Broadband Infrastructure Application
Submission to NTIA – Broadband Technology Opportunities Program

Submitted Date:	**Easygrants ID: 4248**
Funding Opportunity: Broadband Technology Opportunities Program	**Applicant Organization:** UNIVERSITY SYSTEM OF NEW HAMPSHIRE
Task: Submit Application - BTOP	**Applicant Name:** Mr. Scott A Valcourt

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A. General Application Information

Applicant Information	
Name and Federal ID for Applicant	
DUNS Number	111089470
CCR # (CAGE)	1JM68
Legal Business Name	UNIVERSITY SYSTEM OF NEW HAMPSHIRE
Point of Contact (POC)	VICTOR SOSA 6038624865 Ext. victor.sosa@unh.edu
Alternate POC	KAREN JENSEN 6038622172 Ext. karen.jensen@unh.edu
Electronic Business POC	VICTOR G. SOSA 6038620533 Ext. victor.sosa@unh.edu
Alternate Electronic Business POC	KATHRYN CATANEO 6038622001 Ext. K.Cataneo@unh.edu

Name and Contact Information of Person to be Contacted on Matters Involving this Application:	
Prefix	Mr.
First Name	Scott
Middle Name	A
Last Name	Valcourt
Suffix	
Telephone Number	603-862-4489

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Fax Number	603-862-3564
Email	Scott.Valcourt@unh.edu
Title	Director, Proj. Mgmt. & Consulting Svcs

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

Project Role	Name	Phone	Email
Secondary Point of Contact	Mr. Peter , Lester	6038620051	pete.lester@unh.edu

Environmental Point of Contact

Prefix: Mr.
Name: Manning, Bradford
Suffix:
Telephone Number: 6038624041
Title: Director

Organization Classification	
Type of Organization	Non-profit Institution
Is the organization a small business?	No
Does the organization meet the definition of a socially and economically disadvantaged small business concern?	No

Authorized Organizational Representative	
AOR Name	SOSA, VICTOR

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Result	Applicant Authorized

Project Title and Project Description

Project Title: Network New Hampshire Now

Project Description: Network New Hampshire Now is a collaborative initiative to build next generation, high speed middle and last mile fiber optic and microwave networks to connect community anchor institutions, homes and businesses to existing state pathways for economic development, education, healthcare and public safety in line with the FCC National Broadband Plan.

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.

Comprehensive Community Infrastructure Components

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

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Middle Mile

Last Mile Rural

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

Easygrants ID	Project Title
5767	Fixed Wireless Accelerated Broadband Adoption for Unserved and Underserved Portions Southwestern NH

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

Fixed Wireless Accelerated Broadband Adoption for Unserved and Underserved Portions Southwestern NH (#5767) seeks to acquire access to middle mile fiber pooled and constructed in the southwestern area of New Hampshire to increase last mile throughput and capacity for fixed wireless broadband.

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?

- Yes, Applicant is exempt because it is an accredited college or university

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:

Name	Title	Employer

B. Executive Summary, Project Purpose and Benefits

Essay Question

Executive Summary of the proposed project:

"Expanding broadband across the nation will build a foundation of sustained economic growth and the widely shared prosperity we all seek." (President Obama, 2010) New Hampshire lacks broadband connectivity that is symmetrical and capable of delivering current and next generation services when compared to the rest of the country. Few New Hampshire towns and cities have high speed, next generation wireless and fiber access, and beyond those areas, many only have Internet access through dial-up or satellite services, if at all. Many social service, non-profit and commercial organizations receive service through expensive copper-based connections. Imagine not being able to send x-rays through the medical network to tertiary hospitals outside of local rural access hospitals; imagine, not being able to pick up emails from customers as the telephony system is down; imagine, doing a doctoral thesis and not being able to have access to the latest research. Imagine, you are on a holiday staying at an inn in the North Country and there is no Internet access. These are some of the realities in the state which keep NH uncompetitive, and turn away potential business and investment.

The lack of a coherent high speed service delivery system encroaches on the ability of NH to remain a vibrant, innovative and relevant state for its citizens. With this backdrop, the NTIA funding opportunity stimulated the NNHN collaborative to take action with the goal of changing

current reality through the development of a "technology corridor", one which thrives on competition, open access, high speed broadband service. It uses a creative sustainable business model which can attract local communities to continually expand service delivery across remote areas of the State.

Proposed Solution (A)
Community, educational, and technology leaders created Network New Hampshire Now (NNHN), to build an integrated open access middle mile and last mile fiber optic network with a focus on unserved and underserved areas of the state. NNHN will significantly increase the capacity and capability of the state's telecommunications infrastructure while making future last mile build-out easier and less expensive. The business model provides affordable broadband service choices to New Hampshire communities and aligns with all seven BTOP priorities.

Proposed Funded Service Areas (B)
NNHN will build new and connect to existing middle mile fiber in all 10 state counties. A last mile fiber network extension will occur in Rindge (southwest near the Massachusetts border) and Enfield (western New Hampshire). A middle mile microwave network will be constructed and connected to the fiber network for public safety, transportation, public TV and mobile broadband communications on existing mountaintops across New Hampshire.

Proposed Services and Users (C,D,I,J,K)
The network will touch more than 150 communities affecting over 600,000 households and over 900 community anchor institutions including 134 public safety entities, 197 hospitals and medical facilities, 178 educational institutions and 234 public libraries. The network will involve over 450 miles of newly constructed open access fiber optic cable and will leverage over 200 miles of existing dark fiber. The NNHN project will connect nearly 900 distinct subscribers initially, and is projected to connect 200,000 subscribers in 8 years. The project requires $66 million to implement the middle and last mile fiber and wireless networks and provision the network for multiple party usages. The fiber expansion and the 3,800 square mile coverage area of the microwave wireless network will cross 135 Census tracts, create or retain 24 jobs directly through the funding of this project, and will create over 650 additional jobs indirectly statewide.

Type of Broadband System (G)
The fiber optic network will interconnect existing dark fiber as well as build out new middle mile and last mile systems. Owners and service providers on the network will offer services using

common fiber assets. The research and education community will operate dense wave division multiplexing (DWDM) technology, initially capable of providing up to 32 wavelengths each with a capacity of 10Gbps speeds and offering a long-term growth path of increasing speeds higher than 100Gbps and wavelength density greater than 64, all of which are commercially available today. In order to assure convenient access and connectivity for last mile services, the fiber network will support extensions with access points at 1500 foot intervals. Huts and splice points will be placed in or near existing telephone Central Offices (CO). The last mile network uses a state of the art Layer 3 open access architecture that provides symmetric 100Mbps connections to homes, businesses, and community anchor institutions. The microwave network is a point-to-point ring network across 15 mountaintops in New Hampshire offering secure segmented channels of broadband speed traffic for multiple state agencies.

Non-Discrimination and Interconnection Obligations (F)
Any broadband service provider will be able to connect to the NNHN middle mile network to bring cost-effective, high-speed broadband services to the state. One of the current barriers to broadband deployment, identified by the New Hampshire Broadband Action Plan and the FCC National Broadband Plan, is the high cost and low-availability middle mile hurdle that providers must overcome to deploy cost-effective last mile solutions. To encourage last mile expansion, an NNHN partner, New Hampshire FastRoads (FastRoads), will construct middle and last mile fiber and allow any provider to serve customers across the network. NNHN will place network access points in or near existing CO locations allowing all commercial broadband providers to potentially leverage the fiber optic network built across the state regardless of protocol, service or technology.

Applicant and Partner Qualifications (H)
The NNHN consortium brings a wealth of expertise to the initiative:
New Hampshire Department of Resources and Economic Development (DRED)
University System of New Hampshire (USNH)
Community College System of New Hampshire (CCSNH)
New Hampshire FastRoads Coalition (FastRoads), including:
West Central New Hampshire Network (WCNH.net),
Southwest Region Planning Commission (SWRPC),
Keene Municipal Broadband Committee,
Monadnock Economic Development Corporation (MEDC), and the
New Hampshire Community Development Finance Authority (CDFA)

Commercial networking and service providers such as TelJet Longhaul, BayRing Communications, Sovernet Communications, Aviat Networks
Other state agencies, community anchor institutions, and Internet service providers.
The NNHN combined years of technology and business experience will ensure the project's success. Core competencies include: designing, building and operating broadband networks; economic and community development; management of multi-stakeholder initiatives; complex project management; and government contract oversight and accountability.

Business Model (E)
The NNHN networks will be managed by two entities, the New Hampshire Fiber Network (NHFN) and FastRoads.

The common middle mile fiber assets (both newly constructed through BTOP and existing fiber contributed in-kind by commercial vendors) will be owned and governed by NHFN. The common owners of NHFN will be the governing board members, each owning the shares of NHFN. All owners, as evidenced by Indefeasible Right to Use (IRU) fiber leases, will cover the cost of maintenance and operations of the fiber network. Other providers will be welcome to use and lease the fiber network and the many attached letters of commitment from providers and potential customers demonstrate significant pent-up market demand for next generation fiber optic connectivity.

FastRoads will own middle and last mile fiber to the premises (FTTP), construct new provider-neutral infrastructure, and open the network to any service provider to serve those premises connected to the network. FastRoads will charge providers a share of their revenue to cover infrastructure costs, debt service, and operations and to enable expansion into middle and last mile premises not included in the initial plan. FastRoads, working with CDFA, will create a revolving loan/equity fund and will use earnings generated by use of the infrastructure to finance technical assistance and seed capital to replicate the model in other regions of the state until next generation broadband access exists statewide.

Numerous entities statewide recognize the power of NNHN and support the build of a "technology corridor" with a focus on education, health service and economic development. Since State resources to support this initiative are severely limited, NTIA funding will provide much needed relief to those who have been actively seeking next generation broadband service for several years.

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Project purpose:

The purpose of this project is to expand next generation fiber optic broadband connectivity in an open-access manner to unserved and underserved areas in New Hampshire and increase competition to accelerate deployment of 100Mbps capacity proposed by the FCC National Broadband Plan. The greatest deterrent to delivering such 100Mbps capacity is the lack of a robust and open-access core fiber network. The legacy copper wire is not up to tomorrow's competitive challenges. Extending the availability of middle mile fiber to areas of New Hampshire without this capacity, coupled with construction of a last mile fiber network that reaches entire communities as detailed by FastRoads will increase broadband usage in New Hampshire to a level not realized by current methods. The development of adequate middle mile fiber will remove a significant barrier to providers attempting to enter unserved and underserved regions. The middle mile network created by the New Hampshire Fiber Network (NHFN), coupled with the incentive of financial benefits that can be leveraged through the community development and private funding sources, will allow last mile entities to be in a position to extend that last mile service in communities across New Hampshire. In particular, funding of this proposal will enable FastRoads to begin immediately leveraging the middle and connect last mile fiber to homes, businesses, and anchor institutions.

The education engine that fuels our state requires access to the sharpest minds and the best tools to keep that engine operating at peak performance. Broadband enables distance education, skills training, research collaboration, remote equipment access, and idea sharing. The mission to educate New Hampshire is primary for the University System of New Hampshire (USNH) and the Community College System of New Hampshire (CCSNH). This outreach involves strategic program support for schools, libraries, medical and health care providers, other institutions of higher learning and other community support organizations.

This project includes an innovative and effective solution to meet public safety agencies' need for improved access to broadband. The NNHN microwave component integrates multiple disparate systems into a single, open-access microwave wireless network across New Hampshire's mountaintops. The number of antennas on those mountaintop towers in use by public safety agencies will be significantly reduced. This will free up (what is today very scarce) antenna space on the towers for future commercial mobile broadband access providers and offer public safety the broadband capacity to operate in all emergency conditions. Being a heavily wooded and mountainous state, New Hampshire frequently experiences weather conditions that

strain public safety's ability to effectively function during crisis situations when particularly high data transfer rates are required in mobile and remote environments. This project to modernize microwave network equipment on New Hampshire's mountains will benefit all New Hampshire citizens by improving public safety's ability to provide its vital services.

Broadband access is a key economic development driver in the creation of new jobs and in the training of skilled workers for those new and emerging jobs, especially jobs that target vulnerable populations across our state. Several studies from Carnegie Mellon University demonstrate that broadband in a community is a major stimulator for economic growth and job creation.

This project has a strong healthcare component in that major healthcare anchor institutions are targeted as locations to draw middle mile fiber into the community. New Hampshire has already received $5.5 million in federal ARRA funds for healthcare information transfer through the New Hampshire Department of Health and Human Services (HHS). The fiber networks being constructed in this proposal, both middle mile and last mile, are key components to ensuring success for HHS.

Recovery Act and Other Governmental Collaboration:

A number of projects in NH that would support or would have strong synergies with this proposal already have received funding through the American Recovery and Reinvestment Act (ARRA). Funding ($2.87 million) for the construction and lease of 12 fibers via an Indefeasible Right to Use (IRU) lease for Dartmouth College and the University of New Hampshire has been provided by both the National Science Foundation and the National Institutes of Health.

The New Hampshire Department of Health and Human Services has received $5.5 million for the State Level Health Information Exchange Assessment, Planning and Design Project which will require robust and highly-available broadband network access for hospitals and healthcare facilities.

BTOP Round 1 funding provided to Maine Fiber Company for the Three Ring Binder project (BTOP application #1149) will allow for connection between Maine's new infrastructure and that of the Network New Hampshire Now initiative via a connect point in the Conway-Fryeburg region. This state-to-state network connection will strengthen the region's middle mile fiber

networks by providing multiple pathways in the event of fiber or service disruptions on any single connection.

The Department of Housing and Urban Development's (HUD) Community Development Block Grant (CDBG) program is a key funding source for the New Hampshire Community Development Finance Authority (CDFA). While CDBG grants are awarded competitively, it is not unreasonable to assume that some such funds will be awarded to communities during the grant period for the expansion of the FastRoads network into unserved or underserved communities.

The New Hampshire Office of Economic Recovery used discretionary ARRA funds to establish the position of Department of Resources and Economic Development (DRED) Director of Broadband Technology. Funds are requested in this proposal to continue to support the Director for three years, with the position becoming self-funded through the NHFN.

The New Hampshire State Library receives federal funds to maintain connectivity for all 234 municipal library connections, as well as for the maintenance of databases that are accessed by municipal libraries across the state.

The Bretton Woods Telephone Company received ARRA funds through the BIP program (application #2471) in Round 1 to establish FTTP connections to 400 homes and businesses. Key to their continued success is the ability to expand aggregate middle mile access for their network, which is possible through the NNHN middle mile network.

NTIA awarded the University of New Hampshire's GRANIT research group with a $1.7 million grant for broadband mapping. Working in conjunction with the Regional Planning Commissions in the state, a comprehensive database and map of broadband availability down to the premises level will be complete within the next two years.

Fit with BTOP CCI Priorities:

Network New Hampshire Now (NNHN) will provide Comprehensive Community Infrastructure enhancement via creation of a high-speed, middle mile fiber network that emphasizes bringing next generation, high speed, open network connectivity to community anchor institutions and last mile to communities. Accordingly, NNHN addresses all seven BTOP priorities as outlined below.

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1. This project provides Comprehensive Community Infrastructure enhancement by creating a high-speed, middle mile fiber optic network to community anchor institutions with last mile connections to communities. The project plan has been defined to meet the build requirement of 67% complete in 2 years, and 100% complete in 3 years. Our detailed plan documents specify how this will be accomplished.

2. NNHN is comprised of a diverse consortium of public, private, and non-profit entities. The members' expertise and commitment to bringing expanded broadband access to New Hampshire in an affordable, reliable, and sustainable manner create the conditions for this project's success. This strength of the consortium is demonstrated by letters of support from communities all over New Hampshire.

3. NNHN addresses the needs of New Hampshire regions and communities that are below average in economic development. While the HEPGIS online information maps show no counties in New Hampshire as economically distressed, an analysis completed by Plymouth State University in January 2010 shows that Coos County qualifies as economically distressed per the NOFA definition.

4. Higher education and economic development are key areas of focus, especially the Community College System of New Hampshire and locations in need of new economic growth engines, both of which will play significant roles in determining the future of New Hampshire. The Community College System of New Hampshire is accredited by the New England Association of Schools and Colleges (NEASC) and currently serves 12,000 students and 24,000 learners across 7 campuses and 4 academic centers throughout the state. Letters of support from all the public institutions of higher education in New Hampshire demonstrate the critical role NNHN will play in advancing education.

5. NNHN fully supports and enhances public safety communications. The proposed microwave network - to be installed on existing mountaintops - would provide public safety entities in NH with access to a consolidated and modern communication network. These microwave transmitters will be integrated with the middle mile fiber network running to the mountains, thus ensuring continuity of service even during disrupting events such as natural disasters. Our design documents and letters of support from public safety agencies across New Hampshire demonstrate how NNHN addresses this priority.

6. While middle mile network components are the primary focus of the project and account for 97% of the project cost, NNHN recognizes the need for last-mile components in order to provide the level of access desired by New Hampshire citizens. The NNHN project includes a specific last mile component, FastRoads, as well as letters of commitment from commercial Internet Service Providers to deliver last mile services to specific areas of the state.

7. This project involves the construction of middle mile infrastructure utilizing federal funds. A 32.46% non-federal cost match is provided by funds from community anchor institutions and other private sources as evidenced in their letters of commitment.

Consequently, we believe that the Network New Hampshire Now project is an excellent example of communities coming together in a private-public partnership to develop a common resource.

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

- No

Is the applicant deliquent on any federal debt?

- No

If Yes, justification for deliquency:

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: Sub-recipient
Name: Veenstra, Alice
Phone: 6037179123
Email: aveenstra@nhcdfa.org
Address 1: 14 Dixon Avenue, Suite 102
Address 2:
Address 3:
City: Concord
State: New Hampshire
Zip Code: 03301
Organization: New Hampshire Community Development Finance Authority
Organization Type: State or State Agency
Small business: No
Socially and economically disadvantaged small business concern: No

Project Role: Third party in-kind contributor
Name: Kelly, Greg
Phone: 8022643000
Email: gkelly@teljet.com
Address 1: 45 Krupp Drive
Address 2:
Address 3:
City: Williston
State: Vermont
Zip Code: 05495
Organization: Teljet Longhaul
Organization Type: For-profit Entity
Small business: Yes
Socially and economically disadvantaged small business concern: No

Project Role: Third party in-kind contributor
Name: Dugan, Jack
Phone: 6033524939
Email: jdugan@monadnock-development.org
Address 1: 39 Central Square, Suite 201
Address 2:
Address 3:
City: Keene
State: New Hampshire
Zip Code: 03431
Organization: Monadnock Economic Development Corporation
Organization Type: Non-profit Corporation

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Socially and economically disadvantaged small business concern: No

Project Role: Third party in-kind contributor
Name: Kendall, Rich
Phone: 8024632111
Email: rkendall@sover.net
Address 1: PO Box 495
Address 2: 5 Canal Street
Address 3:
City: Bellows Falls
State: Vermont
Zip Code: 05101
Organization: Sovernet Communications
Organization Type: For-profit Entity
Small business: No
Socially and economically disadvantaged small business concern: No

Project Role: Sub-recipient
Name: Markow, Denise
Phone: 6032716862
Email: dmarkow@dot.state.nh.us
Address 1: PO Box 483
Address 2: 7 Hazen Drive
Address 3:
City: Concord
State: New Hampshire
Zip Code: 03302-0483
Organization: New Hampshire Department of Transportation
Organization Type: State or State Agency
Small business: No
Socially and economically disadvantaged small business concern: No

Project Role: Sub-recipient
Name: Kowalik, James
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Address 1: 33 Hazen Drive
Address 2:
Address 3:
City: Concord
State: New Hampshire

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Zip Code: 03305
Organization: New Hampshire Department of Safety
Organization Type: State or State Agency
Small business: No
Socially and economically disadvantaged small business concern: No

Project Role: Third party in-kind contributor
Name: Freeman, John
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Email: jfreeman@ncic.org
Address 1: 347 Portland Street
Address 2:
Address 3:
City: Saint Johnsbury
State: Vermont
Zip Code: 05819
Organization: Northern Community Investment Corporation
Organization Type: Non-profit Corporation
Small business: No
Socially and economically disadvantaged small business concern: No

Project Role: Third party in-kind contributor
Name: Eades, Juliana
Phone: 6032246669
Email: info@communityloanfund.org
Address 1: 7 Wall Street
Address 2:
Address 3:
City: Concord
State: New Hampshire
Zip Code: 03301
Organization: Community Loan Fund
Organization Type: Non-profit Corporation
Small business: No
Socially and economically disadvantaged small business concern: No

Project Role: Sub-recipient
Name: Miller, Carol
Phone: 6032712341
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Address 1: P.O. Box 1856
Address 2: 172 Pembroke Road

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Address 3:
City: Concord
State: New Hampshire
Zip Code: 03302-1856
Organization: New Hampshire Department of Resources and Economic Development
Organization Type: State or State Agency
Small business: No
Socially and economically disadvantaged small business concern: No

Project Role: Other
Name: Beyer, William
Phone: 6032712722
Email: bbeyer@ccsnh.edu
Address 1: 26 College Drive
Address 2:
Address 3:
City: Concord
State: New Hampshire
Zip Code: 03301-7407
Organization: Community College System of New Hampshire
Organization Type: Non-profit Institution
Small business: No
Socially and economically disadvantaged small business concern: No

Project Role: Contractor
Name: Kerrigan, John
Phone: 6502122212
Email: john.kerrigan@aviatnet.com
Address 1: 637 Davis Drive
Address 2:
Address 3:
City: Morrisville
State: North Carolina
Zip Code: 27560
Organization: Aviat Networks
Organization Type: For-profit Entity
Small business: No
Socially and economically disadvantaged small business concern: No

Project Role: Third party in-kind contributor
Name: Foucher, Brian
Phone: 6035467200

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Email: brianf@wivalley.net
Address 1: P.O. Box 1179
Address 2:
Address 3:
City: Keene
State: New Hampshire
Zip Code: 03431
Organization: WiValley, Inc.
Organization Type: For-profit Entity
Small business: Yes
Socially and economically disadvantaged small business concern: No

Project Role: Third party in-kind contributor
Name: Thayer, Banjamin
Phone: 6037661000
Email: bthayer@bayring.com
Address 1: 359 Corporate Drive
Address 2:
Address 3:
City: Portsmouth
State: New Hampshire
Zip Code: 03801
Organization: CenCel, Inc. dba BayRing Communications
Organization Type: For-profit Entity
Small business: Yes
Socially and economically disadvantaged small business concern: No

Project Role: Contractor
Name: Carmichael, James
Phone: 9788080347
Email: rcarmichael@waveguidefiber.com
Address 1: 75 Ski Hill Drive
Address 2:
Address 3:
City: Northfield
State: New Hampshire
Zip Code: 03276
Organization: WaveGuide Communications
Organization Type: For-profit Entity
Small business: Yes
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Description of the involvement of the partners listed above in the project.

The NNHN project is built on public and private partnerships that will result in a New Hampshire (NH) fiber holding corporation to hold and manage the middle mile fiber.

Public & Non-Profit Partners
Education & Research: The University and Community College Systems of NH are providing technology, research and education leadership.

The University System of New Hampshire (USNH) is comprised of four institutions: University of New Hampshire (UNH), Keene State College, Plymouth State University and Granite State College. USNH has 30,000 enrolled students and 75,000 in-state alumni. UNH is the flagship institution, running NH's current statewide research and education network and has a long-standing relationship with similar networks in the US, such as the Northeast Research and Education Network (NEREN), Internet2, and National Lambda Rail. In addition to being a primary customer of the middle mile network, UNH will provide executive leadership through its CIO and Provost and in-kind match of personnel costs.

The Community College System of New Hampshire (CCSNH) has 7 campuses and 4 academic centers that enroll 12,000 full time students and 24,000 learners each year; 99% of the state's population lives within 25 miles of a CCSNH site. Broadband expansion is part of CCSNH's strategy to increase online offerings and expand access and affordability. CCSNH is committed to being a customer of the middle mile network.

State Agencies: NH's state agencies have worked to maximize state and federal investment in Comprehensive Community Infrastructure. Led by the Department of Resources & Economic Development (DRED), the Departments of Safety, Transportation, Education, and Health & Human Services are pooling their technology leadership and approaches. In particular, the Department of Safety, together with New Hampshire Public Television, is spearheading the creation of a microwave network to significantly improve NH's public safety capability and capacity.

Economic Development: NH Community Development Finance Authority (CDFA) administers $40 million in funding resources, including state business tax credits, federal Community

Development Block Grants, Neighborhood Stabilization funding and several loan programs. The Monadnock Economic Development Corporation will serve as the parent corporation for FastRoads. Consequently, CDFA and FastRoads have brought $2.3 million to the initiative.

These public/non-profit partners will ensure that the public interest goals of the BTOP program are realized. Fiber will be allocated for public use to drive improvements in education, research, public safety, healthcare and economic development. The proceeds of the middle mile fiber operation will fund the expansion, improvements and outreach of next generation broadband usage.

Private Partners
Telecommunications Vendors: Expert, reliable Competitive Local Exchange Carriers (CLEC) and fiber construction companies are contributing in-kind and cash match in return for fiber shares to expand their service areas, especially those unserved and underserved. Vendors have contributed technology and business leadership, and over $16 million in match funding. They include Teljet Longhaul, BayRing Communications, Northern Community Investment Corporation, Sovernet Communications and Aviat Networks.

Teljet Longhaul has implemented the largest open-access fiber-to-the-premises (FTTP) telecommunications network in Vermont, with a high degree of infrastructure diversity, security, and reliability. Teljet's core principle is to support healthy local economies by delivering fiber optic-based telecommunications services and solutions, enabling businesses and institutions to provide superior products and customer service and to be better able to compete locally and internationally. Teljet has been in business for 8 years and is a NH CLEC. Teljet currently is the awardee on NIH- and NSF-funded projects led by UNH.

A leading regional provider of voice and data telecommunications services, BayRing Communications helps businesses achieve the quality and reliability needed to maintain first-rate voice and data networks. BayRing has been in business for 13 years, and is a NH CLEC. BayRing has thousands of customers in New Hampshire.

Sovernet Communications provides reliable Internet and telecommunication services to residential and business customers throughout Northern New England. Sovernet has been in business for 15 years, is a New Hampshire CLEC and is providing commitment and funding to operate a pathway within the middle mile network.

Northern Community Investment Corporation (NCIC) specializes in job creation and retention for Carroll, Coos and Grafton Counties (North Country) of New Hampshire. Their Wireless LINC project is a publicly financed fixed wireless infrastructure allowing open access for for-profit Internet Service Providers and other vendors to deliver competitive services to the region's businesses and homes. The investment of NCIC in the project will allow Wireless LINC to expand backhaul services and encourage further investment in the last mile in the North Country.

Aviat Networks is a global provider of end-to-end wireless solutions for mobility and fixed wireless networks. Aviat's expertise in designing and building microwave wireless networks, along with their long involvement with public safety entities as the former Harris Stratex, makes them a key partner in this project.

In return for match and investment, all participants will be shareholders in the holding corporation.

Together, the public, non-profit and private participants support this vision for achieving open broadband access for New Hampshire. The parties have agreement on a sustainable model that supports economic growth, public service, last mile expansion and community development. The private and public participation demonstrates the encompassing support for the NNHN initiative.

D. Congressional Districts

Applicant Headquarters

- New Hampshire

Project Service States

New Hampshire

Project Service Areas

New Hampshire - 1

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New Hampshire - 2

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

- No

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

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

- No

E. Service Area Details

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

- No

Project Details

Service Area Type: Last Mile
Service Area Name: Enfield
Rural Classification of the Last Mile Service Area: Rural
Service Status of the Last Mile Service Area: Underserved

If Service Status is "Underserved" please select at least one applicable option from this list.
No more than 50% of the households in the proposed funded service area have access to facilities-based, terrestrial broadband service at greater than the minimum broadband transmission speed;
No fixed or mobile broadband service provider advertises broadband transmission speeds of at least 3 mbps downstream in the proposed funded service area;
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

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Total Square Miles in Service Area: **40**
Total Population in Proposed Service Area: **4,618**
Total Number of Households in Service Area: **324**
Total Number of Businesses in Service Area: **22**
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: **11**
Unemployment Rate in the Service Area: **7**
Median Income in the Service Area: **47,990**
Estimated Percentage of Households with Access to Broadband: **30**
Estimated Percentage of Households Subscribing to Broadband: **20**

Service Area Type: Last Mile
Service Area Name: Rindge
Rural Classification of the Last Mile Service Area: Rural
Service Status of the Last Mile Service Area: Underserved

If Service Status is "Underserved" please select at least one applicable option from this list.
No more than 50% of the households in the proposed funded service area have access to facilities-based, terrestrial broadband service at greater than the minimum broadband transmission speed;
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

Total Square Miles in Service Area: **37**
Total Population in Proposed Service Area: **5,451**
Total Number of Households in Service Area: **467**
Total Number of Businesses in Service Area: **57**
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: **12**
Unemployment Rate in the Service Area: **7**
Median Income in the Service Area: **50,494**
Estimated Percentage of Households with Access to Broadband: **40**
Estimated Percentage of Households Subscribing to Broadband: **30**

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Service Area Type: Middle Mile
Service Area Name: New Hampshire Fiber Network
Rural Classification of the Last Mile Service Area: Non-Rural
Service Status of the Last Mile Service Area: Underserved

If Service Status is "Underserved" please select at least one applicable option from this list.
No more than 50% of the households in the proposed funded service area have access to facilities-based, terrestrial broadband service at greater than the minimum broadband transmission speed;
The rate of broadband subscribership for the proposed funded service area is 40% of households or less.

Total Square Miles in Service Area: **3,858**
Total Population in Proposed Service Area: **616,383**
Total Number of Households in Service Area: **367,549**
Total Number of Businesses in Service Area: **12,624**
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area: **908**
Unemployment Rate in the Service Area: **8**
Median Income in the Service Area: **63,989**
Estimated Percentage of Households with Access to Broadband: **45**
Estimated Percentage of Households Subscribing to Broadband: **35**

F. Community Anchor Summary

Community Anchor Summary	
Schools (k-12)	159
Libraries	234
Medical and Healthcare Providers	197
Public Safety Entities	134
Community Colleges	11
Public Housing	1

Other Institutions of Higher Education	8
Other Community Support Organization	19
Other Government Facilities	145
TOTAL COMMUNITY ANCHOR INSTITUTIONS	**908**
Historically Black colleges and Universities	0
Tribal Colleges and Universities	0
Alaska Native Serving Institutions	0
Hispanic Serving Institutions	0
Native Hawaiian Serving Institutions	0
TOTAL MINORITY SERVING INSTITUTIONS	**0**

G. Project Benefits

Demographics

Jobs	
How many direct jobs-years will be created from this project?	24
How many indirect jobs will be created from this project?	416
How many jobs will be induced from this project?	234

Methodology used to estimate jobs:

Job-years estimates were produced by employing the methodology suggested by the Council of Economic Advisors in the document located at http://www.whitehouse.gov/administration/eop/cea/estimate-of-job-creation/. This approach equates $92,000 of spending with the creation of one job-year.

While the method does not take into account differences in wages and other costs across different project types and national geography, we find that this simple calculation resonates well when applied in our project in the telecommunications construction sector.

The direct and indirect effects of job creation parallel the project spending, and the induced effect is estimated as being the difference between total jobs created and the estimate of the direct and indirect jobs, 64% of the job-years created represent direct and indirect jobs while 36% are induced jobs.

Using this methodology, Network New Hampshire Now is able to produce job-years estimates that are consistent with government standards. This approach eliminates any points of confusion or contention that could arise from utilizing an alternative methodology, thus increasing the project's accountability.

Project Impact:

Network New Hampshire Now (NNHN) will build new middle mile fiber and will extend existing middle mile fiber across a combined 650 miles of New Hampshire in areas that have been without broadband access or have suffered from significantly inadequate broadband for years. Next generation, open architecture fiber infrastructure will increase competition and accelerate the deployment of 100Mbps connectivity in NH in line with the FCC's National Broadband Plan.

The proposed middle mile service area will extend existing fiber optic network cabling with additional build-out of fiber from Portsmouth (SE) through Rochester to Concord, south through Manchester, west to Rindge and Keene (SW), north to Orford (NW), east to Plymouth (North Central), north to Lancaster and Berlin, and back to Manchester.

NNHN will be governed by a public-private partnership that is committed to creating a fair system of affordable and open access to these new fiber resources. NNHN will encourage the use of this community fiber resource to continually expand broadband access in New Hampshire.

The New Hampshire Broadband Mapping Project currently is collecting broadband access data that empirically verifies the statements of need that this project has acquired. In all of these communities, from large city to unincorporated township, broadband access is either impossible to purchase or the only available option to the premises is too expensive. New Hampshire's terrain in the north and west is mountainous, and the population sparse. The only offering for a community anchor institution to secure broadband services from existing providers in the area is typically copper-based and offers a per-Megabit rate whose cost prevents greater investment in service. The primary rationale cited by commercial providers who could service a region with broadband but choose to not do so, is that of declining returns. NNHN's model overcomes these barriers.

The educational institutions in this project have a significant disadvantage when seeking research data and collaboration opportunities with partners within and outside of New Hampshire. The existing broadband networks do not meet the minimum standards for connectivity to major national and international networks such as TERAGRID, which requires a dedicated 10Gb connection for a research institution to participate in next-generation communications research. Simple data sharing is hampered to an extent that makes New Hampshire non-competitive on the regional and world stage. Plymouth State University's Weather Center, an often-consulted resource for current and archived weather system analysis, is served via a 300Mb Internet connection, which is shared among 5000 students, faculty and staff. Plymouth needs more bandwidth to meet the needs of research and education, but the cost of adding more capacity exceeds the budget to sustain the connectivity. Development of a fiber optic middle mile network will increase the available capacity for Plymouth and other community anchor institutions by orders of magnitude without exceeding the budget for that capacity.

The goal of FastRoads is to remedy this lack by providing fiber connectivity to every home, business, and community anchor institution in the designated service area first, then the region, then the state in as little time as possible and with as much fiber service as is feasible given density and terrain. FastRoads will initially build next generation last mile fiber to the premises (FTTP) to Rindge and Enfield. This region of New Hampshire has a high concentration of unserved and underserved broadband areas, as evidenced by the volume of letters of need and support for the project. Investment in this region and the state has been sporadic, with most service providers finding it extremely difficult to deliver the middle mile backhaul required to significantly connect widespread last mile premises. As a result, underserved communities exist,

with the discrepancies being as blatant as the first four houses on a town road connected to broadband and the following three houses down the road unconnected.

It is not economically feasible for the private sector to provide this high-capacity access for most of the region given the rural nature of the area outside downtown Keene and downtown Hanover. Therefore, FastRoads will build the new middle and last mile fiber infrastructure that is needed in communities, leveraging existing fiber where it is accessible, and opening up the developed network to any service provider to serve those premises connected to the network. FastRoads will charge providers a share of their revenue to cover the infrastructure costs, debt service, and operations. Part of the revenue will be directed into a revolving loan/equity fund that will enable expansion of pathways and equipment into the last mile areas not included in the project plan until all of New Hampshire has broadband access.

FastRoads sees this NTIA funding as a vital opportunity to begin a project whose geographical scope will extend across New Hampshire. Seed capital from NTIA is crucial to the launching of this project.

The microwave partners currently communicate at limited bandwidth on separately owned microwave systems. Many of the partners are not able to communicate to all sites due to the lack of bandwidth availability. This project will replace and upgrade this core middle mile microwave backbone to allow ample bandwidth for each or the public safety institutions and public television and will provide added capacity and new capabilities to each of them as outlined in the support letters. The consolidation of microwave systems also will free-up space on existing overcrowded towers, enabling commercial providers to install antennas and provide service for wireless broadband in un-served and underserved rural areas.

Severe weather events consistently demonstrate that New Hampshire's microwave networks remain operational while copper and fiber landlines are interrupted. Public safety stakeholders require communication systems to be located on mountaintops to enable emergency communications to vehicles and temporary incident management command posts during disasters.

With BTOP funding, this shared microwave network will allow the partners to provide enhanced services in existing coverage areas, and provide new services to rural areas. These services are described in attached letters of support.

There are several exciting additional factors and interested players in this project. For example, the Northern Community Investment Corporation (NCIC) is a non-profit group that connects institutions with funding and development opportunities. NCIC has provided a commitment letter and will provide essential sustaining funds and last mile service for the NNHN network. NCIC continues to grow Wireless LINC, a provider-neutral wireless last mile solution that is effectively reaching homes, businesses, and institutions in the mountainous northern region of NH.

The Network New Hampshire Now project will dramatically increase broadband availability and use in New Hampshire. NNHN is not a static thing. It is designed to accommodate growth, stimulate a healthy broadband marketplace, and continually strengthen New Hampshire's economic and educational capacity for years to come.

Vulnerable Populations:

The middle mile structure will have a direct affect on areas of NH that fit the definition of "economically distressed." While the NTIA maps do not indicate any distressed areas in NH, Coos County, which is the largest county in NH, meets the third criterion both in terms of per-capita income as well as unemployment rate. The area's per capita income of $17,218 in 1999 (the last US Census) represented 80% of the national figure. In 2007, NH's per capita personal income was 80% of the national figure as well ($30,892 versus $31,179). Most recently, the North Country Economic Index released by Plymouth State University in January 2010 details a 5.3% drop in wages and salaries over the last year alone. The Index is a monthly economic report to gauge the performance of the economy in the northern rural New Hampshire counties, which include Coos County. It can be found at: http://www.plymouth.edu/north-country-economic-index.

Coos County's unemployment rate was 8.4% in 2008, meeting the requirement that the rate be greater than 1% of the federal unemployment rate of 7.5%. It also should be noted that 2009 was a difficult year for Coos County, with several major shut downs and layoffs, all of which had a ripple effect on area small businesses and services. The result was a 4.3% yearly decline in covered employment in the fourth quarter (NH Employment Security, 2009).

This economic situation combined with the fact that this region has the lowest broadband penetration rate in the state (both in terms of availability and usage), presents a compelling picture as to why economic development is so challenged in this area.

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Level of Need:

New Hampshire has no funds available to invest in critical infrastructure. There are severe constraints on increased investment in next generation, open access infrastructure that would increase competition and accelerate access to 100Mbps connectivity needed to future proof New Hampshire's economy and spur innovation and economic growth in the public and private sectors. The State of New Hampshire Broadband Action Plan asserted that the number one need for the state was a coordinating leader around the issues of telecommunications development. The DRED Director of Broadband Technology position was created by an act of the New Hampshire Legislature as a result of the Broadband Action Plan and signed into law by the Governor, but no funding was provided for the position. ARRA funds provided to the state stimulus office were used to support this DRED Director position in 2009 but will soon run out.

Few public records exist to highlight the availability of broadband throughout the state. Franchise records of broadband cable providers, along with CLEC filings with the Public Utilities Commission, has offered some mapping data at a town level. The NTIA Broadband Mapping Initiative has awarded funds to the University of New Hampshire to collect and map at the premises level available broadband connectivity. With that data, the state will learn exactly where broadband exists. Until the project has progressed, there is no strong aggregate data.

Already the most remote, coldest, and most sparsely populated region in New Hampshire, the North Country economy has suffered due to the recent collapse of the paper industry. Berlin, Littleton, and Lancaster are three vital, but struggling, municipalities in the North Country that are home to Community College campuses, Granite State College and Cooperative Extension offices. Each of these institutions has only primitive Internet capacity because of the high cost of those services.

The North Country and other regions of New Hampshire demonstrate a phenomenon that is no doubt common across the country. A lack of significant business drivers prevents carriers and ISPs from investing in capacity for these regions; the lack of a market balance for Internet services results in high-cost and low speed access for the people, businesses, and institutions in the region. The network will address this problem by providing high-capacity open-access infrastructure that otherwise would not be built. This removes the barrier for Internet and access service providers doing sustainable business in the region.

In 2006, in its initial study of the feasibility of a regional open access fiber network, WCNH.net (eight towns in west central NH) performed a telephone survey of homes and businesses to determine level of access to high speed Internet service and the monthly expenditures for telecommunications services. The result was surprising, even to those involved with the broadband project: while 92% of the respondents subscribed broadband service, almost 42% percent were using dial-up (the remainder was split between cable and DSL service). In addition, the survey reported that residents were spending over $150 per month on telephone, video, and Internet services (excluding cellular service).

In particular, there is a clear shortage of affordable broadband services, and of next generation high speed connectivity across the state that risks the long term economic health and vitality of its residents, businesses and institutions in spite of the efforts of dozens of representatives of municipalities, anchor institutions (including regional medical centers, school districts, colleges and universities, chambers of commerce, major employers and social service agencies), regional planning commissions, regional economic development corporations, and local citizens over the last ten years or more to craft a solution that will bring broadband services to unserved and underserved communities. In his August 19, 2009 letter, David Evancich, Vice President of the Dartmouth-Hitchcock Medical Center, stated: "With the internet, patient portals, remote clinical monitoring of chronic health conditions and many other electronic innovations rapidly becoming essential to advancing health care while controlling costs, expanding broadband access is essential to enhancing connectivity to residents, especially in rural settings like west central New Hampshire." The longstanding, concerted community efforts signify the extent of the need, while the decade-long lack of success reflects the many barriers to broadband deployment this region faces. These barriers include: challenging geography; unwilling or disinterested providers who have determined that widespread broadband deployment is not a profitable business venture in this area; a powerful telecommunications lobby at the state level determined to stymie regional efforts to build an open access network in order to prevent competition and protect their potential future commercial interests; and the lack of state resources to push forcefully and effectively on behalf of New Hampshire's citizens for rural deployment in the face of opposition from the incumbent providers.

A preliminary map has been developed that depicts the unserved and underserved communities across the region. Clearly, some towns are left out of service areas altogether, while some have very limited coverage. In some areas, broadband services are available, but no town or city in the region is without dead zones. However, the unique population density and distribution

characteristics of towns in the Southwest and West Central regions do not meet the minimum requirements set by broadband providers' business models. A few key city and large town population centers are surrounded by dozens of small, rural New England villages, so there is no single hub of substantial aggregation of large customers. The wire-line backbone infrastructure is not present in any comprehensive fashion and providers' potential revenue does not justify the expense of building the last mile required to make broadband services available throughout the region, despite the fact that a universal demand for broadband service is painfully present. In addition, the challenging topography (mountainous terrain, extensive ledge outcroppings, numerous valleys, rivers and streams) and forested landscape of the region further complicate the business case for the delivery of broadband services. The very reason why people and businesses have chosen to locate in rural New Hampshire – quaint New England village settings, a healthy, quiet, scenic rural landscape, and small, human-scale urban landscapes – are also reasons why telecommunications companies have not flocked to this region.

There is no question that faster and more advanced broadband deployment is needed and is vital to the regional economy. The current shortage has posed monumental challenges for economic growth, particularly for small businesses – the central nervous system of the NH economy with about half of the employers in the state employing four or fewer employees. Addressing the shortage of high speed, affordable broadband services in the Southwest and West Central Region is identified as a priority in the Comprehensive Economic Development Strategy (CEDS) for both Southwest New Hampshire as well as Grafton County that has been approved by the US Economic Development Administration. No single technology is best-suited to solving the shortage of broadband services throughout the region. A multi-faceted approach utilizing fiber and a combination of wireless technologies will be required to equip the region to participate in the global economy.

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

Wireless - Terrestrial Fixed

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Other:

Technology Questions

Methodology for Area Status:

The methodology used to determine area status is straightforward. In 2009, the NTIA awarded a Broadband Mapping Grant to UNH's GRANIT research team designed to gather broadband usage and capability data across the state with the support of the Regional Planning Commissions. Some of the early data available included source listings for community anchor institutions and volunteered data from small pockets of activity. Those communities in New Hampshire that have no broadband access are very vocal about their need, and a complete map was generated using Public Utility Commission data that shows the known broadband providers servicing all municipalities in the state. Those communities with broadband are served predominantly by a single provider in the community, and of the 10 counties in New Hampshire, only three--Rockingham, Hillsborough and Strafford--tend to have their major population centers well connected with broadband. The residential broadband service offerings even in those counties are just beginning to approach levels of 16Mbps. A number of town meetings, town planning boards and municipal broadband committees have developed position statements on the lack of broadband services, and those have been referenced in our data gathering.

Our proposed last mile service areas, Enfield and Rindge, are both classified as rural and underserved. Extensive survey data was collected from within the communities to determine which households had access to broadband services and which did not based on the existence of providers in the community. Rindge has been especially hard hit in November 2009 when Pine Tree Cable, the dominant broadband provider in the area, went out of business overnight.

Our middle mile proposed service area passes through 135 Census block groups, some of which are classified as unserved and underserved as well as rural, while others are served and urban in population. Those unserved and underserved areas all contain community anchor institutions that demand the increased broadband services that the middle mile fiber network will offer. Last mile providers in those communities have been solicited to deliver broadband access after the middle mile network is in place. While not specifically part of the project, a number of last mile providers have already filed letters of commitment to purchase access to the middle mile network with the intention of connecting the unserved and underserved.

The public safety microwave network makes fixed and mobile wireless broadband possible on existing New Hampshire mountaintops, allowing for the possibility of meeting broadband demand needs of the most remote locations in New Hampshire. While the proposed project does not involve delivering the last mile wireless technology, wireless Internet Service Providers, such as WiValley, already are committed to capitalizing on the benefits of the middle mile network to meet unserved and underserved premises.

Description of Network Openness:

The network designed for New Hampshire has openness as a primary principle. All project components adhere fully to the nondiscrimination and interconnection policies and principles as described in Section V.D.3 of the NOFA as well as to the principles contained in the FCC Internet Policy statement (FCC 05-151, 8/5/2005).

Creation of the middle mile fiber network is seen as a major opportunity for economic development, with a new fiber sheath containing up to 288 fiber strands providing an opportunity for growth. The New Hampshire Fiber Network (NHFN) will be responsible for issuing up to forty (40) year Indefeasible Right to Use (IRU) agreements for delivering residential and commercial broadband Internet access, while maintaining the overall sheath over the same period. These IRUs will be available to qualified broadband providers, based on rates established by NHFN with direct input from its board of directors comprised of public and private entities. This rate structure will be consistent and non discriminatory and will be described on the project Website (http://networknhnow.org).

Fiber IRUs will be delivered to the University System of New Hampshire (USNH) to expand broadband capabilities to the higher education institutions comprising USNH, the statewide Cooperative Extension program that has a network of professional Extension staff located in all 10 New Hampshire counties, and all 11 institutions within the Community College System of New Hampshire (CCSNH).

The middle mile microwave network will support available bandwidth across the fiber network to deliver broadband services to existing and future state agencies and core institutions. In addition, the mountain tower points will be connected by fiber optic middle mile networks, further supporting public safety end points for a robust communications network that can withstand the types of natural disasters that have plagued New Hampshire in recent years. Since some mountaintop towers are filled to capacity, mountaintop access is a precious commodity.

Reducing antenna count for the existing mountaintop wireless networks will make more tower space available to providers—a key factor in reaching some underserved and unserved parts of rural New Hampshire.

FastRoads will operate fiber infrastructure as an open access network and will transport any service that meets publicly available service provider minimum qualifications. The Layer 3 network is designed to transport multiple services from multiple providers simultaneously and is designed expressly to allow users access to the services, providers and applications of their choice. FastRoads already maintains a public Website (http://newhampshirefastroads.net) to communicate policies, prices, the Acceptable Use policy, and the standard contract used for all service providers. Additionally, service providers will be free to interconnect with other providers on site or at other peering points on the NNHN network.

System Design:

Network New Hampshire Now (NNHN) will create a network composed of three physical parts: 1) NNHN will build 420 miles of open-access, middle-mile fiber, connecting key regions and institutions in the state; 2) FastRoads will create open-access last mile fiber and equipment infrastructure to connect providers to anchor institutions, businesses, and homes in 2 initial communities; and 3) NNHN will build a mountain-top microwave network that modernizes and combines multiple systems for the State Police, National Guard, Department of Transportation, and New Hampshire Public Television. The overall architecture is next generation and will provide a competitive benchmark accelerating high speed connectivity in NH.

Middle Mile Fiber Network
The middle mile deployment creates a new fiber ring in northern New Hampshire, and completes two existing rings which will connect the Community College and University Systems and anchor institutions. The middle mile will provide backbone service for the FastRoads system, and backhaul links for the microwave system. All new fiber will have frequent hand-hole/splice points to provide easy creation of lateral connections.

NNHN will deploy 420 new miles of high-count fiber in aerial and underground systems. NNHN has identified routes that are feasible and reach the most critical areas of the state, as well as areas that can provide the critical mass of sustaining revenue.

Logical Layers

Several sources will provide anchor and end-user services, leveraging middle mile and FastRoads infrastructure. Providers will cross-connect and co-locate in FastRoads facilities and serve customers directly. Providers and carriers will light the middle mile fiber and serve anchor institutions and other providers.

USNH will expand its I-BEAM NH higher-education network by lighting next generation middle mile fiber to reach Community Colleges, the Cooperative Extension, and other institutions at rates of 10Mbps to 1Gbps. I-BEAM is a DWDM/IRU-fiber network connecting USNH institutions and the UMaine System to Internet and Internet2 in Cambridge, Massachusetts.

Service Providers and I-BEAM will each deploy a combination of high-capacity/long-reach DWDM and medium-reach Carrier Ethernet to maximize value on the middle mile network. Providers will provide IP, MPLS, and SONET lit services to other providers (e.g., interoffice).

FastRoads Network
The FastRoads network connects 24 access nodes on the NNHN fiber network using Gigabit Ethernet. 22 middle mile nodes and the 2 last mile nodes will contain routers and fiber switches. Aerial and underground fiber drops will link fiber switches to the customers over last and middle mile fiber.

Providers will inject services onto the network at pre-defined switches attached to the core network in one of two FastRoads colocation facilities. Services will be defined in the FastRoads Operations Support System, and provisioned automatically and delivered to any connected customer on the network. Service providers will handle Internet backhaul, leveraging the FastRoads open-access inter-connect, NNHN fiber, and the providers' own Internet facilities.

The active Ethernet design of FastRoads provides high-reliability and cost-effective capacity for a range of bandwidths. The residential and business connections will have 100Mbps uplinks, with capability to provision guaranteed quality of service for high bandwidth services like HDTV, and will support up to five HD channels simultaneously. Customer Premise Equipment will provide a range of customer-side copper Ethernet options, as well as analog telephone ports.

FastRoads is designed to enable seamless growth. As demand in a service area increases, additional equipment can be added to a service area, extending the core network into the

neighborhood or rural area. Because FastRoads and NNHN are built entirely on fiber pathways, the capacity exists to provide almost unlimited future bandwidth expansion.

Microwave Network
NH agencies and NH Public Television currently own and operate independent but parallel microwave facilities and towers on dozens of NH mountaintops. This project consolidates these separate networks into one modern system that will significantly increase the bandwidth while simultaneously reducing operating costs. NNHN will leverage existing mountaintop facilities to construct a high-speed, fault-tolerant, ring microwave 300Mbps IP network backbone with connections to NNHN. The design includes digital microwave radios, antennas, waveguide and routers. All traffic will be logically separated using virtualization, enabling the appropriate security and quality of service. RF Spectrum has been pre-determined to be available for what is required by the design.

This network will increase first responder interoperability capabilities, and serve the following New Hampshire entities:

State Police
Dept. of Resources and Economic Development
Dept. of Fish and Game
Dept. of Transportation
Army National Guard
Division of Homeland Security
Marine Patrol
10 Sheriffs Offices and 4 Fire Mutual Aid Offices
NH Public Television
Regional interconnect with State Police forces of ME, MA, and VT

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

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Project Budget		
	Federal Grant Request	**Match**
Last Mile	1,384,069	312,705
Middle Mile	43,150,822	21,077,295
Total	44,534,891	21,390,000

Project Budget Total: $65,924,891

Match Percent: 32.4%

Projects Outside Recommended Funding Range:

-

Outside Leverage	
Applicant is providing matching funds of at least 20% towards the total eligible project costs?	Yes
Matching cost detail	Our project has collected over 32% match including over 7.5% in Cash match and over 24.5% of in-kind match as a share of total project cost. Cash Matches: Totals $5,170,000 The University System of New Hampshire will offer $500,000 in Long Range Technology Planning funds towards the middle mile fiber development component. This funding will be utilized for infrastructure. Business Finance Authority (a public business lender in NH) will lend $2,300,000 to the Monadnock Economic Development Corporation (MEDC) on behalf of the FastRoads last mile fiber development component. This funding will be utilized for infrastructure. Sovernet Communications has completed a letter of intent to connect into the project at a value of $800,000 that will be utilized as program

	income for the project. This funding will be utilized for infrastructure. New Hampshire Department of Transportation will offer $1,400,000 in funds towards the middle mile fiber segment. This funding will be utilized for infrastructure. New Hampshire Public Television will offer $170,000 in funds towards the middle mile microwave wireless network development component. This funding will be utilized for infrastructure. In-Kind Matches: Totals $16,220,000 TelJet Longhaul will provide minimum between 36-48 fibers in a sheath from Manchester to Keene with a commercial worth of $3,420,000. Teljet will receive an equity share of newly created NHFN entity as well as access to 12 Fibers across the network paths. This match will be utilized for infrastructure expansion. TelJet Longhaul will provide minimum between 36-48 fibers in a sheath from Manchester to Plymouth to Hanover with a commercial worth of $4,180,000 million. Teljet will receive an equity share of newly created NHFN entity as well as access to 12 Fibers across the network paths. This match will be utilized for infrastructure expansion. BayRing Communications will provide 72 fibers in a sheath from Portsmouth to Rochester to Concord with a commercial worth of $7,600,000. BayRing will receive and equity share of newly created NHFN entity as well as access to 12 Fiber across the network paths. This match will be utilized for infrastructure expansion. Aviat Networks will offer over $1,020,000 in cash/equipment/services towards the middle mile microwave wireless network development component. This offering will be contingent upon award of RFP for microwave wireless segment. This match will be utilized for

	infrastructure support.
Unjust enrichment	The University of New Hampshire and Dartmouth College already have received federal ARRA funding from the National Institutes of Health (NIH) and the National Science Foundation (NSF) for the Indefeasible Right to Use (IRU) fibers across the path from Manchester to Keene and from Manchester to Plymouth to Hanover. The NIH awarded $1,672,733 for the IRU of 12 fibers, while the NSF awarded $1,200,000.
Disclosure of federal and/or state funding sources	The University of New Hampshire and Dartmouth College have received 20-year IRUs for dark fiber assets through a regional research partnership with the University of Maine, University of Vermont, University of Rhode Island and the University of Delaware called the North East Cyberinfrastructure Consortium. New Hampshire received $1,200,000 from the National Science Foundation's Experimental Program to Stimulate Competitive Research (EPSCoR) Research Infrastructure Improvement Track 2 grant program. Additionally, the National Institutes of Health awarded Dartmouth a $1,672,733 supplement to an existing Centers of Biomedical Research Excellence (COBRE) grant which subsequently was sub-awarded to UNH. The NSF grant funds the 20-year IRU for fiber optic cable from Manchester to Plymouth to Hanover and the NIH grant funds the IRU from Manchester to Keene. Both of these grants were awarded from ARRA funds. The DRED Director of Broadband Technology position, established through a legislative act and signed by the Governor, has been funded for its first 9 months through ARRA grants made to New Hampshire. Funds requested in this proposal will be used to support this position, which will have state liaison responsibilities in ensuring the success of broadband deployment throughout New Hampshire. The New Hampshire State Library administers $1.2 million annually provided to the state through the Library Services and Technology Act. These federal funds are used to supply free content and bibliographic data to all New Hampshire residents via premier

	research databases, 10,000 full-text electronic journals and newspapers and 2 million shared library resources. The ability to conduct job searches, education and interaction with e-government services is an urgent need of our libraries. Since lack of broadband access tracks closely with socio-economic inequality, robust and reliable broadband connectivity is central to the economic inclusion mission of NH's 234 municipal libraries. The Department of Housing and Urban Development's (HUD) Community Development Block Grant (CDBG) program is a key funding source for the New Hampshire Community Development Finance Authority (CDFA). While CDBG grants are awarded competitively, it is not unreasonable to assume that some such funds will be awarded to communities during the grant period for expansion of the FastRoads network into unserved or underserved communities. The New Hampshire Department of Health and Human Services (HHS) already has received $5.5 million in federal ARRA funds for healthcare information exchanges. Construction of the fiber networks described in this proposal, both middle and last mile, is key to ensuring the success of the HHS program. While New Hampshire healthcare facilities have not yet participated in the New England Telehealth Consortium (a Rural Health Care Pilot Program), there is a strong incentive to do so within the context of the Network New Hampshire Now project.
Budget reasonableness	The overall cost of this project is based on the historical cost per mile of fiber construction in New Hampshire. UNH has used information gathered from responses by commercial fiber network providers to requests for proposals through its experience in constructing fiber networks to determine the cost of the design, construction, operation and maintenance of a middle mile statewide network. The commercial providers have offered bids that UNH used in awarding other fiber optic network builds. The FastRoads Coalition concurs with the cost projections based on experience in other areas of the country and the recommendations of the broadband design firm, Design Nine.

	The cost of the NNHN middle mile fiber optic network construction is expected to be $55,000 per mile for a 288 fiber strand aerial installation on existing poles and within existing conduit. This figure is consistent with estimates provided by commercial vendors in New Hampshire through a competitive bid process. FastRoads expects last mile fiber optic network construction in Enfield to cost $4,259 per household and service 324 homes, and in Rindge cost $5,434 per household and service 467 homes. By building the fiber optic connection to the premises, FastRoads allows for service providers to minimize their monthly service fees and, with enough service competition on the network, create opportunities for even lower service fees. The cost of the proposed microwave system averages $220,000 per link and is based on industry standard budgetary estimates obtained recently from several high bandwidth microwave vendors. While the NTIA Public Television Facilities Program (PTFP) document entitled "Construction Costs of Typical Public Television Stations" lists the typical budget for a Digital or Dual System Microwave system as $150,000, these systems are designed to carry only the 25Mbps video and control data for a TV station. The microwave links in this proposal have 300 Mbps capacity, additional equipment to provide fault tolerance, fast re-route in the event of a link loss, and encryption and virtualization for the multiple agencies that will share this network and thus, will cost more to construct. The budget proposed for NNHN is based upon the aggregate of thousands of hours of analysis and construction that has occurred in New Hampshire and elsewhere. We are confident that investment of the funds requested will result in construction of the network to deliver broadband across New Hampshire as designed.
Demonstration of need	Federal funding is crucial to the success of the project. In the New Hampshire Broadband Action Plan of 2008, identification of new

	financial resources to support broadband initiatives was prioritized as "critical" as New Hampshire has few broad-based taxes to apply toward financing broadband initiatives. New Hampshire's current economic climate makes borrowing funds for major statewide projects very difficult without low risk guarantees of return on initial investments. The state agencies and public safety partners in this proposal currently have independent, limited bandwidth, out of date, microwave data systems. The NTIA funds provide the only opportunity for the partners to consolidate systems and implement a high capacity backbone. This type of joint project would never occur otherwise due to separate funding cycles and virtually non-existent State of New Hampshire and local funds. Many people consider access to broadband a critical factor when deciding where to work, buy or sell a home, or locate a business. This lack of broadband makes it more difficult for businesses (particularly technology businesses, colleges and universities, and hospitals) to attract and retain employees. The large and varied collection of attached letters of need and support describes a common story of an absence of broadband and a multitude of deficiencies that result from that lack. Funding from BTOP will serve as a concrete example of a successful investment in New Hampshire's future and should have sufficient impact in the state to attract other sources of funding (federal, state, foundation, and private loan/equity) for needed infrastructure improvements. BTOP funds will allow the build-out of last mile in Enfield and Rindge to occur immediately; expansion into other areas of the state is expected to follow. The investment of Network New Hampshire Now is a reasonable risk for all involved. The Internal Rate of Return (IRR) for the ongoing entity is 10.72% with BTOP funding. With cash matches and grant

	funds made available, the entity is able to maintain a positive cash balance throughout the 8 year pro forma period without the use of debt. Revenues begin to be realized on the network when fibers are connected in the statewide network. Without the grant funds made available by BTOP, third party vendors would have no interest in building and sustaining this project. It would not be possible to recover the upfront construction costs at a reasonable rate of return even over the full 20 year life of the asset. At a 15% discount rate, the NPV of cash flows without BTOP funding equates to -$21.5 million even without including interest payment cash outflows on required debt. The IRR without BTOP funding is -5.08%. The project would not be economically feasible by any means without BTOP funding, which explains why these proposed fiber network segments have not been built by commercial vendors to date.

Funds to States/Territories

States	Amount of Federal Grant Request
New Hampshire	44,534,891

Funds to States/Territories Total: $44,534,891

J. Historical Financials

Matching Funds			
	2007	**2008**	**2009**
Revenue	709,952,000	697,873,000	685,945,000
Expenditures	614,532,000	661,729,000	695,178,000
Net Assets	798,875,000	833,475,000	824,242,000
Change in Net Assets from Prior Year	0	-1,544,000	0

Submitted Date:	**Easygrants ID: 4248**
Funding Opportunity: Broadband Technology Opportunities Program	**Applicant Organization:** UNIVERSITY SYSTEM OF NEW HAMPSHIRE
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Bond Rating (if applicable)			A+/A-1/Stable

K. Project Readiness

BTOP Organizational Readiness

The NNHN initiative involves the creation of the New Hampshire Fiber Network (NHFN) to construct and operate the open access middle mile network. NHFN will own and manage the common fiber assets in a true public-private partnership. The executive leadership of NHFN will ensure that the entity's policies remain consistent with the expectations of the economic stimulus legislation and the NOFA.

UNH has built and/or operated a large fiber optic network serving the five institutions of the University System of New Hampshire and the 11 campuses of the Community College System of New Hampshire. UNH operates network connections between Dartmouth and the University of Maine System as part of the North East Cyberinfrastructure Consortium as well as the Granite State Distance Learning Network, a WAN, Internet, and video-conferencing service, serving over 30 public institutions around NH. UNH maintains a staff of BSCI-trained internal expertise to install and manage several miles of aerial and underground fiber optic and copper infrastructure across 100+ campus buildings and in the surrounding region.

All of NNHN's vendor partners are involved in day-to-day operations and maintenance of fiber networks across New Hampshire. Their leadership and guidance provide assurance that the actions of the common entity will be the best to meet the needs of the customers.

Billing for the middle mile fiber network is straightforward to implement and understand. The commercial providers are likely to be the major NHFN customers, start out small and be expected to grow. There will be one product offering—dark fiber. This fiber will be leased as Indefeasible Right to Use (IRU) agreements managed through a database of available fiber across the state. Carrying out this work could be done either through in-kind services by the University or through outsourcing at market rates. FastRoads will manage the billing for the last mile areas constructed in Rindge and Enfield through a revenue-sharing process with last mile service provider partners.

Sales for the middle mile fiber network will operate under a simple model. With only commercial providers directly connecting to the dark fiber network, the number of customers is likely not to exceed a portion of the 67 service providers in NH today. Sales and Marketing will encourage more last mile providers to come into NH and begin offering broadband services.

Since the only electronic equipment involved is designed to support the community anchor institutions, the operations of the middle mile fiber network are confined to fiber maintenance. All customers of the network, middle mile or last mile, will operate their own network monitoring equipment in their Network Operations Centers (NOCs). NHFN will be responsible for operations, maintenance, and emergency response for the overall fiber sheath. When a fiber cut occurs, the carrier NOCs will contact NHFN to dispatch the maintenance team for repairs.

Construction and Vendor Contracts

Commercial vendor contracts for fiber optic network construction will be required to accomplish the proposed project. The commercial vendors that have expressed a desire to be investing partners in the New Hampshire Fiber Network (NHFN) understand that network construction contracts need to be awarded through an open request for proposal (RFP) process. Network hardware vendors already have provided cost proposals for current network equipment realizing that the price for network equipment is likely to be less when it is ready to be installed on the newly-constructed fiber network. Microwave vendors also are prepared to submit formal bids for equipment and installation services on existing towers.

USNH, CDFA and the commercial vendor partners have drafted a Letter of Intent (LOI) that outlines the essential elements and principles of the relationships that will exist within NHFN to see this project to fruition. Signed versions of the LOI are included in the Uploads section of this application.

Customer Base

The University of New Hampshire operates the current middle mile network, connecting USNH institutions along with the Community College System of New Hampshire locations. The considerable number of customers brought into the NHFN by the fiber optic network partners (mostly large businesses and last mile providers) should have sufficient interest in the fiber paths to be constructed to support their initial operations.

The microwave network will connect the following public safety agencies: New Hampshire State Police, Department of Resources and Economic Development (DRED), Department of Transportation (DOT), New Hampshire Army National Guard, NH Division of Homeland Security, New Hampshire Marine Patrol, 10 County Sheriff Offices, 4 Fire Mutual Aid Offices, and the State Police forces of Maine, Massachusetts and Vermont. The New Hampshire Department of Fish and Game and New Hampshire Public Television also will be connected, providing significantly greater bandwidth to each of these entities than the current separate systems.

FastRoads will establish at the start of this project, it has no existing customer base. In the two last mile proposed service areas, Enfield and Rindge, FastRoads expects to service 324 and 467 homes, respectively. A number of homeowners, businesses and community anchor institutions have expressed interest in connecting to the FastRoads network, allowing the network to be self-sustaining at the onset of operation.

Licenses, Regulatory Approvals and Agreements

New Hampshire Fiber Network (NHFN) will be involved in negotiating customer IRUs for dark fiber access and operations and maintenance services. Some of these IRUs already have been solicited and are provided in the attached letters of commitment. Additionally, NHFN principles have been documented in a Letter of Intent (LOI), which outlines the structure and working relationship of the middle mile partners in the project.

FastRoads will be involved in contract management in five areas: 1) leveraging existing middle mile and backbone resources of service providers; 2) construction of the last mile network; 3) network operations services of the FastRoads network supported by funds other than the BTOP award; 4) outside plant maintenance supported by funds other than the BTOP award; and 5) Internet service providers' access to serve customers on the FastRoads network.

Since the microwave network will utilize existing tower infrastructure and leases, there will be no need to enter into new leases or contracts for access. Pole leases, collocation and last mile pedestal leases will be included as part of make-ready services which will be the responsibility of the construction vendors in the project. Application for these services will be completed by project start.

SPIN Number

143006548 -- University of New Hampshire, Computing & Information Services, Telecommunications Department

143032147 -- TelJet Longhaul, LLC

143018809 -- BayRing Communications

L. Environmental Questionnaire

Project Description

The project will utilize existing Central Office facilities, when possible, to install splice and termination equipment for the network. Additional huts and splice points will be constructed on existing poles in the aerial make-ready positions. Thus, no significant new or modified building construction impact studies will be necessary to complete cable installation on existing poles or existing conduit.

New Hampshire-regulated telecommunications construction projects require Public Utilities Commission oversight. In addition, attachment to existing poles or populating existing conduit will require permits from the local municipality in some cases, as well as pole attachment rights and make-ready work.

If any underground build-out of fiber is required, a clear project plan will need to be filed with the New Hampshire Department of Environmental Services. The build-out review involves a wetlands impact study (an important factor in the southwest region of the state), an Alteration of Terrain review, and local community oversight with public hearings and comment from each affected town's conservation commission or town planning board. Once this six-month process is complete, permits may be issued and underground work may begin. Consequently, the proposed project is designed to utilize all existing aerial installation wherever possible to avoid significant delays in fiber installation.

Property Changes

This project is not expected to clear any property, excavate any property, fence any property or otherwise disturb the current land use and zoning of the areas in the project. The project will

utilize existing Central Office facilities, when possible, to install splice and termination equipment for the proposed network. Additional huts and splice points will be constructed on existing poles in the aerial make-ready positions. Using these existing facilities means that no impacts studies will be necessary to complete cable installation on existing poles or existing conduit.

Due to the high degree of flexibility in placement of system elements and the ability to make use of existing infrastructure, impacts to property are anticipated to be minimal.

Buildings

The project will utilize existing Central Office facilities, when possible, to install splice and termination equipment for the proposed network. Additional huts and splice points will be constructed on existing poles in the aerial make-ready positions. Using these existing facilities means that no impact studies will be necessary to complete cable installation on existing poles or existing conduit. In addition, historic buildings that will be connected with middle mile or last mile fiber optic cabling will utilize pre-existing service entrances and internal network distribution pathways.

Due to the high degree of flexibility in placement of system elements and the ability to make use of existing infrastructure, impacts to buildings, both new and modified, are anticipated to be minimal.

The microwave systems will be constructed on existing towers and facilities currently owned and operated by the State of New Hampshire and New Hampshire Public Television. No additional towers or buildings are required for this part of the project.

Wetlands

The project will utilize existing Central Office facilities, when possible, in existing wetland areas. Using these existing facilities will not require any clearing of vegetation or other wetland impacts to complete cable installation on existing poles or existing conduit.

Any new aerial lines will be run adjacent to existing roadways on existing poles and are not expected to encroach into wetlands.

Due to the high degree of flexibility in placement of system elements and the ability to make use of existing infrastructure, impacts to wetlands are anticipated to be minimal.

Critical Habitats

The project will utilize existing Central Office facilities, when possible. Using these existing facilities will not impact any critical habitats to complete cable installation on existing poles or existing conduit.

Any new aerial lines will be run adjacent to existing roadways on existing poles and are not expected to encroach into critical habitats. We reviewed a list of species that are in the 10 New Hampshire counties that are affected by the project. These species (both animal and plant) include:

E Butterfly, Karner blue (Lycaeides melissa samuelis)
T Lynx, Canada (Contiguous U.S. DPS) (Lynx canadensis)
T Plover, piping except Great Lakes watershed (Charadrius melodus)
E Sea turtle, leatherback (Dermochelys coriacea)
E Wedgemussel, dwarf (Alasmidonta heterodon)
E Whale, finback (Balaenoptera physalus)
E Beetle, American burying (Nicrophorus americanus)
E Puma (=cougar), eastern (Puma (=Felis) concolor couguar)
T Tiger beetle, Puritan (Cicindela puritana)
E Wolf, gray Lower 48 States, except where delisted and where EXPN. Mexico. (Canis lupus)
T Sea turtle, green except where endangered (Chelonia mydas)
E Sea turtle, hawksbill (Eretmochelys imbricata)
T Sea turtle, loggerhead (Caretta caretta)
E Bulrush, Northeastern (Scirpus ancistrochaetus)
E Milk-vetch, Jesup's (Astragalus robbinsii var. jesupi)
T Pogonia, small whorled (Isotria medeoloides)

After a review of these species and their habitats, in relation to the project route, and based on the high degree of flexibility in the placement of system elements and the ability to make use of existing infrastructure, impacts to the critical habitats of the above species are anticipated to be non-existent.

Floodplain

The project will utilize existing Central Office facilities, when possible, in existing floodplain areas. Using these existing facilities, this project will have no sites that are within a 100 or 500-year floodplain necessary to complete cable installation on existing poles or existing conduit.

Any new aerial lines will be run adjacent to existing roadways on existing poles and are not expected to encroach into floodplains.

Due to the high degree of flexibility in placement of system elements and the ability to make use of existing infrastructure, impacts to floodplains are anticipated to be minimal.

Protected Land

The project will utilize existing Central Office facilities, when possible, to install splice and termination equipment for the proposed network. Additional huts and splice points will be constructed on existing poles in the aerial make-ready positions. Using these existing facilities will not require any impacts to historic properties or protected land to complete cable installation on existing poles or existing conduit.

Due to the high degree of flexibility in placement of system elements and the ability to make use of existing infrastructure, impacts to protected lands are anticipated to be minimal, if any.

Coastal Area

The project will utilize existing Central Office facilities, when possible, in any existing coastal areas. Using these existing facilities, this project will have no sites that are within a coastal area necessary to complete cable installation on existing poles or existing conduit.

Any new aerial lines will be run adjacent to existing roadways on existing poles and are not expected to encroach into coastal areas.

Due to the high degree of flexibility in placement of system elements and the ability to make use of existing infrastructure, impacts to coastal areas are anticipated to be minimal, if any.

Brownfield

The project will utilize existing Central Office facilities, when possible. Using these existing facilities will not impact any brownfields in order to complete cable installation on existing poles or existing conduit.

Any new aerial lines will be run adjacent to existing roadways on existing poles and are not expected to encroach into or near brownfields.

Due to the high degree of flexibility in placement of system elements and the ability to make use of existing infrastructure, impacts to brownfields are anticipated to be non-existent.

Submitted Date:	**Easygrants ID: 4248**
Funding Opportunity: Broadband Technology Opportunities Program	**Applicant Organization:** UNIVERSITY SYSTEM OF NEW HAMPSHIRE
Task: Submit Application - BTOP	**Applicant Name:** Mr. Scott A Valcourt

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	MM_ServiceOfferingsCompetitorData.xlsx	Valcourt, Scott	03/26/2010
Network Diagram	Fastroads NetDiag.pdf	Valcourt, Scott	03/26/2010
Network Diagram	BTOP 2 NH I-BEAM (USNH) B.pdf	Valcourt, Scott	03/26/2010
Build Out Timeline	BuildOutTimeLine-032610b.pdf	Valcourt, Scott	03/26/2010
List of Community Anchors and Points of Interest	CAI-POI-Detail 032610.xlsx	Valcourt, Scott	03/26/2010
Management Team Resumes and Organization Chart	MgmtTeamOrgChart032310.pdf	Valcourt, Scott	03/24/2010
Management Team Resumes and Organization Chart	NNHNMgmtTeam032410.pdf	Valcourt, Scott	03/24/2010
Management Team Resumes and Organization Chart	ARRAbio10-ACohill.pdf	Valcourt, Scott	03/24/2010

Management Team Resumes and Organization Chart	ARRAbio10-AVeenstra.pdf	Valcourt, Scott	03/24/2010
Management Team Resumes and Organization Chart	ARRAbio10-BShepperd.pdf	Valcourt, Scott	03/24/2010
Management Team Resumes and Organization Chart	ARRAbio10-CMiller.pdf	Valcourt, Scott	03/24/2010
Management Team Resumes and Organization Chart	ARRAbio10-DBronson.pdf	Valcourt, Scott	03/24/2010
Management Team Resumes and Organization Chart	ARRAbio10-DGReen.pdf	Valcourt, Scott	03/24/2010
Management Team Resumes and Organization Chart	ARRAbio10-JYoung.pdf	Valcourt, Scott	03/24/2010
Management Team Resumes and Organization Chart	ARRAbio10-KBShields.pdf	Valcourt, Scott	03/24/2010
Management Team Resumes and Organization Chart	ARRAbio10-SValcourt.pdf	Valcourt, Scott	03/24/2010

Management Team Resumes and Organization Chart	ARRAbio10-SWengert.pdf	Valcourt, Scott	03/24/2010
Management Team Resumes and Organization Chart	ARRAbio10-TFranke.pdf	Valcourt, Scott	03/24/2010
Government and Key Partnerships	4248 WiV Letter of Support.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	Aviat Committment Letter.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	BTOP2 Letter of Support-UNH.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	CenCel-BayRing Vendor Letter of Intent.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	BTOP-Grant-Letter-CCSNH.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	BTOP-Grant-Letter-DRED.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	CDFA ltr of support.pdf	Valcourt, Scott	03/26/2010
Government and Key	Claremont-Letter-Match.pdf	Valcourt, Scott	03/26/2010

Partnerships			
Government and Key Partnerships	CLF-Match-letter-032410.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	NCIC Commitment Letter 032210.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	NH State Police Suport Letter.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	NHDOT Letter 032410.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	NHPTV Committment Letter.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	NNHN Letter of Support-USNH.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	Sovernet-Letter-032010.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	Support Letter MEDC.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	Teljet Vendor Letter of Intent.pdf	Valcourt, Scott	03/26/2010

Government and Key Partnerships	NHOS.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	Governor's Letter of Support for NNHN 3-26-10.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	NH National Guard.pdf	Valcourt, Scott	03/26/2010
Government and Key Partnerships	Congress-BTOP.pdf	Valcourt, Scott	03/26/2010
Historical Financial Statements	FY2007 CDFA Audit Report.pdf	Valcourt, Scott	03/24/2010
Historical Financial Statements	FY2008 CDFA Audit Report.pdf	Valcourt, Scott	03/24/2010
Historical Financial Statements	FY2009 CDFA Audit Report.pdf	Valcourt, Scott	03/24/2010
Historical Financial Statements	2007 Income Statement - new.pdf	Valcourt, Scott	03/26/2010
Historical Financial Statements	2007BalanceSheet.pdf	Valcourt, Scott	03/26/2010
Historical Financial Statements	TelJet Dec.2008 Balance.pdf	Valcourt, Scott	03/26/2010

Historical Financial Statements	TelJet Dec.2008 Income-updated.pdf	Valcourt, Scott	03/26/2010
Historical Financial Statements	TelJet Dec.2009 Balance v.032610.pdf	Valcourt, Scott	03/26/2010
Historical Financial Statements	TelJet Dec.2009 Income v.032610.pdf	Valcourt, Scott	03/26/2010
Historical Financial Statements	AnnualReport_2009.pdf	Valcourt, Scott	03/21/2010
Historical Financial Statements	2008AnnualReport.pdf	Valcourt, Scott	03/21/2010
Historical Financial Statements	MEDC-Consolidated Financial Statements 2007 and 2006.pdf	Valcourt, Scott	03/24/2010
Historical Financial Statements	MEDC-Consolidated Financial Statements 2008 and 2007.pdf	Valcourt, Scott	03/24/2010
Historical Financial Statements	MEDC-June 2009 - Year End Financial Statements.pdf	Valcourt, Scott	03/24/2010
Historical Financial Statements	NHPTV-FY09-FY08 SRECNA.pdf	Valcourt, Scott	03/24/2010
Historical Financial Statements	NHPTV-FY09-FY08 Statement of Cash Flows.pdf	Valcourt, Scott	03/24/2010

Historical Financial Statements	NHPTV-FY09-FY08 Statement of Net Assets.pdf	Valcourt, Scott	03/24/2010
Budget Narrative	unh_rate_agreement.pdf	Valcourt, Scott	03/26/2010
Budget Narrative	BudgetNarrative.pdf	Valcourt, Scott	03/26/2010
Detailed Budget	CCI Detailed Budget Final for Submission.xlsx	Valcourt, Scott	03/26/2010
Pro-forma Forecast	ProFormaBudgetProjections Final for Submission.xlsx	Valcourt, Scott	03/26/2010
Pro-forma Forecast	Pro Forma Financial Projections Attachment FR.xls	Valcourt, Scott	03/26/2010
Subscriber Estimates	MM_SubscriberEstimates.xlsx	Valcourt, Scott	03/26/2010
Dashboard Metrics	KeyMetricsDashboard-032510f.pdf	Valcourt, Scott	03/26/2010
Service Area Data	ServiceAreas 032610.xlsx	Valcourt, Scott	03/26/2010
Network Maps	BTOP 2 NH Fiber concept F.pdf	Valcourt, Scott	03/26/2010
BTOP Certifications	BTOPCertification.pdf	Valcourt, Scott	03/26/2010
SF-424 C and D	SF424CD-032610c.pdf	Valcourt, Scott	03/26/2010

Supplemental Information	LetterOfSupportUNHBroadband.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	supportLetter-Springfield.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Sutton support letter.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	PeterboroughCommitmentLetter-Signed.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Commitment letter Rep Merry.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	jorodpygscn00090.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	RepWeber_Support_Letter.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	s0f8yksoscn00041.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	s0f8yksoscn00052.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	s0f8yksoscn00063.pdf	Valcourt, Scott	03/26/2010

Supplemental Information	s0f8yksoscn00074.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	s0f8yksoscn00085.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Cheshire Med letter for BTOP grant.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	DHMC_support_letter_final.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Letter_NewLondon_Hosp_Support 3-23-10.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	NETC UNH BTOP Letter.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Network NH - HHS.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Network NH Now Letter - Elliot Health System 032210.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	NH Hospitals Letter of Support 030510.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	UNH support letter - stuarnett 032210.pdf	Valcourt, Scott	03/26/2010

Supplemental Information	VNA Letter.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Weeks BTOP Letter.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	BTOP2 Letter of Support-GSC.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	BTOP2 Letter of Support-KSC.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	BTOP2 Letter of Support-PSU.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	BTOP Letter of Support ColbySawyer 3-23-10.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	BTOP Letter of Support NHDOE 3-22-10.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	BTOP-Grant-Letter-GSDLN.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	BTOP-Grant-Letter-NHCUC.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	CarrollLtr.pdf	Valcourt, Scott	03/26/2010

Supplemental Information	DOC-dresden-support.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	GraftonLtr.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	HillsboroughLtr.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Keene-School-Letter.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	KRSD Support letter 032310.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Library-letter-032310.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	MerrimackLtr.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Network_NH_JYK-Dartmouth.PDF	Valcourt, Scott	03/26/2010
Supplemental Information	NetworkNHBTOP 032210 - FPU.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	RockinghamLtr.pdf	Valcourt, Scott	03/26/2010

Supplemental Information	StraffordLtr.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	SullivanLtr.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	UNH-CE-Letter-021110.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	1275_001-DarmouthPrinting.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	20100326 MSAGBroadbandSupport.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Broadband Letter 3-35-10.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Broadband Support Letter - NHLRA.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	BTOP-Grant-Letter-BIA.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	BTOPLetter-Vision-032210.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Commitment Letter USES Agency 031810a.pdf	Valcourt, Scott	03/26/2010

Supplemental Information	commitmentLettersupport031810bwtc.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	DOC190310.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	EIM-Broadbandsupport.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	EVP-Keene-Letter.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Hanover CoC - letter.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Ledyard Support Letter.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Letter KeeneCoC 032310.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Letter to New Hampshire.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	LetterSupport_KingArthur_03 22 10.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Lucidus - Broadband.pdf	Valcourt, Scott	03/26/2010

Submitted Date:	**Easygrants ID: 4248**
Funding Opportunity: Broadband Technology Opportunities Program	**Applicant Organization:** UNIVERSITY SYSTEM OF NEW HAMPSHIRE
Task: Submit Application - BTOP	**Applicant Name:** Mr. Scott A Valcourt

Supplemental Information	lymeproperties032410.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	MacMillin_Letter-032310.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Network NH Now Ltr ERIGO.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Rust-letter-032210.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Sidehill-Broadbandsupport.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Support Letter Bank 2010.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	TelJet UNH Endorsement Letter.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	BOS-Acworth-Letter-032310.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	DOC032210-enfield.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	DOC032310-newlondon.pdf	Valcourt, Scott	03/26/2010

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Supplemental Information	DOC032310-sunapee.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	DOC220310.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	DOC240310-rindge.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	DOC240310-swanzey.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Letter-KeeneMayor.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	Letter-Merrell-032410.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	LymeLetter 032210.pdf	Valcourt, Scott	03/26/2010
Supplemental Information	MX-2600N_20100322_191456.pdf	Valcourt, Scott	03/26/2010