

Nebraska Libraries and Schools: Beyond the Walls Pilot Project

A pilot project to equip five Nebraska school districts and five public libraries with the wireless technology necessary to extend the school district network to the public library for purposes of providing faster Internet for public school students to access the digital resources provided by the school district.

Background:

One hundred percent (100%) of Nebraska public school districts (245 districts with 307,000 total students) are connected to the statewide education network known as Network Nebraska. Over 99% of these districts enjoy fiber optic transport connections capable of 1 Gigabit speeds or more. Over this statewide network, K-12 entities, both public and private, aggregate their Internet demand and purchase from several state contracts that sport one of the lowest unit rates in the country. The statewide backbone, statewide Internet, and over 300 Layer 2 transport circuits are completely scalable for the future and are sustainably self-funded.

Contrast this scenario with the 268 Nebraska public libraries. An overwhelming majority of these public libraries, mostly rural, are connected with DSL, cable modem, and fixed wireless connections with download speeds below 10Mbps. In many cases, the 3-10Mbps of Internet is expected to serve from 6-15 public computers, not to mention the patrons who come in with wireless devices, also expecting to access free Internet. Many of the public libraries share in municipal broadband contracts with low cost or “free” Internet service, and approximately 73% of Nebraska public libraries do not apply for any E-rate support.

The Pew Report, U.S. Census, and Nebraska Rural Poll data suggest that as many as 10% of our public school students, or over 30,000, reside in homes without wired Internet access. This situation is often referred to as the “homework gap” or “digital inequity”. This lack of broadband at home may be due to economics, geography, or parental values and priorities. By 2019, it is projected that there will be over 100,000 district-owned computing devices (e.g. laptops, tablets, etc...) in Nebraska that will be checked out or assigned to students with the expectation that they will access the Internet at home to complete homework, communicate with teachers, monitor their grades, and access learning and content management systems.

It is not uncommon for public libraries to leave their Wi-Fi routers on 24 hours per day, and consequently, at all hours of the evening, and in all temperatures and weather conditions, parents and students can be found in parking lots outside the public libraries accessing a free, but insufficient source of Internet. This phenomena is regrettably repeated over and over again across rural Nebraska. It is projected that this environment of “no Internet at home” will persist for another decade, at least, until at which time residential Internet services are built out, or other wireless technologies evolve.

In a majority of rural communities, the public library is situated within three miles (or less) of the public high school or other fiber-connected public school. Typically, these two political subdivisions have never worked together or shared telecommunications services, and they definitely have never collaborated within the Universal Service Fund’s E-rate program, although the public library is assigned its E-rate discount from the poverty and rurality factors of the adjacent school district. The three mile distance is well within the effectiveness of TV White Space and microwave transmission, although these technologies have rarely been explored.

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Proposed Pilot Solution:

The Nebraska Office of the CIO, in partnership with the Nebraska Library Commission, is seeking \$75,000 in grant funds to purchase equipment and installation to enable directional TV White Space UHF or microwave transmission to extend the Internet access from at least five rural public school districts to at least five rural public libraries with the intent to make available “Homework Hotspots” where students can co-locate to log into their district’s digital resources, access the school district-filtered Internet to complete homework assignments, and to communicate with teachers and collaborate with fellow students, whether synchronously or asynchronously.

The criteria for participation would include:

- Geographic appropriateness
 - Linear distance between buildings to be ≤ 5 kilometers (~3 miles)
 - Capable of line-of-sight or non-line-of-sight wireless connections
- Facility appropriateness
 - Agreement to permit non-penetrating tower or structure in support of a base station and transmission antenna not higher than 30 meters above ground on the public school.
 - Agreement to permit non-penetrating tower or structure support of a client converter device and directional antenna not higher than 30 meters above ground on the public library.
 - Agreement to have both TVWS devices or microwave devices within 150 feet of the primary switch or router in both facilities.
- Collaboration
 - Agreement to discuss policies and filtering requirements for shared Internet use
 - Agreement to share technical expertise, as needed
 - Agreement to promote and co-market the “Homework Hotspots” so that students in need of adequate Internet could access the library’s Wi-Fi after hours and on weekends
 - Commitment to explore the prospect of an E-rate mini-consortium involving the public school district and public library with the intent to make all interconnection hardware, installation, and maintenance E-rate eligible