



**Broadband Infrastructure Application**  
**Submission to NTIA – Broadband Technology Opportunities Program**

<b>Submitted Date:</b> 3/22/2010 1:19:56 PM	<b>Easygrants ID:</b> 4422
<b>Funding Opportunity:</b> Broadband Technology Opportunities Program	<b>Applicant Organization:</b> OCEAN STATE HIGHER EDUCATION ECONOMIC DEVELOPMENT ADMINISTRATIVE NETWORK.
<b>Task:</b> Submit Application - BTOP	<b>Applicant Name:</b> Mr. George K. Loftus

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## A. General Application Information

Applicant Information	
Name and Federal ID for Applicant	
<b>DUNS Number</b>	025488169
<b>CCR # (CAGE)</b>	57DY4
<b>Legal Business Name</b>	OCEAN STATE HIGHER EDUCATION ECONOMIC DEVELOPMENT ADMINISTRATIVE NETWORK.
<b>Point of Contact (POC)</b>	GEROGE LOFTUS 4018860887 Ext. 201 george@oshean.org
<b>Alternate POC</b>	ALISON FERREIRA 4018860887 Ext. 203 alison@oshean.org
<b>Electronic Business POC</b>	GEORGE LOFTUS 4018860887 Ext. 201 george@oshean.org
<b>Alternate Electronic Business POC</b>	ALISON FERREIRA 4018860887 Ext. 203 alison@oshean.org

Name and Contact Information of Person to be Contacted on Matters Involving this Application:	
<b>Prefix</b>	Mr.
<b>First Name</b>	George
<b>Middle Name</b>	K.
<b>Last Name</b>	Loftus
<b>Suffix</b>	



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<b>Telephone Number</b>	401-886-0887
<b>Fax Number</b>	
<b>Email</b>	George@OSHEAN.org
<b>Title</b>	President and CEO

**Additional Contact Information of Person to be Contacted on Matters Involving this Application:**

Project Role	Name	Phone	Email
Secondary Point of Contact	Ms. Alison , Ferreira	4018860887	alison@oshean.org

**Environmental Point of Contact**

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**Organization Classification**

<b>Type of Organization</b>	Non-profit Corporation
<b>Is the organization a small business?</b>	No
<b>Does the organization meet the definition of a socially and economically disadvantaged small business concern?</b>	No



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<b>Authorized Organizational Representative</b>	
<b>AOR Name</b>	LOFTUS, GEORGE
<b>Result</b>	Applicant Authorized

**Project Title and Project Description**

**Project Title:** Beacon 2.0

**Project Description:** OSHEAN’s Beacon 2.0 project will deliver a middle mile infrastructure to provide substantially upgraded and affordable broadband connections using a dedicated fiber optic network. The project will serve the unmet Broadband capacity needs of our Community Anchor Institutions (CAI), including higher education, health care, and government organizations, in Rhode Island and Southeast Massachusetts.

**CCI Priority Checklist**

**The following items were selected from the CCI Priority Checklist:**

1. This project will deploy Middle Mile broadband infrastructure to community anchor institutions.
2. The project will deploy Middle Mile broadband infrastructure and has incorporated a public-private partnership among government, non-profit and for-profits entities, and other key community stakeholders.
3. This project will deploy Middle Mile broadband infrastructure in economically distressed areas.
4. This project will deploy Middle Mile broadband infrastructure to community colleges.
5. This project will deploy Middle Mile broadband infrastructure to public safety entities.
6. This project will deploy Middle Mile broadband infrastructure and either includes a Last Mile infrastructure component in unserved or underserved areas or has received commitments from one or more Last Mile broadband service providers to utilize the Middle Mile components. Any Last Mile components in rural areas do not exceed 20% of the total eligible costs of the project.
7. This project will deploy Middle Mile broadband infrastructure and the applicant has proposed to contribute 30 percent or more in non-federal cost match.



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**Comprehensive Community Infrastructure Components**

The following items were selected from the Comprehensive Community Infrastructure Components:

Middle Mile

**BIP Applicants**

Have you also applied to BIP for funding in the sample proposed funded service area?

- No

If Yes, please provide the project title and Easygrants ID number:

Title of Joint BIP Application:

Easygrants ID:

**Other Applications**

Is this application being submitted in coordination with any other application being submitted during this round of funding?

- Yes

<b>Easygrants ID</b>	<b>Project Title</b>
346	Beacon 2.0 LCC (Library Computer Center)

If YES, please explain any synergies and/or dependencies between this project and any other applications.

OSHEAN was awarded a Public Computer Center grant in BTOP Round 1 called “Beacon 2.0 LCC (Library Computer Center)” and it is Grant # 346.

Beacon 2.0 LCC will provide 600+ computers (327 replacements), printers, new routers and switches, and 10 mobile computer centers for its Ocean State Libraries (OSL) member libraries. These computers will:



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- expand capacity to offer public-use PCs
- enable expanded employment training and workshops
- provide streaming video equipment to promote regional access to state wide education programs; and, to allow libraries to offer classes in one location and allow the content to be shared at any public library.

OSHEAN works closely with OSL, a non-profit organization with 49 member libraries that provides the public with over 6.9 million items borrowed per year. It has a membership of over 520,000 registered library card holders. Nearly all RI residents have access to an OSL library in their own communities.

**Synergies:**

If awarded, this Beacon 2.0 Middle Mile project will use fiber optic networks to expand the State's broadband capacity and enable affordable service to CAIs in all five RI counties including the 49 libraries that will benefit from our recently awarded grant for Beacon 2.0 LCC.

Our libraries have become the primary locations for accessing online resources for many Rhode Islanders as they are forced to give up their home broadband connections during this recession. They provide laid-off/displaced workers with essential services including online job searches, on line job applications, and basic Internet training.

The awarded Beacon 2.0 LCC project is designed to enable OSL to set up permanent workstations at all of its libraries plus 10 state-of-the-art mobile computer centers, geographically dispersed and located in Rhode Island communities that are the most underserved and have higher rates of poverty. These centers will allow us to offer streaming video shared among libraries. Videoconferencing between OSL and the member libraries will be used for instruction, workshops, conferences, etc. For libraries like Island Free Library on Block Island, staff would likely increase their attendance from what is less than 20% of all OSL meetings and workshops to close to 100%.

Creating affordable connectivity for these libraries is essential to achieve the synergies we have planned, especially for distance learning applications. OSHEAN's proposed Beacon 2.0 middle mile project will provide that affordable, sustainable, and substantially upgraded access to



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Libraries access. Working with our last mile providers, [REDACTED] Beacon 2.0 will make access more affordable throughout the state.

**Individual Background Screening**

Is the Applicant exempt from the Department of Commerce requirements regarding individual background screening in connection with any award resulting from this Application?

- No, Applicant is subject to these requirements

If the answer to the above question is "No," please identify each key individual associated with the Applicant who would be required to complete Form CD-346, "Applicant for Funding Assistance," in connection with any award resulting from this Application:

<b>Name</b>	<b>Title</b>	<b>Employer</b>
George Loftus	President	OSHEAN

## **B. Executive Summary, Project Purpose and Benefits**

**Essay Question**

**Executive Summary of the proposed project:**

**BROADBAND NEEDS OF OUR ANCHOR INSTITUTIONS AND AN OPPORTUNITY**

Rhode Island and South Coast, Massachusetts' non-profit CAIs have significant, unmet needs for broadband capacity. Commercial access simply does not meet their heavy demands. CAIs need a minimum of 1 GigE for basic functions and several are seeking up to 10 GigE for advanced applications. Unfortunately this amount of capacity is usually not affordable and, in some cases, not available.



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Founded in 1999, OSHEAN is a non-profit consortium and collaborator between private enterprise, government, and many CAIs including universities, community colleges, libraries, schools, hospitals, state police and emergency responders. With Beacon 2.0, OSHEAN is positioned to help boost Rhode Island out of its recession and to implement an important program that will benefit the state’s most vulnerable citizens. Our existing broadband service, Beacon 1.0, delivers broadband capability to our member CAIs utilizing dark fiber at affordable rates. The Beacon 2.0 infrastructure will leverage this infrastructure and will reach all Rhode Island counties and parts of South Coast, Massachusetts.

The Beacon 2.0 project will offer substantially upgraded connections to 20 significant anchor institution partners representing 50 facilities. It will also provide middle mile fiber that passes approximately 349,000 households, 9,000 businesses, and nearly 500 CAIs including hospitals, community colleges, universities, non-profit research organizations, nursing homes, community health centers, public libraries, firehouses, police stations, over 70 K-12 schools, and the Narragansett Indian Tribe. Beyond the 20 institutions that have already committed, we expect to add other new subscribers and have provided a conservative estimate of 14 additional institutional subscribers in our pro-forma projections.

Rhode Island has one of the nation’s highest unemployment rates (12.9%). Four of the state’s five counties are classified as distressed by the Bureau of Economic Analysis and the Bureau of Labor Statistics. In addition to helping the anchor institutions that help our citizens, OSHEAN estimates that Beacon 2.0 will create 337 job-years, which consist of 160 direct job-years, 56 indirect job-years, and 121 induced job-years.

#### AN ACTIVE PARTNERSHIP WITH THE COMMUNITY

All of the anchor institutions to be passed by the Beacon 2.0 Network will now be able to obtain enhanced broadband service of 1 GigE to 10 GigE at rates significantly below those offered by commercial providers. The following CAIs are partnered with OSHEAN and all have signed letters of commitment to provide their own funding to connect to the Beacon 2.0 Network. They include:

- Brown University
- Care New England – Butler and Kent Hospitals





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- Community College of Rhode Island – Newport and Warwick Campuses
- CharterCARE – Roger Williams Medical Center and Fatima Hospital
- City of Providence – Knowledge District, Save the Bay Organization, Botanical Center at Roger Williams Park, Providence Pier, City Hall, and Providence Public Works
- State of RI, Division of IT – Dept. of Environmental Mgt (TF Green Airport), Pastore Complex, Capitol Hill, State Data Center, Dept. of Transportation (Hope Valley and Maintenance Headquarters, and RI State Police (Scituate and Wickford Barracks)
- Lifespan – Newport Hospital, Coro Building, Coro to Rhode Island Hospital, and Bradley Hospital
- Narragansett Indian Tribe
- New England Institute of Technology – E. Greenwich & Warwick Campuses
- OSHEAN – Headquarters, AP1, AP2, and AP3
- Providence Community Health Centers – Allen Berry and Chaffee Centers
- Rhode Island Administrative Office of State Courts – Florence Murray and McGrath Courthouses
- Rhode Island Network for Educational Technology (RINET), representing 73 libraries and 383 K-12 schools
- Roger Williams University
- Salve Regina University – Newport and Pawtucket Campuses
- South County Hospital – Hospital, EGMOB, SCH Kenyon, and Surgical/VNS



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- University of Massachusetts, Dartmouth – Main, SMAST and Fairhaven Outreach Campuses
- University of Rhode Island – Feinstein and Alton Jones Campuses
- United States Naval War College
- Westerly Hospital

**SYSTEM OVERVIEW AND AFFORDABLE, SUSTAINABLE SERVICES TO BE OFFERED**

OSHEAN will leverage existing dark fiber assets and, where needed, build new fiber to provide the affordable advanced optical infrastructure that our CAIs need. When compared to current commercial rates, Beacon 2.0 will save subscribers ██████ at 1 GigE point-to-point levels. CAIs requiring very high capacity will benefit by our 10 GigE capacity offering, a service that is not commercially available to many of these institutions.

Our solution also serves to “future-proof” our CAIs. OSHEAN services will initially include broadband access at the 1 and 10 GigE capacities but will be scalable to 100 GigE, which is sure to be required by some CAIs within 8 years. We chose a 48-strand fiber build because a lesser amount would become insufficient within 5 years. Finally, our use of fiber optic networks will allow our CAIs to take advantage of future data exchange technologies that have not yet been commercialized, such as those beyond IP.

OSHEAN will continue to provide full network management services, 24x7x365, all with industry standard service levels appropriate to the mission critical nature of our subscribers’ enterprise systems.

OSHEAN will abide by the FCC’s non-discrimination and network interconnection obligations, specifically FCC’s Broadband Policy Statement 05-151. To encourage broadband deployment and preserve and promote the open and interconnected nature of the public Internet, all OSHEAN institutional subscribers will be entitled to access the lawful Internet content, run applications, and use services of their choice. Subscribers will also be able to connect their choice of legal devices that do not harm the network.

**SIGNIFICANT QUALIFICATIONS AND SOLID BUSINESS PARTNERSHIPS**

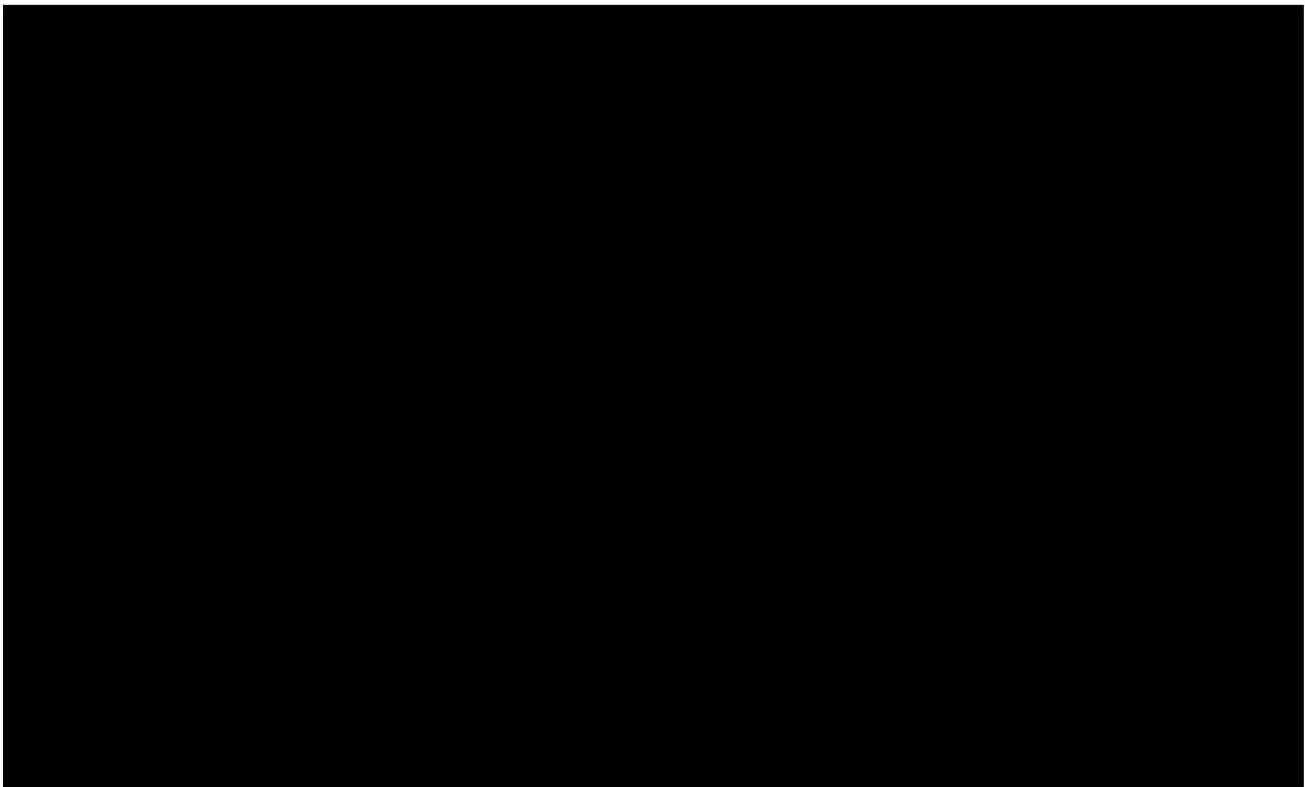


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OSHEAN has a record of success in implementing similar projects as a non-profit broadband service provider, having operated a fiber-based layer 3 ISP network for the last 10 years. Over that time the network has grown to a multi gigabit capacity network. To take advantage of favorable pricing from upstream ISPs in Boston, OSHEAN developed strategic agreements with dark fiber providers for low cost transport. Since then, OSHEAN has been steadily connecting 14 CAIs and 35 facilities at an average growth rate of 15% per year. OSHEAN also holds a maintenance contract on the Level 3 Rhode Island State Fiber. The Core Network Team was also responsible for the network design and maintenance of the NEREN Optical network which connects New England's most prestigious educational institutions.

In addition to the anchor institutional partners listed above, OSHEAN's qualifications are complemented by the following significant commercial business partners:





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**OVER 30% MATCHING FUNDS**

OSHEAN is requesting \$22,169,183 in this application. We will receive matching funds from our partners totaling \$11,396,558 (\$10,434,857 of which is cash), which represents 34% of the grant request. CAIs and Partners provided Letters of Commitment delineating matching funds.

**Project purpose:**

**A – Problem/Opportunity**

Rhode Island and South Coast, Massachusetts’s non-profit CAIs have the greatest community needs for advanced broadband capacity, yet they have limited resources to pay for a solution. In many areas, access to dark fiber is simply unavailable and existing commercial line access does not meet their heavy demands. CAIs require a minimum of 1GigE in order to communicate with each other, their constituents and the Internet at-large. Several are seeking up to 10GigE for advanced applications. Through Beacon 2.0, OSHEAN will provide the opportunity to deliver higher bandwidth and affordable broadband solutions to those anchor institutions that do not have access to dark fiber today.

**B – Effective Solution**

Beacon 2.0 will create a 357 mile fiber network that will substantially upgrade connections to 20 CAIs and 50 facilities and will also pass hundreds of potential CAIs. For ten years, OSHEAN has been building a communications infrastructure to serve the needs of RI and MA institutions of higher education, state and federal government agencies, non-profit research organizations, public libraries, schools, workforce development and economic development efforts. OSHEAN will leverage existing dark fiber assets and build new fiber to provide the economical, advanced optical infrastructure needed.



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Our solution also serves to “future-proof” our CAIs by making our infrastructure scalable to 100 GigE, by using 48-strand fiber, and by using a fiber optic solution that will allow our CAIs to take advantage of future data exchange technologies that have not yet been commercialized.

**C – Broad Significance and Opportunities to Replicate**

Beacon 2.0 will have a wide scale effect on RI and South Coast, MA. It will pass 500 institutions and points of interest and provide an affordable option for broadband access between 1 GigE and 10 GigE. Beacon 2.0 will have an immediate impact on 50 CAI facilities. Synergies with our successful Round 1 application (Beacon 2.0 Library Computer Center, Grant # 346) will allow our Beacon 2.0 middle mile project to provide affordable, sustainable, and substantially upgraded access to Libraries. This will allow the libraries to provide distance learning, completion of patron online job applications, and virtual library meeting attendance for library staff. The equipment for this capability was awarded in the Round 1 grant, however the affordable broadband connectivity can only be realized buy the proposed Beacon 2.0 network.

**D – Unserved/Underserved Area**

Beacon 2.0 will provide middle mile capacity within underserved areas. OSHEAN has developed partnerships with organizations that will bring connectivity to South Coast, MA, Narragansett Indian Tribe, and Block Island. OSHEAN will work with our member RINET to bring service to the school, library, hospital and town hall on Block Island. We will seek a service provider to offer last mile wireless services in western Rhode Island.

**E – BTOP Statutory Purposes**

OSHEAN’s mission is clearly aligned with BTOP’s purposes and the Beacon 2.0 Project is an excellent fit as described below.

**E. 1. & 2. Unserved/Underserved**

See Part D. above.

**E. 3: Anchor Institutions**



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Beacon 2.0 will support educational institutions, public libraries, hospitals and other health care organizations, and other community support organizations. In summary:

Education – OSHEAN will provide enhanced capabilities, such as distance learning, to the community and technical colleges that are the backbone of technical career training and the reeducation of our workforce. Beacon 2.0 will bolster the strong life science research engine that exists between our research universities and our leading hospitals, by creating 10GigE connections to shared supercomputing facilities. Beacon 2.0 will pass over 70 K-12 schools making more capacity and access options available to them.

Health – OSHEAN will provide the capacity for the collaboration of our research hospitals and universities. Digital diagnostic images and medical records systems will be sharable among partner hospitals. Over \$11M in ARRA HITECH funds will be leveraged to connect 9 health care organizations to the State’s Care Health Inform Exchange (HIE).

Government – OSHEAN will provide economical broadband access to one of RI’s largest government campuses of state agencies; including the Departments of Labor and Training, Health, and Transportation as well as increase public access to records at Rhode Island’s underserved courthouses.

Outreach to Vulnerable Populations – Beacon 2.0 will enable distance learning and streaming of employment assistance at 49 public libraries. Two community health centers located in the two largest urban areas will be expanded to deliver health services to the most vulnerable populations in the state. We will connect healthcare and educational facilities at the Narragansett Indian Tribe.

**E. 4: Public Safety**

We will build dark fiber to 2 State Police and the newly build RI State Police headquarters which houses the statewide E911 system. We will provide dark fiber to the Providence’s public safety wireless network that supports the city’s police and fire departments. We will leverage Federal Homeland Security grants that provide security cameras for vital infrastructure such bridges and the Port of Providence. We will provide support for the RI Disaster Medical Assistance Team,



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which was recently honored by the U.S. Department of Health for its model program to administer H1N1 vaccinations.

**E. 5: Job Creation**

Beacon 2.0 will create 364 job-years. Beacon 2.0 will also provide the ultra-broadband 10GigE connections that our research hospitals and universities need to conduct the bio-research that will serve as a catalyst for job creation by spinning-off the entrepreneurial firms in life sciences and medical device manufacturing that will be the cornerstone of RI's knowledge economy.

**Recovery Act and Other Governmental Collaboration:**

OSHEAN has planned this project in close cooperation and collaboration with governmental bodies and other important institutions in the community. We will also leverage two American Recovery and Reinvestment Act (ARRA) grants for health information technology (HIT).

**Leverage other ARRA Grants**

The Rhode Island Quality Institute (RIQI) received \$11.28 million from two American Recovery and Reinvestment Act (ARRA) grants for health information technology (HIT). This investment will help create jobs and allow hospitals and providers throughout the state to upgrade their technology systems and improve patient care while controlling costs and reducing medical errors. The RIQI is a national leader in health IT. Their work has demonstrated that evidence-based outcome measures can reduce medical errors, provide better preventative care, improve the quality of care, and reduce costs. Specifically, RIQI has received two separate grants:

1. Health Information Exchange Award - \$5,280,000: this funding will assist RIQI in implementing an integrated information exchange to improve health outcomes, reduce medical errors, and make our health care delivery system more effective and efficient.
2. Regional Extension Center Award - \$6,000,000: much like agricultural extension services aid farmers in growing crops, HIT regional extension centers will assist health care providers in integrating effective HIT systems. This funding will allow RIQI to provide such vital technical assistance to doctors, hospitals, and other health care providers.



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Beacon 2.0 will create substantial project efficiencies with the RIQI’s efforts through the use of the Beacon 2.0 network to provide connectivity from Rhode Island hospitals to a central data center. The data center, which is currently connected to the OSHEAN network, will provide the hub by which all data is distributed to stakeholders.

Beacon 2.0 will leverage the construction of a fiber network by the University of Rhode Island which utilizes federal grants from the Dept of Energy, National Science Foundation, and National Institutes of Health for a total of \$2.6M. This collaboration will provide greater efficiencies by allowing URI to utilize the Beacon 2.0 Network to extend its reach.

We will leverage the RI EMA Urban Area Security Initiative federal homeland security grants in the amount \$4.5M, to provide connectivity from security cameras that monitor vital infrastructure such as bridges and the Port of Providence.

OSHEAN has used its training facility, which will be connected to the Beacon 2.0 Network, to provide training funded by the Governor’s Comprehensive Workforce Improvement Grant. This grant has provided approximately \$40K in funding to train approximately 100 IT professionals.

**Fit with BTOP CCI Priorities:**

**1 – Community Anchor Institutions**

OSHEAN’s core mission is to provide broadband access and equipment to CAIs. Today, through Beacon 1.0, OSHEAN connects 14 of its CAIs to dark fiber. Through Beacon 2.0, OSHEAN will provide new and substantially upgraded connections which will directly benefit the majority of Rhode Island’s most important CAIs, as well as the hundreds of thousands of citizens served by them by. All partnering organizations have signed letters of commitment to fund their own connection to the Beacon 2.0 Network. In addition, Beacon 2.0 will pass by hundreds of additional CAIs such as libraries, health centers, labs, and more; that will now have access to affordable broadband connectivity.

**2 – Public-Private Partnership**

As described in our “Program Information – Recovery Act and Other Governmental Collaboration” section, OSHEAN has collaborated closely with governmental bodies and other



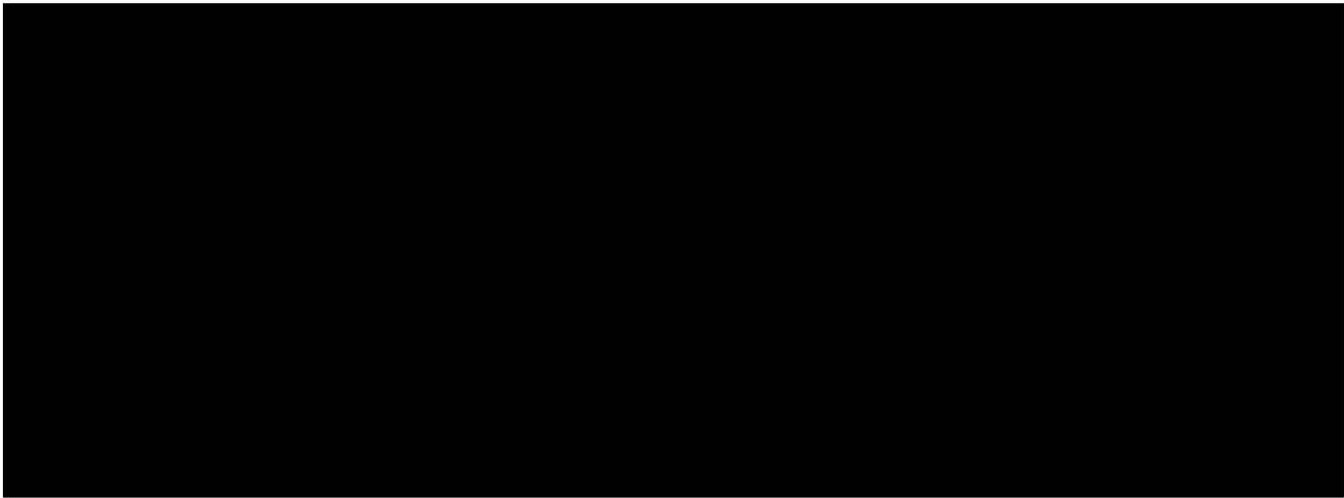


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<b>Funding Opportunity:</b> Broadband Technology Opportunities Program	<b>Applicant Organization:</b> OCEAN STATE HIGHER EDUCATION ECONOMIC DEVELOPMENT ADMINISTRATIVE NETWORK.
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important institutions in the community. OSHEAN has worked closely with the RI State CIO and Broadband Stimulus Review Committee. We reached out to the Board of Higher Education and focused on identifying distance learning broadband needs of community colleges. In our collaboration with University of Rhode Island, the state’s largest public university, we identified several areas where increases in bandwidth will support the research being conducted at URI and around the globe. We also worked with the Department of Transportation to plan how it will use fiber resources for their intelligent traffic management system.

As described in “Partners – Partners Description,” the three main corporate partners that will assist OSHEAN in implementing the project include:



### 3 – Economically Distressed Areas

Rhode Island has the 3rd highest unemployment rate in the country at 12.9%. Bristol County in Massachusetts holds an unemployment rate of 12.2%. Five of the six counties served are classified as economically distressed areas according to Bureau of Economic Analysis and the Bureau of Labor Statistics. Due to budget deficits, programs are being cut, facilities are being shut down, and workers are being furloughed. Beacon 2.0 will deliver 364 job years. The Narragansett Indian tribe will utilize Beacon 2.0 advanced capacity to augment services in their new medical clinic, student computing center, and will also allow the tribal law office greater access to statewide resources as well as a direct connection to the RI State Police.



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#### 4 – Community Colleges

Beacon 2.0 will enhance distance learning programs at community colleges for career training of students including new campus at New England Institute of Technology and the Community College of Rhode Island (CCRI). At CCRI, we will bring dark fiber to the Warwick and Newport campuses (Newport campus is in the middle of a public/subsidized housing area). These institutions are all workhorses for reeducating and retraining displaced workers. They maintain an open admissions policy and affordable access for their 24,000 students, and cater especially to “non-traditional” students with diverse educational backgrounds. These institutions have seen a dramatic increase in the number of students taking online courses, increasing their demand for broadband capacity.

#### 5 – Public Safety Entities

Beacon 2.0 will benefit several RI public safety entities including 2 State Police Barracks. It will support RI Emergency Management Agency and RI State Police 911 to facilitate the consolidation of the intelligent traffic management system control center. Fiber will also be pulled to the new state police headquarters, a campus that houses multiple public safety entities. There, Beacon 2.0 will provide a seamless communications infrastructure among the public safety agencies within RI. The project will also provide additional capacity for the RI Disaster Medical Assistance Team. Beacon 2.0 will enable the integration of Providence city and institutional security camera systems to increase visibility of police into university campuses and allow connection of cameras to monitor the Port of Providence.

#### 6 – Last Mile Component

While Beacon 2.0 is a Middle Mile Project, OSHEAN is collaborating with several partners that commit to bring connectivity to last mile service areas some of which are underserved. They include:

- Taunton Municipal Light Plant (TMLP) - portions of South Coast, MA
- Narragansett Indian Tribe – Tribal lands in southern RI
- [REDACTED]
- RINET – K-12 schools and libraries throughout Rhode Island



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- Vendor being sought for portions of western Rhode Island

7 – 30% Match

Our proposed Beacon 2.0 project has received financial and in-kind commitments that will result in a match of 34%. Moreover, over 90% of our match is in cash. Commitments have come from vendors, OSHEAN and the many anchor institutions that will pay to connect to the Beacon 2.0 Network.

**Is the applicant seeking a waiver of the Buy American provision pursuant to section x.Q of the NOFA?**

- No

**Is the applicant delinquent on any federal debt?**

- No

If Yes, justification for delinquency:

**Are you seeking a waiver of any requirement set forth in the NOFA that is not mandated by statute or applicable law?**

- No

**Is the applicant a current recipient of a grant or loan from RUS?**


- No

## **C. Partners**

**Are you partnering with any other key institutions, organizations, or other entities for this project?**

- Yes

If YES, key partners are listed below:

	
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Project Role: Other



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**Description of the involvement of the partners listed above in the project.**

OSHEAN has conceived of and planned this project in close cooperation and collaboration with partners from government, important anchor institutions in the community, and private vendors. We submitted a preliminary proposal to the RI State CIO, Broadband Stimulus Review Committee in August 2009 for Beacon 2.0. Leading up to that proposal, OSHEAN worked diligently with the Chief Information Officer of Rhode Island, and provided numerous inputs to his Broadband Stimulus Review Committee. A common denominator in our discussions and collaboration with RI government organizations was that Beacon 2.0 would help them implement programs that they had already identified as necessary, and that would otherwise require state government money.

Beacon 2.0 is a partnership between OSHEAN, corporate partners, and 20 significant CAIs representing 50 institutional facilities that have committed funding, as evidenced by the attached letters of commitment.

**OSHEAN (Applicant)**

OSHEAN has spearheaded the project and is responsible for overseeing its implementation, operation of the Beacon 2.0 network, and financial management and administration. OSHEAN



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maintains, operates and provisions a DWDM network using the Cisco 15454 Optical Platform. We lease dark fiber from commercial entities. OSHEAN holds SLAs with these entities to ensure any service disruptions are repaired quickly. The OSHEAN network operations center (NOC) is staffed 24 hours a day and 7 days a week. OSHEAN will make an in-kind contribution of \$214,201 for the recurring lease of existing fiber to be used with Beacon 2.0.

#### Anchor Institutions

These include 20 significant institutional partners and 50 facilities that will provide funding to connect to the Beacon 2.0 Middle Mile project and to maintain the network infrastructure within their own facilities. Total matching funding from CAIs includes \$2,477,383. As a standard, each CAI will match, at minimum, \$40,000 of the lateral cost required to construct a connection to each of their facilities. CAIs that lie more than one (1) mile from the backbone may provide a greater contribution. All institutional commitments and specific cash matches are confirmed in the attached letters of commitment.

#### Partnering CAIs include:

- Brown University
- Care New England – Butler and Kent Hospitals
- Community College of Rhode Island – Newport and Warwick Campuses
- CharterCARE – Roger Williams Medical Center and Fatima Hospital
- City of Providence – Providence Knowledge District, Allens Avenue Backbone, Save the Bay Organization, Botanical Center at Roger Williams Park, Providence Pier, and Providence Public Works
- State of RI, Division of IT – Dept. of Environmental Mgt, Pastore Complex, Capitol Hill, State Data Center, Dept. of Transportation (Hope Valley and Maintenance Headquarters), and RI State Police (Scituate and Wickford Barracks)



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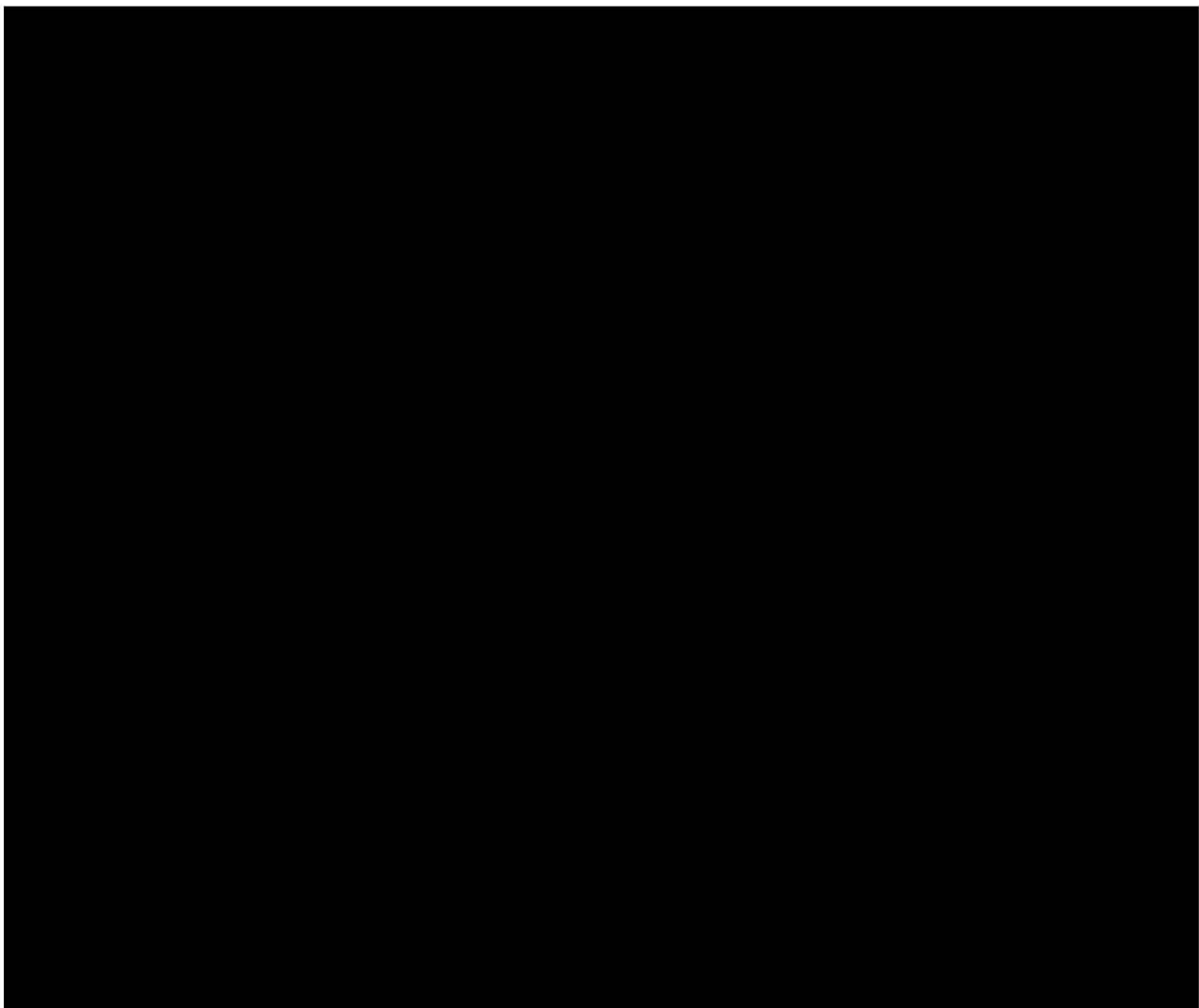
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- Lifespan – Newport Hospital, Coro Building, Coro to Rhode Island Hospital, and Bradley Hospital
  - Narragansett Indian tribe
  - New England Institute of Technology – 2 Campuses
  - OSHEAN – Headquarters, AP1, AP2, and AP3
  - Providence Community Health Centers – Allen Berry and Chaffee Centers
  - Rhode Island Administrative Office of State Courts – Florence Murray and McGrath Courthouses
  - RINET
  - Roger Williams University
  - Salve Regina University – Newport and Pawtucket Campuses
  - South County Hospital – Hospital, EGMOB, SCH Kenyon, and Surgical/VNS
  - University of Massachusetts, Dartmouth – Main, SMAST and Fairhaven Outreach Campuses
  - University of Rhode Island – Feinstein and Alton Jones Campuses
  - United States Naval War College
  - Westerly Hospital
- Vendors/Others



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## **D. Congressional Districts**

### **Applicant Headquarters**

- Rhode Island





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**Project Service States**

Rhode Island

Massachusetts

**Project Service Areas**

Rhode Island - 1

Rhode Island - 2

Massachusetts - 3

Massachusetts - 4

**Will any portion of your proposed project serve federally recognized tribal entities?**

- Yes

**Indicate each federally recognized tribal entity your proposed project will serve.**

Narragansett Indian Tribe

**Have you consulted with each of the federally recognized tribal entities identified above?**

- Yes

## **E. Service Area Details**

**Is the applicant seeking a waiver for providing less than 100% coverage of a service area?**

- No



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**Project Details**

**Service Area Type:** Middle Mile  
**Service Area Name:** Rhode Island  
**Rural Classification of the Last Mile Service Area:** Non-Rural  
**Service Status of the Last Mile Service Area:** Served

**If Service Status is "Underserved" please select at least one applicable option from this list.**

**Total Square Miles in Service Area:** 1,545  
**Total Population in Proposed Service Area:** 1,050,788  
**Total Number of Households in Service Area:** 309,300  
**Total Number of Businesses in Service Area:** 7,070  
**Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area:** 448  
**Unemployment Rate in the Service Area:** 13  
**Median Income in the Service Area:** 29,984  
**Estimated Percentage of Households with Access to Broadband:** 90  
**Estimated Percentage of Households Subscribing to Broadband:** 65

**Service Area Type:** Middle Mile  
**Service Area Name:** South Coast, Massachusetts  
**Rural Classification of the Last Mile Service Area:** Non-Rural  
**Service Status of the Last Mile Service Area:** Served

**If Service Status is "Underserved" please select at least one applicable option from this list.**

**Total Square Miles in Service Area:** 123  
**Total Population in Proposed Service Area:** 103,293  
**Total Number of Households in Service Area:** 39,900  
**Total Number of Businesses in Service Area:** 1,030  
**Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area:** 48  
**Unemployment Rate in the Service Area:** 12



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**Median Income in the Service Area:** 20,978  
**Estimated Percentage of Households with Access to Broadband:** 85  
**Estimated Percentage of Households Subscribing to Broadband:** 63

## F. Community Anchor Summary

<b>Community Anchor Summary</b>	
<b>Schools (k-12)</b>	0
<b>Libraries</b>	0
<b>Medical and Healthcare Providers</b>	15
<b>Public Safety Entities</b>	4
<b>Community Colleges</b>	4
<b>Public Housing</b>	0
<b>Other Institutions of Higher Education</b>	10
<b>Other Community Support Organization</b>	4
<b>Other Government Facilities</b>	13
<b>TOTAL COMMUNITY ANCHOR INSTITUTIONS</b>	<b>50</b>
<b>Historically Black colleges and Universities</b>	0
<b>Tribal Colleges and Universities</b>	0
<b>Alaska Native Serving</b>	0



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<b>Institutions</b>	
<b>Hispanic Serving Institutions</b>	0
<b>Native Hawaiian Serving Institutions</b>	0
<b>TOTAL MINORITY SERVING INSTITUTIONS</b>	<b>0</b>

## G. Project Benefits

### Demographics

<b>Jobs</b>	
<b>How many direct jobs-years will be created from this project?</b>	233
<b>How many indirect jobs will be created from this project?</b>	82
<b>How many jobs will be induced from this project?</b>	49

#### Methodology used to estimate jobs:

As requested by the application guidance, OSHEAN referenced the Council of Economic Advisor’s “Estimates of Job Creation from the American Recovery and Reinvestment Act of 2009” document to estimate job-years. Based on a project cost of approximately \$33.5 M, OSHEAN used the government standard denominator of \$92K to calculate 364 job-years. Direct/Indirect job-years were calculated by a factor of 64% and Induced job years as a factor of 36%. Finally, based on our own calculations for jobs based on our partner estimates, we the Direct/Indirect job-years were subdivided into individual estimates.

#### Project Impact:

Beacon 2.0 will have a wide scale effect on the CAIs that impact the broadest percentage of the population, including universities, community colleges, public libraries, health maintenance organizations, public safety, and government agencies. The Beacon 2.0 path will traverse all of RI’s five counties and South Coast, Massachusetts. It will pass nearly 500 anchor institutions, over 349,000 households and approximately 8,100 businesses.

The following describes a summary of Beacon 2.0’s impact and then “zooms in” on several examples that describe more precisely how select CAIs will benefit from Beacon 2.0.



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## SUMMARY IMPACT

### Education/Continuing Education/Workforce Retraining Impact

Immediate beneficiaries include 2 Community Colleges at 4 Locations, 10 university campuses, and 1 RI State Agency. Beacon 2.0 will allow for affordable broadband connectivity to the RI Division of Labor and Training and will meet the growing demand for distance learning programs at 2 of the state's most important institutions for career retraining of displaced workers: Community College of RI, and New England Institute of Technology. Beacon 2.0 will leverage the benefits of NEREN's research network at more colleges and universities and create supercomputing synergies between universities. Beacon 2.0 will create synergies with an awarded \$1.2M BTOP Round 1 grant to enable important broadband streamed services at 49 libraries at 70 locations, such as online job searches and applications.

### Health Impact

Immediate beneficiaries include 15 hospital facilities and health centers. Others potential CAIs include nursing homes/long-term care facilities, doctor's offices, and clinics. Beacon 2.0 will pose great synergies with two other ARRA grants (\$11.28 M total) awarded to the RI Quality Institute (RIQI) for managing and transporting data-intensive medical files. Beacon 2.0 will make distance learning more accessible to medical professionals. It will enable affordable automated records management and transfer to/from community hospitals, long term care facilities, and doctors' offices.

### Public Safety Impact

Immediate beneficiaries include 2 State Police barracks, 2 courthouses, and 5 security camera facilities in the City of Providence. The fiber will be installed at the new public safety campus which houses the State Police, Statewide E-911 PSAP, Intelligent Traffic Monitoring Center, RI EMA and Port Authority. Beacon 2.0 will provide a seamless communications infrastructure among these public safety agencies within RI. The project will also provide additional capacity for the RI Disaster Medical Assistance Team. Beacon 2.0 will connect cameras to monitor the Port of Providence.

### Other Government Impact



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Immediate beneficiaries include 13 government agencies. Beacon 2.0 will provide substantially upgraded broadband access to one of RI’s largest government campuses of state agencies. The Dept. of Labor and Training (DLT) has grown progressively dependent on online correspondence as many Rhode Islanders seek employment assistance. With an unemployment rate nearing 13%, the DLT has been besieged with requests for unemployment benefits and has outpaced the department’s staff ability to address process claims. Increasingly the DLT has turned to online resources to mitigate this overwhelming demand.

**SPECIFIC IMPACT EXAMPLES**

**Online Learning at Community Colleges with an Emphasis on Workforce Retraining:**

Unemployment rates in RI and nearby South Coast, MA exceed 12% and show no immediate sign of dropping. Beacon 2.0 will provide broadband access to two community colleges and will enable online learning for career re-training of displaced workers. With the displacement of workers, the state’s community colleges are called upon to reeducate and retrain workers in growing and emerging fields such as allied health and green technologies. Examples include wind energy, smart grid and smart building technologies. The community college systems maintain an open admissions policy, affordable access, and especially cater to “non-traditional” students with diverse educational backgrounds. Online learning is a cost-effective option for many. Beacon 2.0 will provide for the affordable high-speed access that these institutions, several of which reside in economically depressed areas. Currently, 55% of students at community colleges are enrolled in online learning, a percentage that significantly increases annually.

**Synergies with Ocean State Libraries (OSL) Grant awarded in Round 1:**

OSHEAN was awarded a \$1.2M public computer center grant in BTOP Round 1. OSL will now set up permanent broadband workstations at all 49 of its member libraries plus state-of-the-art mobile computer centers, geographically dispersed and located in Rhode Island communities that are the most underserved and have higher rates of poverty. If this Beacon 2.0 Middle Mile project is awarded, OSL will be able to obtain significantly increased capacity. These centers will directly benefit both the neediest citizens and the library staff that is working to support them. Increased bandwidth will allow OSHEAN to deliver the online services that were intended



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to compliment the equipment that was awarded in the round 1 BTOP grant. A detailed description of the OSL Round 1 BTOP grant is provided within the “Other Applications” element of the “Project Information” section.

**Synergies with Rhode Island’s “Knowledge District”:**

The City of Providence is building a Knowledge District on 20+ acres of land within a revitalized section of the city which will serve as the epicenter for research-driven entrepreneurial activity. This initiative is critical to economic recovery and job creation. An important part of this project will be the construction of a statewide high performance data center. OSHEAN will create a critical fiber optic connection between the Knowledge District and major educational and healthcare institutions. This will allow collaboration among institutions for data-intensive research, such as the NIH \$20M Clinical and Translational Science Award. Beacon 2.0 will provide the infrastructure that no individual institution could afford.

**Synergies with Statewide Public Safety Programs:**

Beacon 2.0 will enable the affordable integration of several institutional security camera systems, including universities and hospitals, into the City of Providence’s network so that police can monitor the campuses. Although sophisticated camera networks exist at several prominent Providence institutions such as Brown University, the city police are not connected, despite their overlapping jurisdictional responsibilities. A \$4.5M Homeland Security Grant will be leveraged to connect cameras to monitor vital infrastructure such as the Port of Providence. Beacon 2.0 will provide tremendous synergies that would otherwise require city/state funds which are unavailable.

OSHEAN’s current network provides connectivity to five of the state’s seven courthouses. Beacon 2.0 will leverage this existing infrastructure by connecting the remaining two courthouses, which is necessary to meet Chief Justice Suttle’s goal of increasing usage of videoconferencing to all courthouses to cut costs of prisoner transportation.

**Synergies with 2 ARRA grants – Supporting the State’s Health Information Exchange (CurrentCare)**



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The RI Quality Institute (RIQI) received \$11.28 million from two ARRA grants for health information technology. CurrentCare will expand the state’s capacity for improving the quality of public health. It will allow medical records to follow the patient, providing clinicians immediate access to critical health care information and advanced research where and when treatment decisions are made. CurrentCare, whose data center currently resides on OSHEAN’s network, has already enrolled 37,000 Rhode Islanders and deployed a pilot project. Unfortunately, some facilities do not have the broadband capacity necessary to participate, particularly those that cater to vulnerable populations. Beacon 2.0 will enable that participation.

**Synergies with RINET**

The K-12 schools and library statewide network, is managed and operated by the RI Network for Educational Technologies (RINET) which was one of OSHEAN’s founding members in 1999. RINET utilizes a \$4M annual fund, collected through State surcharges and E-rate subsidies, to pay for leased circuits that connect 49 libraries and 350,000 students at 383 schools. In recent years the connectivity requirements of schools and library have outstripped the funds to satisfy the demand.

The ability for the dwindling funding pool to meet the school and library demand has been extremely difficult. As indicated in the FCC report “Connecting America: The National Broadband Plan,” schools and libraries will need 1 GigE of connectivity in the future. Beacon 2.0 is the sustainable solution that will help make that happen.

**Vulnerable Populations:**

Beacon 2.0 will enable CAIs to close the “digital divide” by making substantially upgraded broadband access possible for those institutions that are key to serving RI’s less affluent citizens, including community health centers, long term care facilities, public libraries, community colleges, RI Division of Labor and Training, and Narragansett Indian Tribe. Beacon 2.0 will enable online learning programs at the state’s most important institutions for career re-training of displaced workers, Community College of Rhode Island, and New England Institute of Technology.

Vulnerability related to Narragansett Indian Tribe:





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The Narragansett Indian Tribe provides health care and education programs for their 2,500 members. Located in rural Washington County, the tribal lands house a medical clinic and computer center for tutoring students, as well as their Law Enforcement offices and a community center. Beacon 2.0 will bring a direct fiber connection to these facilities to allow for reliable, high speed broadband to provide online access to resources needed to provide health care, education and public safety.

**Vulnerability related to Education:**

University endowments have dropped to record lows. Unaffordable broadband access has stalled state and regional cooperation among universities. Community colleges are overwhelmed in trying to train the state’s unemployed/displaced workforce. All budgets are slashed with programs cancelled and staff downsized.

**Vulnerability related to Healthcare:**

In March 2010, 16% of Rhode Islanders were reported to be without health insurance. This is the highest level ever and has doubled since 2000. This has put a significant strain on the health care system and particularly community health centers which bear the burden of providing care for the uninsured.

Providence Community Health Centers (PCHC) is the largest primary health care provider in Providence, serving more than 35,000 patients, regardless of their ability to pay. Operating five health clinics, PCHC is the largest provider of the WIC nutrition program in Rhode Island, with 6,500 participants.

In order to accommodate the growing uninsured population and deliver cost effective health care, Beacon 2.0 will provide the substantially upgraded bandwidth required to integrate PCHC into the statewide HIE.

**Vulnerability related to Libraries:**

Libraries are forced to mitigate the “Digital Divide.” They cater to displaced or otherwise career changing workers with services that help them get back into the workforce. As people lose jobs, families are canceling their home internet service and depend more heavily on the libraries to be



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their internet resource, their community connection, and their place to learn. Rhode Island libraries are trying to survive difficult times.

**Level of Need:**

Rhode Island’s anchor institutions in education, healthcare, and public safety have a tremendous unmet need for broadband capacity. OSHEAN’s Beacon 2.0 Project will address these needs by leveraging existing available fiber assets and building new fiber to provide a sustainable advanced optical infrastructure needed by our State’s anchor institutions today. Beacon 2.0 will also provide a “future-proof” infrastructure to support our institutions as they prepare our citizens for the jobs of the future.

**Unmet Needs of our Anchor Institutions**

Rhode Island has a competitive residential broadband market with two major providers serving most of the homes in the state. Our anchor institutions have some level of access to commercial broadband everywhere in Rhode Island. Unfortunately, the available broadband products do not meet their heavy bandwidth demands. These institutions need a minimum of 1GigE in order to communicate with each other, their constituents and the Internet at-large and several (e.g. Brown University, CCRI, URI, Lifespan) are seeking up to 10GigE for advanced applications. The cost for bandwidth capacity at these levels exceeds available budgeted funds.

**Meeting the Need Where Access to Dark Fiber is Available**

Six years ago, OSHEAN members committed to finding a solution to restrictions on bandwidth that the commercial market was creating. In response, OSHEAN sought out competitive dark fiber agreements to develop our Beacon 1.0 service. This fiber is now ready to support the 10GigE connections that some of our advanced members seek in this proposal, a testament to the fact that dark fiber solutions are extensible and scalable.

By leasing existing dark fiber from wholesale providers and operating our own optical equipment, OSHEAN is able to provide our members with cost effective 1GigE connections. The original Beacon 1.0 service saved our members over \$1.7 M in 2008 and again in 2009. Through our current Beacon 1.0 project, OSHEAN provides over 36GigE of connectivity to anchor institutions over dark fiber [REDACTED]



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### Meeting the Need Where Access to Dark Fiber is Not Available

With Beacon 2.0, OSHEAN will install new fiber in areas where we are unable to lease dark fiber today. This includes Newport County, Bristol County, Washington County, and extreme western Kent & Providence counties in Rhode Island, and Bristol County in neighboring Massachusetts. All but Washington County have been defined as economically distressed by the Bureau of Economic Analysis and the Bureau of Labor Statistics.

OSHEAN experience indicates that those institutions without access to dark fiber are the most in need of a solution because they cannot afford the necessary level of bandwidth at commercial rates. Such institutions have difficulty participating in some of OSHEAN's services such as access to our Safe Harbor disaster recovery center and our Cumulus Cloud Computing Service in Providence and Springfield, MA. Our health care institutions are unable to easily transfer digital diagnostic images or PACS system data between facilities. We have clear evidence that dark fiber removes the bandwidth barriers our anchor institutions face by providing them with at least 1GigE capacity at a [REDACTED] savings when compared to commercial access.

### Examples of Need: Underserved Newport County, Rhode Island

Newport County is made up of two islands and a peninsula making it costly to provide fiber assets. There is no dark fiber available to Newport County, yet this county houses four of our anchor institutions including Salve Regina University, Newport Hospital, the U.S. Naval War College and one of the four campuses of the Community College of Rhode Island (CCRI). This campus of CCRI is a cornerstone of the revival of a portion of Newport that contains a large population of economically disadvantaged persons living in subsidized public housing. These students are now within walking distance of the college. Students at this CCRI campus participate in the nursing and allied health program, training workers for one of the growing industries in Rhode Island. This campus would benefit greatly from an increase in broadband that would allow for high definition video conferencing to collaborate with faculty at other CCRI sites on the mainland.

### Example of Need: Underserved Bristol County, Rhode Island



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Bristol County, RI sits on a peninsula and is the home of two OSHEAN members, Bradley Hospital for Children, and Roger Williams University (RWU). RWU has engaged several providers in the county to seek access to dark fiber but has been unsuccessful in bringing fiber to its campus. RWU utilizes videoconferencing to collaborate with the marine studies programs at URI. RWU's School of Law has worked with the courts to videoconference courtroom hearings from Providence into the classroom. These efforts, however, can only be performed are stifled due to the RWU's limited broadband capacity. With Beacon 2.0, RWU seeks a 10GigE connection which would provide the opportunity to expand these programs.

**Examples of Need: Underserved Washington County, Rhode Island**

Washington County is the southernmost county in Rhode Island and houses anchor institutions such as three campuses of URI, Westerly Hospital, South County Hospital, Washington County Courthouse, the Narragansett Indian Tribe, and access to Block Island. This county is the furthest from Providence and has no access to dark fiber, forcing them to pay the highest rates in the state.

South County Hospital had to resort to building its own fiber link between two of its facilities in Washington County, at a cost of \$110,000 for less than a mile, in order to afford the 1GigE capacity that was desperately needed.

Westerly Hospital recently sought to create a fiber link between the main hospital and a clinic in nearby Connecticut, but the cost of the build was prohibitive. Beacon 2.0 will provide fiber that will reduce that cost.

The University of Rhode Island (URI), a land grant college, has three campuses located in Washington County. The main campus in Kingston is currently seeking a 10GigE connection to the OSHEAN network to obtain access to other research universities via Internet 2. This capacity is not available to them. The Graduate School of Oceanography is located at the Narragansett Bay Campus and is the home of the Innerspace Center, which uses advanced telepresence facilities to link researchers from around the country to ocean research ships at sea around the globe managing underwater robotic submarines. This telepresence facility brings live pictures from the sea floor and allows researchers on land to direct the pilots of the robots to certain areas of interest on the sea floor. The Innerspace Center is always challenged with obtaining adequate



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bandwidth to carry the signal from a satellite landing station to the Narragansett Bay campus in RI. A dark fiber connection of 1GigE or 10 GigE would address this need.

URI is partnering with OSHEAN to build a fiber path for a portion of the connection to OSHEAN using NSF and NIH infrastructure grants. OSHEAN will leverage this \$1M of fiber for other members as well. URI plans to light its portion of fiber at 10GigE. To support URI's 10GigE, Beacon 2.0 will need to complete the fiber path to the OSHEAN network in Providence.

URI is also collaborating with several towns in Washington County and the Washington County Regional Planning Council to build a fiber optic network that will connect town CAIs to the university and each other. The university will leverage Federal funds to extend services to nearby towns. OSHEAN will provide expertise to URI to assist with this effort.

Narragansett, in Washington County, will be the landing site for our submarine fiber cable that will bring the only fiber connection to Block Island, which is located 10 miles off the Rhode Island coast. The first off shore wind farm on the east coast has been sited off the Block Island coast. Deepwater Wind is the private firm that will install this wind farm, and is installing a submarine power cable between Narragansett and Block Island. OSHEAN will partner with Deepwater Wind to leverage the cost of installing a power cable to include the first fiber optic cable to serve Block Island. The optical cable will be used to bring improved broadband capacity to the island residents, and will provide important monitoring capacity for the green energy wind farm project.

Example of Need: Underserved Bristol County, Massachusetts

OSHEAN is collaborating with Taunton Municipal Light Plant (TMLP) a century old government-owned utility that provides electric service, cable television, and telephony services to 34,000 customers in Southeastern Massachusetts. TMLP has implemented a pilot program to bring residential broadband service to 1,000 of its electric service customers. Utilizing Beacon 2.0 middle mile infrastructure, TMLP will provide last mile broadband service to homes and businesses throughout the South Coast Massachusetts. Additionally, TMLP is seeking to employ "Smart-Grid" technologies such as automated meter reading (AMR), load control, SCADA and network security. TMLP is also supporting public safety, Homeland Security, education and municipal network initiatives which would greatly benefit from Beacon 2.0.



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## H. Technology

### Technology Type

Indicate the technology that will be used to deliver last mile services. The following items were selected:

Wireline - Fiber-optic Cable

Other:

### Technology Questions

#### Methodology for Area Status:

The two Beacon 2.0 Middle Mile Service areas (Rhode Island and South Coast, Massachusetts) are both "served" in the aggregated, despite the fact that several census block groups are underserved.

OSHEAN contracted with Broadband Consulting Group, Inc. (BBCGi) to conduct our analysis of census blocks passed by our Beacon 2.0 Middle Mile Program. BBCGI is a consortium of broadband technology, telecom, marketing, and IT specialists with significant experience in developing, building and marketing complex technologies for service providers.

BBCGi has constructed maps by census block group (CBG), as well as the geographic and demographic description of the Beacon 2.0 proposed funded service area. BBCGi uses a combination of proprietary network testing as well as existing provider knowledge to determine if a specific CBG or funding service area is unserved or underserved. BBCGi purchased current household records from Experian Marketing Solutions to obtain a representative sample of household addresses and demographics for individual Census Block Groups within each proposed funding service area.

To determine which CBGs were underserved, BBCGi used multiple criteria for determining underserved status:

Availability Test: BBCGi tested for availability of broadband for a sample of individual households within each CBG in the proposed Beacon 2.0 funding service area to determine the



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percentage of households that did not have broadband available. The qualification threshold was <50% of the households with broadband access.

**Advertising Test:** BBCGi used its extensive history and expertise in developing and tracking market research for telecom and broadband service providers to determine if any broadband providers were advertising broadband service of at least 3 Mbps (downstream) in the proposed funding service area.

**Adoption Test:** BBCGi used proprietary sampling techniques, availability indicators, and demographic based adoption modeling to determine the rate of broadband subscribership for the proposed Beacon 2.0 funding service area. The qualification threshold was <40%.

BBCGi’s sampling methodology for determining underserved areas included:

- 1) Processed active telephone numbers and corresponding addresses against public switched telephone number databases, cable and telephone franchise databases, individual provider broadband availability websites, and internal databases to determine both availability and penetration of broadband service for each household in the representative sample, and
- 2) Input all collected data into BBCGi’s database to provide directly measured or modeled penetration estimates for the appropriate geography (CDC or area, depending on application).

**Description of Network Openness:**

OSHEAN understands that, as a precondition of award, the proposed project (Beacon 2.0) must be consistent with the FCC’s non-discrimination and network interconnection obligations, specifically FCC's Broadband Policy Statement 05-151. Because OSHEAN offers broadband services as the integral component of our product offering, we maintain a network non-discrimination policy and will ensure that Beacon 2.0 abides by the policy.

OSHEAN’s policies on nondiscrimination, interconnection, and network management will be accessible on the OSHEAN Web site. If any changes to these policies are made the Web site will be updated and notification of such changes will be sent to our members.

**Nondiscrimination Policy**



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OSHEAN provides Internet services to community anchor institutions in an open, non-discriminatory manner. Any OSHEAN member is eligible to connect at reasonable rates and terms. As part of this project OSHEAN will connect its members to several upstream Tier 1 service providers that provide full access to the public Internet. OSHEAN makes no distinction in its treatment of customer traffic based on application or content.

#### Interconnection Policy

Beacon 2.0 will provide interconnection points in the collocation facilities. These interconnection points allow ILEC, CLEC and other independent telecom companies to service the last-mile area with wholesale access at reasonable rates and terms to network components and services such as wavelengths and fibers, in accordance with OSHEAN Policies. OSHEAN also encourages settlement-free peering with all willing Internet service providers.

#### Network Management Policy

The OSHEAN Internet service is based on best-effort delivery. OSHEAN does not use any mechanisms to allocate bandwidth preferentially to any specific class of users, applications, providers, or sources. OSHEAN members, peers, and providers are limited only by the physical or contractual bandwidth limitations of their connection to the network. OSHEAN does not restrict user's access to specific content, block the use of specific applications, or limit the type of devices that can be used to access the network. OSHEAN will block any traffic destined for its infrastructure by unauthorized sources and will take the appropriate action to either block or limit traffic that transits its network if, the core technical team at OSHEAN determines, that traffic is harmful to the recipient. OSHEAN will cooperate with law enforcement if notified of harmful or illegal traffic transiting its network.

#### System Design:

The new OSHEAN Beacon 2.0 Network will extend the reach of the existing Beacon 1.0 network to middle mile CAIs using new physical fiber infrastructure. The proposal includes two service areas, Rhode Island and South Coast, Massachusetts. The Network design consists of four sections including, Physical Fiber Infrastructure, Optical Transport, Routing\Switching and Network Management.



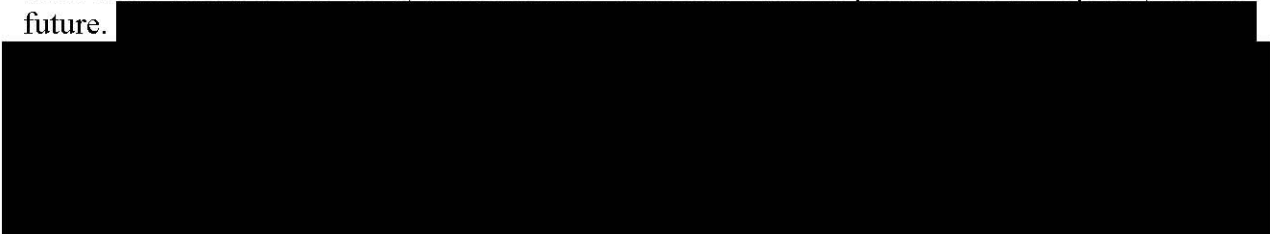


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### Physical Fiber Infrastructure

The new physical infrastructure will support interconnection points spread throughout the service areas for CAIs. The fiber cable plant will consist of Single Mode Fiber which will meet or exceed the ITU-T G.652 Standard. The new cable plant will be constructed as 95% aerial and 5% underground for a total of 357 miles and passes through all five counties in RI and Bristol County MA. The new fiber consists of 48 strands dedicated to OSHEAN members. OSHEAN will hold a 20 year IRU on the 48 Strands with 20 years of renewal options. After analysis of bandwidth trends of our CAIs, we determined this fiber count to provide robust capacity for the future.



OSHEAN currently leases 2 strands of fiber from Providence to Boston, MA that will augment the new infrastructure. OSHEAN is a member of NEREN, which currently holds an IRU with Level 3 for a fiber ring from Providence to Hartford, Springfield, and Boston. Leveraging this existing NEREN fiber allows our members to interconnect with Open Cape, Northern Crossroads (NoX), TMLP, Internet 2, Cogent, Sprint, Level 3 and other providers. It will also allow our members connectivity to the OSHEAN disaster recovery and cloud computing site in Springfield, MA.

### Optical Transport

OSHEAN will use [REDACTED] DWDM Nodes, strategically located throughout RI and South Coast, MA, configured in a ring topology and installed in anchor institutions. Eight Node locations are Higher Education sites where existing building infrastructure such as HVAC and Protected Power can be leveraged. These nodes will serve as the connection points for other OSHEAN members in the node vicinity. All CAIs that are not in the vicinity of an Optical Node will be connected via dedicated fiber strands.

Some nodes will also serve as Interconnection points to other regional networks. Two of the Nodes (Boston and PVD AP3) will be augmented to allow interconnection between the NEREN



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Optical network and the New Beacon 2.0 Optical Network. By leveraging the NEREN optical network OSHEAN will be able to provision 1GigE and 10GigE services to CAIs anywhere on either network.

Each Node is fully redundant, configured with the appropriate amplification and dispersion compensation to support 40 channels at 10GigE with a total capacity of 400GigE, scaleable to 100GigE per channel and a total capacity of 4000GigE. Each node will be designed with a Reconfigurable Optical Add Drop Multiplexer (ROADM) card which transports 40 channels in the C band. These key optical components have been designed to scale to 100GigE per channel. This network will have a combination of 2 degree and multi-degree ROADMs. Services will be provisioned redundantly (East and West) on the New Beacon 2.0 network. Add/drop functionality can be provisioned on any lambda at any of the node locations

#### Routing and Switching

Each node will consist of a tunable 20GigE [REDACTED] (10GigE East and 10GigE West) which supports twenty 1GigE client ports and can be equipped with GigE optical transceivers providing inexpensive connectivity to the backbone for anchor institutions. Each 1GigE client port can be provisioned to add/drop bandwidth at each node on the New Beacon 2.0 Network. The Xponder behaves like a layer 2 switch and supports many features of a layer 2 switch including, VLANs and QoS functions. The Xponder capabilities allow OSHEAN to provision bandwidth as needed without long term commitments, which is beneficial to R&E projects for collaboration between researchers.

The new Beacon 2.0 Network will have Optical Nodes at the OSHEAN Aggregation Points (PVD AP1, PVD AP2/RISD and Boston) The AP1 router serves as the connection to the Internet. The AP2 router serves at the connection to research and education networks such as the NoX and Internet2. The Boston router serves as a redundant connection to the Internet and the NoX. The NoX facilitates advanced networking among research institutions in New England.

Each member will receive the appropriate 1GigE or 10GigE router. If the existing member router is capable of supporting the new connection then only the interfaces will be provided to augment the router.

#### Network Management



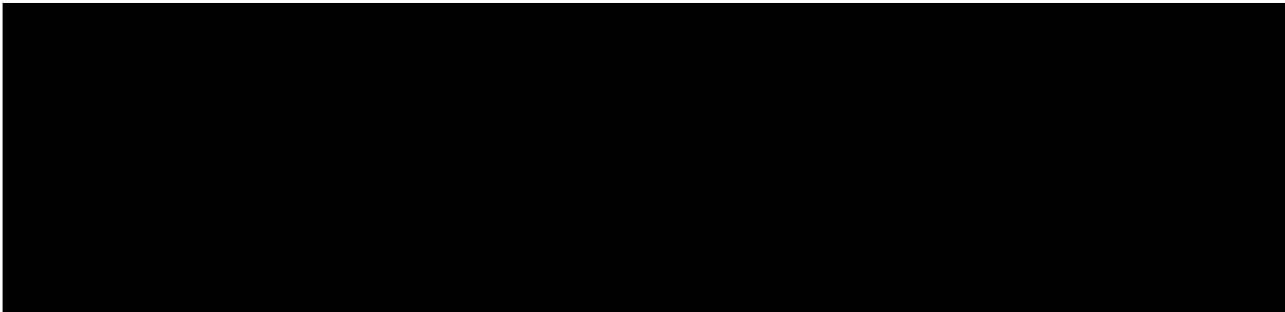
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OSHEAN will expand its current tools for network monitoring and management of the network into a highly available architecture [REDACTED]

The following services will be run on the highly available environment:

- SNMP - Used to monitor servers and network gear.
- DNS - Critical to delivering network services available to all OSHEAN members.
- RADIUS - Used for authentication to the networking infrastructure.



**Is the applicant seeking a waiver pursuant to section IX.C of the NOFA so as to sell or lease portions of the award-funded broadband facilities during their life?**

No

## I. Project Budget

Project Budget		
	Federal Grant Request	Match
Last Mile	0	0
Middle Mile	22,169,183	11,396,558
<b>Total</b>	<b>22,169,183</b>	<b>11,396,558</b>

**Project Budget Total:** \$33,565,741



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**Match Percent:** 34.0%

**Projects Outside Recommended Funding Range:**

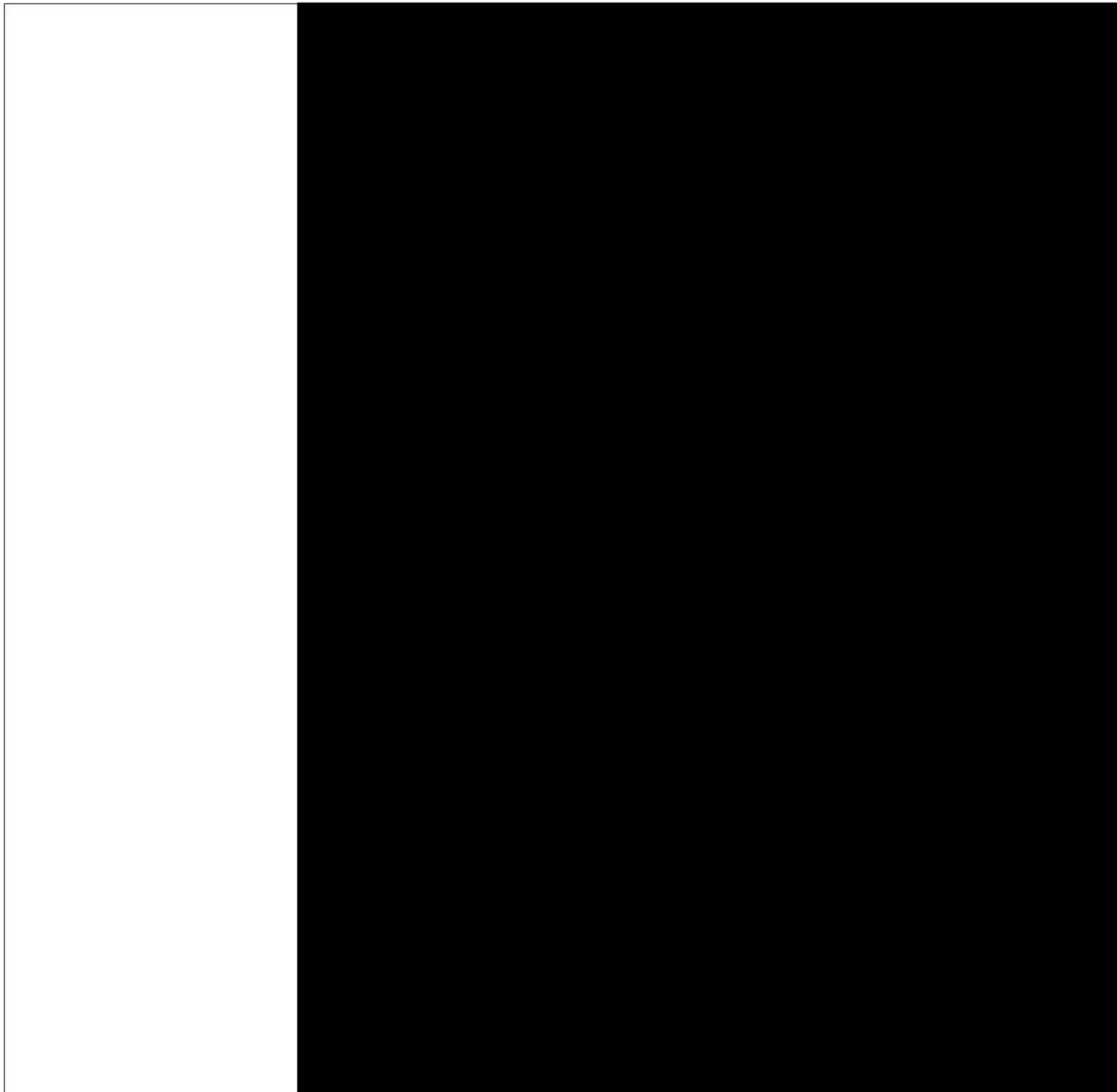


Outside Leverage	
<b>Applicant is providing matching funds of at least 20% towards the total eligible project costs?</b>	Yes
<b>Matching cost detail</b>	<p>For its Round 2 BTOP proposal, OSHEAN has determined the total project cost to be \$33,565,741. Adhering to the NTIA’s 20% required match and 30% suggested match standards, OSHEAN has secured \$10,434,857 of Cash Match and \$961,701 of In Kind Match. Together the Cash Match at 31.09% and In Kind Match at 2.87% equal 33.96% of the total project budget. Details for each match source are as follows:</p> <p>Cash Match - \$10,434,857 (31.09% Total Project Budget)</p> <p>Total Fiber Partners – 8,599,899 (25.62% Total Project Budget)</p>



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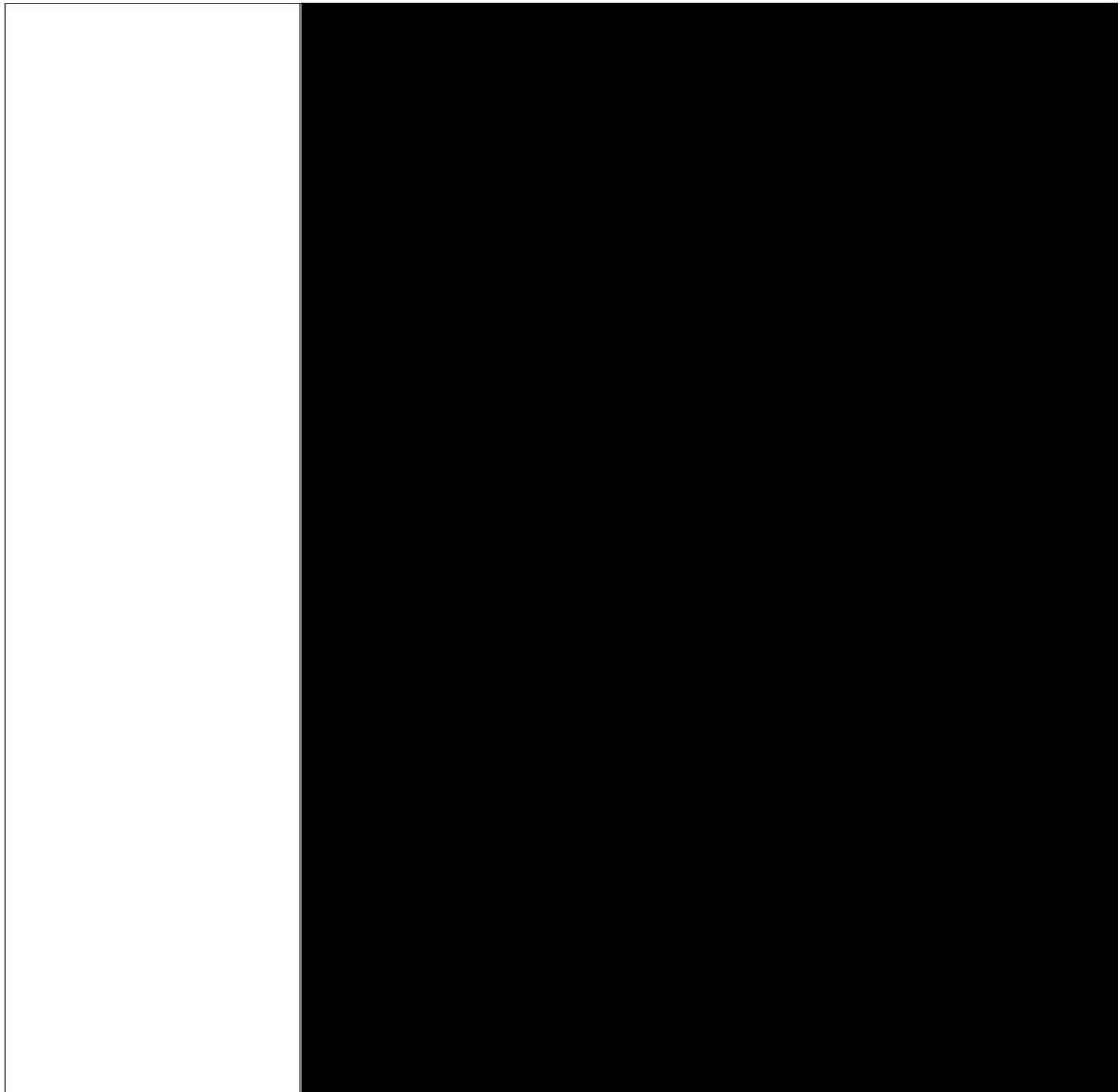
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<b>Unjust enrichment</b>	Neither OSHEAN, nor our partners, nor any other entity associated with this project is requesting any financial (or in-kind) support for the Beacon 2.0 Program, other than what is applied for in this grant application. We have not applied for any Federal support for non-recurring costs.
<b>Disclosure of federal and/or state funding sources</b>	As described in our “Project Impact” component of the “Project Benefits” section, the Rhode Island Quality Institute (RIQI) has received \$11.28 million from two American Recovery and Reinvestment Act (ARRA) grants for health information technology



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	<p>(HIT). These funds do not duplicate any funds requested under this grant as this grant will provide the broadband connectivity that creates synergies for the RIQI grant.</p> <p>As described in the “Other Applications” component of the “Project Information” Section, OSHEAN was awarded a grant in BTOP Round 1 for our Public Computer Center project, Specifically, \$1.6M for the Beacon 2.0 Library Computer Center (LCC) project. That awarded grant will fund hardware and software purchases that are not included in this Beacon 2.0 Middle Mile application but will create synergies.</p>
<b>Budget reasonableness</b>	<p>When developing the portfolio of total allowable costs for its middle mile project, OSHEAN relied on competitive bids, partner quotes, industry standards and field experience to ensure that all expenses were accurate, scalable, and reasonable to provide the proposed service to our Community Anchor Institutions (CAI).</p> <p>For the project OSHEAN will construct 357 miles of new fiber infrastructure, 50 CAI laterals, and 3 partner laterals in Rhode Island and Massachusetts for \$26,978,794.</p> <div style="background-color: black; height: 150px; width: 100%;"></div> <p>In certain areas, OSHEAN or its partners hold access to fiber assets which will be made available as In Kind Match to OSHEAN as part of the BTOP project, but would otherwise be leased or purchased to</p>





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	<p>complete the new infrastructure. In Kind Match totals \$961,701, or 2.87% of the total project cost.</p> <div style="background-color: black; height: 150px; width: 100%;"></div> <p>Based on experience and industry standards, OSHEAN has also determined that costs totaling \$1,080,000 will be required for Professional Services – inclusive of Project Managers, Engineers, Auditors and Consultants.</p> <p>OSHEAN “Units” are defined as the number of CAIs buildings, plus several OSHEAN core facilities, that are planned connectors to the proposed fiber. As determined by this proposal, the number of Units totals 50.</p> <p>To ensure project sustainability while also providing CAIs with the lowest cost, highest capacity service, OSHEAN developed the following pricing structure:</p> <div style="background-color: black; height: 40px; width: 100%;"></div> <p>At the proposed pricing, OSHEAN pricing falls at least <span style="background-color: black; color: black;">[REDACTED]</span> lower than commercial rates.</p>
<b>Demonstration of need</b>	In an effort to provide a next generation infrastructure to all of



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<p>OSHEAN’s Community Anchor Institutions, OSHEAN has continuously found that leasable dark fiber does not exist outside of Rhode Island’s Metro areas and the South Coast of Massachusetts. While OSHEAN has explored opportunities to build out its own dark fiber network to reach underserved areas, it has found that the project is neither scalable nor financially feasible without federal assistance.</p> <p>OSHEAN is an established 10 year old organization with proven experience in dark fiber deployments and impeccable financial history with its long serving financial institution, Merrill Lynch. When investigating self-funding for the project, OSHEAN researched loan and line of credit options with the bank and found that while financing would be granted, OSHEAN was not able to independently sustain the payment schedule required for a \$22M note. With an annual operating budget just below \$4M, a loan 500% greater than annual operations is too great a financial risk to be undertaken by OSHEAN.</p> <p>Prior to BTOP, only Community Anchor Institutions in close proximity to existing dark fiber were able to take advantage of the high capacity, low cost asset. Those that reside more than a few miles away from any dark fiber backbone were only left with the option to build connections at prohibitive rates. OSHEAN Community Anchor Institutions work directly with OSHEAN for collaborative technology projects, when working together reaps greater reward and lower cost than doing it alone. Prior to BTOP, individual members reached out to OSHEAN to seek out dark fiber opportunities for their campuses. However, even when pooling funds, OSHEAN and members were only able to secure funding for a fraction of the \$33.5M required. With budget cuts and endowment freezes, adequate funds are simply not available.</p> <p>OSHEAN estimates the total project budget to be \$33.5M. OSHEAN is seeking a federal funds request of 66.05% (\$22M) and is providing a Cash Match of 31.09% (\$10.4M) and In Kind Match of 2.87%</p>
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	<p>(\$961K). The NPV analysis without BTOP funds amounts to -\$11M. We are seeking a federal contribution of \$22M which is significantly greater than the NPV analysis without BTOP. OSHEAN is depreciating \$4.4M of equipment and amortizing \$27M of fiber. To ensure sustainability, OSHEAN has developed a business model that establishes reasonable pricing models that will produce revenues to cover both operating and project expenses. We recognize that this project will be constructed over a three year period, during which the outlay of funds for capital will be substantial. In later years, as revenues grow, depreciation and amortization are significant non-operating expenses.</p>
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**Funds to States/Territories**

States	Amount of Federal Grant Request
Rhode Island	19,508,881
Massachusetts	2,660,302

**Funds to States/Territories Total:** \$22,169,183

## J. Historical Financials

<b>Matching Funds</b>			
	<b>2007</b>	<b>2008</b>	<b>2009</b>
<b>Revenue</b>	2,636,457	2,961,616	3,238,460
<b>Expenditures</b>	2,492,874	2,822,525	3,122,497
<b>Net Assets</b>	2,101,534	2,240,625	2,356,588
<b>Change in Net Assets from Prior Year</b>	107,826	139,091	115,963
<b>Bond Rating (if applicable)</b>	Not Applicable	Not Applicable	Not Applicable



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## K. Project Readiness

### BTOP Organizational Readiness

#### Organization Credentials

OSHEAN is thoroughly prepared to implement Beacon 2.0 and has a track record of success in implementing similar projects as a non-profit broadband service provider; having operated a fiber-based layer 3 ISP network for the last 10 years. Over that time the network has grown to a multi gigabit capacity. OSHEAN leases dark fiber from providers to take advantage of favorable pricing from upstream ISPs in Boston and connects our 28 non profit member organizations, and numerous buildings to the network core. We are also responsible for the maintenance of the Level 3 Rhode Island State Fiber build. The Core network team was also responsible for the design and maintenance of the NEREN Optical network connecting New England's most prestigious educational institutions.

#### Governance and Management

OSHEAN's President and CEO is George Loftus. He is OSHEAN's chief strategist for the development of innovative technology solutions and was the catalyst for building the coalition of partners and anchor institutions that have endorsed Beacon 2.0 and are making financial commitments to back up those endorsements. OSHEAN maintains an active board of directors, represented by senior professionals at Rhode Island School of Design, Roger Williams Univ., Univ. of RI, Brown Univ., Roger Williams Medical Center, RINET, Lifespan, RI College, and Johnson & Wales Univ. We represent some of New England's most prestigious nonprofit institutions. Our membership is a mirror image of the anchor institutions and other organizations this grant seeks to assist.

#### Project Management and Implementation

OSHEAN has contracted a professional project manager who will oversee the project from beginning to end, and that has already built the project schedule. OSHEAN has impressive vendor partners that lay fiber nationwide and provide turnkey implementation leadership and



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support. In summary, OSHEAN is particularly well qualified to implement and operate a broadband infrastructure and then to be a sustainable broadband services provider.

#### Project Viability

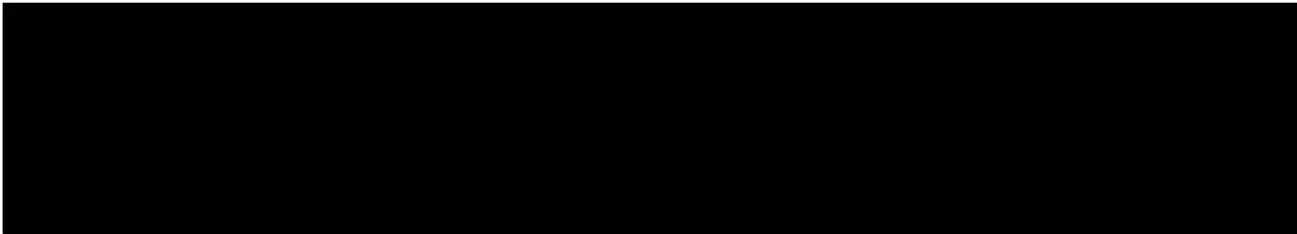
Beacon 2.0 is a viable project whose requirements were driven by the needs of the state and its leading institutions. Considerable planning work was facilitated by OSHEAN and its membership. We worked for several years with our institutional membership to articulate the various individual needs for Beacon 2.0. We have collaborated with the state government, anchor institutions, and key private sector partners. We have obtained letters of financial and technical support from OSHEAN membership and all partners.

#### Financial Accounting and Reporting Systems in Place

OSHEAN's financial statements are prepared in accordance with Generally Accepted Accounting Principles (GAAP) and are audited on an annual basis. Our Certified Public Accountants (CPAs) have certified our internal control procedures as well as our newly designated fixed asset tracking system.

#### Construction and Vendor Contracts

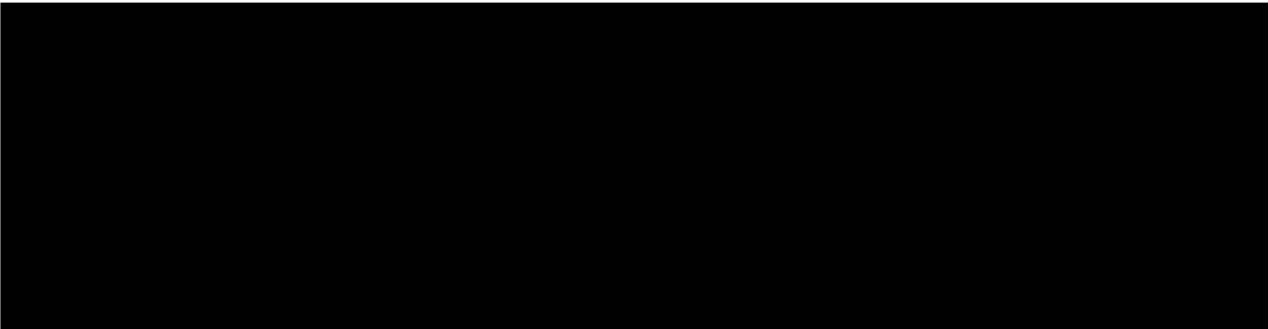
OSHEAN has established agreements with three main partners that will be involved in deploying the Beacon 2.0 network facilities. They include [REDACTED]. Their commitment can be demonstrated by the fact that each of them will provide a cash match to the project, supported by attached letters of commitment.





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**Customer Base**

Within the proposed funded service area, OSHEAN’s existing customer base and Community Anchor Institutions include the following:

Universities, Colleges, and 2 Community Colleges – Within the proposed funded service area, OSHEAN currently has fourteen member institutions which comprise one community college, one state college, two state universities, one naval war college and nine private colleges and universities.

Hospitals, Community Health Centers, Nursing Homes, Veterans Homes, and other Long Term Care Facilities – OSHEAN currently has 5 member organizations that lie in the proposed funded service area. Under the BTOP proposal, OSHEAN will connect two additional health care organizations to the network and open the service to any other interested parties.

State Government and Public Safety Agencies – OSHEAN currently has four state government and public safety agency members in the proposed funded service area. Offices include the RI Division of Information Technology, RI Secretary of State, RI Judiciary System, and RI Disaster Medical Assistance Team. Under the BTOP proposal, OSHEAN will add the City of Providence, State Police, and RI EMA to its membership and open the service to any other interested state and public safety organizations.

K-12 and Libraries – Through its member RINET, OSHEAN may provide services to Rhode Island’s K-12 community and extend services to its Round 1 BTOP Community Computer Center award sub-recipient Ocean State Libraries.



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**Licenses, Regulatory Approvals and Agreements**

OSHEAN hired an engineering consulting firm to conduct site surveys and to advise us on acquiring licenses and regulatory approvals required to implement and operate Beacon 2.0. Our partner Fibertech currently has pole attachment and conduit use agreements with Verizon and National Grid. In addition, they have a Certificate of Registration with the State of Rhode Island to transact business in the State as a Telecommunications provider. They have franchise agreements with the City of Providence and the City of Cranston. Our Environmental Engineer has performed due-diligence on our proposed route. These are the only requirements as of application submittal. For this project, we will require municipal construction permits along the route and potentially additional franchise agreements. Our partners Fibertech Networks and RCN metro are experienced with all required permits.

Finally, we will need building access for those anchor institutions that have agreed to connect directly to Beacon 2.0. We foresee no problem here as these institutions have provided signed letters of support and commitment.

**SPIN Number**

Not Applicable

## **L. Environmental Questionnaire**

**Project Description**

OSHEAN does not anticipate any issues surrounding environmental effects of the network. [REDACTED]

[REDACTED] For this network, we anticipate that we will be using existing telephone poles in the “communication space” along routes that use major streets – i.e. it is unlikely that our network will be along neighborhood



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streets, or protected wetlands. [REDACTED]

**Property Changes**

OSHEAN does not anticipate any requirement to clear, excavate, or otherwise disturb land during the project. We will deploy new network along existing Rights-of-Way and existing telephone poles.

**Buildings**

For this project, OSHEAN’s partners (anchor institutions) will be providing space within their own buildings (universities, hospital facilities, existing data centers) and we do not plan the construction of any new buildings.

**Wetlands**

This project will not affect Wetlands. We will deploy new network along existing Rights-of-Way and existing telephone poles.

**Critical Habitats**

This project will not affect critical habitats. We will deploy new network along existing Rights-of-Way and existing telephone poles.

**Floodplain**

We do not anticipate this project affecting Floodplains.

**Protected Land**

This project will not affect protected lands. We will deploy new network along existing Rights-of-Way and existing telephone poles.

**Coastal Area**

Rhode Island's coastal zone includes the whole state. However, the inland extent of the regulatory authority of the State’s CZMA agency is 200 feet inland from any coastal feature, to watersheds, and to certain activities that occur anywhere within the State that include: power-





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generating plants; petroleum storage facilities; chemical or petroleum processing; minerals extraction; sewage treatment and disposal plants; solid waste disposal facilities; and, desalination plants. As such, we anticipate no problems.

**Brownfield**

This project will not affect Brownfields.



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**Uploads**

The following pages contain the following uploads provided by the applicant:

Upload Name	File Name	Uploaded By	Uploaded Date
Service Offerings and Competitor Data	Upload 01 - Service Offerings - Competitor Data (03-16-10).xls	Loftus, George	03/16/2010
Network Diagram	Upload 02 - Network Diagram (03-17-10).pdf	Loftus, George	03/17/2010
Build Out Timeline	Upload 03 – Project Plan and Build-out Timeline (03-11-10).pdf	Loftus, George	03/11/2010
List of Community Anchors and Points of Interest	Upload 04 - Community Anchor Institutions and Points of Interest (03-18-10).xlsx	Loftus, George	03/18/2010
Management Team Resumes and Organization Chart	Upload 05 - Management Team Resumes And Organization Chart (03-18-10).pdf	Loftus, George	03/18/2010
Government and Key Partnerships	Upload 06 - Letters of Commitment (03-18-10).pdf	Loftus, George	03/18/2010
Historical Financial	Upload 07 - OSHEAN	Loftus, George	03/04/2010



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Statements	Historical Financial Statements (2 yrs).pdf		
Budget Narrative	Upload 08 - Budget Narrative (03-18-10).pdf	Loftus, George	03/18/2010
Detailed Budget	Upload 09 - Detailed Budget (13-11-10).xls	Loftus, George	03/11/2010
Pro-forma Forecast	Upload 10 - Pro Forma Financial Projections (03-18-10).xls	Loftus, George	03/18/2010
Subscriber Estimates	Upload 11 - Subscriber Estimates (03-12-10).xls	Loftus, George	03/12/2010
Dashboard Metrics	Upload 12 - Key Metrics Dashboard (03-18-10).pdf	Loftus, George	03/18/2010
Service Area Data	Upload 13 Service_Areas.xls	Loftus, George	02/24/2010
Network Maps	Upload 15 - Network Maps (03-05-10).pdf	Loftus, George	03/04/2010
BTOP Certifications	Upload 16 - Authentication and Certifications (02-22-10).pdf	Loftus, George	02/22/2010



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SF-424 C and D	Upload 17 - Signed SF-424C and D (03-18-10).pdf	Loftus, George	03/18/2010
Supplemental Information	Upload 18 - Supplemental Information.pdf	Loftus, George	03/22/2010