

(EDU) 2011 Wireless Off-Premise Connectivity Proposal

Submitted on behalf of the Hartford Union High School District, Erin School District, Friess Lake School District, Herman #22 School District, and Neosho J3 School District

12/17/2010

Introduction, Goals and Objectives

The following proposal for the E-Rate Deployed Ubiquitously (EDU) 2011 Wireless Home Connectivity funding is a joint proposal submitted on behalf of the Hartford Union High School (HUHS) District and the following PreK/K-8 school districts: Erin Public School District, Friess Lake Public School District, Herman #22 Public School District, and Neosho J3 Public School District. The Hartford Union High School District and the PreK/K-8 districts possess equivalent geographic borders, have worked collaboratively to gather the necessary data to inform our decision-making, and could therefore jointly benefit from the following proposal. Although HUHS will be the primary and most immediate beneficiary of subsidized home internet connectivity for students, given the nature of the proposal, all the aforementioned PreK/K-8 Districts could also benefit long-term.

The Wisconsin Department of Public Instruction (DPI) requires each school district to develop and implement a recurring three-year Information and Technology Plan outlining the broad goals and objectives related to instructional technology in general. The following goals and objectives relate specifically to student home wireless connectivity needs at HUHS:

Goal 1: Develop and implement a standards-based, information and technology-infused curriculum that enhances student achievement and promotes lifelong learning within students and staff, serving as a state, national, and international model of evidence-based practice.

Objectives:

- A. Develop and implement a standards-based, information and technology-infused curriculum that enhances student achievement, serving as a state, national, and international model of evidence-based practice.
- B. Develop and implement inquiry and project-based approaches that promote lifelong learning within students and staff, serving as a state, national, and international model of evidence-based practice.

Goal 2: Provide anywhere, anytime access to District information and technology resources and support efficient and effective use of those resources by students and staff.

Objectives:

- A. Ensure 24/7 access to District information and technology resources by procuring/enabling students and staff to use a digital information and communication tool capable of accessing district information and technology resources.
- B. Establish a systematic training plan that supports efficient and effective use of District information and technology resources, differentiated to meet the needs of individual students and staff.

Goal 3: Promote information and technology literacy skills and ethics development within students and staff, by developing instructional strategies and support structures that encourage growth, and formative and summative assessments that regularly measure proficiency.

Objectives:

- A. Provide the necessary resources to help students and staff expand their information and technology literacy skills.
- B. Ensure growth of student and staff information and technology literacy skills by regular administration of formative and summative assessments.

Additionally, several HUHS Strategic Goals correlate nicely with our student home wireless connectivity needs:

Strategic Goal 1: We will implement 21st Century Skills so that all students have the necessary tools for lifelong learning.

Strategic Goal 2: We will implement instructional strategies that incorporate research-based best practices for increased student learning and achievement.

Strategic Goal 6: We will teach students how to learn to improve their learning efficiency and success.

Strategic Goal 7: We will provide opportunities for students who are credit deficient to recover credits needed for graduation.

Historical Use of Mobile Wireless Devices at HUHS

Home wireless devices currently are not issued to students, only teaching and administrative staff members are issued business-class laptops. A potential phased 1:1 learning deployment is feasible for the 2011-2012 school year, with the freshmen class potentially receiving a standard District-issued computing device. The standard device has not been chosen yet, given the dynamic development environment of mobile computing devices, but at the very minimum, the device chosen will need to incorporate an 802.11b/g/n-capable wireless network adapter.

Availability of Off-Premise Broadband Wireless Access

A December 2010 1:1 Learning and Home Internet Connectivity survey was issued to the parents/guardians of all current HUHS students, as well as to the parents/guardians of students in several of our PreK/K-8 feeder Districts. Although not all PreK/K-8 feeder Districts participated in the distribution of the 1:1 Learning and Home Internet Connectivity survey, many of the current HUHS parents/guardians also have younger children in the feeder Districts that did not participate. For comparative purposes, we'll use the "broadband" definition supplied by the 802.16 wireless broadband standard, *the support of data rates equal to or greater than 3 Mbps.*

A total of 356 household respondents completed the survey either online or in paper format. A paper version of the survey was distributed to all households on-record who lacked home Internet access. Not all questions on the survey required a response, therefore you may see a discrepancy in the number of total respondents for each question. Only those questions directly related to home Internet access are detailed below.

Figure 1 indicates that 22.8% (88 out of 355) of respondents either do not have home Internet access or access the Internet via a medium with minimal capacity (i.e. dial-up or DSL). Another 44% (157 out of 355) access the Internet at home via satellite or cellular-based wireless that are often affected by weather-related elements.

Figure 1

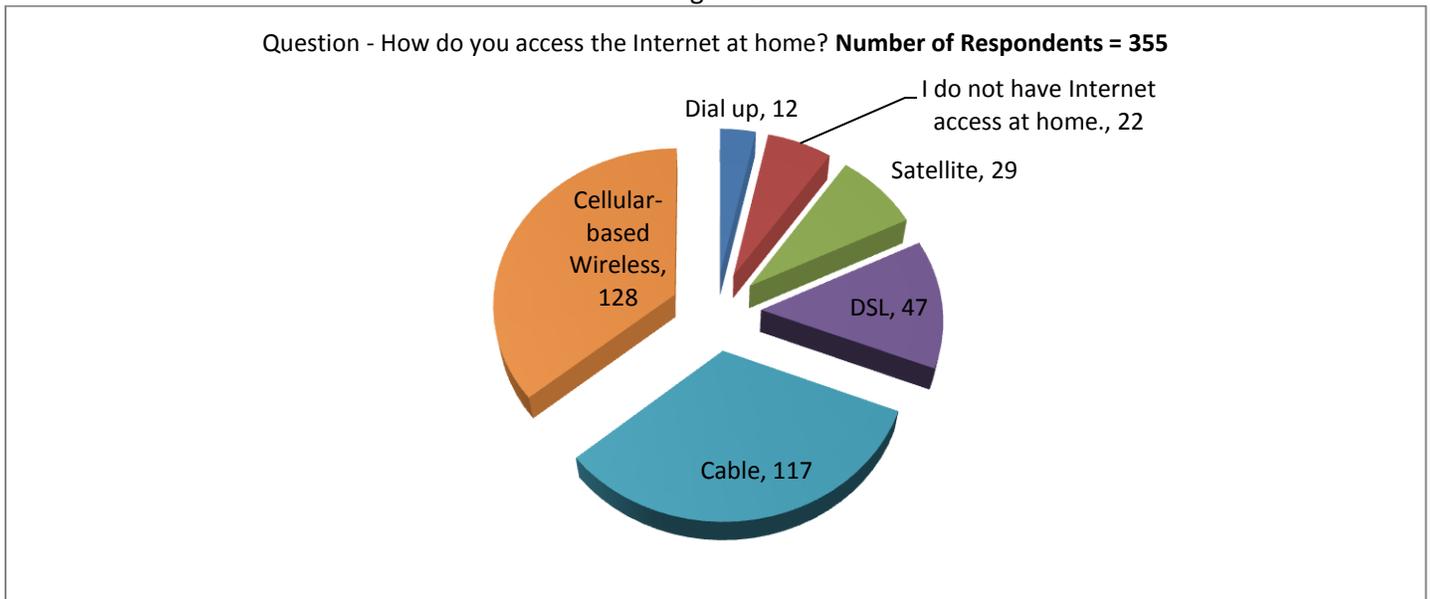


Figure 2 indicates that none of the respondents receive broadband download speeds, but 55.8% of respondents receive currently-acceptable rates of at least 1Mbps download speeds.

Figure 2

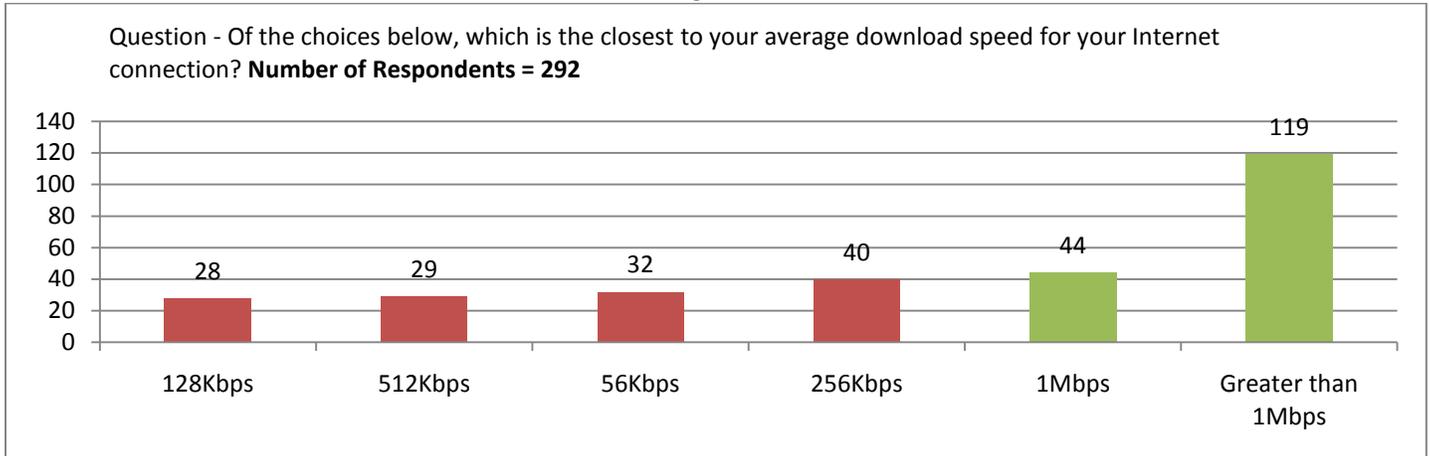


Figure 3 indicates that none of the respondents receive broadband upload speeds, but 44.9% of respondents receive currently-acceptable rates of at least 1Mbps upload speeds.

Figure 3

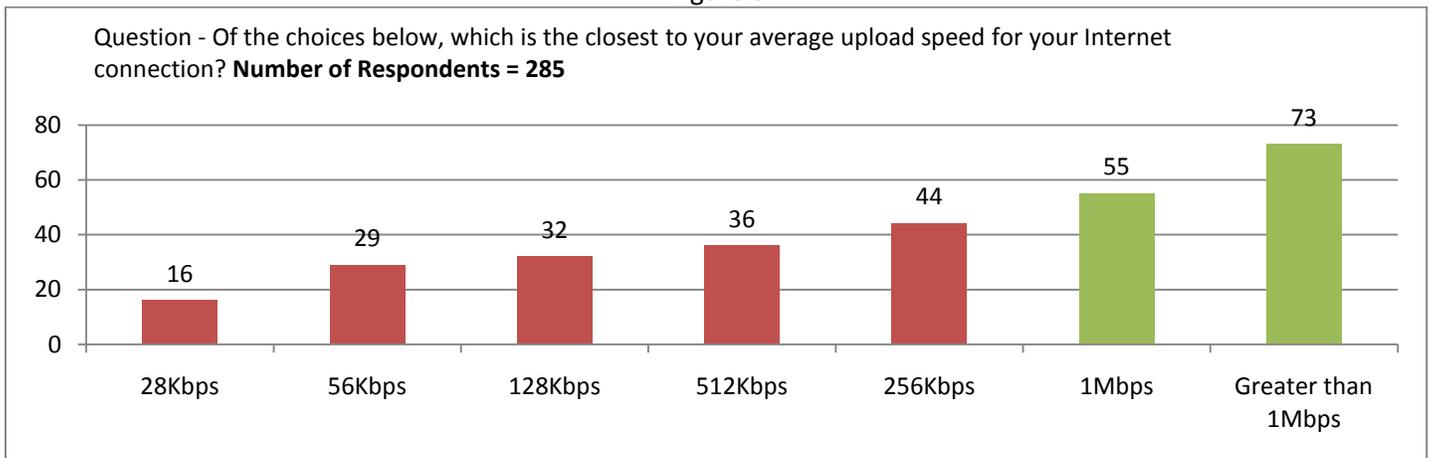
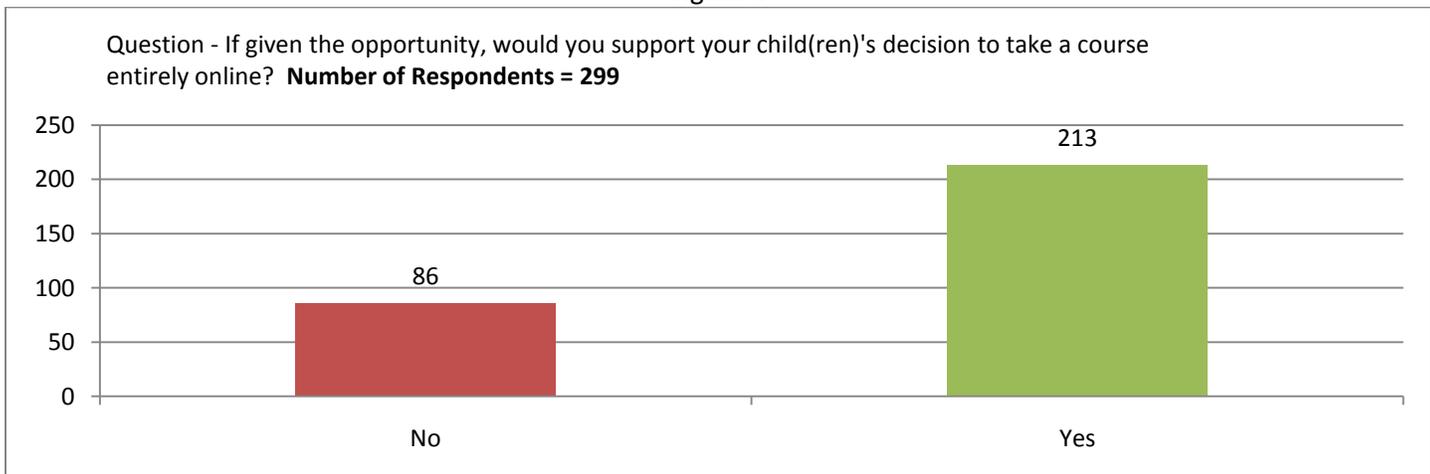


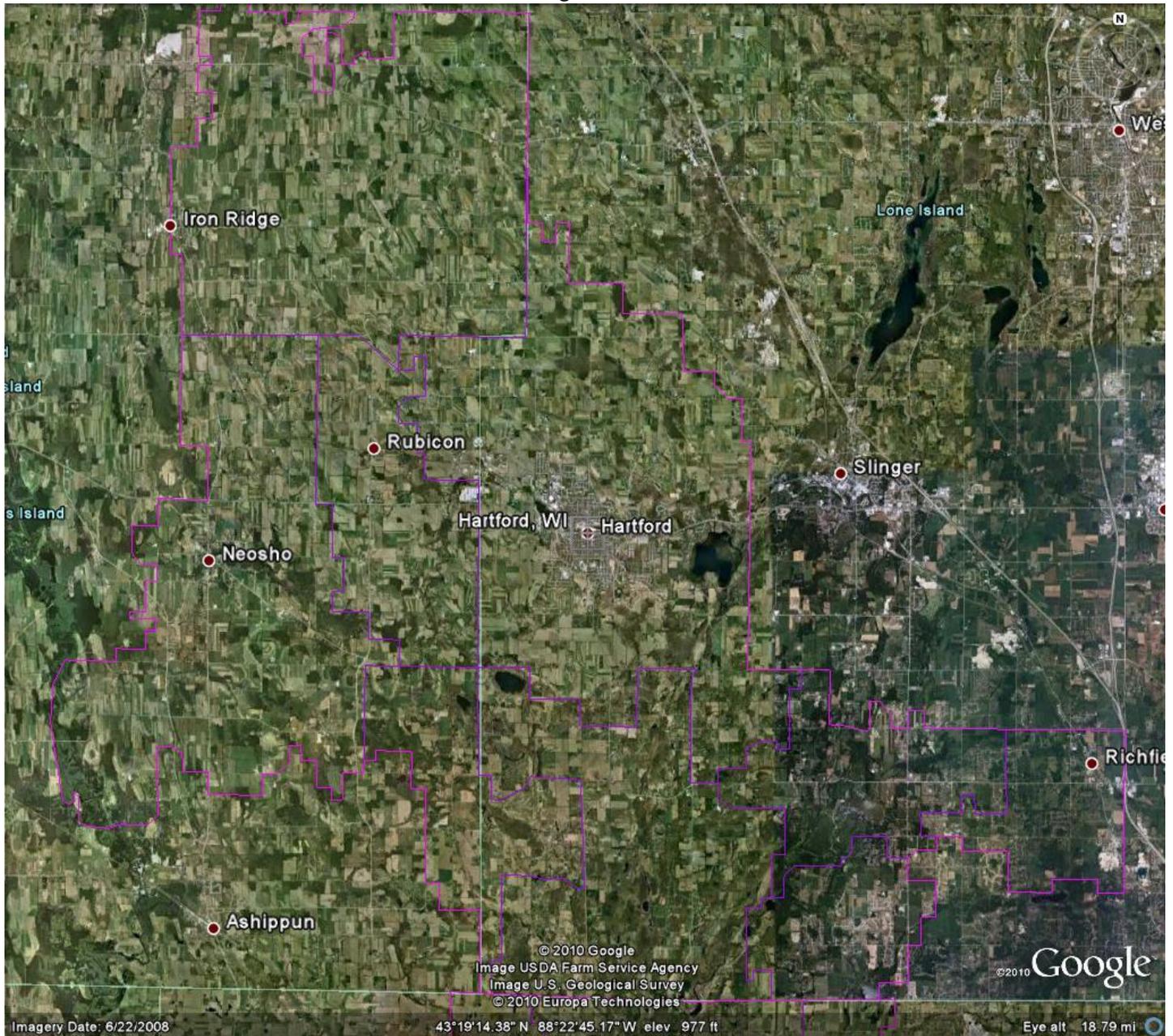
Figure 4 also indicates that a large percentage (71.2%) of respondents would support their child(ren) enrolling in a fully online course.

Figure 4



Several obstacles present themselves as we search for an efficient means of filling the home broadband wireless Internet connectivity gap. The Hartford Union High School District covers a vast geographical area, enclosing the geographical boundaries of seven total PreK/K-8 feeder Districts (see **Figure 5**). The pink outline designates the border of Hartford Union High School District and the purple outlines designate the borders of the seven PreK/K-8 feeder Districts.

Figure 5



In addition to the vast geographic area covered by Hartford Union High School District, the topography of the region does not allow for easy deployment of broadband Internet access to the rural households within the District (see topographical **Figures 6 and 7** supplied by the US Geological Survey) using traditional cellular-based technologies. Subsequently, commercial providers do not have the financial incentives to “build-out” their broadband wireless coverage to most of the rural households in the District.

Figure 6



Figure 7



Off-Premise Broadband Wireless Access Costs

Since September 2010, the Hartford Union High School District and several PreK/K-8 feeder Districts have been in communication with a regional provider of residential rural WiMAX Internet service, Granite Broadband <http://www.gbandinc.com/>. We have requested financial estimates of the costs to “build-out” broadband wireless Internet access to the most rural parts of our District(s) (see **Figure 8**). Another such provider located in Southeastern Wisconsin has since been identified, EthoPlex <http://www.ethoplex.com/>, and communications have been initiated to determine if the provider will supply a cost estimate to “build-out” residential broadband wireless Internet access to our most rural constituents.

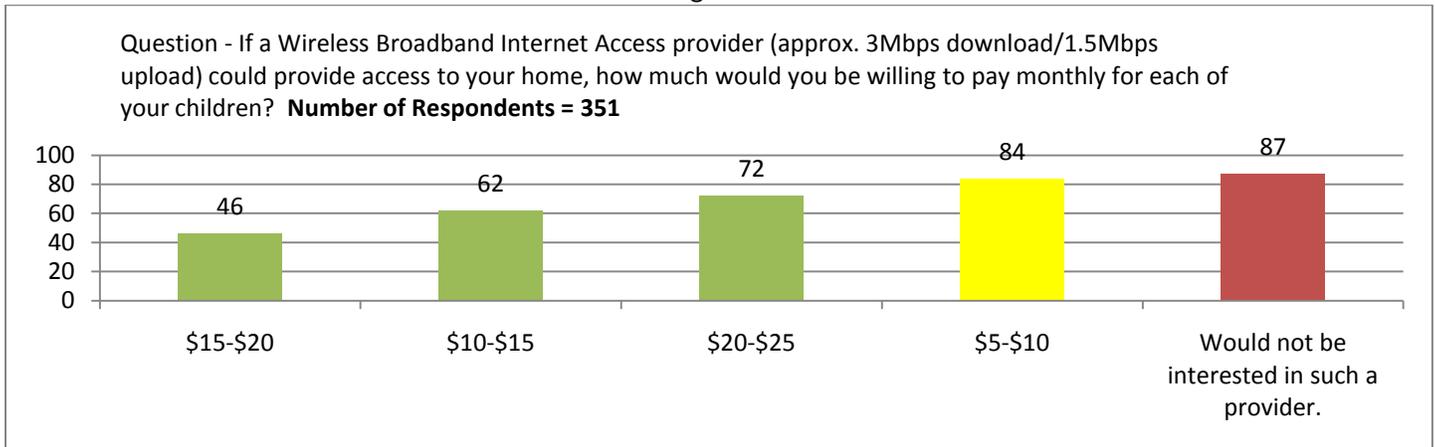
Figure 8

Granite Broadband Model					
School District	Hartford Union 805 Cedar St. Hartford, WI	Erin 6901 Hwy O Hartford, WI	Friess Lake 1750 Highway 164 Hubertus, WI	Herman #22 N6409 Highway P Mayville, WI	Neosho J3 201 Center St. Neosho, WI
Billed Entity Number	132732	132734	132742	132758	132762
2009-2010 Poverty Level	18.3%	8.9%	3.02%	35.0%	27.1%
2009-2010 Student Enrollment	1510	349	298	100	177
Capital Cost per student unit (equipment and installation)	\$150.00	\$150.00	\$150.00	\$150.00	\$150.00
Potential Number of Students Served by WiMAX Network (see Figure 9 for calculations)	1135	262	224	75	133
Estimated Total First Year Cost to Build Out Access to Each Home	\$170,250.00	\$39,300.00	\$33,600.00	\$11,250.00	\$19,950.00
Pre-Discount Annual Access Cost per Student (12 mo. * \$20.00/mo)	\$240.00	\$240.00	\$240.00	\$240.00	\$240.00
Total Annual Access Cost (Potential Students Served * Pre-Discount Annual Access Cost)	\$ 272,400.00	\$62,880.00	\$53,760.00	\$18,000.00	\$31,920.00
2009-2010 Discount Rate	40%	50%	50%	70%	60%
Total Annual EDU 2011 Subsidy Amount per District	\$108,960.00	\$31,440.00	\$26,880.00	\$12,600.00	\$19,152.00
Remaining Amount to Paid for by Individual Subscribers to WiMAX Network	\$163,440.00	\$31,440.00	\$26,880.00	\$,5400.00	\$12,768.00

*Please note that the first year costs to build a rural WiMAX infrastructure would be the shared responsibility of the individual Districts, local municipalities, and the broadband wireless Internet access provider. This proposal seeks funding for only the annual discounted access costs. Students and families interested in home broadband wireless Internet access would be able to contract annually at a discounted rate. The Districts noted above would not be paying the balance for home broadband wireless Internet access, unless decided locally to further subsidize the student population identified by their free/reduced lunch status. *Please also note that the devices used to access the WiMAX network would either be the local District's responsibility or a parent/guardian/student responsibility.*

The December 2010 1:1 Learning and Home Internet Connectivity survey also asked respondents to identify how much they would be willing to pay monthly, per child, if a wireless broadband Internet access provider could provide access to their home. Although 24.8% of respondents indicated that they would not be interested in such a provider, nearly 51.2% of respondents indicated a willingness to pay a monthly fee of \$10 - \$25, within the forecasted range of the monthly broadband wireless Internet access fee charged by Granite Broadband, minus the average District discount rate . Nearly 24% of respondents would not/could not spend more than \$10 a month on such a fee.

Figure 9



Off-Premise Broadband Wireless Alternatives

Current broadband wireless alternatives either are too costly or simply don't exist. The major broadband wireless Internet carriers, Verizon, AT&T, and Sprint, simply haven't "built-out" their GSM or CDMA broadband wireless networks to cover many of the rural areas and households, even though their coverage maps will claim to do so. *Feel free make a visit to rural Hartford to experience for yourself.* Current monthly plans for all major broadband wireless Internet carriers start at \$50/month for a 5GB allowance and do not provide measures to limit allowances ← a necessity when student access is being considered. A rural WiMAX network with unlimited monthly access is not only a financially-responsible alternative, it is a practical alternative.

Current and Potential Partnerships

This joint proposal already indicates the willingness of local individual School Districts to collaborate on efforts to extend student learning beyond the traditional school day and minimize disparity of student home Internet access. Even though not all PreK/K-8 Hartford Area Feeder Districts participated in the distribution of the 1:1 Learning and Home Internet Connectivity survey, it is our firm belief that additional collaboration and resource-sharing will be facilitated by an approved EDU 2011 Proposal. Several of the Districts detailed in this proposal are exploring 1:1 Learning initiatives. Approval of this EDU 2011 Proposal would also likely expedite the likelihood of those Districts implementing a 1:1 Learning initiative.

HUHS has also recently been involved in discussions with the Hartford Area Development Corporation <http://www.hadc.org/> regarding extended broadband Internet options in a regional Business Park. Dozens of small-to-medium sized businesses in the park currently do not have a broadband Internet provider. Laying a physical fiber backbone to most of the small-to-medium sized business is simply cost-prohibitive and would take far longer than the businesses are willing to wait for upgraded service. Licensed broadband wireless Internet options are being sought and the aforementioned broadband wireless Internet service providers are viable options for these small-to-medium sized businesses.

CIPA-Compliance

In partnership with a chosen broadband wireless Internet service provider, several measures can be put in place to ensure CIPA-compliance, as well as ensuring only District student access is being subsidized by E-Rate funding. Several of the Districts included in the proposal already utilize a mobile content-filtering application. If a District-owned device is issued to a student, filtering of inappropriate content will occur no matter where and when the device is being used off-premise. If a family/student-owned device is used at home, our Districts would require that the student have the mobile content-filtering application installed on their home device, authorized by a custodial parent/guardian.

To keep non-student users from utilizing/tethering to the WiMAX connection intended for student use only, a variety of VLANning protocols and/or MAC address filtering protocols will be employed. Although we cannot, and no School District should claim to be able to do so, guarantee that absolutely no unauthorized access will occur, we will put the proper security and access protocols in place to prevent such access.

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