CONNECTME FUND
GRANT APPLICATION

TOWNS OF HANCOCK AND LAMOINE BROADBAND PROJECT

MARCH 22, 2010

Axiom Technologies
3 Water Street
Machias, ME 04654
(207) 255-0679
www.axiom-tech.net

ConnectME Fund
Fourth Round Grant Application
March 2010

1. **Date:** **March 22, 2010**
2. **Project Title:** **Towns of Hancock & Lamoine Broadband Project**
3. **Submitting Entity:** **Axiom Technologies**
4. **Grant Amount Requested:** **$163,038.79**
5. **Project Contact Information:**

Susan Corbett, CEO
3 Water St.
Machias, ME 04654
(207) 255-0679, Fax (207) 255-5825
susan.corbett@axiom-tech.net

6. **Party Who Prepared Application:**

Susan Corbett, CEO & Nelson Geel, CTO
3 Water St.
Machias, ME 04654
(207) 255-0679, Fax (207) 255-5825
susan.corbett@axiom-tech.net
nelson.geel@axiom-tech.net

7. **Executive Summary of the Project:**

Axiom Technologies, in collaboration with the Towns of Hancock and Lamoine, submits this Grant Application in response to the ConnectME Authority Grant Funding Program for deployment of broadband in rural Maine.

The Town of Hancock has 1200 homes and the Town of Lamoine has 803 homes, based on the 2009 State Planning Office Projections. Axiom Technologies and the Towns of Hancock and Lamoine have a goal of bringing high-speed broadband access to 90 to 95% of the unserved households. We expect a "take-rate" of 35% in Year One.

At a Town of Hancock Selectmen's meeting on January 21, 2010, (Invited guests were officials from Lamoine and Sullivan) Town officials and the public confirmed that Hancock and Lamoine has no broadband availability in specific areas and requested Axiom to apply to the ConnectME Authority for funding. Following discussions with Time Warner Cable and Fairpoint Communications, we are unclear of the number of homes that are presently served as it is difficult to attain an accurate assessment of broadband coverage. We are therefore estimating that these two towns have approximately 40% existing broadband coverage.

Axiom recognizes that there may be some broadband coverage from Premium Choice's tower locations in Eastbrook and Franklin. Axiom confirms that when doing site surveys for broadband signal, if the subscriber can be better served by a pre-existing access point on Premium Choice's network, we will inform Premium Choice and not install a radio at the subscriber's location. Axiom confirms that it will not use "public funding" if the subscriber can be served by "private funding". Additionally, in areas that there is a possibility of Premium Choice coverage, Axiom recognizes their use of 900 MHz radio transmitters, and will not deploy 900 MHz radio gear that causes interference on currently utilized channels.

Lack of broadband in several areas of Hancock and Lamoine were confirmed via the ConnectME Broadband Availability mapping, from discussions with officials from the Towns of Hancock and Lamoine, and from the multiple Hancock and Lamoine residents who have contacted Axiom requesting to be included in Axiom's database for Internet service. Axiom confirms with the residents that they are not able to receive broadband service from another Internet Service Provider and documents this confirmation in our database.

This due diligence assessment demonstrated the essential need for broadband capability in the *unserved* areas in Hancock and Lamoine, Maine.

The Board of Selectmen and residents of Hancock and Lamoine strongly support the approval of Axiom's grant application to the ConnectME Authority for funding.

Axiom has conducted a study of the Lamoine/Hancock area pursuant to a build-out of broadband infrastructure, targeting the unserved portions of those towns. Several new and challenging aspects to service delivery in the area have been identified. These challenges will reduce the effectiveness of our classic tower + mini-PoP multipoint wireless deliver mechanism. The first issue is the shape of the inhabited coastline. The border between Lamoine and Hancock consists primarily of a deep, winding bay with many settled fingers of land on either side. Additionally, off the primary bay three smaller secondary inlets, Hills Cove, Kilkenny Cove and Partridge Cove further obfuscate the visible shoreline. Traditionally mini-PoPs on opposing shorelines would be utilized to serve the residents on the other shore. In this case, there are not two relatively parallel shores facing one another. Rather, the majority of the coastal mileage between the two communities is hidden from the opposite shore within the winding inlets. Additionally, the foliage varies from thick to very thick. Our lowest frequency radio systems (900 MHz), even with their improved foliage penetration characteristics, could not delve deep enough into the canopy over the regions of interest to be effective. Finally, mileage is extensive along many of the access roads as they wind toward the inhabited sections of the coast; many individual roads travelling three to five miles to reach the first home clusters. As an example, the Town of Lamoine is roughly five miles wide east to west, but it is nearly a fifteen mile drive from some eastern points to the western edge along the roadways. While we had been considering remote-terminal DSL service as a possible solution, the significant mileage of the area's roadways also limits the effectiveness of this method.

To address these unique delivery challenges Axiom is developing a new technology delivery system. Utilizing both our experience and knowledge of cross platform technologies and leveraging our excellent relationship with several other regional vendors, we have created a hybrid wireless/wireline solution that can deliver even more targeted service than our mini-PoP methodology. These "micro-PoPs" are still outdoor systems and are able to target service areas down to the individual home, while effectively uplinking to the enterprise network.

We are excited to deploy this new technology to the benefit of area residents in Hancock and Lamoine. We believe that the specific challenges of reaching the most difficult unserved locations in those communities will be representative of those final-percentile households across the state, both in the difficulties presented by extreme geographical features and ultra dense forestation. It will take innovative design and application to bridge those final percentage points and we believe our new delivery mechanism will be a useful tool in that application.*

(*See Confidential Engineering Design Attached)

Axiom's engineers and Towns of Hancock and Lamoine officials will identify the tower site pending approval of this grant application. The Town of Hancock has committed to finding a property for Axiom's use for a tower as a match for the grant.

The tower in Hancock and Lamoine will receive its signal from Axiom's transmitter site at Black Cap Mountain, Eddington, Maine. There will be radio gear at the tower site. This tower site will also be incorporated into Axiom's existing wireless infrastructure in Washington County, specifically the tower constructed from the Town of Steuben ConnectME 2008 grant, enabling redundant service to the Towns of Hancock and Lamoine. Without this tower build, wireless, high-speed Internet service would not be possible in the unserved areas of Hancock and Lamoine.

Axiom has a Resellers Agreement with Fairpoint Communications. Fairpoint is planning on bringing DSL high-speed capability to many of its Remote Terminal locations throughout Maine in 2010. Hancock and Lamoine has not been identified as a potential site as of this date. However, should Fairpoint bring DSL service to a Remote Terminal in Hancock and Lamoine, Axiom will also offer DSL service, moving its wireless subscribers off of the wireless network. This serves two purposes; first it supports Axiom's business model of collaboration and blending technologies; and second, it allows the "recycled" subscriber radio to be deployed to an area that is unserved, stretching public and private investment.

Axiom has contacted Tom Federle, attorney for Time Warner Cable, regarding overlap of service in the proposed service area of Hancock and Lamoine. Axiom has stated to Time Warner Cable that they will sign an "Overlap Avoidance Agreement" and not deploy wireless service if the subscriber can get Time Warner's cable Internet service. Time Warner Cable understands that wireless service knows no boundaries and that there will be crossover of Axiom's wireless network over Time Warner's existing coverage.

In April 2010, Stinson Seafood Plant in Gouldsboro will close its doors and 128 workers will lose their jobs. This plant has been operating in Prospect Harbor for more than 100 years and is the last sardine cannery in the United States. Axiom is collaborating with Eastern Maine Development Corporation and Machias and Ellsworth Career Centers to recruit two to four displaced Stinson employees for ConnectME grant projects. If awarded this grant, Axiom will train these individuals as Field Technicians to install subscriber radio units in Hancock and Lamoine and the surrounding area.

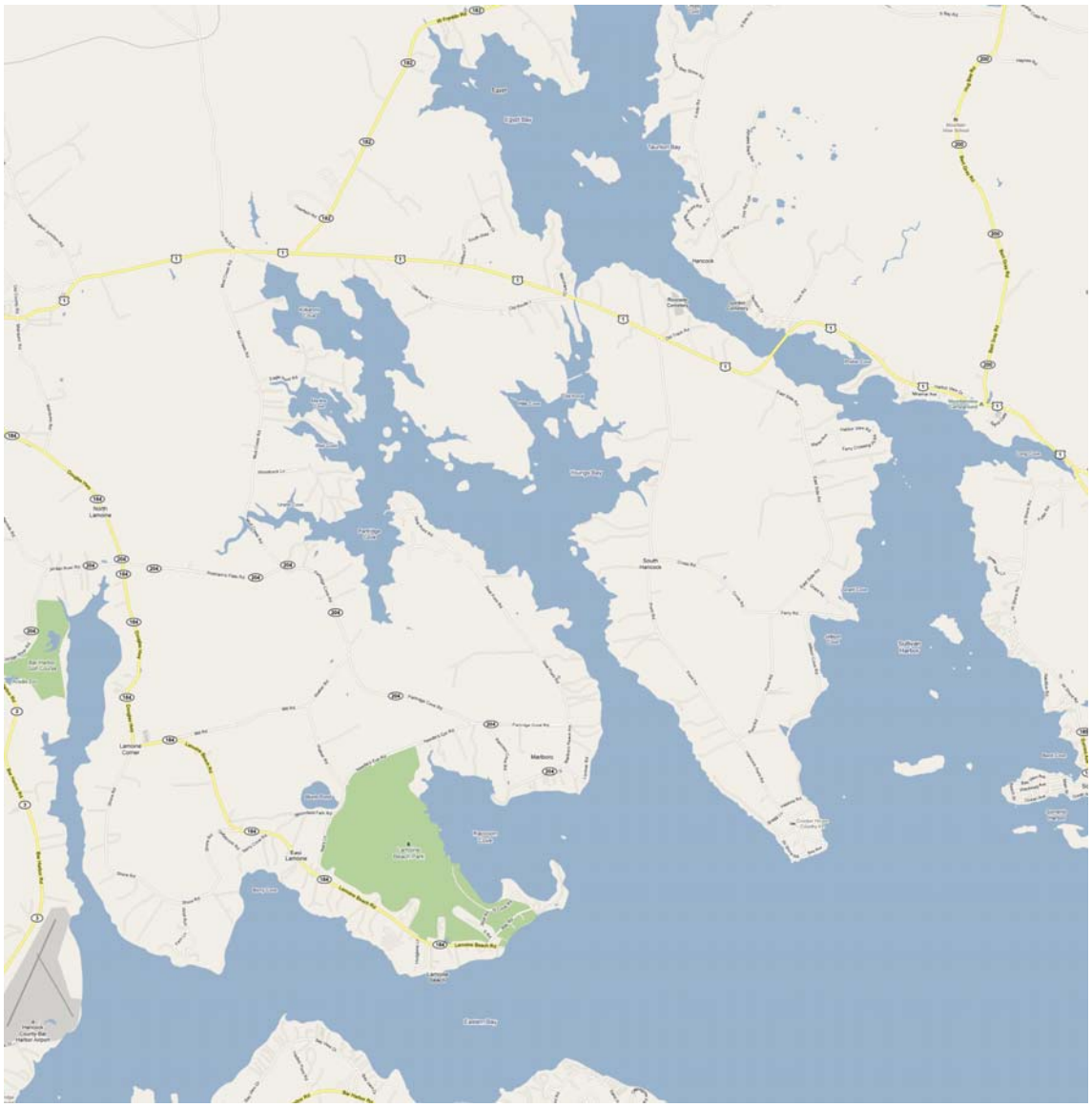
8. **A description of the geographic area proposed to be served by the project and sufficient information to establish that it is an unserved area, preferably at street-level granularity, and not likely to be served in the foreseeable future. (Most applicants conduct independent research to determine if a community has broadband or are sufficiently familiar with the community to know that there isn't any terrestrial broadband available).**

   Applicants must be aware of recent legislative changes that require the ConnectME Authority to give priority to grant proposals that, relative to other proposals, seek to extend access to broadband internet service to a

higher percentage of an "unserved" area within a municipality or other appropriate geographic area. The legislation requires the Authority to also consider the percentage of households with access to broadband service when establishing criteria to define unserved and "underserved" areas;

Hancock and Lamoine are located in Hancock County. Hancock is served by U.S. Route 1 and Maine Route 182. Hancock village lies on Taunton Bay, an inland extension of Sullivan Harbor. It covers 34.4 square miles, has 1200 homes and 2147 residents. Lamoine is a fishing, vacation and retirement community covering 34.4 square miles and has 803 homes and 1495 residents.

At the Hancock Selectmen's meeting on January 21, 2010, Hancock and Lamoine Towns officials and the public confirmed that Hancock and Lamoine has areas of no broadband availability and requested Axiom to apply to the ConnectME Authority for funding. Lack of broadband in the unserved areas of Hancock and Lamoine, Maine was confirmed via the ConnectME Broadband Availability mapping and through a due diligence assessment. These reports demonstrated the essential need for broadband capability in the *unserved* areas of the Towns of Hancock and Lamoine.



9. A description of the proposed project, including:

a. public-private partnerships that have been established;

Axiom Technologies, in collaboration with the Towns of Hancock and Lamoine, desires to bring high-speed Internet service to the residents and businesses of Hancock and Lamoine, Maine. Letters of support from Hancock and Lamoine Selectmen are attached.

b. evidence that the private partner in the project is eligible to receive funding from the Authority;

Axiom Technologies, LLC was founded and incorporated in the fall of 2001. It reorganized as a Maine Limited Liability Corporation October 13, 2004, and Articles of Incorporation were filed with the Secretary of State. All Members unanimously adopted a revised Operating Agreement in October 2005. Axiom Technologies, LLC maintains its business office at 3 Water Street, Machias, ME 04654.

Axiom Technologies is a Maine for-profit corporation. It has been the recipient of three ConnectME grants since 2007 and has a proven track record in public-private partnerships. It is through the collaboration of municipalities, economic development groups, businesses and residents that Axiom's business model has proven successful. Of the 80+ Access Points that have been installed by Axiom to date, all but the mountain sites (four towers) are at no rent. This is a testimony to the support and commitment of the communities.

c. the type of service to be provided, indicating the technology used and the upstream and downstream speeds of the service to be provided;

Service is provided to the customer's premises (either business or residential) via wireless technology. The systems utilized are fixed point to multipoint radio networks whereby multiple subscriber radios at the customer's premises connect to master transmitter sites on towers, hilltops and buildings that possess geographical advantages including height and clear sight lines. In this manner, site selection for these "Access Points" (includes "mini-Pops") is similar in process to that of a cellular phone carrier; however, our cost to deploy transmitters is much lower, allowing more transmitters to be installed within a geographical area, thereby improving coverage and accessibility. Additionally, because of the implementation of "micro-PoPs"*, we will be able to utilize "low-gain" subscriber radio units, which are lower in cost. In the traditional "Line of Site" system, a "high-gain" subscriber radio unit is considered the preferred technology.

(*See Confidential Engineering Design Attached)

Axiom utilizes several different radio frequencies, 900 MHz, 2.4 GHz and 5.8 GHz which have proven very effective in high-speed broadband deployment. We have added 3.6 GHz radio gear to transmitter sites which enables the availability of a 10Mbit symmetrical product that is cost effective.

Axiom has obtained the necessary FCC licensing to field and operate radio electronics in the 3.65 GHz band. The technologies utilized are capable

of over-the-air data transmission rates up to 100mbit. Axiom's subscriber plans set customer bandwidth at between 1 and 10mbit downstream and 500k – 1.5mbit upstream for residential service. Up to 10mbit symmetrical service is available for businesses requiring increased upstream bandwidth for server hosting or similar applications. In addition to the advanced radio systems, Axiom will also be installing augmented power systems for protection against AC grid outages; the primary cause for service interruption in the Downeast region. These power systems utilize deep battery arrays and, where terrain permits, power generation via hybrid solar and wind generators.

A 190 foot tower will be built in Hancock and Lamoine. There are no existing towers or buildings of high elevation in the area that could be utilized to deploy Access Points. This tower will transmit service to 23 "mini-PoPs and micro-PoPs" that will be deployed in Hancock and Lamoine.

There will be a direct link from Axiom's transmitter site at Black Cap Mountain in Eddington, Maine, which receives its signal from Oxford Network's location in Bangor, Maine. This microwave system brings bulk bandwidth via Oxford's fiber network to Axiom's wireless infrastructure. Additionally, a Fairpoint DS3 Circuit located at Axiom's headquarters in Machias will provide a redundant link via its existing wireless network.

d. an estimate of the time required to complete the proposed project;

The Towns of Hancock and Lamoine Broadband project will take an estimated twelve months, depending on weather.

e. the number and percentage of households and businesses within the area to be served by the project (i.e. who can be served given technical limitations);

The project is projected to reach 90 to 95% of the unserved homes and businesses in Hancock and Lamoine.

f. the estimated price per customer of the service to be provided by the proposed project; and

Estimated cost per household is $141.33.

g. a map (preferably GIS compatible) or list of municipalities or parts of municipalities that may be covered by the proposed project with GEO Codes.

Geo Codes are: 09170 and 09180. Map is attached.

10. The total amount of funding requested from the Authority;

The total grant request is: $163,038.79.

11. The applicant's financial commitment to the project in addition to the funding requested from the Authority;

Axiom is committed to financing the remainder of the expenses of the project.

12. The estimated number of customers/households who will directly benefit from the project who are currently unserved (provide lists or numbers of potential customers that have indicated a strong commitment to subscribe);

It is estimated that 90 to 95% of the unserved homes and businesses in Hancock and Lamoine will have access to wireless broadband availability.

13. Evidence of community support for the proposed project, which may include letters or signatures of residents or businesses located within the area of the proposed project (also, provide letters of interest from landowners for placement of facilities and support commitments from municipalities or community groups);

See the attached letters of support from Town officials from the Towns of Hancock and Lamoine. Since the Selectmen's meeting on 1/21/10, multiple Hancock and Lamoine residents and businesses have contacted Axiom to be included in Axiom's database. When adding potential subscribers to our data base, Axiom confirms with the residents that they are not able to receive broadband service from another Internet Service Provider.

14. **A description of the applicant's experience relevant to the proposed project; and**

Axiom Technologies is a telecommunications company located in Machias, Maine that has been creating, researching and developing a wireless technology for broadband deployment in rural Maine. Axiom has been working diligently for the past five years in researching and developing wireless networks, and has installed over 80 Access Points serving 80 previously unserved geographical areas, representing 40 Towns in Washington County. Access Point installation work is ongoing as of this grant application.

Axiom is the recipient of three ConnectME grant awards in 2008/2009 ($657,665.00 in total grant funding) and is continuing to deploy broadband using its existing business model to Towns and territories in Washington County throughout 2010. At the completion of the ConnectME Washington County Broadband Project,

Axiom will have a wireless infrastructure with approximately 100 Access Points, creating an umbrella over the entire County.

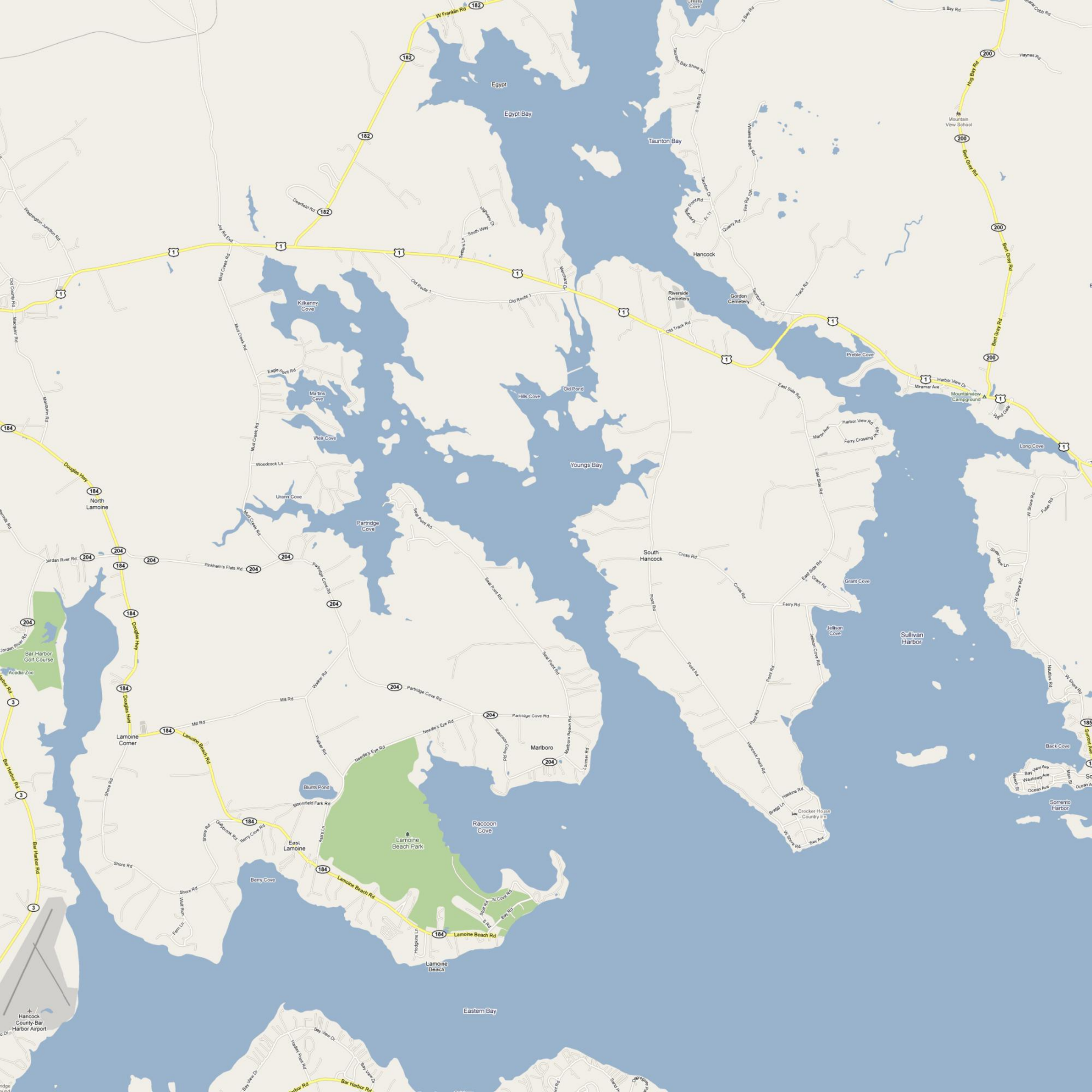
15. A demonstration of financial viability provided by pro-forma financial statements for the project and company financial statements. Confidential information may be submitted and should be so marked.

Financial Analysis and Budget

The budget will be reviewed on reasonableness and accuracy. Provide the following financial information with as much detail as possible:

	ConnectME Grant Funding	Cash Match	In-Kind Match	Other Funding Sources	Total
Personnel	$ .00	$92,289.60			$ 92,289.60
Contractual Services: Tower Build	$50,067.91	$ 2968.19	$4200		$ 57,136.10
Start up Expenses and Capital Expenditures: Access Points	$62,500.00	$ .00			$ 62,500.00
Supplies and Materials: Radio Receivers for Subscribers Job Supplies	$ 50,470.88 $ .00	$ .00 $46,144.80			$ 50,470.88 $ 46,144.80
Telecommunications	$ .00	$ 6,000.00			$ 6,000.00
Training					
Travel	$ .00	$ 11,536.20			$11,536.20
Other costs					
Total	**$163,038.79**	**$158,838.79**	**$4200**		**$326,077.58**

*See attached financial statements and reports.


Egypt
Egypt Bay
Taunton Bay
Hancock
Kilkenny Cove
Riverside Cemetery
Gordon Cemetery
Preble Cove
Mountain View School
Mountainview Campground
Long Cove
Hills Cove
Old Pond
Martins Cove
Weir Cove
Youngs Bay
Urann Cove
Partridge Cove
North Lamoine
South Hancock
Grant Cove
Jellison Cove
Sullivan Harbor
Bar Harbor Golf Course
Acadia Zoo
Lamoine Corner
Marlboro
Blunts Pond
Raccoon Cove
Lamoine Beach Park
East Lamoine
Berry Cove
Crocker House Country Inn
Back Cove
Sorrento Harbor
Lamoine Beach
Eastern Bay
Hancock County-Bar Harbor Airport

Town of Hancock

P.O. Box 68 • 18 Point Road • Hancock, Maine 04640
Phone: (207) 422-3393 Fax: (207) 422-6705

January 21, 2010

Phil Lindley, Executive Director
ConnectME Authority
138 Statehouse Station
Augusta, ME 04333

Dear Mr. Lindley,

Hancock's Board of Selectmen and Axiom Technologies' representatives have discussed deploying wireless broadband in the Town of Hancock.

The Board of Selectmen and the residents of Hancock strongly support the approval of Axiom's grant application to the ConnectME Authority for funding. We are committed to finding property for Axiom's use for a tower as a match for the grant.

Sincerely,

Dexter R. Bellows
Chairman, Board of Selectmen

Town of Lamoine, Maine
606 Douglas Hwy.
Lamoine, ME 04605
207-667-2242
e-mail town@lamoine-me.gov,
website www.lamoine-me.gov

Town of Lamoine, Maine
Established 1870

January 22, 2010

Ms. Susan Corbett
Axiom Technologies
4 Main St.
Machias, ME 04654

Dear Ms. Corbett,

Thank-you for taking the time to speak with me this morning about your company and the possibilities of expanding broadband coverage to unserved areas of our community.

The Town of Lamoine is greatly interested in pursuing further discussion of opportunities to make broadband available to homes where the service is not currently available. Nearly every day we are approached at the town office by people asking for service. The Board of Selectmen has made business development a top priority, and expanding broadband service so that it is available to all in town is a key to that. Just last night the Board met with residents of a subdivision road who told them that had they known ahead of time they would not be able to get high speed internet service, they would not have built or moved there.

We understand that your company may be pursuing a ConnectME grant, and would like at some point to meet with you to discuss the possibilities and responsibilities for that.

Sincerely,

Stu Marckoon, Adm. Asst. to the Selectmen

SM/me
Cc: Selectmen, File