus on in the United States and in Maine.

The Digital Inclusion Program for Our Katahdin includes 4 components:

1.Affordable Internet – Cost continues to be a major barrier to broadband adoption. Our Katahdin should consider addressing "ability to pay". The following providers have been contacted regarding low-cost broadband availability:

- FairPoint Communications:
  - Eligible low-income FairPoint residential customers can quality for a discount on qualified internet service at their primary residence under the Lifeline Program. The discount consists of federal monthly support of $9.25.

  - Eligible FairPoint residential customers residing on tribal lands may qualify for an additional federal discount of up to $25 per month and installation assistance.

  - Further information, including applications forms, can be found at: www.fairpoint.com/home/residential/phone/lifeline.html

- Charter Communications (formerly Time Warner Cable):
  - Charter offers "Spectrum Internet Access", which is a low-cost broadband offering. www.SpectrumInternetAssist.com

  - Plan includes:
    - $14.99 for 30/4 Mbps with no data caps
    - Internet Modem Included
    - No Contracts Required
    - Add in-home WiFi for $5.00 more per month
    - Customers must not have been a Charter Communications subscriber within 60 days of signing up for Spectrum Internet Assist.

    - Eligibility requires participation in one of the following:
    - National School Lunch Program (NSLP); free or reduced cost lunch

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- Community Eligibility Provision (CEP) of NSLP
- Supplemental Security Income (SSI) (>age 65 only)
- Residents may visit Charter Communication's website or call 844-525-1574 to determine eligibility

- Our Katahdin Technology Fund: A fund ~could~ be established to offer a discount to low-income families to address broadband adoption and take-rate
  - Axiom is working with the Broadband Committee to determine the feasibility of establishing a fund

2.Affordable Equipment Assessment – Low-cost or free computers are often just as important as having access to low-cost or free Internet options, particularly for people in low-income communities.

- PC's for Maine www.pcsformaine.org offers refurbished, older computers that are donated by businesses in Maine and are available to low-income families.

- PC's for Maine will consider installing a kiosk at a local business to sell low-cost computers locally. Axiom would be happy to work with a local business and facilitate a conversation with PC's for Maine, should Our Katahdin decide to move forward.

- Lending Library of Devices, laptops, desktops, iPads, etc., could be established for residents to borrow on an "as-needed" basis. The devices might be donated or Our Katahdin could seek grant funds to purchase equipment. Millinocket Memorial Library and the East Millinocket Public Library might be the lending institution.

3.Digital Literacy Training* – Computer Skills Training /Digital Literacy Training plays a critical role in technology and workforce development training.

- University College/Eastern Maine Community College (UC/EMCC) is located in East Millinocket. https://learn.maine.edu/east_millinocket offers computer skills classes on a rolling basis. There is a computer lab available for student use. UC/EMCC is interested in increasing digital literacy services to the region, and is committed to providing resources – staff and space – to increase digital literacy classes to residents and businesses in the Our Katahdin region.

- Maine Dept. of Labor's CareerCenter, http://www.mainecareercenter.gov/locations/notices.shtml?id=93995, is located at One Industrial Drive in East Millinocket, is working in collaboration with Eastern Maine Development Corp., www.emdc.org, and is committed to assist with workforce development skills efforts.

- Axiom Education & Training Center offers Digital Literacy classes for residents and businesses, and would be pleased to partner with University College/Eastern Maine Community College. We recommend offering the residents of Our Katahdin digital literacy courses over a 6 to 12-month period of time, one class per week in the 3 towns of Our Katahdin; Millinocket, East Millinocket & Medway, ensuring that the program has predictability over some period of time for full residential and business participation.

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In rural communities, time, distance, travel is a barrier to educational attainment; holding classes that are in accessible locations that are familiar and not intimidating will increase participation and are geographically spread out throughout the designated service ensure strong, widespread participation and good, measurable impacts.

Recommended Class Locations:
- Katahdin Region Higher Education Center
- Millinocket Memorial Library
- East Millinocket Public Library
- Medway Town Hall or Medway Middle School
- University College/Eastern Maine Community College
- Business Locations

Recommended Classes include:
- Introduction to Computer
- Windows 7, 8, 10
- Internet Safety
- Microsoft Word
- Microsoft Excel
- Microsoft Outlook
- Microsoft Publisher
- Microsoft PowerPoint
- QuickBooks
- PhotoShop
- Social Media including FaceBook for Business & Individuals, Twitter, etc.
- WordPress
- Video Streaming
- iPad
- Gmail
- Google Docs, etc.

*Digital Literacy Training program pricing included in Attachment C-2.

Axiom will work with the Our Katahdin to pursue funding for digital literacy classes for residents and businesses.

4.Public Computer Access – Increasing Public Access Computing allows residents to access technology in places in which they feel comfortable and supported is essential. If a business or resident cannot afford equipment or an Internet subscription, and if broadband is not available at their location, Public Computer Access is essential.

- Millinocket Memorial Library has 5 computers available for public use. Wireless internet is also available for residents and businesses with their own computer to use during library hours.

- East Millinocket Public Library has 1 computer available for public use. Wireless internet is also available for residents and businesses with their own computer to use during library hours.

- Community HotSpots are open access networks that allow citizens in a downtown or other public spaces access to the Internet. This is a simple, straightforward way to help a town or region get more connected. It is an affordable, convenient way to help visitors and residents easy, seamless connectivity.

  In additional to the Millinocket Memorial Library and East Millinocket Public Library, WiFi is available at a variety of locations including: The Blue Ox Saloon, Pelletier Loggers Family Restaurant, Katahdin Cabins, New England Outdoor Center, Dunkin Donuts, McDonalds, as well as several other business entities. Several Community HotSpots are being recommended for the Our Katahdin region.

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Appendix C-2

Our Katahdin
Digital Literacy Pricing

Budget

Teacher or Tutor (Fringe & Salary)	$60,000
Travel	$ 6,000
Survey Monkey (Annual Fee)	$ 612
Supplies	$ 3,000
Academic Services Group (curriculum)	$ 2,388
Administration	$18,000
Total Budget	**$90,000**

❖ Budget based on 1-year program, 1 class per week
❖ Budget based on 10 students per class
❖ Includes program for Millinocket, East Millinocket & Medway

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