Executive Summary

The Commonwealth of Massachusetts through its Broadband Institute has committed to “light up” dark fiber located along Interstate 91 in the Pioneer Valley of Massachusetts. The route goes through three counties of the Pioneer Valley – the southern county Hampden, which contains the City of Springfield and is largely urban and served by large cable and telephone companies, the central county of Hampshire, which includes the five-college area of Northampton and Amherst and is also served by large cable and telephone companies, and the northern county Franklin, which is rural and largely unserved or underserved under NOFA guidelines. We have outlined the served and underserved areas that our network will address based on information provided to us by the Massachusetts Broadband Institute, an entity established by the Commonwealth of Massachusetts. There are 27 communities in the county with a total population of a little more than 70,000 people. Only three of these communities are served and based on the surveys conducted by the Commonwealth of Massachusetts, we believe that there are approximately 20,500 households and about 45,000 people in underserved and unserved communities. There are 832 business and institutions in the County. Based on a map provided by the Massachusetts Broadband Institute, there are 21 public safety entities in the County and three hospitals or community health care centers. There are more than 50 schools, 31 libraries, two colleges and 175 government and community institutions. We propose to build a wireless network to serve these unserved and underserved areas with a wireless network that can be built with an unprecedented low cost for a broadband network.[1] Our network will initially connect into the lit fiber enabled by the Massachusetts Broadband Institute. We will interconnect to the fiber through a network access point that we will build in one of our target areas in Franklin County. The key elements of our network, as described in more detail in our network description below, are millimeter wave radios that provide Gigabit per second wireless connections over long distances at high availability rates. These radios are made by our affiliate, Loea Corporation, which manufactures its radios at 164 West Street in West Hatfield, Massachusetts adjacent to Franklin County in Hampshire County also in the Pioneer Valley. We will also deploy microwave links for longer-distance communication. These radios will be housed on towers that we will construct through the County. The network will also include network exchange points that will include layer 2 and 3 switches, which will connect the network access points to WiMax base stations that enable us to provide a broadband last mile solution to subscribers. The last piece of the network will be subscriber cards and in some cases subscriber units to enable connectivity to the WiMax network. In some cases, these products will be distributed at no additional charge to subscribers. The network will have exceptional upstream and downstream speeds of up to 10-50 megabits per second. Some groups have estimated that the cost of providing service to subscribers in areas like this
would be about $2,500 per subscriber. Verizon has stated that its costs in largely urban and suburban areas for its FTTP solution is about $1,500 per subscriber and the Vermont Department of Public Service has estimated that costs per subscriber to provide broadband in rural Vermont would be about $4,000 per subscriber. See http://www.internet2.edu/government/files/EDUCAUSE_FCCcomments_060809.pdf. We believe that the costs in Franklin County would be closer to the Vermont estimate. We believe that we can deploy our network for a cost of less than $1,000 per subscriber, assuming we can obtain over time about 1/3 of the unserved and underserved households as subscribers to our service. The network will be an Internet service access network and will be open to other phone and content providers. If the network does not generate additional use of the network through other providers, we will seek to create partnerships with phone and content providers. Our open pipe will thus address the non-discrimination and interconnection obligations of the BTOP. Our Vice President of Technology and CEO have established some of the initial wireless broadband networks in the country. Our Vice President of Technology ran the largest wireless broadband network in the country and established an offsite network operations center for the network in Hawaii. We intend to build a similar NOC in Hawaii that will manage the operations of the network on a 24/7 basis. The network will benefit from additional work obtained by our parent corporation. To date, we have one additional project in which we will wholesale services to a public network being built in Hawaii for certain portions of its network. In addition, we pioneered the development of millimeter-wave transmission of data over long distances. We provided the springboard for the FCC’s opening of the millimeter-wave spectrum, deployed the first units ever built and have created the widest and most novel applications of these radios. Our parent company holds patents on the use of millimeter-wave radios for use in cellular backhaul applications. The software systems for our Internet billing and provisioning system will be built by a company headquartered in Massachusetts. It has built and specified similar systems for some of the largest telecommunications providers in the world, including one of the largest providers in Europe. We have compiled a detailed budget for our network. Based on this budget, we estimate that our network will cost approximately $5.2 million. We have done detailed financial analyses of potential subscribers in the County. Based on the penetration rates that we have forecast, we believe that we can create a viable service only if we are covered under the BTOP program in which we provide 20% match of the infrastructure costs. Our parent company has committed to provide the funds to meet the match requirement. We will also raise additional funds to cover operating losses that we expect to have in the first two years of operations. We cannot create a viable network if we have to rely on the RUS BIP program with 50% grants and 50% loans. The reason is that because of the large amount of debt, we cannot raise sufficient equity. As a result, financing of the network under the RUS program is not possible. As indicated above, we expect to penetrate about 1/3 of the available unserved and underserved subscribers over time. As a result, we believe that our network will address the needs of approximately 7,400 households and approximately 150 businesses and other institutions. We believe that construction of our network will require 16 construction and installation man-years over the next 18 months. In addition, the network will require four NOC jobs in Hawaii, three service jobs in the County, two sales jobs in the County and two other administrative jobs. The operational jobs thus total 11 people in addition to contributing to two senior management jobs at our parent corporation and support for our overall administrative personnel. We cannot estimate the number of jobs created by
products and other services that we purchase for the network, but we can estimate that the 15 millimeter-wave links that we purchase from our Loea Corporation affiliate will account for between one and two jobs. This represents about 7% of our capital costs. If similar ratios apply for other products, the capital costs will account for about 21 additional jobs. Note that our network can be exported to other areas of the country, a valuable feature for the BTOP program. Using the Millimeter wave technology in the 70 to 80 GHz spectrums combined with a fall-over microwave system that is patented by our parent corporation and exclusively licensed to our affiliate, Loea Corporation, we will build a ring network in high capacity areas bringing high bandwidth and Metro Ethernet services. Although our proposal is a total last mile solution connecting from the I-91 fiber that will be “lit up” by the Commonwealth of Massachusetts, this wireless solution provides the highest bandwidth per unit cost available today for a long-range delivery system. As such, it is the world’s most efficient middle mile solution and is central to our ability to produce our low network cost per subscriber in a rural area. Therefore, this network element represents an important middle-mile solution for BTOP elsewhere in the country. Finally, we note that the design for our network access points and WiMax base stations call for outdoor enclosures powered by solar power. This “green” aspect of the network design is an ancillary benefit of our wireless network. Note [1]: Trex Enterprises Corporation is applying for this grant, and if selected will assign it to its subsidiary TB Pioneer Corporation.