Response to
Request for Proposal

Town of Vinalhaven

Submitted by:

Mark Ouellette

December 6, 2018

207.255.0679

mark@connectwithaxiom.com

Axiom
every connection counts

Dear Vinalhaven Town Officials,

Thank you for the opportunity to respond to the Vinalhaven Request for Proposal. I trust you will give Axiom's response your most serious consideration. Axiom's mission, since our beginnings as a company fourteen years ago has been *"to deliver strategic and customized broadband solutions to remote communities across Maine"*

Axiom brings enormous capabilities to a project like this. There are a few things that differentiate us from other providers. We are scrappy, open minded, out-of-the-box thinkers who will be there to creatively solve issues, save cost, and customize solutions for your community needs, without sacrificing quality and reliability.

Axiom Technologies is an LLC based at 3 Water Street in Machias, ME 04654.
We have read the RFP carefully and understand the goals of the community:

- Affordability- at least one tier of service must be less than $75/month
- Futureproof- Any proposed system must not only be built to serve the needs of the community now- but well into the future
- Any system must have the capability to bring 1000/1000Mbps to all homes
- The town is interested in an approach in which they own the system
- Any construction plan must consider a phased approach

What you will find within this proposal for constructing and operating a world-class fiber solution is a passion for giving Vinalhaven the absolute best internet system possible that will meet your needs today, and for many decades to come. We at Axiom look forward to answering any questions you may have about this RFI response and our strong interest in working with you. Please contact me directly at (207) 272-5617 (m) or mark@connectwithaxiom.com.

Regards,

Mark Ouellette
President & CEO

5.1 Company Description

Axiom believes every connection counts. We believe that broadband access is vital in today's digital age to create and sustain jobs, provide equal opportunity healthcare and education to all and to keep rural communities vibrant. We strive to create economic opportunities for everyone and to advance rural telecommunication models that are sustainable, scalable, and replicable.

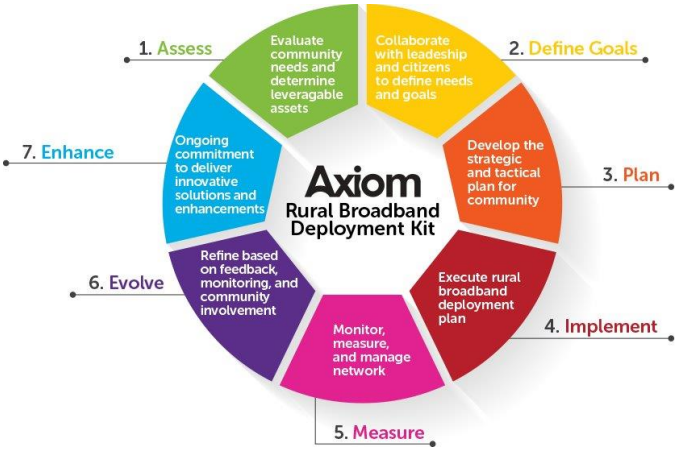
COMMITTED TO RURAL BROADBAND DEPLOYMENT

Axiom is working to deliver critical broadband services to rural communities and to connect them to each other and to the world. This is about much more than a fast connection — it is about people's livelihoods, education, and well-being.

CONNECTING REMOTE AREAS OF MAINE

Axiom has a proven ability to shape rural deployment strategies, while driving innovative thinking. Over the past decade, we have designed and constructed more than 120 access points connecting more than 2,500 square miles in one of America's most challenging terrains — rural Maine. Today, we are working to provide these proven rural deployment solutions across Maine and beyond. We continue to innovate and use a combination of solutions including fiber, wireless, DSL, and TV White Space.

Axiom Technologies was incorporated in 2004 and has designed, built and maintain a blended network that include fiber optics middle mile transport and FTTP, several DSL deployments and a fixed wireless network that connects some of the remotest areas of Washington County. Axiom's operational footprint has grown beyond Washington County in the last few years and we have added customers on Chebeague Island, Cranberry Isles and Cliff Island. In 2020, we are expecting to build projects in Roque Bluffs and Monhegan Island and as well as several other projects. Over our 15 years in business we have evolved, not just as a network operator and constructor, but into a company that delivers a full suite of professional planning and development tools. Understanding the needs of communities and regions, Axiom has developed a Broadband Deployment Kit that helps communities understand



their assets, develop goals and a plan for implementation and evolution that ensures that the broadband operating system continues to meet the needs of the community for many, many years to come.
Axiom does not deliver one-size-fits-all solutions. We customize our products and solutions based upon a number of factors including proximity to existing community assets, population density and terrain.
Axiom uses the best combination of product solutions. Our planning and deployment framework provide a methodology that allows for flexibility, but at the same time adheres to a clearly defined path. This helps ensure the best product mix and execution plan is used for each community.
We are constantly pushing the technology envelope and are deeply familiar with Fiber Optic, DSL and a variety of Fixed-Wireless solutions, including emerging LTE and TV White Space… all are being used to connect real customers in our current operational network now.
We currently operate our main office in Machias and have satellite workers on Chebeague Island, Cranberry Isles and Cliff Island, with a total of 10-15 employees, depending on the season and our workload. We tend to do things ourselves, and all of our customer service, field crew, billing and engineering are done in-house in Machias.

KEY STAFF AND EXPERIENCE

Axiom has been a pioneer of Broadband deployment in Maine. From its roots, the first wireless Broadband connection in Washington County in 2005, Axiom has grown to be a full-service engineering, planning and deployment, management and professional services team that assists communities to get connected or upgrade connectivity, while maintaining a network across Washing ton County and several islands.

We have significant experience planning, constructing and operating difficult island deployments:

- Understand fully the challenges of working on islands, from boat schedules and barging, increased cost, complicated island politics, difficult homeowner relationships and a mirid of other issues- we have done and seen it all!
- We have done planning projects on several islands, including Cranberry Isles, Cliff Island, Chebeague Island, Monhegan Island and the bridged islands of Arrowsic, Georgetown and Southport.
- Several of these planning projects led to construction and operational contracts for Axiom
- Our expertise with hybrid solutions that blend wireless and fiber solutions is unapparelled in Maine
- Our out of the box thinking brought significant savings and critical construction and operational ideas that helped move projects forward and created strong trusting relationships between the community and Axiom

Key Team Members:

MARK OUELLETTE

President & CEO

Mark Ouellette is the CEO and President of Axiom with responsibility for overseeing and growing Axiom's Internet and wireless businesses and oversees all aspects of Axiom. Mr. Ouellette has held a number of senior leadership positions in the state of Maine. Previously, Mr. Ouellette was the Executive Director of Mobilize Maine, where he worked with regions across the state to help develop and implement measurable, private sector economic development strategies. Before that, Mr. Ouellette served as Director of Business Development for the State of Maine. Earlier, he served as Chief of Staff to U.S. Representative Tom Allen. Mr. Ouellette has 20 years of economic and community development experience. He has a strong track record of successfully writing and securing federal, state, and foundation grants. Most recently, he was pivotal to receiving a $1.3M USDA grant to serve Cranberry Isles and a premiere Microsoft grant award to provide Internet access to homes in Washington County, Maine, using TV white space. Currently Axiom has been a major driver of three USDA grants that are pending for Monhegan Island, Roque Bluffs and Arrowsic. Under Mark's leadership the company has begun to grow, acquiring Chebeague.net in 2016 and designing, constructing and operating a Fiber to the Home Network on Cranberry Isles and Cliff Island and continues to expand the Professional Services side of the company working with over a dozen communities and counties across Maine to expand broadband and bridge the Digital Divide.

Mr. Ouellette is an active speaker and participant in panel discussions on a wide range of economic development topics and strategies, including providing broadband access to rural communities.

Nate Brimmer

Vice President of Operations

Nate has served in a variety of roles at Axiom and was named VP of Operations a year ago, charged with overseeing all aspects of day to day deployments and overseeing all of Axiom's various projects including all of our construction and operations on islands. Nate has spearheaded our new island project, Cliff Island, which became fully operational in August of 2019. Nate's expertise includes fiber optic network planning and construction, as well as managerial responsibilities with Axiom staff and all contractors.

KIM EMERSON

Director of Special Projects

Kim Emerson serves as Director of Special Projects for Axiom, where he oversees wireless technologies, DSL, and fiber optic buildouts. His role includes network and technology planning, development of architecture and roadmaps, and the continued evolution of broadband deployment methodologies.
Mr. Emerson is proficient in a multitude of programming scripts and languages including Perl/CGI, Javascript, SQL, and ASP. He completed training and received certifications to administer and deploy the Mikrotik RouterOS platform including MTCRE, MTCWE and MTCTCE, as well as an A+ Certification, which he obtained to teach a certification course to high school and adult education students.

IAN SAWYER

Director of Network Services

Ian Sawyer serves Axiom's entire organization across many disciplines including managing Axiom's network infrastructure, maintenance and installations. Ian is the architect of many of Axiom customized builds for clients and communities and is an advisor on all significant projects at Axiom.
Mr. Sawyer is a CompTIA A+ Certified Technician with over ten years of hands-on experience with hardware and software technologies. He has the proven skills necessary to support complex IT infrastructures across rural communities. Mr. Sawyer has extensive experience in Windows Operating Systems, networking, firewalls, as well as identifying and preventing malware.

Please find a summary of all of your questions addressed:

1. How long has the company been in operation?
    a. 15 years
2. The location of the field office closest to the island?
    a. Machias is our HQ's and all of our services are delivered from this office. We would commit, as we have in other island locations to hiring someone on island to assist with customer relations and troubleshooting should we be chosen as the operator of a new fiber internet system

3. Technical, managerial and operational experience of the team
    a. Please see section labeled "Key Staff and Experience" above. We have planned, constructed and operated fiber optic, DSL and wireless systems across our network for many years, including several island deployments over the past few years.
4. How long has the company engineered internet infrastructure networks?
    a. Over 14 years
5. The number of communities we serve?
    a. Close to 50. We have customers spread out across almost every Washington Country community including the Unorganized Territories and Chebeague Island and Cranberry Isles and Cliff Island. We currently have approximately 1000- 1100 customers and have a 1.5% turn rate, which is much lower that national industry average of 5%. A typical loss of customer would be for moving out of Washington County.
6. Any contract termination and reason why?
    a. No
7. Growth of Company in recent years?
    a. We have doubled our fiber customers this year and expect to double those customers again in 2020
8. Customer Implementation Rate- have any of our customers/clients implemented a broadband project as a result of a feasibility study?
    a. Yes. Feasibility studies have led to two projects that are built and operational. In both cases Axiom was chosen as the builder and operator. Cranberry Isles and Cliff Island.
    b. Another- Roque Bluffs- has signed a contract with Axiom to build and operate the system in 2020.
    c. Three others- Monhegan Island and Arrowsic and Roque Bluffs, are waiting on potential grant funding through their pending applications with USDA
    d. One other- Indian Township is working with Axiom on a creative funding mechanism to bring a FTTP system to that community
9. Any relevant successes in obtaining grant funding on behalf of municipalities?
    a. Yes. The successes are too numerous to list here, but Axiom has been a prolific and successful grant partner at the local, state and federal level. Here are a few recent examples that may be relevant to Vinalhaven:
        i. $1.3M to Cranberry Isles- USDA Cool and Connected, first grant of this type awarded east of the Mississippi.
        ii. More than $1M in projects submitted successfully to ConnectME Authority for funding. Latest include $175,000 pending on USDA grants to three communities, $69,000 to Cranberry Isles and several planning grants, including more than 15 communities in rural Maine and Mid-Coast Maine that are ongoing now
        iii. HotSpots- Axiom has raised over $30,000 to support HotSpots in rural communities including Millinocket, Eastport, Waterville and Machias from a variety of sources

5.2 Example Project

Axiom currently serves 1,000 plus customers that utilize a variety of technologies - wireless, DSL and fiber optics. During our 15 years in business, we have done whatever it takes to get a connection to a potential customer to locations that the incumbent carriers have not connected. It is no understatement that 100s of customers would be left unserved without Axiom's efforts. We have done this work in some of the most difficult and remote areas in Maine.

Cranberry Isles

In 2017, Axiom responded to an RFI for Cranberry Isles to plan, design, construct and operate a network on three of the islands that consist of Cranberry Isles. Axiom was awarded a contract of up to $1.3M to plan, construct and operate the network. According to a selectperson on the island, Malcolm Fernald, "*Axiom's proposal was so far superior to the other submissions that an RFP for the finalist that was planned, was cancelled, because Axiom's proposal did everything the town was looking for.*"

Our proposal made several recommendations that saved the Cranberries well over $100,000 of build cost, meet an extremely aggressive deadline for deployment and put in place a revenue sharing model that will return over $25,000 a year back into a town technology fund.

Every home on each of the three islands will be capable of receiving 1 Gigabyte of service (1000Mbps) and have the same level of service capability that you could obtain in New York City or the Google fiber cities of Austin and Kansas City.

This project features a number of innovative ideas including laying fiber on the ground and a first ever in Maine to install our own utility poles that produced cost savings and avoided large delays in implementing the project. In addition, we are using licensed wireless technology to bring the signal from Great Cranberry to Islesford and Sutton Islands.

Axiom was also a key contributor to the Cranberries receiving a $1.3M grant through USDA- the first grant of its kind awarded east of the Mississippi. Axiom wrote and supported all of the applications technical aspects and contributed significantly to almost all parts of the application.

- ✓ Designing, constructing and operating FTTP infrastructure on all three of the Cranberry Islands
- ✓ Out of the box thinking that saved well over $100,000 on project
- ✓ Currently serving 180 homes with service levels up to 1 Gigabyte, across three islands

Cliff Island

The Cliff Island project began with a brief meeting at the Island Institute's Broadband Conference in 2017. From there, Cliff was part of a three-island, Casco Bay group that planned for a FTTP build. Eventually, Cliff (part of the City of Portland) raised its own money to implement a solution with island investors. The initial cost estimate of over $500,000 was revised down to under $300,000 through a series of innovative and simple ideas and a combination of island champions and support, Axiom's willingness to support the project with in-kind labor and several on-island institutions partnered to make this project a great success. Cliff Islanders can now boast they have better internet connectivity on the island than mainland Portland☺

- ✓ Saved over $225,000 through a series of innovative solutions
- ✓ Currently serving 70 homes on the island
- ✓ FTTP is capable of delivering 1 Gig of service to each home

Axiom Innovation

Axiom is a hardworking, scrappy company that does whatever it takes to deliver broadband internet to hard-to-reach places. We would like to highlight several innovative and supportive ideas from these two island experiences and another now moving forward.

Construction Design Cost:

In the case of both of these islands, we did do an engineering study, but we feel it's not worth the cost to do a full-blown study that may cost you several hundred thousand dollars. You referenced Islesboro, where after several $100,000s spent on studies, there was still an unexpected cost overrun with pole licensing. We believe strongly that you need a good engineering plan, but we have built FTTH now on both of these islands, with Cranberry staying operational for two winter seasons, while avoiding these exorbitant costs of engineering. In the case of Vinalhaven, part of the planning process would be to fully explore a partnership with the town or Fox Island Electric.

Innovate to save cost:

In the case of Cranberry Isles, we saved time and money by avoiding the pole licensing process, while constructing a town-owed pole infrastructure on Great Cranberry and Islesford. And on Sutton Island we served 20 homes with fiber that was laid on the ground across the island. Actually, we also placed fiber on the ground that serve some long private roads on both Islesford and GCI. There was plenty of eyebrows raised when we did both of these things (placed our own poles and running cabling on the ground), but both

approaches are successfully implemented and saved cost – without compromising the capabilities and reliability of the system.

On Cliff Island, we also brought the cost of the overall project down by over $225,000 by utilizing island labor to the fullest extent possible, running cable on the ground across the whole island (avoiding costly pole licensing fees) and contributed significant labor cost to the project to make it viable. In addition, we repurposed a wireless connection that was serving Chebeague Island, saving over $30,000 in new equipment cost.

The Cliff Island project lead us to be the chosen constructor and operator on Monhegan Island, where they were interested in us following the water and buried electrical lines to serve customers. We expect to build Monhegan sometime in 2020.

Wireless Experts:

We are not aware of any competitor in Maine that brings extensive wireless service expertise while also operating fiber networks on islands. We currently serve Cliff Island and two of the three islands of Cranberry Isles with dedicated FCC licensed high-capacity wireless internet. These links shoot bulk bandwidth from island to island or in the case of Cliff island, from Portland to Cliff, then that internet is distributed with FTTP. In the case of Vinalhaven, you have small islands that would potentially want service. We have expertise, both in Point-to-Point and Point-to-Multipoint deployments, both of which may be needed to serve those small island locations from Vinalhaven. In addition, we would expect to negotiate the use of undersea fiber owned by Fox Island Electric. If this is not possible, we have the know how to build a high-capacity wireless link from the mainland, as an alternative.

Ownership:

Many companies insist on owning the infrastructure. We have a different model and encourage municipalities to own the network, while we operate it. We have developed a unique partnership model in which we share a % of gross revenue through our public-private partnership agreements, which we have with both Cliff Island and Cranberry Isles. In the case of Vinalhaven, a municipal ownership model should be investigated. However, Fox Island Electric is the most logical choice to own and potentially operate the system, with a strong partnership with an internet service provider. Bottom line is that Axiom is open to different models of ownership, cost sharing and revenue distribution.

5.3 Proposed Financial Model

Vinalhaven is a unique Maine island in many ways- it has the largest year-round population of all Maine islands that support a vibrant, year-round downtown and island institutions as well as one of the state's largest lobstering economy. It has developed strong co-op models with Fox Island Electric and the Vinalhaven Water District and significant community input and involvement through volunteer efforts with the comprehensive plan to the library and school. Axiom has done planning in well over 50 communities and Vinalhaven has a number of pieces that are likely to make this project successful.

- A history of strong volunteer islander participation in island institutions
- A willingness to "own your own"
- Institutions that are potential partners to any new internet service

Business Structures- 3 Examples

The options and feasibility of any model relies on the potential number of customers and revenue in comparison to the amount of operational expense. Given that Spectrum serves a good part of the community, any Internet Service Provider is going to want to reduce its risk and likely this project will require significant public subsidy to be successful. We have done a preliminary look at revenue and expense modeling to give us a sense of how feasible each model might be.

Our understanding is that there is a preference toward a municipally owned model. We applaud and agree with this approach. At its heart, municipally owned models help communities control their own communications infrastructure which helps them leverage the right technology, provider and pricing to help the community remain vibrant and meet its needs into the future.

One potentially attractive model is on Islesboro where the community went through extensive planning- over years- to pick the construction company and the Internet Service Provider. In this model the design contract, construction contract and operational contract were all bid on and awarded separately. There are pros and cons to this approach, which should be explored more fully to help the community understand the tradeoffs. GWI, the operator of the system, lit the network, provides telephone support, and performs all maintenance and upgrades to the town-owned infrastructure. The town is the billing agent and has a town employed technician on island. Our understanding from speaking to one of the chief architects of this approach is the $360/year service fee to each home is used to pay GWI's management fee to operate the system. The system- entirely paid for by taxpayer funds was a $3.8M bond for 20 years.

- ✓ Municipally owned
- ✓ Blended responsibilities that might be modeled to employ Fox Electric to maintain and repair network on island
- ✓ A fixed fee to each subscriber- all subscribers can receive up to a Gig of service- depending on user demand
- ✓ Significant taxpayer subsidy

Cranberry Isles took a slightly different approach while still wanting the infrastructure to be municipally owned. Unlike Islesboro, they sent out an RFI and selected Axiom, under one contract, to build and operate the network. In this case, Axiom provides network maintenance and support of all home connections and in-home equipment, billing, technical support, including an on-island, Axiom trained technical support person. The Town provides insurance for any catastrophic event, and maintains the generators and tree clearing of main fiber lines. Axiom pays a fee of $10/per month/per subscriber that returns over $20,000 in revenue to the town annually, in exchange for a long-term Public-Private Partnership contract. Voted to be funded at Town Meeting but received a USDA grant for the full build of $1.2M.

- ✓ Municipally owned
- ✓ Blended responsibilities, but more responsibility on the ISP
- ✓ Several cost saving measures
- ✓ Multiple rate groups provided at different price points- but all are capable of receiving a Gig of service
- ✓ Revenue sharing model

Cliff Island is an investor led model, as they are part of the City of Portland, and Portland was not interesting in participating in any meaningful way to assist Cliff. Several investors came together and formed CI Fiber LLC. The LLC acts much like a municipality, like the model for Cranberry, where Axiom and CI Fiber entered into a contract where Axiom would provide network maintenance and support, hired an on-island support technician, all billing and collections and provides a yearly franchise fee to the LLC of over $10,000 a year. In this model, the investors are expected to make a modest return on their investment of 3-4%. A number of innovative partnerships and on-island labor drove the cost of the project down over $200,000 from our original estimate. This is a model that Island Institute and Axiom are working to implement on Chebeague Island and beyond.

- ✓ Privately owned by island investors

- ✓ Blended responsibilities, but like Cranberry, more responsibility on the ISP
- ✓ A number of cost saving measures
- ✓ Multiple rate groups- all are capable of receiving a Gig of service
- ✓ A slightly larger revenue sharing model for the investors to help them recoup their money

Important Resource: Fox Island Electrical

Across the country, more electrical co-ops are considering providing fiber connectivity. These co-ops are interested in achieving better reliable, provide additional services to customers such as electrical usage smart meters, maximize their investments in equipment and manpower and create an additional revenue stream that stabilize and sustain their operations. How involved and open Fox is to either owning or operating a fiber network or willingness to partner with an ISP to help maintain and support a new system on Vinalhaven should be thoroughly investigated. Fox Electric is an attractive partner for a number of reasons including owning (most of) the utility poles and an underseas cable that could bring internet from the mainland reliably, would avoid the cost of utility make ready cost, owning equipment, such as a bucket truck that would avoid significant barge fees and time delays in the event of a main line being cut, and presumably workers that are used to working outside, at height on dangerous electrical lines. These skills can easily translate to fiber optic cabling and technical support. Cultivating the possibility of this relationship would bring significant savings to operational costs- and likely construction cost, if Fox was interested in helping with the construction, while also providing numerous benefits to the Electrical Co-op.

FTTP Models

There is no doubt that fiber is a long-term investment in a community's future; fiber supports 21st Century economic opportunities; fiber leapfrogs communities that are left behind to the front of the pack; and fiber, over the long run, is less expensive than other technologies.

Our hope would be to leverage the submarine fiber cable owned by Fox Island Electric that would deliver bulk internet from the mainland to a point on the island. This would then allow all traffic on the future island fiber network to flow back to the internet completely on a fiber highway. Once the internet reaches the island, there are several possible designs of the network, one would be to use the existing utility pole structure to string fiber optic cable and "drop" connections to each home or business by following the same path as electrical line connections. For the 50 or so miles of private road, we could still use the utility poles, or could lay fiber on the ground depending on an investigation of the conditions on island. This could potentially save cost, but there are some tradeoffs of on-ground vs on utility poles that would need to be discussed. At the

end of the day, we envision connecting every home to fiber on the island and serving smaller islands with a wireless connection that would then be transferred to a fiber optic cable to deliver service, just as on Vinalhaven. For the purpose of the initial RFI, we did not do any significant engineering to look at connections to each of the islands off the coast of Vinalhaven. We expect to do this work if chosen as the planning partner. That said, Axiom has extensive experience with wireless island connections and looks forward to bringing our expertise to this project.

Phases

As suggested in the RFI, we have created a three-phase approach; North-Phase I, East- Phase II and West-Phase III. These three phases can be combined or mixed and matched as Vinalhaven sees fit. A number of assumptions are built into our desktop estimates which we would expect to refine if we are awarded the planning grant.

Assumptions in our Construction Pricing:

- No pole licensing or make ready cost
- No pole replacement cost
- Take Rate Assumptions- Phase I= 70%; Phase II= 50%; Phase III= 50%

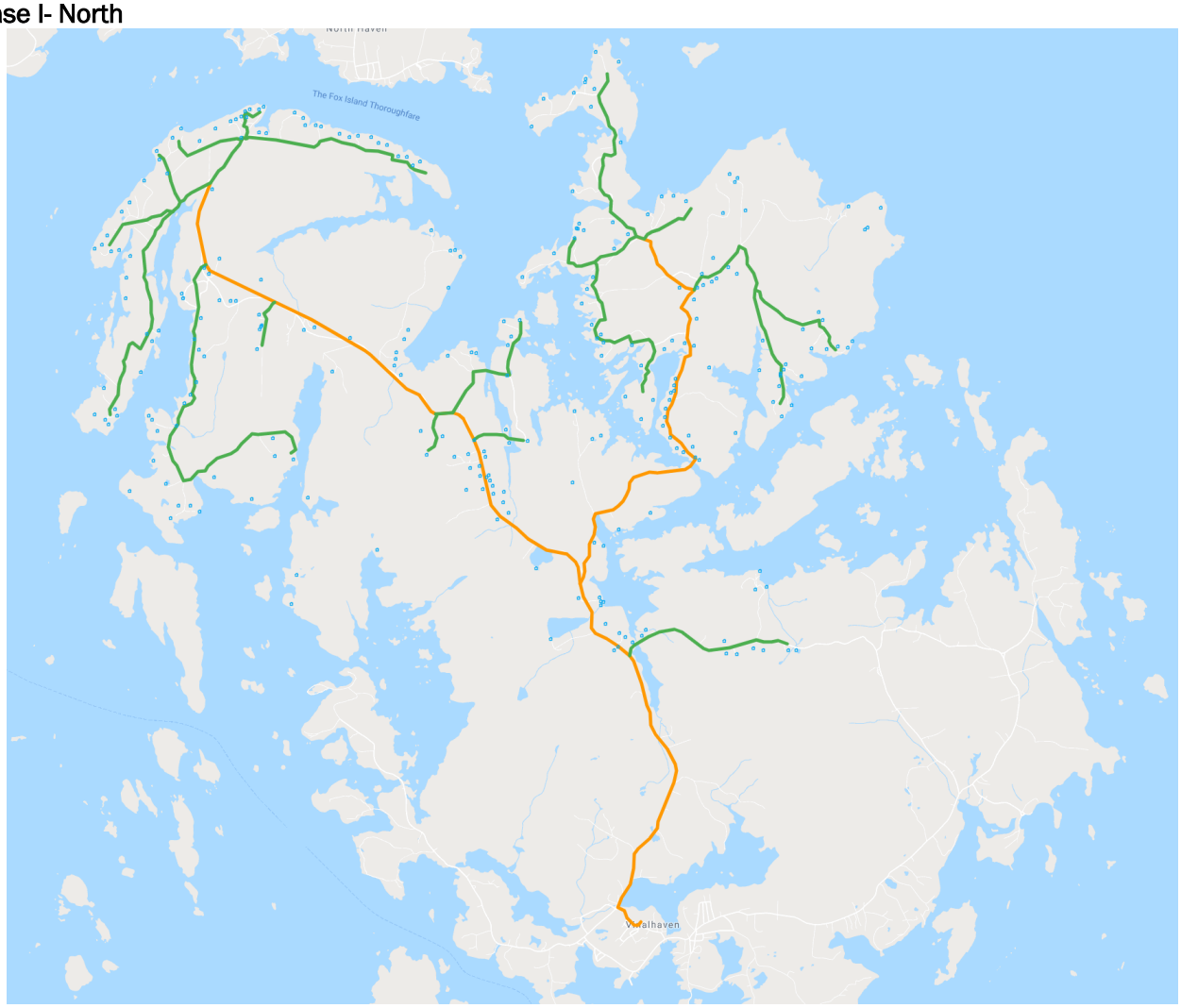
We believe there will be minimal cost to access utility poles that are not owned by Fox Electric. Further, we understand that some pole replacement may be possible. These costs will be determined during the planning phase when Axiom can have deeper discussions and pole assessments on-island. In addition, we expect to use on island equipment and have not accounted for potential barge and other island expenses that can come with a project of this size. This is strictly a first cut at expected construction cost, and significant due diligence will need to be undertaken to determine final construction cost.

Fiber Optics

We propose a Fiber to the Premise (FTTP) plan that is capable of each subscriber receiving up to a Gig (1000Mbps) of service.

- Equal Access to All- no matter where you live on Vinalhaven any home would have access to the same speeds and reliability as any other resident
- Fast & Reliable- The system would be built to withstand fluctuations in demand, would deliver lightning fast speeds and use the most reliable technology on the market
- Futureproof- Fiber technology would mean that Vinalhaven never falls behind again, with little to no upgrades over the next 20 years or more
- Symmetrical service that delivers equal speeds, both download and upload

Phase I- North



Orange Line= High Capacity Trunk – Green lines= Lower fiber count drops

Blue Dots= Homes and Business locations

Details:

Number of poles- 847

Total number of premises passed- 276 (83 year-round, 193 seasonal estimates)

Construction Cost- Phase I

Bill of Materials		$856,130
Regen Hardware & Installation		$133,785
Customer Premise Drop Cable		$30,360
Customer Premise Installation		$144,900
Total Phase I Budget		$1,167,175

Cost Component Definitions

Bill of Materials

This category is materials and equipment cost for the entire project, minus the CO/Regen Hardware & Installation and the cost of drop cable, which are separate line items in the budget.

CO/Regen Hardware & Installation

CO refers to Central Office, which is a term of art that Internet Service Providers use to describe where the equipment that would be needed to power the system and where the internet would be distributed from to each home. Regen hardware is the equipment that would be used to power the internet system and control each individual connection through this central system. These costs also include a heated and cooled utility shack that would house the equipment.

Customer Premise Cable

This is an estimated cost of the fiber to connect each home from the street to the home.

Customer Premise Installations

These costs are associated with the equipment needed at each home. This is the cost of connection to 100% of the homes.

Revenue and Expense Modeling- Phase I

As part of Axiom's commitment to our mission to help rural communities more fully understand what ISPs are facing serving a small community, we have created a revenue and operational expense budget that helps the community and the ISP better negotiate an operating agreement with whatever model of ownership the community chooses.

It's important to understand that these are simply an illustration of how Axiom would envision the feasibility of operating a system and what potential customer rates could look like. The potential revenue is based on service levels and take rates that are solely Axiom projections and are intended for demonstation only, each provider would have their own revenue and cost models. However, these numbers can show you generally what a provider might expect if the town were to build a new fiber system and importantly, how much participation, if any, might be expected from a provider to return revenue back to the town.

Revenue

Rate Group	# of Subscribers	Monthly Rate	Annual Revenue
25/5Mbps	41	$69.99	$34,435
50/10Mbps	12	$79.99	$11,518
100/20Mbps	6	$109.99	$7,919
Seasonal		Yearly rate	
25/5Mbps	95	$713.99	$67,829
50/10Mbps	27	$815.99	$22,032
100/20Mbps	14	$1121.99	$15,708
TOTALS	193 (70%)		**$159,441**

- Seasonal rates are calculated at 85% of year-round subscriber rates for this model
- The Rate Groups and monthly cost are entirely Axiom's and may differ depending on provider
- Take-rate is the estimated number of homes we believe would take service. We believe a 70% take-rate is achievable- in this part of the island

Expense Estimates

Operating Expense Catagories			Yearly Cost
Bandwidth			$27,864
Phone Technical support			$2,518
Administrative support			$1,328

FC support (local)			$8,968
FC support (Remote)			$34,151
Franchise/Revenue Return	(negotiated)		
	TOTAL		**$74,830**

Bandwidth is the cost of bulk wholesale internet.

Phone tech support is the estimated cost to maintain phone support for customers for the year.

Administrative Support is the cost of billing/collections and support for billing questions.

Local Field Crew is the cost of Axiom hiring a local person to conduct simple trouble shooting at the home.

Field Crew (Remote) is the cost of dispatching FC from Machias to deal with more serious issues- breakage, splicing, etc.

Two important takeaways of this section:

- How critical take-rate is to the overall viability of the project (less subscribers, less opportunity for profits)
- The monthly operating expenses are generally fixed, no matter the number of subscribers (there is not a direct correlation between subscriber counts and expenses) however Fox Electric could reduce costs substantially if they were trained to perform all break/fix and customer premise troubleshooting

Phase II- East

Orange Line= High Capacity Trunk – Green lines= Lower fiber count drops

Blue Dots= Homes and Business locations

Details:

Number of poles- 496

Total number of premises passed- 562 (225 year-round, 337 seasonal estimates)

Construction Cost- Phase II

Bill of Materials		$703,358
Regen Hardware & Installation		$109,875
Customer Premise Drop Cable		$61,820
Customer Premise Installation		$210,750
Total Phase II Budget		$1,085,803

Cost Component Definitions

Bill of Materials

This category is materials and equipment cost for the entire project, minus the CO/Regen Hardware & Installation and the cost of drop cable, which are separate line items in the budget.

CO/Regen Hardware & Installation

CO refers to Central Office, which is a term of art that Internet Service Providers use to describe where the equipment that would be needed to power the system and where the internet would be distributed from to each home. Regen hardware is the equipment that would be used to power the internet system and control each individual connection through this central system. These costs also include a heated and cooled utility shack that would house the equipment.

Customer Premise Cable

This is an estimated cost of the fiber to connect each home from the street to the home.

Customer Premise Installations

These costs are associated with the equipment needed at each home. This is the cost of connection to 100% of the homes.

Revenue and Expense Modeling- Phase II

As part of Axiom's commitment to our mission to help rural communities more fully understand what ISPs are facing serving a small community, we have created a revenue and operational expense budget that helps the community and the ISP better negotiate an operating agreement with whatever model of ownership the community chooses.

It's important to understand that these are just an illustration of how Axiom would envision the feasibility of operating a system and what potential customer rates could look like. The potential revenue is based on service levels and take rates that are solely Axiom projections and are intended for demonstration only, each provider would have their own revenue and cost models. However, these numbers can show you generally what a provider might expect if the town were to build a new fiber system and importantly, how much participation, if any, might be expected from a provider to return revenue back to the town.

Revenue

Rate Group	# of Subscribers	Monthly Rate	Annual Revenue
25/5Mbps	79	$69.99	$66,351
50/10Mbps	23	$79.99	$22,077
100/20Mbps	11	$109.99	$14,519
50/50Mbps-Business	5	$109.99	$6,599
Seasonal		Yearly rate	
25/5Mbps	118	$713.99	$84,251
50/10Mbps	34	$815.99	$27,744
100/20Mbps	17	$1121.99	$19,074
TOTALS	282 (50%)		**$240,615**

- Seasonal rates are calculated at 85% of year-round subscriber rates for this model.
- The Rate Groups and monthly cost are entirely Axiom's and may differ depending on provider
- Take-rate is the estimated number of homes we believe would take service. We believe a 50% take-rate is achievable- in this part of the island

Expenses

Operating Expense Category			Yearly Cost
Bandwidth			$55,728
Phone Technical support			$3,682
Administrative support			$1,941
FC support (local)			$13,103
FC support (Remote)			$49,899
Franchise/Revenue Return	(negotiated)		
	TOTAL		$124,352

Bandwidth is the cost of bulk wholesale internet.

Phone tech support is the estimated cost to maintain phone support for customers for the year.

Administrative Support is the cost of billing/collections and support for billing questions.

Local Field Crew is the cost of Axiom hiring a local person to conduct simple trouble shooting at the home.

Field Crew (Remote) is the cost of dispatching FC from Machias to deal with more serious issues- breakage, splicing, etc.

Two important takeaways of this section:

- How critical take-rate is to the overall viability of the project (less subscribers, less opportunity for profits)
- The monthly operating expenses are generally fixed, no matter the number of subscribers (there is not a direct correlation between subscriber counts and expenses) however Fox Electric could reduce costs substantially if they were trained to perform all break/fix and customer premise troubleshooting

Axiom
every connection counts

Phase III- West

Orange Line= High Capacity Trunk – Green lines= Lower fiber count drops

Blue Dots= Homes and Business locations

Details:

Number of poles- 247

Total number of premises passed- 481 (96 year-round, 145 seasonal estimates)

Construction Cost- Phase III

Bill of Materials		$585,978
Regen Hardware & Installation		$10,000
Customer Premise Drop Cable		$52,910
Customer Premise Installation		$180,375
Total Phase II Budget		$829,263

Cost Component Definitions

Bill of Materials

This category is materials and equipment cost for the entire project, minus the CO/Regen Hardware & Installation and the cost of drop cable, which are separate line items in the budget.

CO/Regen Hardware & Installation

CO refers to Central Office, which is a term of art that Internet Service Providers use to describe where the equipment that would be needed to power the system and where the internet would be distributed from to each home. Regen hardware is the equipment that would be used to power the internet system and control each individual connection through this central system. These costs also include a heated and cooled utility shack that would house the equipment.

Customer Premise Cable

This is an estimated cost of the fiber to connect each home from the street to the home.

Customer Premise Installations

These costs are associated with the equipment needed at each home. This is the cost of connection to 100% of the homes.

Revenue and Expense Modeling- Phase III

As part of Axiom's commitment to our mission to help rural communities more fully understand what ISPs are facing serving a small community, we have created a revenue and operational expense budget that helps the community and the ISP better negotiate an operating agreement with whatever model of ownership the community chooses.

It's important to understand that these are just an illustration of how Axiom would envision the feasibility of operating a system and what potential customer rates could look like. The potential revenue is based on service levels and take rates that are solely Axiom projections and are intended for demonstration only, each provider would have their own revenue and cost models. However, these numbers can show you generally what a provider might expect if the town were to build a new fiber system and importantly, how much participation, if any, might be expected from a provider to return revenue back to the town.

Revenue

Rate Group	# of Subscribers	Monthly Rate	Annual Revenue
25/5Mbps	67	$69.99	$56,272
50/10Mbps	19	$79.99	$18,238
100/20Mbps	10	$109.99	$13,199
50/50Mbps-Business	5	$109.99	$6,599
Seasonal		Yearly rate	
25/5Mbps	102	$713.99	$72,827
50/10Mbps	29	$815.99	$23,664
100/20Mbps	15	$1121.99	$16,830
TOTALS	241 (50%)		**$207,629**

- Seasonal rates are calculated at 85% of year-round subscriber rates for this model.
- The Rate Groups and monthly cost are entirely Axiom's and may differ depending on provider
- Take-rate is the estimated number of homes we believe would take service. We believe a 50% take-rate is achievable- in this part of the island

Expenses

Yearly Operating Expense Category			Yearly Cost
Bandwidth			$55,728
Phone Technical support			$3,682
Administrative support			$1,941
FC support (local)			$13,103
FC support (Remote)			$49,899
Franchise/Revenue Return	(negotiated)		
	TOTAL		$124,352

Bandwidth is the cost of bulk wholesale internet.

Phone tech support is the estimated cost to maintain phone support for customers for the year.

Administrative Support is the cost of billing/collections and support for billing questions.

Local Field Crew is the cost of Axiom hiring a local person to conduct simple trouble shooting at the home.

Field Crew (Remote) is the cost of dispatching FC from Machias to deal with more serious issues- breakage, splicing, etc.

Two important takeaways of this section:

- How critical take-rate is to the overall viability of the project (less subscribers, less opportunity for profits)
- The monthly operating expenses are generally fixed, no matter the number of subscribers (there is not a direct correlation between subscriber counts and expenses) however Fox Electric could reduce costs substantially if they were trained to perform all break/fix and customer premise troubleshooting

Totals of All Phases

Construction

Phase I		$1,167,175
Phase II		$1,085,803
Phase III		$829,263
Total Cost of Construction		$3,082,241

Revenue

Phase I		$159,441

Phase II		$240,615
Phase III		$207,629
Total Revenue		$607,685/year

Operating Expenses

Phase I		$74,830
Phase II		$124,352
Phase III		$124,352
Total Expenses		$323,534/year

Axiom is fully operating networks on three Maine islands and anticipate being awarded a grant to construct and operate a fourth network on Mohegan Island. As such, we can say we have extensive experience with construction challenges and revenue and expense modeling on islands. Given the projected numbers above, Axiom would be interested participating in several ways.

- Return a % of yearly revenue back to the community
- Contribute labor and expertise to bring construction cost down
- Open to a municipally owned model

Additional information requested:

Axiom would appreciate being seriously considered to build and operate the proposed system on the island. If chosen we would either refund the planning money as part of the overall cost of a construction project or would do the additional due diligence on a plan for free, if we were chosen to construct and operate the system. We would also strongly consider operating the system and partnering with the town to hire a construction company that meets the design specs of our proposed system. We believe that working with Axiom will save cost, but certainly understand the interest of the town to explore all options.

If the planning would not necessary lead to a construction or operating contract or prohibit Axiom in any way from bidding on the construction or operation of the system, we would prefer to bid on operating and construction.

We estimate the cost of just planning to be $20,000.

Q: Grants and other funding resources to minimize the impact on property tax bills

USDA ReConnect Grant- A new funding year will be available in the late winter or early spring; eligibility is questionable for areas covered by Spectrum that can meet a 10/1Mbps standard. So appropriate due diligence would be required to determine what, if any, areas would be eligible. This grant requires a 25% cash match.

ConnectME Authority- The Authority regularly gives out approximately $600,000 in grant funding. Scoring is based on a number of criteria, but the better the cash match, the more likely to be awarded funding. Typical grants can run from $50,000- $200,000.

EDA- U.S. Department of Commerce- EDA focuses its resources on economic development opportunities and can give grants, with little to no match of $500,000 to well over $1M. The process is long and requires working closely with the regional EDA representative. Typically, these grants begin with a sit down with the regional rep to ascertain what program would be the best fit, and their assessment of the likelihood of a successful application.

Island Institute- The Island Institute is a good partner for island and coastal communities and has invested significantly with both manpower and dollars to help communities move their broadband projects forward.

Q: Identify possible companies to construct a FTTP network on the island

There are a number of construction companies and independent contractors that would bid on directly or as a partner on a project like this.

Hawkeye Connections based in Poland, Maine is familiar to Axiom and we worked with them to construct FTTP on Great Cranberry Isles and on Cliff Island. Frank Start is an independent contractor and can be part of a team of construction or do individual pieces of a project (ex. All home installations) Pioneer out of Houlton recently hired a two-man construction crew. We have not used them yet but have had them bid on a couple of projects. There are several potential construction contractors based outside of Maine, who may be interested in bidding on the construction portion of the project and we would help identify those contractors and judge interest.

Q: Identify possible companies capable of serving as an ISP on the island

There are a few local companies that might be interested in operating a FTTP system on Vinalhaven. Besides Axiom, GWI is probably the next most likely to consider. Possibly Pioneer, but they tend to be more

focused in Northern Maine. Projects like yours can pose significant challenges to an ISP, each would need to carefully consider the revenue and expense modeling to determine if they were interested.

Q: Identify possible companies that would be able to maintain infrastructure, lines, poles, etc. on the island
See first answer, as we see these same Maine-based companies or individual as being a good fit to support infrastructure on the island, ultimately, we believe that Fox Island Electric is by far the best fit, if they are open to be trained. This would give the island the fastest response times should something need to be repaired or fixed.

Summary

There is a lot in this section to unpackage and consider. We would like to highlight several points that make Axiom the best choice as a partner with Vinalhaven:

- Axiom is an out of the box thinker and understands how to save cost with creative thinking and a willingness to work closely to understand and leverage island-based support
- Axiom is willing to share significant on-going revenue generated from subscribers
- Axiom believes that the cost of expensive plans often does not pay off and we would prefer to put the cost of the plan into construction
    - You do need a plan, just don't overpay for one
- Please feel free to reach out for clarifying information on our modeling at any time

5.4 Proposed Project

Q: **How the project would meet the broadband goals described in Section 3 above**
A: Our vision for this project would be to bring Fiber to every home that wants it on the island regardless of their location. Our proposal, like other FTTP builds that Axiom has completed would bring better reliability and speeds and futureproof a network that rivals Google Fiber cities. This system would have the capability up to 1000/1000Mbps symmetrical service, and we have proposed a low-tier rate of under $75/month, with a seasonal rate that has seasonal customers paying more than year round customers, reflecting our values that rural island communities cannot be sustainable without a year-round population. This system would allow for unlimited streaming, 4K quality TV like content, phone and internet. It will withstand high use summer demand without a slowdown and consistently deliver to each subscriber the speeds that they signed up for.

We believe that service by the end of summer 2021 is achievable. And we have provided a vision for a phased approach for you to consider. We have included a preliminary engineering study which with refinement could be brought to bid.

Q: **Overview of how the cost of said design would vary based on the proposed models**
A: We would expect the cost to decrease, especially as island participation increases, through a relationship with Fox Island Electric or other on-island equipment or labor resources that might become available as this project progresses.

Also, construction in phases would likely increase costs as economies of scale, transportation and labor savings over a larger project would be less likely realized. A full buildout would achieve the lowest cost of construction in our experience.

Last, our design anticipates no cost to put the fiber cable on existing utility poles owned by Fox Island Electric. If the electric company required some fee to place new cable on their poles or if there are significant pole replacements that would be necessary as a result of placing a new fiber cable, those costs

are not accounted for in our construction costs. These questions can be answered through the planning process.

Q: **Provide an estimated timeline for a FTTP project, including the feasibility study and successful delivery of internet services**

A: There are a number of variables to consider, but we would expect to meet your deadline for service at the end of summer 2021.

Winter-Spring 2020- Feasibility Study

Winter-Spring 2020- Discuss potential on island partners and financial model that best fits island goals

- Forming a robust Broadband Committee is essential, if not already assembled
- If a survey is desired to determine if a phased approach makes sense, this would be important to complete- if this continues into the summer, it may delay the start of construction

Summer 2020- Prepare for construction

- Go out to bid for construction and operations
- Finalize any loose ends on construction
- Obtain a stamped engineering study (if desired)

These steps are dependent on approach and who you desire to work with on feasibility

Winter- Spring 2020-21- Begin construction

- Order equipment and materials
- Begin trunk fiber construction

Summer 2021- Complete trunk fiber build

- Build all drops to each home

Fall 2021- All construction completed and operational

Q: **List at least three examples of grants, foundations, and/or funding mechanisms to reduce the burden on the municipal assessment (related to property taxes)**

A: This question was answered as part of Section 5.3. Copied here also.

USDA ReConnect Grant- A new funding year will be available in the late winter or early spring; eligibility is questionable for areas covered by Spectrum that can meet a 10/1Mbps standard. So appropriate due diligence would be required to determine what, if any, areas would be eligible. This grant requires a 25% cash match.

ConnectME Authority- The Authority regularly gives out approximately $600,000 in grant funding. Scoring is based on a number of criteria, but the better the cash match, the more likely to be awarded funding. Typical grants can run from $50,000- $200,000.

EDA- U.S. Department of Commerce- EDA focuses its resources on economic development opportunities and can give grants, with little to no match of $500,000 to well over $1M. The process is long and requires working closely with the regional EDA representative. Typically, these grants begin with a sit down with the regional rep to ascertain what program would be the best fit, and their assessment of the likelihood of a successful application.

Island Institute- The Island Institute is a good partner for island and coastal communities and has invested significantly with both manpower and dollars to help communities move their broadband projects forward.

Final Thought

Thank you for the opportunity to be considered. If you have any additional questions or would like to schedule an interview to discuss this project and our vision, do not hesitate to reach out to me at (207)272-5617 or mark@connectwithaxiom.com.