"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, and 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.