Executive Summary

The LECI Broadband Collaborative Network is a consortium designed to connect public entities in the four counties of Eaton, Livingston, Clinton and Ingham for the purpose of sharing Internet, fostering collaboration and enabling high speed network services. We have attempted to deliver high speed connections for many years with no success. We feel that with connections between our eight institutions we will greatly enhance the operation of our network and be able to provide a greater service set to our members. Without a consortium and/or grant funding this network will be impossible at this point in time to implement. Individual circuit costs between our locations are way too high for anyone to afford the buildout and there just isn't the business case for a private telecom provider to lay out the capital to run fiber or utilize wireless towers to connect our area. We are comprised of a service area of 2,275 with a total population of 636,610. Once receiving the grant funding we are planning to connect our institutions which will then connect all the local K12s, municipalities, townships, county offices, libraries, head start agencies, health departments, fire police, and other public entities across our four counties in a Wide Area Network for high speed internet and for inter-agency collaboration. This network will be accompanied by a system that is being developed that will encourage collaboration amongst the agencies once connected and allow them to leverage each other to provide a more efficient way of conducting business. This network will be the catalyst for partnerships and bulk purchasing of network services as well as most technology resources including infrastructure, hardware, software and support. Our organization will act as the consortium lead making sure that we facilitate this process and drive home the value of such a powerful entity. Our experience includes managing fiber as well as wireless and hybrid networks. We have implemented innovative ways to share a data center to our current constituents, providing advanced services in cost effective ways through economies of scale. In our partnership with Cisco Systems we have worked to drive home the reasons to our member organizations for increased broadband access and speeds. Everything we have built has been designed to be scalable and reliable such as the wireless network we are proposing with Netrepid. The proposed solution meets or exceeds all of the desired elements of partnered entities. A licensed wireless solution will provide 1,000 mbps full duplex of fiber-type speeds to each of the 8 remote sites. Additionally, the backhaul to the IU has an aggregate speed of over 4,000 mbps. This provides more than sufficient bandwidth to meet the technical requirements of the participating agencies. Access to broadband Internet is an integral part of conducting personal and professional activities on a day to day basis. The Internet is a mission critical commodity no different then electricity. The network will be available to other community partners and in some instances provide broadband access where it does not currently exist. The WAN will be capable of supporting all technical requirements and uses. Delivery of video
content ' Distance Education ' Hosting instructional and educational-support applications ' Voice and Video Over IP ' Two-way, real-time video ' Other applications supporting curriculum and administration

The proposed network is a layer 3 design. Each remote site will be segregated as required to meet the technical needs of the entity. The data from each Remote Site will be routed through the network as appropriate utilizing appropriate filtering, management, and distribution. The network that will be constructed will meet the needs of the participating Agencies as well as offers a great deal of flexibility for growth and network expansion. Not only is higher bandwidth available but in most cases other desired connections can be attached directly to the backbone with little construction and extremely quick delivery times relative to other options. The capacity of the backbone is more than adequate to accommodate additional connections. The proposed solution utilizes Licensed Wireless as the transport medium. There are many advantages to this solution. Aside from the lower cost of building to remote areas, Licensed Wireless also allows for easier bandwidth upgrades and single accountability. In many other solutions there are multiple providers that are all depending on each other to provide the quality of services required. In the solution provided by Netrepid there are no outside entities involved. The entire network is designed, built, and managed entirely by the Netrepid team. There are some myths about wireless networks. The most relevant one is that wireless connections fail during storms. This is the result of poor engineering. There are extremely accurate calculations that can be used to account for the effects of rain and other storms on a wireless link. The technology being used has grown considerably over the last few years. In addition to better power requirements and antenna designs, the radios are also equipped with dynamic power and modulation. This means that the radios will dynamically adjust transmit power and data rates to adjust for performance effecting weather. The use of dedicated wireless over fiber allows a one-time purchase (tower and hardware) to be more cost effective than a leased telecommunications connection and is cheaper than maintaining fiber hardware over time, while still providing more bandwidth than forecasted to be needed through the life of the connection. Netrepid currently have these services in place for many other clients spread over 6 states. Netrepid will employ a dedicated maintenance team, equipped with spare hardware, to rotate through the network visiting each site at least once a month. This will ensure that most problems are solved before they become issues. The monitoring together with the help desk and the maintenance team will ensure that the performance requirements are met. The maintenance team will be no more than 1 hour from any site at any time and the truck will always be equipped with spare hardware in the event of a hardware failure. Netrepid employs a call center and 24/7 SNMP monitoring of the networks it manages. This is the first line of defense. In most cases the monitoring and the analysis performed by the help desk is enough to catch issues before they occur. Regardless of whether the issue is determined through the monitoring or contact made by the client agency, the help desk will open a trouble ticket with the appropriate information and begin the remediation process. The maintenance team will be dispatched to investigate the issue on site while the help desk attempts troubleshooting through the network. The maintenance team is equipped with all of the tools, supplies, and spare hardware to repair any failure. The maintenance team will never be more than 1 hours drive from the location. This allows the Netrepid team to respond within the required time. The customer contact will also have a VIP document that will detail the regular business hours and after business hours call procedure to report trouble issues. There will also be an email address that will function as the mechanism to open a ticket. Specific information pertaining to the trouble will need to be documented by the customer including: nature of the problem,
time first noticed, frequency of the issue and at least two phone numbers where the customer contact can be reached (one phone number for regular business hours, one phone number for after business hours). Updates will be provided via the ticketing system. Requests for additional information will be made through phone contact or email. A monthly report will be produced monthly regarding the frequency of trouble tickets submitted. This report will also identify the school reporting the trouble and the nature of the problem. This solution will bring many new opportunities to our member organizations. We will be able to offer services across our four counties instead of just one as we are doing at this time.