

APPENDIX C

LTIS Broadband Infrastructure Plan Executive Summary

Lincoln Technology Improvement System

BROADBAND INFRASTRUCTURE PLAN

2014 – 2020

Chris Beutler, Mayor

Miki Esposito, Director of Public Works & Utilities

Executive Summary

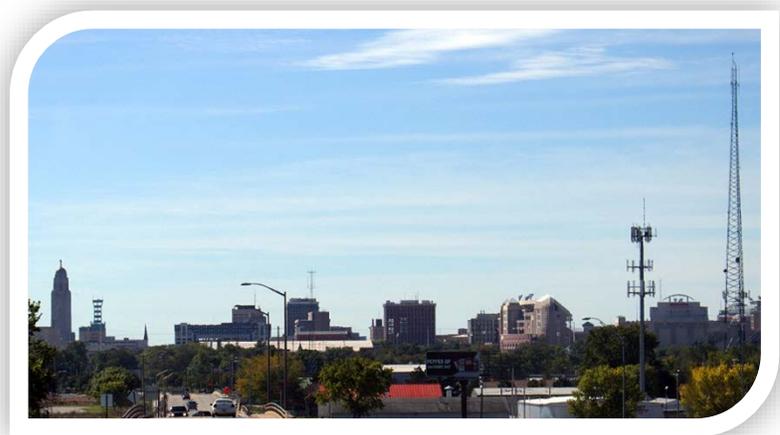
Broadband Infrastructure Capital Improvement Plan (\$750,000 per year)

Starting in late 2012, the Mayor's office, City Council, Chamber of Commerce and Lincoln Partnership for Economic Development came together to support an initiative called the Lincoln Technology Improvement System (LTIS). The LTIS project calls for a master planned broadband infrastructure system installed throughout the city to be made available for lease to private carriers. The goal of the system is to create competition for services and lower the cost of constructing new networks within the City. The current system consists of over 300 miles of broadband infrastructure that has been leased to five broadband companies (UNL, Nebraska Link, Windstream, UPN and CenturyLink) over the last year. The system will support up to 8 new providers over the next 20 years. Based on this success, the City Council adopted a Broadband Infrastructure Capital Improvement Program into the 2014-16 annual budgets to support the system growth.

The Broadband Infrastructure Capital Improvement Program (CIP) spans six years (2014-2020) and includes three objectives:

1. Expand the LTIS broadband infrastructure to cover major business centers within the City.
2. Upgrade the existing Institutional Fiber network to a 10 gigabit capable system.
3. Construct new broadband connections for Public entities in the City.

In a flat world, Lincoln is competing with communities around the globe to attract new businesses and keep young professionals. Affordable access to Gigabit-speed fiber networks has been proven to foster innovation, business investment, and growth in communities across the nation. Expanding the LTIS broadband infrastructure to our major business centers will enable Lincoln to offer businesses access to affordable, fiber-based networks. By the end of 2020, 100 miles of new LTIS broadband infrastructure will be extended to connect Airpark, Havelock, Yankee Hill, Coddington and other major business centers with world-class network technology.



Institutional Network Improvement Plan (\$200,000 per year)

Upgrading the community network will benefit the City, County and State government agencies with faster backbone connections. Upgrading the Institutional Network will connect all city and county facilities to the 10 gigabit fiber backbone. Additional expansion of the Institutional Network will increase employee productivity and decrease costs across all departments. Phase one of the CIP program will upgrade 30 miles of multimode fiber to the 10 gigabit standard in the first two years. Phase two will remove old copper cables from ten miles of existing conduit making it available for commercial carrier usage. Once complete, all public facilities connected to the Institutional Fiber Network will have access to a 10 gigabit fiber connection.

Public agencies and private businesses share a common goal in today's economic climate, "Doing more with less." Employee productivity is the backbone of successful strategies in achieving this goal. With more and more emphasis placed on technology to achieve increased productivity, network cost and speed must be constantly evaluated. The City has over 60 locations with high-cost, low-speed, copper network connections. The non-fiber network locations include public libraries, parks and civic entities. Once connected to the Institutional fiber network, employees at these locations can see their productivity increase through faster downloads, fewer computer viruses and consistently higher network performance. Department managers will see a 94% cost reduction in the cost to provide network connections from \$50 per megabit to \$3 per megabit. The broadband CIP will add fiber-based network connections at more than 40 locations by 2020.

Included within the Institutional Network expansion project is an IP Network Master Plan. The IP Network Master Plan will add 16 million new IP addresses to the public network. Adding the new IP addresses will allow the Institutional Network to grow for the next 50 years. Additional funding would enable the connection of all public facilities to the Institutional fiber network.

Downtown Lincoln Wi-Fi Plan (\$350,000 per year for 4 years)

The efficient use and expanded access to public Wi-Fi resources are fundamental to Lincoln's future economic growth and global competitiveness. Congestion of the wireless spectrum and scarcities in both licensed and unlicensed bands must be addressed for continued innovation and investment



growth. Access to wireless technology in our public spaces for use by residents, visitors, and even businesses has become an everyday expectation. In 2006, a panel of public and private sector leaders evaluated public Wi-Fi for Lincoln. They recommended a public Wi-Fi system be installed in the core economic zone. The Downtown Lincoln Wi-Fi Plan is a public-private partnership which gives residents and visitors a fast and reliable Wi-Fi connection in one of the most exciting and fastest growing areas of our community.

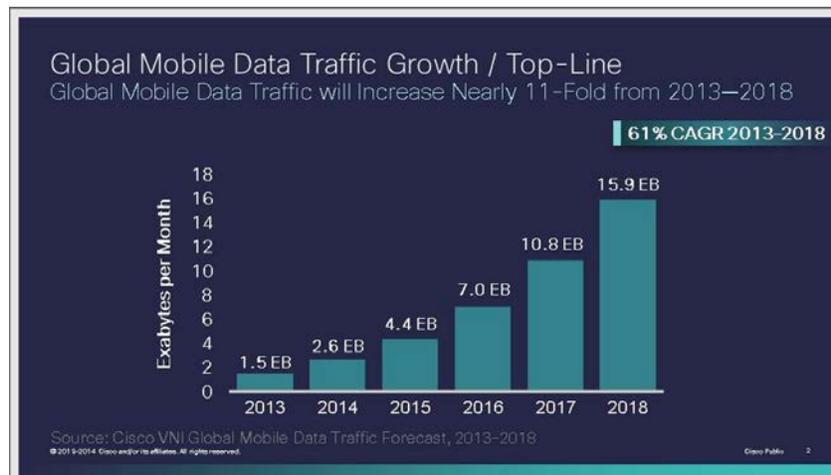
In May 2014, the City and five private entities collaborated to provide a pilot Public Wi-Fi service for Iron Horse Park. Iron Horse Park is located in the center of the revitalized Haymarket and new Rail Yard districts. The project was scheduled to last from May 15th to Sept 15th. The public response to the Wi-Fi system was overwhelmingly positive. Over 1,500 people accessed the system during the project.

On August 9th, 2014, the Lincoln Chamber of Commerce, Lincoln Partnership for Economic Development, WRK, and several private businesses sponsored a “Support the Public Wi-Fi” party with over 250 people logging into the public wireless system during this 4 hour event. Additionally, 150 people logged into Facebook and “liked” the Public Wi-Fi. Multiple positive news articles and letters were written in support of the Lincoln Public Wi-Fi Plan.

The Public Wi-Fi Plan would construct new public wireless systems in the following areas:

1. Phase I – Centennial Mall and Civic Plaza
2. Phase II – Haymarket and Rail Yard
3. Phase III – Downtown Retail Economic Zone

Lincoln’s broadband strategy is based on a strategy of partnership between community leaders and private broadband carriers to ensure the success of the Public Wi-Fi system. Creating a Public Wi-Fi system in downtown Lincoln will further our goals of economic development and technology leadership. Mobile data traffic is projected to double every year for the six years. The Public Wi-Fi system has been designed to handle this growth. UNL staff, Downtown Lincoln Association, Lincoln Chamber of Commerce and members of the City Council have offered support for the project.



According to Cisco, by 2018 Global mobile data traffic will exceed 15 Exabytes (EB). An Exabyte is equivalent to a million Terabytes. Just 10 Terabytes of data would hold the printed collection of the U.S. Library of Congress. LTE Cellular networks are limited to 20 megabits per seconds (Mbps). Current Wi-fi technology (802.11ac) is rated at 500 Mbps or 40 times faster than LTE. The Downtown Lincoln Wi-Fi infrastructure is designed to support the LTE/Wi-Fi convergence and small cell network designs of the near future.

Summary and Recommendations

As the driving force behind the Tennessee Valley Authority and Rural Electrification Act, Senator George Norris would remind us “cooperation is a mechanism for self help.” The LTIS project was born of cooperative effort between Lincoln’s business, community, and City leaders. The success of the initial LTIS is unquestioned. In the first 18 months of operation, it system has achieved the following goals:

1. Six private conduit lease agreements have been signed
2. Over 60 miles of private fiber optics have been installed
3. A competitive Cable TV franchise has been signed
4. Public Broadband service cost has decreased 80% and services increased 400%

The LTIS Broadband Infrastructure Plan goals are to extend competitive fiber optic-based broadband networks to our community business; upgrade and expand the existing Institutional Network to all public entities; and create a broadband infrastructure to ensure future generations have affordable, competitive, and quality access to the infrastructure of the 21st century. To achieve these goals, the LTIS Broadband Infrastructure Plan included \$1.3 million dollars in funding for three elements:

1. Broadband Infrastructure to Business Centers
2. Institutional network upgrades and expansion
3. Public Wi-Fi in the Central Business District

The LTIS Broadband Infrastructure Plan will continue to achieve success through cooperation with community stakeholders and the vision of our City Leadership. Public Works requests support from Mayor Chris Beutler and the Lincoln City Council in identifying continued funding for this project.

LTIS Mission Statement:

“To deliver fast, reliable, and affordable broadband to City of Lincoln citizens and businesses”