

Broadband USA Applications Database

Applicant Name: Keystone Initiative for Network Based Education and Research

Project Title: Pennsylvania Research and Education Network (PennREN)

Project Type: Middle Mile

Executive Summary

8. Executive Summary of Project The Pennsylvania Research and Education Network (PennREN) is a public/private venture for the design, construction and management of fiber optic networks statewide which will offer affordable, enhanced broadband services to Pre-K through 12 and higher education systems, health care networks, libraries, state and local governments and workforce/economic development entities. a. Opportunity the proposed system seeks to address The public benefits of affordable access to robust broadband services are well-documented. The availability of funding through the American Recovery and Reinvestment Act for the creation of a statewide network for research and development in the Commonwealth is a once-in-a-generation opportunity. PennREN, through its operating entity, KINBER (the Keystone Initiative for Network Based Education and Research) will serve as the coordinator for the construction and management of a statewide fiber optic network accessible to a host of educational, research, health care and economic development partners seeking to aggregate services for their members and subscribers at affordable cost. The need for a cost-effective networking infrastructure far exceeds what any single entity could procure on its own. The partners identified in this proposal lack sufficient capital to construct their own networks and/or the ability to charge fees at a rate high enough to sustain a system once it is built. PennREN will use the Recovery Act funds, matched by contributions in excess of twenty percent of the total project cost, to construct the network. By aggregating the service needs of the partners, it will have the ability to negotiate rates lower than those now available. Without Recovery Act funding this project will not go forward. b/c. A general description of the proposed funded service areas and number of households and business participating The PennREN network will reach every region of the Commonwealth with more than 44,000 square miles of coverage. The network will provide in excess of 4,082 miles of direct access to an estimated 5,159,780 individuals in 2,047,442 households and 204,193 businesses within the 10 mile radius of the community anchor institutions. d. Number of community anchor institutions, public safety entities, and critical community organizations passed and/or involved with project (e.g., health care, education, libraries, etc.) The network is designed with thirteen core nodes at anchor institutions: The University of Scranton, Lehigh University, Philadelphia Collocation facility, Penn State Hershey, D & E Collocation facility, Level 3 Communication Collocation facility, Indiana University of Pennsylvania, Allegheny Center Mall, Slippery Rock University, Penn State/Behrend, Clarion University, Penn State Dubois, and Bucknell University. The institutions of higher education were chosen because of their strong presence in the potential service areas and their willingness to permit all-hours access by nonemployee staff. Each core node will host Ethernet switch and optical transport equipment. The core nodes are supplemented by over 50 local nodes which will not have PennREN-controlled equipment, but

are intended as a mechanism to allow broader access to the network via dark fiber. e. Proposed services and applications for the proposed funded service areas and users PennREN has established relationships with a number of commercial partners to offer a menu of services to subscribers. Through an agreement with a fiber optic construction company, PennREN will have forty-eight (48) strands of fiber optic cable that encompasses nearly 1696 route miles within the Commonwealth. Two strands of fiber will yield more than 100 Gigabytes of capacity. Two other commercial partners manufacture optical and switching electronics and will enable PennREN to offer Private Wavelength Services and Shared Wavelength Services. By choosing one of these options subscribers will have the option to: create their own statewide infrastructure that reaches areas where such a capability has not been possible or cost prohibitive; assign dark fiber pairs in point to point configurations; enjoy significant economies of scale through the deployment of “managed services” for entities that require full state, partial or adjoining region access to reach their objectives or combine with other groups to benefit from shared wavelength services. Initially, PennREN will provide Internet access to its members through existing relationships with Cogent (through MAGPi in Philadelphia), and Sprint and Global Crossing (through 3ROX in Pittsburgh). Additional service providers can be readily added because of the PennREN nodes at carrier hotels in these two cities. PennREN subscribers will be able to connect to any service provider with a connection at any of the 13 primary backbone or local nodes on the network. f. Approach to addressing the non-discrimination and interconnection obligations As part of its mission as a network serving community anchor institutions in the Commonwealth without discrimination, KINBER will populate its Board of Directors with representatives from public and private universities, community colleges, health care providers and economic development entities, among others. KINBER will also develop a community-based Advisory Board to facilitate inclusive dialogue and collaboration throughout the Commonwealth. The business plan for the rollout of services to subscribers will reflect the consensus on the fairest distribution to all of these interests. g. Type of broadband system that will be deployed (network type and technology standard) An optical network using dense wave division multiplexing h. Qualifications of the applicant that demonstrate the ability to implement and operate a broadband infrastructure, and/or be a sustainable broadband service provider During the design and early construction phases, while permanent staff is being identified, PennREN will be overseen by the staff from the originating partners who have years of experience in developing and managing robust broadband networks. For example, the MAGPi partners work for the University of Pennsylvania and manage a Philadelphia Gigapop serving portions of Pennsylvania and Delaware. The 3ROX partners work for Carnegie Mellon University and manage a Pittsburgh Gigapop providing connection to both Internet 2 and the National Lambda Rail. The Pennsylvania State System of Higher Education, with its 14 campuses and the Pennsylvania State University with its 24 campuses, a teaching hospital, and with privately owned fiber connecting the campus in State College to the Pittsburgh Gigapop will assign professionals to the project. Specific information about the staff described above is included in the resumes provided in response to question 37. i. Overall infrastructure cost of the broadband system Recovery Act Funding \$99,660,678 Matching Funds \$29,217,353 Total \$128,878,031 j. Overall expected subscriber projections for the project As documented in Attachment H we have identified 71 cumulative subscribers. k. Number of jobs estimated to be created or saved as a result of this project. During the initial phases of the project, the fiber optic network design and construction partners will utilize the workforce necessary to meet the deadlines for completion in the application. It is anticipated that

dozens of resources will be involved in the design and construction phases. The PennREN originating partners will interview and hire staff for KINBER which will total five permanent positions to be supplemented by contracts for specific services. The project has been developed to be a catalyst for stabilization and future growth in several important segments of the economy of the Commonwealth including higher education, health care and workforce development.