Report of the Kan-ed Study Committee to the 2012 Kansas Legislature

CHAIRPERSON: Representative Marc Rhoades

OTHER MEMBERS: Senators Pat Apple, Terrie Huntington, Kelly Kultala, Mike Peterson, and John Vratil; and Representatives Richard Billinger, Tom Burroughs, Terry Calloway, and Peggy Mast

STUDY TOPIC

- Evaluate the Kan-ed program for efficiency and effectiveness in providing schools, libraries, and hospitals with broadband Internet access. Specifically, determine the economic value of the Kan-ed program to the state, describe how Kan-ed funds are used, determine if there is a more cost efficient way to provide schools, libraries, and hospitals broadband Internet access, and compare the costs of alternatives to the Kan-ed program.

December 8, 2011

Kan-ed Study Committee

Report

Conclusions and Recommendations

Related to each of the charges in bold below to the Kan-ed Study Committee by the 2011 Legislature, the Committee makes the following conclusions and recommendations.

Evaluate the Kan-ed program for efficiency and effectiveness in providing schools, libraries, and hospitals broadband Internet access.

The Committee found that Kan-ed has operated in an effective manner as it relates to its statutory charge of bringing connectivity to Kansans.

The Committee recommends that Kan-ed staff continue to implement its recommendations in the Circuit Utilization Report provided to the Committee, that is determining the most efficient and effective actions to take with underutilized circuits and those circuits with a "disconnect" recommendation. During this review, Kan-ed staff should keep in mind that some customers may under utilize circuits because of the sporadic manner in which the circuit is needed; therefore, the circuit should be maintained.

The Committee also recommends that Kan-ed continue to conduct circuit utilization reviews of all circuits under the Kan-ed jurisdiction.

Kan-ed should conduct utilization analysis with defined and published objective metrics with a formulaic approach and avoid subjective or anecdotal analysis that cannot be numerically backed. Additionally, Kan-ed should re-work its network program to provide equity in funding alternative solutions for members with needs that are not effectively or efficiently served within the confines of the current Kan-ed 2.0 Advanced Virtual Private Network (AVPN) or Kan-ed Authorized Provider (KAP) offerings.

There also needs to be some kind of formula prepared that would, going forward, allow Kan-ed to know at what point an under-utilized site needs to be disconnected and allowed to seek the kind of connectivity that suits a site's individual needs.

Determine the economic value of the Kan-ed program to the state.

The Committee found that the four content areas provided *via* Kan-ed: Empowered Desktop (Learning Station), EMResource, library databases, and LiveTutor all seem to cost less to provide to Kansas *via* Kan-ed than through other avenues. The question remains whether all four of these resources are needed or whether there are other avenues to meet the need.

The Committee recommends that the 2012 Legislature consider the following when reviewing the Kan-ed budget, particularly regarding these programming content areas:

- Consider content that may be more valuable in parts of the state where access to resources may be less readily available, *e.g.* library databases in western Kansas. By way of comparison, in FY2011, the total statewide cost of the databases was $1,474,467. Total database usage (searches) during FY2011 was 9,477,418 = 16 cents per search.

- Consider the value of EMResource for the state regarding disaster response and homeland security and because of this, work with Kan-ed and the Kansas Hospital Association to determine if there is another entity, other than Kan-ed, that should manage the EMResource program. In addition, evaluate whether the Kansas Universal Service Fund (KUSF) is the best funding source for this program or should alternative funding be located so the program could be assured longevity. EMResource project cost for FY2011 was $189,845.

- Review the value of any remaining content areas, and determine whether Kan-ed is the correct "home" for these programs, and whether KUSF funding is the most reliable funding source or alternative sources should be found.

Committee members noted that tutoring programs are available on-line for free, which could assist in taking the place of the LiveTutor program which was discontinued by Kan-ed on July 1, 2011.

Describe how Kan-ed funds are used;

Determine if there is a more cost-efficient way to provide broadband Internet access to schools, libraries, and hospitals;

Describe any alternate ways to provide broadband Internet access to schools, libraries, and hospitals; and

Compare the costs of alternatives to the Kan-ed program.

Regarding the four remaining charges to the Committee shown above, all four charges will be addressed as part of a performance audit of the Kan-ed program which should be completed and presented to the Kansas Legislature in late January 2012.

However, it is worth noting the five conclusions that came from the Kan-ed Circuit Bandwidth Utilization Report. The full report is available upon request from the Kansas Legislative Research Department.

> "Conclusion #1 – Half of the Kan-ed 2.0 sites present as good candidates for commercial Internet connections rather than the advanced regional network connections (ARN) provided by Kan-ed, which would result in a large amount of savings. An excellent example of this is the library community where only 13 percent passed the initial test for ARN connectivity, and a mere 4 percent are using scheduled video services. However, with a utilization rate of 84 percent, it is clear that the library community does have a strong need for connectivity."
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> "Conclusion #2 – Not derived from this report (the Circuit Bandwidth Utilization Report) alone, but supported by it, a great number of sites appear to have Internet connections separate from the Kan-ed connection. Traffic patterns for Kan-ed 2.0 connections, in comparison to KanREN connections, and statements from many in the Kan-ed community support this. One of the major rationales of Kan-ed 2.0

was that sites would only need a single connection for everything, citing the inefficiency of multiple connections. It would seem clear that above the free T1 level, a large number of Kan-ed sites are finding local connectivity options more cost effective than larger Kan-ed circuits, yet they continue to receive a free Kan-ed T1. If the Kan-ed 2.0 network program cannot offer affordable, single connection services that meet member needs, then the Kan-ed 2.0 network is failing to live up to Kan-ed's own intentions for it."

"Conclusion #3 – Traffic patterns for a non-trivial number of connections reveal video is in use, but the current Kan-ed video method is not the best fit. It appears that many sites are using fully interactive two-way video systems and connections for applications that are essentially one-way. While this does work extremely well, one-way video does not require dedicated resources like bi-directional video does, and costs considerably less. An update or refreshing in technologies used to most efficiently meet needs is warranted."

"Conclusion #4 – This report should form the basis of a more thorough, site-by-site query of needs, backed by data. While this numerical analysis should make the network connectivity needs for most of the Kan-ed 2.0 sites clear, recommendations for a large number that are 'in the middle' will require consultation with the sites directly. Any conclusions should be backed by data. For example, if a site were to claim to be heavily dependent upon two-way interactive video, yet data shows the application is used only sparsely, it raises questions about how critical the activities are, or is the site actually using a second commercial Internet connection for part of their video needs."

"Conclusion #5 – There is a large disparity between KanREN and Kan-ed members. On average, KanREN circuit size is much larger, KanREN circuits are more utilized, and patterns suggest more applicable ARN connections. The segment of KanREN's network operation that was compared is the segment that is applicable. This clearly indicates that there are differences in the KanREN and Kan-ed networking programs. Higher utilization suggests that without subsidized funding, KanREN members are more judicious in choosing a bandwidth level. At the same time, the higher connectivity bandwidth suggests more network service needs, and that the KanREN model is more scalable at higher speeds. Likewise, the Kan-ed model appears extremely popular for T1 level (100 percent subsidized) connectivity."

"Clearly, the Kan-ed 2.0 network program is providing services that are being used. It is also clear that a non-trivial number of Kan-ed 2.0 sites have non-Kan-ed Internet connections with considerably faster speeds than the Kan-ed free T1. Many of these sites are the smallest Kan-ed sites: public libraries. This raises serious questions as to whether or not the T1 technology is the answer for future broadband connectivity, or even much of it today."

In addition, the Committee commends Kan-ed and KanREN staff for providing a plan for developing a single statewide network which will provide customers with a single Advanced Regional Network and will help customers identify whether a direct connection to the regional network is most effective for the customer or whether connection to a private telecommunications provider is better.

Further, the Committee recommends Kan-ed staff develop cost-sharing plans for customers as

well as sliding fee scales based upon ability to pay.

Finally, the Committee recommends that the 2012 Legislature review the governance and oversight of the KUSF with an emphasis on ensuring accountability of the funding keeping in mind the possible loss of the KUSF as further national policy proceeds in that direction.

Proposed Legislation: None.

Background

The Kan-ed Study Committee was created by 2011 HB 2014 to evaluate the Kan-ed program for efficiency and effectiveness in providing schools, libraries, and hospitals with broadband Internet access. 2011 HB 2014 provided the Committee with the following parameters for its study:

- Determine the economic value of the Kan-ed program to the state;
- Describe how Kan-ed funds are used;
- Determine if there is a more cost efficient way to provide schools, libraries, and hospitals broadband Internet access; and
- Compare the costs of alternatives to the Kan-ed program.

The Committee consists of five House members and five Senate members appointed by the Legislative Coordinating Council (LCC). The Committee met on September 13 and October 27, 2011.

Committee Activities

September 13, 2011, Meeting

Kan-ed's Statutory Mandate

The Committee began its September 13, 2011, meeting by reviewing Kan-ed's statutory mandate. The framework for Kan-ed has been enacted and modified through several pieces of legislation. In 2001, the Legislature passed Senate Sub. for HB 2035. The bill's stated purpose was to provide for a broadband technology-based network for schools, libraries, and hospitals to connect to broadband Internet access and intranet access for distance learning. The Kansas Board of Regents (Regents) was directed to contract with communications providers for the creation, operation, and maintenance of the Kan-ed network. The network was not to impair existing contracts for telecommunications or Internet service. Furthermore, no new construction of state-owned assets was to be undertaken in the creation of the network. Regents was authorized to appoint advisory committees with participants knowledgeable about topics such as network facilities and services, network content and user training, and any other topics as may be necessary or useful.

In 2002, Sub. for SB 614 established a funding mechanism for Kan-ed. The bill provided that, beginning January 1, 2003, funding for Kan-ed would come from the Kansas Universal Service Fund (KUSF). The bill required the Board to request funding approval through the appropriations process each year. Funding for Kan-ed was capped at $10.0 million each fiscal year. These provisions originally were set to expire on June 30, 2005. However, 2005 HB 2026 extended this expiration date to June 30, 2009, and phased out funding for Kan-ed from the KUSF over four years. After this sunset, the statute required that "state general fund moneys shall be used to fund the Kan-ed network and such funding shall be of the highest priority along with education funding." For the past three fiscal years, the annual budget bill has included a proviso that authorized the transfer of funds from the KUSF to Kan-ed. In fiscal year 2012, Kan-ed was appropriated $6.0 million from the KUSF; a $4.0 million reduction from the previous year. The

Kan-ed Act can be found at KSA 75-7221 to -7228.

Overview of the Kan-ed Program

The following two paragraphs describe Kan-ed 1.0, and should not be confused with Kan-ed 2.0, which is completely different.

The Committee received a review of the Kan-ed program from Legislative Post Audit staff and Kan-ed staff. The Kan-ed network consists of 19 network access points located across the State, connected by 24 circuits. The network access points serve as connection points to the Kan-ed network—users connect to the network through these access points. The circuits act as pipes that transmit electronic data—such as video conferencing traffic—from one access point to another.

Originally, the Kan-ed network comprised 17 circuits, mainly located in eastern Kansas. Over time, the network has expanded to 24 circuits, most of which were added in western Kansas. According to Kan-ed staff, expanding the network allowed them to reduce many members' costs of connecting to the network.

Kan-ed members are defined in statute as K-12 schools, public libraries, hospitals and higher education institutions. The total potential Kan-ed membership is 883. In 2007, at the time of the Legislative Post Audit report, there were 290 connected members. As a result of the launch of the Kan-ed 2.0 network, connected members increased from 290 (43 higher education institutions, 43 hospitals, 167 K-12 schools, 37 libraries) in December 2008 to 451 (41 higher education institutions, 73 hospitals, 207 K-12 schools, and 130 libraries) in June of 2011.

Findings from an October 2011 Kan-ed Circuit Bandwidth Utilization study showed that across all Kan-ed constituent groups combined, that of the 407 sites, only 176 sites (43 percent) needed the Advanced Regional Network (ARN) that Kan-ed provides and only 123 sites (30 percent) needed scheduling video services. The remaining, based upon their use of the current Kan-ed network, needed fewer services. For example, 207 (51 percent) easily would need only simple Internet connections, 25 sites (6 percent) do not necessitate any connection at all and disconnection was recommended. Finally, the report showed that 111 sites (27 percent) were underutilizing the circuits. The definition in the report of the term "underutilization" is "a site connection that presents as either very infrequently used (*e.g.,* a few hours a month) or usage never comes close to the provisioned bandwidth of the circuit. In this context, underutilized should be considered **very** underutilized, as the calculation of utilization was generous."

The successful bidder for the Kan-ed 2.0 network was AT&T. But Kan-ed also partners with 23 private telecommunication companies to provide broadband connections to 168 additional Kan-ed members. It is the belief of many of the Committee members that the T-1 lines which are brought to the Kan-ed members at a cost of approximately $690 per month are many times slower than they could get from other providers at less of a cost. Much improvement on connectivity, speed and overall technology has been made since 2008. Should not the cost be coming down?

From 2007 to today, Kan-ed has received $56 million: $50 million from the KUSF and $6 million from the State General Fund. Since 2008, Kan-ed, apart from its other work, has provided grants to Kan-ed members for equipment and circuit costs.

Higher Education Institutions	$1,546,326
Hospitals	$1,899,278
K-12 Schools	$3,757,597
Libraries	$2,366,170
Total	$9,569,371

The primary services Kan-ed makes available to all its members include research databases and various learning applications. Other services are available to connected members only.

Services available to all members can be accessed through any Internet connection, whereas services for connected members require a physical connection to the Kan-ed network. The Kan-ed program also provides broadband Internet connection subsidies and equipment grants for some of its members.

A brief description of Kan-ed services is provided in the chart below.

Services Available to All Members	
Empowered Desktop	A computer application that provides access to a variety of instructional programs and educational data-bases. Empowered Desktop is available to all members but is geared towards a K-12 audience.
Educational and Research Databases	Five major databases allow searches of: • More than 26 million articles from 120 newspapers; • U.S. Federal census records from 1790 to 1930; and • A variety of nursing and health journals.
EMS System *(Hospitals Only)*	A computer application that allows hospitals to communicate with each other during emergency situations about such things as the availability of hospital beds and transportation.
KanGuard Filtered Internet *(Libraries Only)*	A computer application libraries use to filter out potentially offensive Internet content.
E-Rate 1-800 Telephone Support *(Schools, Hospitals, and Libraries)*	Provides telephone support for members applying for federal E-Rate funding.
Services Available Only to Connected Members	
Interactive Distance Learning	Generally used by K-12 schools and higher education institutions, this service allows students and teachers to interact with others across the state. The need for this capability is one of the primary reasons members become connected.
Video-conferencing	A service that allows connected members to participate in videoconferencing sessions with others. Because videoconferencing requires constant flow of large amounts of electronic data, the quality of videoconferencing is improved greatly when conducted over the Kan-ed network.
Renovo Scheduler	An optional tool used to automatically schedule videoconferencing and interactive distance learning sessions with others.
Internet2	A private, high-speed, research-based Internet geared towards higher education and K-12 institutions.
Network Operations Center	This center monitors and trouble-shoots the Kan-ed network and provides technical assistance to connected members.

Source: LPA analysis of Kan-ed network, services, and usage data.

Overview of Kansas Research and Education Network (KanREN)

Chairperson Rhoades requested that KanREN staff address the Committee and provide a brief overview of KanREN. KanREN is a non-profit consortium of colleges, universities, school districts, and other organizations in Kansas, organized for the purpose of facilitating communication among them, and providing themselves with connectivity to the Internet *via* a statewide TCP/IP network. KanREN is an independent, not-for-profit 501(c)(3) Kansas corporation. Membership in KanREN is open to any college, university, library, or school district in Kansas. Other non-profit organizations may join the consortium subject to the approval of the KanREN executive committee.

KanREN is not a commercial Internet Service Provider (ISP), though it does provide Internet connectivity for most of its member sites. KanREN is not supported with any funding from the state or federal governments. Though begun with funding from the National Science Foundation in 1993, today KanREN is completely supported by membership fees paid by its member institutions. KanREN is not an agency of the state or federal governments. The KanREN network is interconnected with the Kan-ed 2.0 network providing seamless access between them. KanREN provides Kan-ed most of its Internet service, and access to other resources such as networks operated by Internet2. Additionally, KanREN monitors, manages and maintains the Kan-ed 2.0 network under contract with Kansas State Board of Regents (KSBoR).

Testimony and Request for Information

A number of conferees appeared at the September 13, 2011, meeting and together provided the Committee with an overview of the Kan-ed program. The organizations that appeared included the Kansas Revisor of Statutes, Legislative Post Audit, Kan-ed, Kansas Board of Regents, Kansas Corporation Commission, Kansas Hospital Association, Prairie Hills School District, Barton County Community College, State Library, Kansas Cable Telecommunications Association, State Independent Telephone Association, AT&T, and KanREN.

Senator Vratil requested that Kan-ed conduct a cost benefit analysis of its services and present this information to the Committee at the October 27, 2011, meeting.

October 27, 2011, Meeting

At the Committee's final meeting on October 27, 2011, members reviewed the charge to the Committee as well as the documents and presentations made by Kan-ed and KanREN staff and came to the following conclusions.

Evaluate the Kan-ed program for efficiency and effectiveness in providing schools, libraries, and hospitals broadband Internet access.

"The Committee found that Kan-ed has operated in an effective manner as it relates to its statutory charge – bringing connectivity to Kansans."

In its report to the Committee, Kan-ed and KanREN staff provided a Circuit Utilization Report identifying further efficiencies that might be achieved *via* review of the 407 circuits managed by KanREN on behalf of Kan-ed and provided through AT&T. Specifically, KanREN, acting as network operator for Kan-ed staff identified 25 circuits that do not appear to be used and a possible 112 circuits that are underutilized. A review could determine if there is a justifiable reason that circuits are used in a limited manner, such as a hospital that would use the circuit on an irregular basis for telemedicine work.

In addition to the 407 circuits described in the above report, there are other circuits provided by 20 Kan-ed authorized providers. There is no reason to believe the utilization rates differ in this latter situation.

The Committee commends Kan-ed and KanREN staff for developing a vision for a single advanced regional network. Committee members were told this network would focus on the needs of the institutions and encourage collaboration, without directly competing with commercial service providers.

Kan-ed and KanREN included the following in a joint vision statement provided to the Committee:

- Provide needs assessment and funding assistance services to small, rural customers, such as rural school districts, rather than direct connection to a regional network;

- Identify the customers which could be better served by a local telecommunications provider and which ones could be best served by a direct connection to a regional network; and

- Work with telecommunications providers to interconnect their networks with the advanced regional network, which could keep Internet traffic in Kansas and reduce out-of-state spending.

Determine the Economic Value of the Kan-ed Program to the State

The Committee found that the four content areas provided via Kan-ed: Empowered Desktop (Learning Station), EMResource, library databases, and LiveTutor all cost less to provide to Kansas via Kan-ed than through other avenues.

Content Area Descriptions

Committee members reviewed a cost-benefit analysis of the four content areas provided by Kan-ed which are:

Empowered Desktop or Learning Station. Since 2004, LearningStation—a private company—has worked with Kan-ed, the statewide network in Kansas, to deliver the Empowered Desktop by Kan-ed to every educator and student across the state. The Empowered Desktop by Kan-ed is a portal, accessible anytime and anywhere, with resources for teaching and learning.

LearningStation, a leading provider of customized e-learning tools for K–12 classrooms, connects administrators, teachers, parents, and

students to maximize the digital classroom and improve student achievement. Schools use LearningStation's innovative solutions to evaluate and address individual student needs with Learning Station's Test Builder, a standards-aligned formative assessment and integrated instruction tool; communicate with students and families through LearningStation's Teacher Pages, an easy-to-use website creation tool; store and share files simply and securely online with the Education Backpack; and engage students with integrated online content that fits seamlessly into class assignments. LearningStation has been honored by several groups in the learning industry for its significant contributions to the growth of education technology.

EMResource. In 2004, The Kansas Hospital Education and Research Foundation was granted funding from Kan-ed to support a statewide license of EMResource. EMResource is a web-based program providing real time information on hospital emergency department status, hospital patient capacity, availability of staffed beds, and available specialized treatment capabilities.

Databases. Kan-ed provides grant funding to the State Library which negotiates, coordinates, contracts for and provides a portion of the funding for statewide subscriptions to electronic databases so that all Kansans may have high quality information resources. An example of the databases made available include nursing databases required for nursing accreditation and InfoTrac Student Edition, a periodical database for high school students with over 1,100 titles, cross searchable with e-books.

Tutor.com. Tutor.com provided on-line tutoring for students in grades K–12 as well as college students and other adults. This service was discontinued on July 1, 2011, because of the budget cut to Kan-ed.

Cost Evaluation of Each Content Area

The Committee reviewed documentation provided by Kan-ed comparing the cost of providing each of the four content areas to customers across the state with the estimated costs of providing the same or similar services in an alternative manner. The results of that comparison is described below.

Empowered Desktop or Learning Station. Kan-ed staff presented a cost comparison of this content area as provided by Kan-ed compared to the purchase of the same material in the private market. The savings shown was nearly $3.9 million saved via the Kan-ed unlimited statewide license available to all Kansas students and schools compared to school districts purchasing the same product on their own. The cost to the State is $551,820 but its unclear how many students and teachers are taking advantage of this program and how it is helping students' progress in their learning.

EMResource. According to Kan-ed and Kansas Hospital Association staff, EMResource is unique in the United States in the services it provides to hospitals. Currently, EMResource is available in 26 states, including all states surrounding Kansas except Nebraska. As stated above, EMResource project cost for FY2011 was $189,845.

Committee members agreed that EMResource provides a very important service across the state, particularly critical in times of natural disaster or other emergency situations when a community needs to rely on sending patients to neighboring hospitals, such as was needed in the aftermath of the Joplin tornado.

Databases. The State Library provided information to the Committee that showed that the cost of the statewide databases provided by Kan-ed and the State Library cost nearly $1.5 million. State Library staff estimated it would cost individual libraries approximately $24.0 million to license the database content on their own.

Tutor.com. In FY 2011, Kan-ed paid $309,000 for the Live Tutor service through Tutor.com. Further information presented indicated that if students have to pay for alternative tutoring services, the cost could have been from $405,000 to $472,500, based on a cost estimate of $30 to $35 per hour for tutoring services.

This service was terminated in Kansas on July 1, 2011. Committee members were informed that similar services currently are available at no charge via the Internet.

Legislative Post Audit and the Kan-ed Study Committee

Regarding the four remaining charges to the Committee shown below, staff from the Legislative Division of Post Audit told members all four questions would be answered as part of a performance audit of the Kan-ed program which should be completed and presented to the Kansas Legislature in late January 2012.

- Describe how Kan-ed funds are used;
- Determine if there is a more cost-efficient way to provide broadband Internet access to schools libraries, and hospitals;
- Describe any alternate ways to provide broadband Internet access to schools, libraries, and hospitals; and
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Committee Recommendations

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