Illinois City Upgrades Network as Foundation for Economic Growth

City of Aurora integrates advanced fiber optic network to improve government efficiencies, saving taxpayer dollars.

Executive Summary

City of Aurora, Illinois

- **Industry:** State and Local Government
- **Location:** Aurora, Illinois
- **Number of Employees:** 1052

CHALLENGE

- Improve communication services
- Reduce costs paid to third-party providers
- Upgrade bandwidth and availability of network infrastructure to enhance productivity

SOLUTION

- Integrate Cisco fiber optic network between municipal government buildings to upgrade network capabilities

RESULTS

- Saved US$485,000 per year for Aurora taxpayers
- Upgraded and streamlined network infrastructure across all 52 municipal government sites, increasing network speed and availability

Challenge

Aurora is the second largest city in Illinois, with its municipal government employees spread across 52 different buildings within 46 square miles. Although Aurora has a larger, centralized City Hall facility, municipal government operations occur all the way down to "single person shops," or individual employee offices dispersed across the city. The ability to collaborate and communicate between remote locations is imperative for city government employees to maintain productive service to Aurora constituents.

Aurora was using a variety of traditional connectivity network equipment from a host of different providers. With such a mix of service providers and equipment, Aurora's network infrastructure was highly disparate, making it difficult to manage and use. The existing equipment could support multiple networks over the same cable, but cable capacity was stretched and that negatively affected network reliability and performance. Beyond inhibiting regular email usage and data sharing, the weak network prevented Aurora from using distance-bridging technologies such as video conferencing. Ted Beck, chief technology officer of Aurora, comments on the networking challenges facing the city: "Even if the network was available, it was difficult to use."

In addition, Aurora's weak, divided network infrastructure hindered government employees' access to computer applications, for example, email, payroll, purchasing, and other applications used to support daily business operations. The network was disjointed, resulting in high fluctuations and variance in available applications to employees from building to building. Employees in government buildings with faster network connections, for example City Hall, benefited from easy access to a range of applications. By contrast, in government buildings with slower connections, employees had access to only a few tools such as email. For those employees, this lack of access to tools meant having to travel all the way to City Hall to access the high-speed connection, resulting in wasted time and decreased staff productivity.

Furthermore, Aurora was becoming increasingly concerned with the costs of its unreliable network. Aurora was paying third-party services approximately US$350,000 a year simply for servicing a handful of government buildings. Beck says, "Maintaining the equipment, with all the different providers, was prohibitively expensive." The expensive mix of equipment lacked a common, cohesive backbone. Frustrated with the high costs of an ultimately unreliable, dated network infrastructure, the Aurora City Council agreed to fund a new network solution.

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Mayor Tom Weisner
Mayor, City of Aurora

Solution

To tackle mounting costs and debilitating network inefficiencies, Aurora began to look at ways to use fiber optics, an advanced, innovative technology, to replace its older, traditional copper network. However, Aurora was relatively new to fiber optic technology. As such, Aurora needed to partner with a company that could provide fiber optic expertise and lead the change of its network infrastructure.

Aurora considered working with Cisco early on in the solution design process. Aurora employees were already familiar with the Cisco brand, having used their equipment such as routers in the past; they were pleased with the reliability that the hardware demonstrated. Mayor of Aurora, Tom Weisner, says: "When I found out Cisco was going to be a major player in our solution, it was an entity that I recognized well based on a strong reputation." The ultimate differentiating factor that set Cisco apart from other providers was its cutting-edge approach to network systems. Cisco proved to have the know-how to leverage fiber networks using an advanced color optic system, which increases network reliability and performance. Beck says: "There are an awful lot of providers that make switch gear, some even play in optical space… but Cisco is the big dog in color transition."

Cisco® coarse wavelength-division multiplexing (CWDM) and dense wavelength-division multiplexing (DWDM) use technology that optimizes fiber based on light color, making it possible to simultaneously run multiple networks over the same strands. By installing the Cisco CWDM and DWDM technologies, Aurora was able to stretch its network, meaning more coverage, while retaining high percentage availability. The CWDM and DWDM systems also facilitated the design of a highly available, multiservice network. Ultimately, Aurora consolidated its network from multiple technologies to one, Cisco, immediately eliminating inefficiencies in the system and changing the network management to a much more holistic approach.

Results

Aurora's network upgrade has resulted in a range of successes and improvements across the municipality. The consolidation of equipment and providers, and integration of Cisco's CWDM/DWDM system, provided an annual savings of $485,000 for the city. These savings resonate in the current economic climate, as affirmed by Mayor Weisner: "With local governments increasingly facing limited resources, you have to be able to find efficiencies in operations." Although the cost savings are gratifying, Beck notes that that was just the beginning: "The priority for the fiber optic network was initially cost savings; however we're realizing that the benefits don't end there. We've had some super wins with this technology, and we're going to keep leveraging the infrastructure." Mayor Weisner confirms theses

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successes: "Pretty quickly, we saw a return on investment, both financially and otherwise. We have a much greater capability and fewer problems."

Today, the network has been upgraded and streamlined across all 52 municipal government sites, meaning faster network speeds and more applications available for employees, even those working in remote sites other than the City Hall. Aurora's improved network quality also supports the implementation of cost-saving, efficiency-driving tools such as video conferencing. For example, in Aurora's public safety technical support group, half of the staff works in separate buildings. In the past, Beck and his team traveled across town to hold meetings and trainings with the various departments. The new, reliable fiber optic network supports a video conferencing system, enabling employees to collaborate and communicate directly with Beck's team while staying in their respective buildings. Overall, Beck estimates that he and his colleagues have gained "at least an hour a day" in travel time with the Cisco fiber optic network solution.

Cisco network enhancements have affected other departments in Aurora. Following the 2008 infrastructure upgrade, Aurora designed and built a new police department that incorporates the new Cisco equipment to help ensure both the municipal and public safety departments used the same hardware. Having a singular hardware provider means that public safety employees can be trained to use the same skills, subsequently decreasing training costs while increasing staffing efficiencies.

Furthermore, using its new fiber optic network as a foundation, Aurora has implemented a traffic signal management system, allowing the municipal government to control traffic during times of road construction, or even in times of potentially hazardous or natural disasters. Aurora's traffic management system project was funded by a $7 million Congestion Mitigation and Air Quality (MAQ) grant, a grant for which Aurora qualified primarily because the city already had a network in place.

The residents of Aurora are well aware of, and pleased with, the benefits of the new network. Peter Lynch, a member of the Mayor's Broadband Business Roundtable Group and resident of Aurora, recognizes the benefits of the technology upgrade: "As a taxpayer and resident, I'm thrilled that the city has been so progressive and far-sighted, to both seize the opportunity to lower costs, as well as improve the municipality and gaining a new advantage in economic development with technology."

Aurora is working on leveraging its new network to become a backbone for the community, namely by tying local school districts to their network in places to augment their communication services. This initiative has the potential to increase process and data efficiencies and cost-effectiveness, and to create interconnectivity

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Product List

ROUTING AND SWITCHING

- Cisco Coarse Wavelength-Division Multiplexing (CWDM)
- Cisco Dense Wavelength-Division Multiplexing (DWDM)

between the communities. Recently, Aurora officials were presented with an opportunity to begin this initiative. A nearby school district contacted the Aurora municipal government for help; the district had integrated a new field system and had no way to track home addresses within the district. As it turned out, the Aurora government had an existing city database on its website. The fiber optic network facilitated sharing this data with the school, saving the school time and resources. Beck comments on the new collaboration: "With our city government making gains with the new technology, we can turn around and help schools to succeed." Eventually, the goal is to leverage Aurora's fiber optic network to facilitate virtual classes between local school districts.

Looking forward, Aurora has high hopes that their fiber optic network will be a driver for economic development and an increasingly collaborative atmosphere in the area. Beck foresees that the high network availability could be appealing to local firms seeking to expand or to companies seeking to relocate: "People want quality connectivity, redundancy, and routing diversity. By improving our city's communications facilities, we are making the city eligible as a prime area for businesses."

The fiber network installed by the City of Aurora with Cisco's technology gives new meaning to Aurora's long-standing nickname: "The City of Lights". The nickname originally referred to Aurora being first to use electric street lights for publicly lighting the entire city in about 1881. Today's ground-breaking illuminations travel inside fiber optic cables and have significantly upgraded the quality and efficiency of government connections for Aurora. Mayor Weisner comments: "Cisco's fiber network has helped us become the 21st century version of the City of Lights: the city of light speed."

For More Information

To find out more about the fiber optics, go to: http://www.ciscopress.com/articles/article.asp?p=170740

To find out more about CWDM go to: http://www.cisco.com/en/US/prod/collateral/modules/ps5455/ps6575/prod_brochure0900aecd803a53ea.pdf

To find out more about DWDM go to: http://www.cisco.com/en/US/products/hw/optical/ps2011/products_technical_reference_chapter09186a00802342dc.html