

**State of Nebraska  
NASCIO Nomination  
Information Communications Technology (ICT) Innovations**

# **The Nebraska Statewide Telehealth Network**

## **Executive Summary**

The Nebraska Statewide Telehealth Network currently connects 67 rural hospitals, eight regional medical centers which serve as hub sites, seven Omaha metropolitan hospitals, 17 public health departments, and six bioterrorism labs in Nebraska. The network is used for patient consultations, teleradiology, trauma and emergency room care, continuing medical education, emergency communications and bioterrorism preparedness training, video medical interpreting services, and administrative meetings.

The Nebraska Statewide Telehealth Network is a collaborative effort of the Nebraska Hospital Association, Nebraska hospitals, the State of Nebraska (including the Nebraska Information Technology Commission, Office of the Chief Information Officer, Nebraska Public Service Commission, and Health and Human Services System), the University of Nebraska, area health education centers, and the Nebraska Medical Association. Technical assistance was provided by the University of Nebraska and the State of Nebraska.

The Nebraska Statewide Telehealth Network is improving patient outcomes and expanding continuing education opportunities for health professionals. Mental health consultations and teleradiology are the services most often provided via the network. Telehealth helps patients reduce travel time and costs. In some cases, telehealth supports the mental and emotional health of patients who may not be willing or able to receive care the traditional way.

The Nebraska Statewide Telehealth Network is improving the operation of government in several ways. The system has greatly enhanced bioterrorism and public health preparedness. On February, 23, 2006 over 70 sites participated in the Avian Bird Flu Conference lead by U. S. Health and Human Services Secretary Mike Leavitt. The telehealth network is also generating significant savings in staff time and mileage costs, saving hospitals and public health departments over \$750,000 in staff time and nearly \$700,000 in mileage costs between January 2005 and May 2006. The savings in staff time and mileage costs exceeds the state's investment of \$1,080,000 through the Nebraska Universal Service Fund by approximately \$370,000.

The Nebraska Statewide Telehealth Network has leveraged state resources through the Nebraska Universal Service Fund with funding from the federal Universal Service Fund and bioterrorism funding. For every dollar invested by the Nebraska Universal Service Fund, nearly \$3.50 has been contributed by federal sources.

## Project Description

The Nebraska Statewide Telehealth Network connects nearly all of Nebraska's hospitals, public health departments, and bioterrorism labs into one of the most extensive telehealth networks in the country. The Nebraska Statewide Telehealth Network was created to address the shortage of health specialists—especially mental health professionals—in rural areas of the state and to expand continuing education opportunities for health professionals. In addition, public health and emergency management officials needed a way to provide training on bioterrorism preparedness and emerging public health threats such as mumps, West Nile Virus, and avian flu.

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The Nebraska Statewide Telehealth Network builds upon existing telehealth networks and resources in the state, connecting them into a unified network. Efforts to obtain support for telehealth from the Nebraska Universal Service Fund began in 2002. On Sept. 8, 2004, the Nebraska Public Service Commission approved an initial plan for the telehealth network. The network has been implemented in phases. By January 2005, sufficient connections between hub hospitals were in place to begin the initial phase of network operations. By January, 2006, nearly all of the state's hospitals and public health departments were connected to the network. The Nebraska Statewide Telehealth Network currently connects 67 rural hospitals, eight regional medical centers which serve as hub sites, seven Omaha metropolitan hospitals, 17 public health departments, and six bioterrorism labs in Nebraska. The network is used for patient consultations, teleradiology, trauma and emergency room care, continuing medical education, emergency communications and bioterrorism preparedness training, video medical interpreting services, and administrative meetings.

Significant resources have been devoted to training site coordinators at rural hospitals. Telehealth coordinators at regional hub hospitals have provided on site training for rural coordinators. Additional training is being provided via the telehealth network. The Nebraska Medical Association is also providing information and training on telehealth to physicians.

The network is a private IP network using a hub and spoke design with a backbone interconnecting the hub sites. Most of the network is based on 1.5mbps T1 lines. The backbone is based on multiple T1 lines. There are some locations using ethernet based provider services. Standardized network routers are in place at each location with large routers at the hub site locations and small to mid-size routers at each end-point location.

Every site also includes an appropriately sized firewall. The routers and firewalls are configured and managed by the hub site locations. Most of the hub sites also include an IP video bridge to support multiple site video sessions. The network will be used to support H.323 video, teleradiology, and other telemedicine applications. A map of the network is included.

## **Improvement of Operation of Government**

The Nebraska Statewide Telehealth Network is improving the operation of government in several ways. The system has greatly enhanced bioterrorism and public health preparedness. On February, 23, 2006 over 70 sites participated in the Avian Bird Flu Conference led by U. S. Health and Human Services Secretary Mike Leavitt. The telehealth network has enhanced the capabilities of Nebraska's Health Alert Network. A test on May 3, 2006 included 89 facilities.

The Nebraska Statewide Telehealth Network is also generating significant savings in staff time and mileage costs by using the system for administrative meetings and continuing education. Between January 2005 and May 2006, hospitals and public health departments experienced savings of \$757,250 in staff time (30,290 hours @ \$25.00/hour) and mileage costs of \$696,792.73 (1,728,201 miles @ the federal reimbursement rate which averaged \$.40/mile over the evaluation period).

## **Benefits**

The Nebraska Statewide Telehealth Network is improving patient outcomes, expanding access to specialist services, and providing additional continuing education opportunities for health professionals. Telehealth helps patients by reducing travel time and costs. In some cases, telehealth supports the mental and emotional health of patients who may not be willing or able to receive care the traditional way.

Between January 2005 and May 2006, 275 telehealth consultations were performed using interactive video. Nearly half of these consultations were for mental health, behavioral health, psychiatry, or geriatric psychology. Health care professionals are also using interactive video in innovative ways. For example, the Central Nebraska Area Health Education Center is using the network to provide medical translation services for patients who speak languages other than English. Without telehealth, these patients would have had to travel over 150 miles on average to see a specialist, saving patients \$16,500 (41,250 miles @ \$.40/mile).

Teleradiology is the most used application of the network. The two regional hospitals with the most active teleradiology programs reported over 28,000 teleradiology studies in a six-month period. Before teleradiology, rural hospitals would have to drive diagnostic

images of trauma patients to the nearest regional hospital. Teleradiology has drastically reduced the time required to read diagnostic images, dramatically improving patient care.

The Nebraska Statewide Telehealth Network is also expanding continuing education opportunities for health professionals. Over 350 educational sessions and over 100 conferences have been presented over the network between January 2005 and May 2006. One hub site coordinator estimated that the number of educational sessions offered has grown 10%-20% since the statewide network has been in place. The University of Nebraska Medical Center is completing a pilot program to evaluate the use of the network to deliver medical lecture series (grand rounds) on internal medicine, psychiatry, and neurology to physicians at eight hospitals.

The following story illustrates the benefits that telehealth is having on patient outcomes:

### Telehealth network eases tiny baby's transition home



Born four months early and weighing only 13.9 ounces, Trey Keifer is a medical miracle. He is the tiniest baby to ever survive at Saint Elizabeth Regional Medical Center. His mother, Jessica, was airlifted from North Platte to Lincoln where an emergency Caesarean section was performed to save her life and hopefully that of her unborn son. Both lives were saved to the amazement of the medical teams.

During Trey's four-month stay in the Saint Elizabeth newborn intensive care unit, videoconferences were set up between Saint Elizabeth and Great Plains Regional Medical Center in North Platte using the Nebraska Statewide Telehealth Network. Through videoconferencing, Jessica was able to arrange support services for the family; family members in North Platte were able to see Trey and to visit with Jessica; and Trey's neonatologists at Saint Elizabeth and his physicians in North Platte were able to discuss his medical needs and care.

Impressed with how well videoconferencing has eased Trey's transition back home to North Platte, doctors and nurses at Saint Elizabeth now plan to regularly set up videoconferences with the families and doctors of infants with special medical needs who reside outside of the Lincoln area.

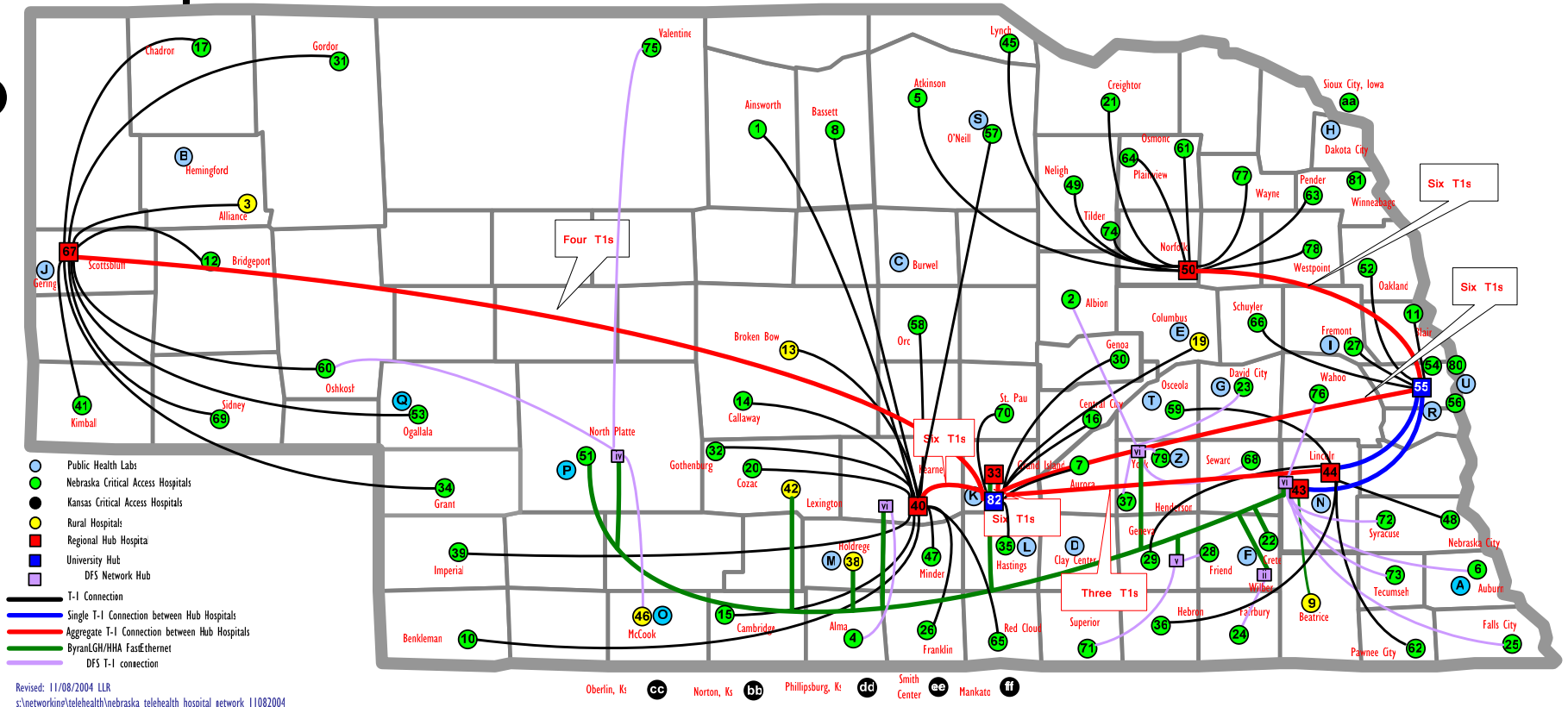
## Return on Investment

The Nebraska Statewide Telehealth Network has leveraged state resources through the Nebraska Universal Service Fund with funding from the federal Universal Service Fund and bioterrorism funding. For every dollar invested by the Nebraska Universal Service Fund, nearly \$3.50 has been contributed by federal sources. Investments from the Nebraska Universal Service Fund over the past three years are estimated at \$1,080,000. During that three-year period, an approximately \$2,765,000 in federal funding commitments from the Universal Service Fund was received by Nebraska hospitals. Another \$1,000,000 in bioterrorism funding was received.

The Nebraska Statewide Telehealth Network is also generating significant savings in staff time and mileage costs, saving hospitals and public health departments over \$1,450,000 in staff time and mileage costs between January 2005 and May 2006. The savings in staff time and mileage costs exceeds the state's investment of \$1,080,000 through the Nebraska Universal Service Fund by approximately \$370,000.

# Nebraska Telehealth Hospital Network

## Revised Plan for July 1, 2005



### Nebraska Hospitals

1. Ainsworth	28. Frienc	55. Omaha	University of Nebraska Medical Ctr
2. Albion	29. Geneva	56. Omaha	Alegant Health Immanuel
3. Alliance	30. Genoa	57. O'Neill	Seward Memorial
4. Alma	31. Gordon	58. Ord	Valley County
5. Atkinson	32. Gothenberg	59. Osceola	Annie Jeffrey
6. Auburn	33. Grand Island	60. Oskosh	Garden County
7. Aurora	34. Grant	61. Osmond	Osmond General
8. Bassett	35. Hastings	62. Pawnee City	Pawnee County
9. Beatrice	36. Hebror	63. Pender	Pender Community
10. Benkelman	37. Henderson	64. Plainview	Plainview Public
11. Blair	38. Holdrege	65. Red Cloud	Webster County
12. Bridgeport	39. Imperial	66. Schuyler	Alegant Health
13. Broken Bow	40. Kearney	67. Scottsbluff	Regional West Medical Center
14. Callaway	41. Kimball	68. Seward	Seward Memorial
15. Cambridge	42. Lexington	69. Sidney	Memorial Health
16. Central City	43. Lincoln	70. St. Paul	Howard County
17. Chadron	44. Lincoln	71. Superior	Broadstone Memorial
19. Columbus	45. Lynch	72. Syracuse	Community Memorial
20. Cozad	46. McCook	73. Tecumseh	Johnson County Hospital
21. Creighton	47. Minden	74. Tilden	Tilden Community
22. Crete	48. Nebraska City	75. Valentine	Cherry County
23. David City	49. Neligh	76. Wahoc	Saunders County
24. Fairbury	50. Norfolk	77. Wayne	Providence
25. Falls City	51. North Platte	78. West Point	St. Francis
26. Franklin	52. Oakland	79. York	York General
27. Fremont	53. Ogallala	80. Omaha	Creighton Hospital
	54. Omaha	81. Winnebago	Winnebago Indian Hospital
		82. Grand Island	College Park

### Hospitals From Other States

aa. Sioux City, Iowa	
bb. Norton, Ks	Norton County Hospita
cc. Oberlin, Ks	Decatur County Hospita
dd. Phillipsburg, Ks	Phillips County Hospita

### Dark Fiber Solutions Network Hubs

i. Lincoln Bryan LGH, 1600 S. 48th	iv. NP GPRMC, 601 W. Leota St., North Platte
ii. Wilber Head End, 901 N. Main, Wilber	v. Geneva Head End, 300 C. St. Geneva
iii. DFS York, 600 1/2 Grand Ave, York	vi. Kearney Head End, 804 Ave. A., Kearney

### Nebraska Public Health Depts.

A. Auburn	Southeast District Health Dept.
B. Hemingford	Panhandle Public Health Dept.
C. Burwell	Loup Basin Public Health Dept.
D. Clay Center	Clay County Health Dept.
E. Columbus	East Central District Health Dept.
F. Crete	Public Health Solutions
G. David City	Butler County Health Dept.
H. Dakota City	Dakota County Health Dept.
I. Fremont	Three Rivers Health Dept.
J. Gering	Scotts Bluff County Health Dept.
K. Grand Island	Central District Health Dept.
L. Hastings	South Heartland District Health Dept.
M. Holdrege	Two Rivers Public Health Dept.
N. Lincoln	Lincoln-Lancaster County Health Dept.
O. McCook	Red Willow County Health Dept.
P. North Platte	West Central District Health Dept.
Q. Ogallala	Sandhills District Health Dept.
R. Omaha	Douglas County Health Dept.
S. O'Neill	North Central District Health Dept.
T. Osceola	Polk County Health Dept.
U. Papillion	Sarpy/Cass Dept. of Health and Wellness
V. Trenton	Southwest Nebraska Public Health Dept.
X. Wayne	Northeast Nebraska Public Health Dept.
Y. Wisner	Elkhorn Logan Valley Public Health Dept.
Z. York	Four Corners Health Dept.