



Minneapolis Nets Industry-Leading Public/Private Partnership and Technology with US Internet and BelAir Networks

Ranked as a top tech city in the U.S., the most athletic city, and home of many Fortune 500 companies – Minneapolis is a world-class city in many aspects. It is the largest city in the state of Minnesota, and offers a unique urban lifestyle where commerce, industry and technology are blended with museums, arts and sports – and more than 6,000 acres of parkland, in fact nearly a half square mile of open space for every square mile of residential.

Historically, the Town of Minneapolis was incorporated in 1856, and in 1878 adopted the motto *En Avant* (a French term meaning “Forward”) – leaving an indelible stamp on the city and setting a course to become one of the most progressive communities in the country. It comes as no surprise to find Minneapolis at the vanguard of North American cities that are installing wireless mesh networks to foster innovation and economic development.

The new network, known as *Wireless Minneapolis*, is being built by US Internet, a Minnesota-based service provider, using industry-leading wireless mesh products from BelAir Networks. It will provide ubiquitous broadband access throughout the metropolitan area, changing the way in which residents, civic employees and visitors live, work and play in the city. It will enable Minneapolitans to keep pace with today’s information-driven economy.

The Challenge

Like many municipalities around the world, Minneapolis is faced with the creed of “spend less and do more”, an endeavor to increase the efficiency and effectiveness of government services, but not the cost. As a cornerstone of this challenge, the city needed an economical means to meet all of the municipal government Internet access needs, including networking and wireless connectivity for remote and mobile employees.



“US Internet offered the best proposal, and we were very pleased with the performance of their pilot network and the BelAir Networks technology.”

Karl Kaiser
Minneapolis CIO

In fact, the city set a goal of establishing all of these services at significantly lower rates than they were currently paying. And it needed a way to provide ubiquitous access to these applications and services throughout a 54 square mile territory.

The new wireless network also needed to support public safety; providing police, firefighters and emergency medical personnel with high-speed, mission critical access to applications and databases. This access must be mobile, allowing first responders and law enforcement to connect and communicate on the go, even at vehicle speeds.

“The kind of technology that we’re looking for must be rugged to deal with the weather extremes that we have in Minneapolis. It must be reliable because we are counting on this network for public safety, as well as residential and business and visitor uses. It must be able to deliver a very high quality of service to all of our users. It must be able to give us the bandwidth delivery that we are looking for and it must be able to give us the ubiquitous coverage that is important to all of the programmatic goals that we have established for this network.”

James Farstad,
President, rClient

Minneapolis also wanted the wireless network to make the city a more competitive location for new businesses, and a world-class center for education.

Several of the city’s Five Year Goals center on bridging the “Digital Divide”, providing equal access to educational opportunities and establishing a culture of innovation for all Minneapolis residents.

In terms of services for local residents and businesses, the new network must also provide “neutrality”, allowing wholesale access to the network to new and existing Internet Service Providers and Hot Spots – ensuring a competitive market for consumers.

The Solution

Minneapolis did not want to use taxpayer dollars to build the new network, so they sought a public-private partnership. The partnership business model had to maximize the return on the city’s existing infrastructure, in particular a fiber optic network. Other assets, such as access to city buildings, street lights and poles, were also to be made available to the partner. In addition, for a period of ten years the city itself would become an anchor tenant for the new network.

City officials received proposals from nine potential partners, and selected two finalists. Each of the final contenders built a pilot wireless network over a square mile of Minneapolis. The technology solutions were then evaluated over a two month period, closely monitoring the performance levels vis-à-vis the goals established for the new network.

US Internet, one of the finalists, chose wireless mesh equipment from BelAir Networks. “We reviewed about every product out there and went to a number of cities to see real-world deployments, and the BelAir Networks product stood head and shoulders above what we were seeing technically from anything else” said Kurt Lange, co-founder of US Internet.

By the end of the trial, Lange's convictions proved correct – the BelAir Networks equipment provided true broadband wireless service, delivering carrier-grade voice, data and video with seamless mobility. US Internet was awarded the contract to build, own and operate the broadband wireless network using BelAir Networks gear.

The Design

The solution was designed using BelAir Networks dual and multi-radio products to provide a flexible range of options, including “outside-in” coverage whereby the outdoor-mounted wireless nodes deliver coverage in nearby buildings or homes. The complete metro-wide network will be built using the same BelAir200 and BelAir100 products already in service throughout the pilot area.

The BelAir200 units are four-radio wireless switch routers built specifically for outdoor deployments. Each BelAir200 includes an access radio module that uses the 2.4 GHz band to support Wi-Fi client access. Every BelAir200 can also be configured with up to three separate 5 GHz backhaul radio modules. These radios and their associated antennas are used to connect multiple BelAir systems in a wireless backhaul mesh that delivers client traffic to and from the Internet. The resulting system provides unmatched capacity, security, reliability, and scalability for large-scale wireless deployment throughout the city. The BelAir100 used in the Minneapolis deployment is a two-radio, wireless multi-service node that accepts the same radio modules as the BelAir200.

“Learning from the experiences and challenges faced by other cities, Minneapolis has chosen both a business model and a technology solution that ensure immediate, ongoing, and sustainable benefits to our citizens, visitors, municipal workers and public safety personnel.”

**R. T. Rybak,
Mayor of Minneapolis**

This range of dual and multi-radio products, with multipoint-to-multipoint, point-to-multipoint, point-to-point and multiple point-to-point backhaul options, allows US Internet to cost-effectively cover densely populated zones as well as extend the reach of the network coverage to less-densely populated areas, without sacrificing performance. The network performance and carrier-class QoS compares favorably to wired systems.

In addition to Wi-Fi and WiMAX, BelAir's mesh network architecture also supports the licensed 4.9 GHz Public Safety spectrum which ensures that Minneapolis can deploy an efficient network combining dedicated access for law enforcement and first responders, along with mobile wireless access for public works, residences and businesses, over a single network – concurrently, at broadband speeds.

The Result

The city's new wireless broadband network will make Minneapolis the largest wireless city in North America. It will serve city employees, including an exclusive public safety network for police and first responders, and will provide economical wireless broadband access to residences and business throughout the metropolitan area.

In fact, for a low monthly cost of \$19.99, the network will offer subscribers, equipped with wireless enabled laptops and notebooks, high-speed Internet access at rates of 1 to 3 Mbps, from anywhere in the city. Premium data rates, at a cost of \$24 to \$29 per month, will offer bandwidth in the 5 or 6 Mbps range. In anticipation of the ubiquitous broadband network, expected to be fully deployed by the end of 2007, hundreds of keen residents have already pre-registered for service with US Internet.

Today, the Minneapolis wireless network is focused on wide-area Wi-Fi, but BelAir's unique multi-radio wireless backhaul mesh architecture can also be applied to other wireless technologies such as WiMAX and cellular. This level of software upgradeability ensures that the city and US Internet will get years of service from these products, with a seamless evolution path – improving the return on investment and reducing maintenance costs.

With *Wireless Minneapolis*, US Internet and BelAir Networks have illustrated that well-architected broadband wireless networks are the ideal solution for world-class cities... like Minneapolis.



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