# An Overview of the Employment of Telecommunications Technology in Kansas: History, Status, Possibilities

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# Highlights

It is a pleasure to be here to present this overview of the employment or use of telecommunications infrastructure and technological advancements in Kansas. Chairman Morrison's invitation provided an opportunity to update an earlier research effort I assembled when serving as Director of the Kansas Telecommunications Consortium in the early 1990s. It was interesting to review the history.

The update I've provided is divided into three tabbed sections. In compiling the old and new materials, I was surprised to end up with 270 pages, but they are color-coded, so I hope it can serve as a good resource for you.

**Tab 1** documents outline the activities of the Kansas Telecommunications Consortium in 1989 and 1990, and some of the accomplishments involving education, business and government. Also included is legislation that created DISC (the Division of Information Systems and Computing), and parts of the DISC 2006 Annual Report.

**Tab 2** starts the selections of state telecom networks including the Lightcore-KDOT Public-Private Partnership for Fiber Optics and the Intelligent Transportation System (ITS) along with current Kansas telecommunications legislation.

**Tab 3** articles describe the newest deployments of broadband bundled services by telephone companies, partnerships of cable and cellular companies and a new endeavor of an internet search engine provider. Technology continues to set the pace fed by customer demand. The challenge to stay in the race is increasingly interesting. It could be said that the greatest breakthroughs are made where there is less regulation and less bureaucracy to maneauver.

What was the Telecommunications Consortium? What did it do? The Telecommunications Consortium was established in 1988 to develop a state-wide, state-of-the-art telecommunications system in Kansas. The first task was to identify stakeholders. The group assessed current technology and served as a forum to discuss IT needs, protocols, standards and possibilities for cooperative efforts. Perhaps the most intriguing challenge was interactive video. Several demonstration projects were carried out. One included linking government and business in Topeka, London and Hong Kong. Another demonstration showed the possibilities of sharing teachers, so Kansas students -- particularly in rural areas -- could fulfill college preparatory requirements and other career-building education. Lee Droegemueller was the Commissioner of Education at the time, and a passionate advocate for distance teaching and learning. He was quite creative in linking schools that straddled the two area codes that existed at the time. Before long, with Droegemueller's encouragement, five distance learning clusters were operating. One of the most important elements critical to the success of the distance learning projects was standardization of protocols for the CODEC's (expensive videoconferencing machines). The person Droegemueller selected to head this effort was Denise Moore. Now, with these years of learning, research and experience, she is heading IT for the State as Director of DISC.

The Consortium also wanted to demonstrate the new technology to the Legislature, so on February 15, 1990, in the Old Supreme Court Room, using early video conferencing equipment, legislative hearings were held by interactive video. Another project demonstrated "telemedicine." The University of Kansas Hospital in cooperation with the Kansas Department of Education coupled the bandwidth of the school clusters with the Regents Educational Communications Center at Kansas State University to link with doctors and patients in Hays, Colby, Goodland and 21 northwest counties and to hospitals in Fort Collins, Colorado and Cheyenne, Wyoming. It was an exciting time.

Before going to the information under Tabs 2 and 3, this is a good time to spend a moment comparing the sizes and shapes of some of the "parts" that make up the "plumbing" of the information age.

In 1987, 5-inch floppies were supplanted by the 3.5 inch floppy (or disk). Floppies, or disks, measured volume of data. A 3.5-inch floppy would hold 1.44 megabytes (Meg) of information. This book is **20** megabytes as a PDF file, so it would have taken 13 floppies to "record" it. A CD is 700 Meg or 486 floppies, and a DVD is 4.3 Gig or 3,500 floppies. A CD would hold 35 books of data this size, and a DVD would hold 270 books of this size.

T1 is a way of looking at bandwidth or plumbing **pipe** size. A T1 transports 1.5 Meg in 1 second -- that's about one 3.5-inch floppy of information transported in one second. A T1 consists of 24 voice circuits or 48 copper wires. It would take a T1 13 seconds to transport the data in this book. If 30 T1s are bundled, the product is called DS-3. This copper bundle is a DS-3. This second bundle is composed of fiber optic cable. One strand of fiber in this bundle is a number of DS-3's. Fiber has over 20,000 times the capacity of a twisted pair of copper wires. The Wireless technology can carry as much or more data as fiber.

A preview of the future is in Tab 3. ATT calls their latest $4.6 billion improvement to 19 million homes U-Verse, a combination of fiber and copper. Verizon's is deploying fiber to the home spending $18 billion on 18 million homes. Cable operators are implementing what is referred to as the quadruple play of broadband, television, phone and wireless. Wireless is seamlessly converting from cell to Wi-Fi or Wi-MAX with speeds approaching one Meg and beyond. Even search engines like Google are starting their own "Hot Spot" networks. In his February 1, 2007 presentation to Congress, FCC Chairman Kevin Murphy points out in 1986, there were only 500,000 wireless subscribers. Today, there are 219 million wireless subscribers with $60 billion in revenue. Prices have fallen 82% since 1996 – 14% last year. An example of what can be done without regulation and intense competition where the customer picks the winner because the carrier provides the service desired by the customer.

Today, broadband serves nearly 600,000 Kansas homes and is available in 95% of the United States with 42% of U. S. households subscribing to broadband. The information age has arrived.

Returning to legislation in Kansas and documentation of future deployments --