



TILSON

Brian Booher
93 Cottage St.
Town of Bar Harbor, Maine

February 13, 2015

Dear Brian,

Thanks for taking time to talk about your vision for broadband improvements for the Town of Bar Harbor. Broadband is an increasingly important component of community growth and development plans, and we are always happy to help municipalities take control of their telecommunications future. See our CEO, Josh Broder's Tedx Dirigo talk on broadband in Maine.

http://www.youtube.com/watch?feature=player_embedded&v=8iAtCdxgzms

While Tilson works worldwide, it is always a pleasure to work on projects close to home. Moreover, we have worked extensively with in the Mt. Desert region on projects with the Maine Fiber Company, Ellsworth Economic Development Corporation, the Jackson Laboratories, and other organizations. It is a pleasure to have the chance to work here again.

Tilson helps communities, network owners, and government agencies to identify the technological solution that best meets their development goals. In the case of Bar Harbor, we will prepare a report that outlines solutions for serving constituencies of increasing size within the town's geographic boundary. The narrowest constituency will include the Town center and the municipal buildings. The broadest constituency will include all premises within the Town boundaries. Tilson will work with you and the Town to identify the desired other constituencies for analysis in the preliminary stage of the project.

As a result of working for such a diverse set of clients, we offer substantial experience with a variety of wired and wireless technologies and are well positioned to provide unbiased consultation driven by your specific needs. At a minimum, Tilson will provide an optical and wireless network solution to each broadband constituency that is identified. At the end of the engagement, Tilson will provide the Town with a report that the council can use to raise capital, identify partners, and implement network implementation.

The scope of work includes:

- Define a new community standard for broadband availability in Bar Harbor based on what stakeholders need and want.



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- Identification of service constituencies for broadband improvement and define membership. For example, one constituency might include all municipal buildings. Another might include all residences, businesses, and institutions east of Kebo St. in the downtown area.
- Conduct a telecom asset inventory to understand the current state of broadband access and underlying infrastructure in/serving Bar Harbor. Tilson has a strong understanding of the area from previous projects and can complete this very efficiently.
- Design wireline and wireless solutions for serving each constituency
- Prepare capital cost estimates for implementing each solution
- Estimate the operating costs associated with each solution.
- Prepare high level business models and revenue projections for different solutions.
- Value the economic benefits (improved GDP, job growth, tax base growth) associated with broadband improvements.

Tilson has capacity to start this project immediately, and can submit the first draft of the final report within 90 days of kickoff for a total cost of \$37,775. Please contact me for any clarifications on this response.

Best Regards,

Aaron Paul
Director, Energy and Broadband Consulting

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Scope of Work

The following scope of work will produce a document that will allow Bar Harbor to select the broadband solution that best meets the Town's most immediate needs in terms of speed, cost, revenue, and access.

1. **Define Service Constituencies.** Tilson understands that the Town has not decided to pursue a universal broadband solution. Therefore, Tilson will work with the Town to identify multiple constituencies to serve with a broadband solution. These will range in geographical scope and membership.
2. **Perform and inventory of telecom assets and needs in Bar Harbor.** Tilson will survey Bar Harbor's telecommunications infrastructure to determine the following:
 - a. The carriers currently providing service, and their key assets;
 - b. Tower assets that might provide wireless broadband solutions;
 - c. Options for leveraging future infrastructure improvements to improve access
 - d. Description of ownership rights to the OTT/Maine Fiber Company fiber running into the Jackson Laboratories and potential for leverage.

This step will proceed in parallel with the service constituency definition

3. **Provide a high level designs for network solutions at each constituency.** Tilson will provide high level wireline and wireless network designs that contemplate:
 - a. Head end location
 - b. Route mileage
 - c. Backbone and lateral location
 - d. Passive vs. active network
 - e. Tower location and signal propagation
4. **Provide a high level cost estimate for a network solution that meets the standard.** Tilson will provide capital and operating expense estimates for each network design. Capital expenses will include labor, materials, professional services, and other capital cost elements needed to deploy the recommended solution. Estimated operational costs include pole attachment fees, maintenance and repair, and SG&A. This information will be a critical factor as you consider your business model decision and seek to find partners and funding for the project.
5. **Review business model options and high level revenue projections.** Tilson will provide guidance the best business model given the town's appetite for risk and administrative burden, the size and type of the recommended network, and the use of existing network assets. Tilson will also prepare revenue projections and pro-formas. Tilson will draw on the experience of other Maine and U.S. community broadband projects to the extent possible.



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6. **Value the economic benefits of the network.** Tilson will use benefits transfer method to value the potential benefits of the proposed broadband adoption plans in terms of improved GDP growth, increased tax base, job creation, and consumer wellbeing.
7. **Final Report.** Tilson will prepare a final report for review by designated representatives in Bar Harbor that presents all of the above information in a clear and concise product. Tilson will compile comments and prepare a final draft within ten business days of receipt of comments. The reports can be prepared separately or jointly depending on the Town's preferences.



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Deliverables and Proposed Schedule

At the conclusion of the engagement, Tilson will produce a report that presents the following information:

- Overview of the telecom asset inventory
- Definition of service constituencies
- Network designs to serve each constituency
- Capital costs of each network design and solutions
- Economic analysis of each solution design including operating cost estimate, revenue potential, and economic benefit.

To meet these objectives in a timely, cost-effective manner, Tilson proposes the following 90-day schedule.

Task	Proposed Due Date
Kickoff Meeting Meet in Bar Harbor to review scope of work and align project expectations.	Day 1
Define Service Constituencies Select the service constituencies for which broadband solutions will be proposed. Define the service objectives.	Day 15
Conduct Asset Inventory Provide overview of broadband assets in town including possible opportunity to leverage any already existing assets in the area.	Day 30
Network Designs and Cost Estimates Deliver high level network design and cost estimate, including all make ready, labor, and materials.	Day 50
Economic Analysis Analysis to determine the economic benefit and feasibility of each potential solution at the different service constituencies.	Day 70
Final Report Tilson will submit a final report that will include a description of economic benefits and an overview of business model options. This will be followed by one in person meeting to discuss business model	Day 90



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Task	Proposed Due Date
recommendations. Tilson will respond to one round of client comments and produce a final report after the client’s review period.	

Team Overview and Pricing

Tilson’s primary project management resource will be Aaron Paul. Aaron will oversee all project execution, deliverables and communication with the community. The roles and responsibilities of the other project staff members are detailed in the following table, with qualifications of the full Tilson team included below:

Name	Project Role	Responsibilities	Contact Information
Aaron Paul	Director	Executive Supervision and Senior Editor of Deliverables	Phone: 207-358-7406 Email: apaul@tilsontech.com
Mark Buxton	Senior Consultant – Wireline Solutions	Network Engineering and technical advisory	Phone: 207-358-7422 Email: mbuxton@tilsontech.com
Jim Harding	Senior Consultant – Wireless Solutions	Network Engineering and technical advisory	Phone: 207-521-4106 Email: jharding@tilsontech.com
Liza Quinn	Senior Consultant	Project Management, Survey Preparation, Economic and Financial Analysis	Phone: 207-358-7459 Email: equinn@tilsontech.com
Nick Bournakel	Senior Consultant	Project Management, Report Preparation	Phone: 207-358-7415 Email: nbournakel@tilsontech.com

Tilson will conduct the scope of work for a fixed fee of \$39,775. The table below includes a task-based itemization of the fee structure. This fee includes the cost of two consulting trips to Bar Harbor. Tilson will invoice the Town in three monthly payments of \$12,592.

Asset Inventory	\$5,500
Service Constituency Definition	\$7,000
Network Design and Cost Estimate	\$7,650
Economic Analysis	\$5,750
Report Preparation	\$10,875
Expenses	\$1,000
Total	\$37,775



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About our Team

Aaron is the Director of Tilson’s Energy and Broadband consulting practice. He leads consulting teams in developing solutions to state and municipal broadband challenges. He works with engineers, policy makers, and stakeholders from problem identification through solution deployment. Over the past 18 months he has advised over 40 state and local government entities on telecommunications challenges.

His background is in managing complex public, private, and public-private partnership infrastructure developments. Aaron brings six years of analytically intensive management consulting experience to the team. He provides financial analysis, market strategy, market analysis, and business modeling services to his teams. He is an expert at quantifying the financial and non-market economic benefit of public investments in infrastructure and policy programs. Benefits quantified include productivity increases, wage improvements, job creation, tax base increase, and improvements in consumer well-being. Aaron’s research, analysis, and technical writing have produced over one dozen white papers and articles.

Prior to joining Tilson, Aaron helped guide military and civilian policymakers in areas including U.S. Department of Defense procurement, land conservation policy, tax policy, and mission decision analysis. He has advised all five branches of the military on acquisition and management strategy. His analyses have helped govern natural resource conservation policy in four states. He sits on the boards of the Maine Technology Institute and the Maine Appalachian Trail Land Trust. He holds a BA in History from Reed College, as well as an MBA and a Masters of Environmental Management from Yale University.

Liza Quinn is a Senior Consultant at Tilson, and has a background in energy, telecommunications and town planning. In the energy sector she worked with investor- and municipally- owned utilities to buy and sell electricity to lower their cost of service and/or increase revenues. She also worked on teams to secure project and corporate financing, and provide analytical support to acquisitions and divestitures. Liza’s telecommunications background started with cost modeling, pricing and transactional support of wholesale services, and progressed to a role a general manager of a \$77 million colocation services business unit providing networked space in conjunction with power, security, and interconnection services. She holds an MBA and an MFS from Yale University. She has taught Macroeconomics at SMCC has been on the Cape Elizabeth Planning Board for several years.

Nick Bournakel is a Senior Consultant in Tilson’s Energy and Broadband Group. Nick possesses a background steeped in regulatory analysis and business and has significant experience working with government agencies at both the state and federal level. His systematic, energetic, and thorough approach to research, analysis, and outreach in answering the challenges, obstacles, and uncertainties



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facing clients serves an overarching goal—to provide each client with the necessary guideposts to inform a strong, forward-looking strategy for the future. He has previously worked as an independent consultant with a variety of clients in the cleantech sector and provided market and regulatory analysis for clients. He has also worked as a project manager for a local startup company in the realm of renewable transportation, where he served as a liaison to government agencies. Nick holds a BA in Philosophy from Bates College, as well as a JD from the University of Maine School of Law.

Mark Buxton is a Senior Consultant at Tilson. Mark’s main focus is fiber optic construction management and providing GIS support on the Three Ring Binder project in Maine, and on maintenance and road job management for Iberdrola USA’s CLEC affiliate. Mark brings to the Tilson team an extensive knowledge of construction techniques and general construction practices. He has over 20 years of experience in every aspect of the construction industry including designing and planning, building fiber optic cable routes, as well as aerial and underground construction management. Mark previously owned and operated a successful broadband contracting company working for Time Warner Cable, Bellsouth, State of North Carolina, and Time Warner Telecom.



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