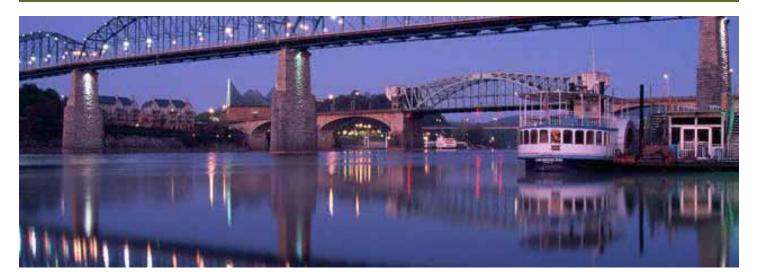# THE CITY THAT THINKS BIG—CHATTANOOGA'S BROADBAND VISION

**CHATTANOOGA IMPROVES CITY SERVICES, SAVES TAXPAYER DOLLARS AND LEADS THE WAY IN TECHNOLOGICAL INNOVATION USING MOTOROLA'S ROBUST WIRELESS BROADBAND NETWORK SOLUTION.**

## SITUATION

**Like any city, Chattanooga is faced with budget constraints and the need to do more with less. The city needed to increase bandwidth and coverage to achieve its goal of improved efficiency across the many city departments. To provide the foundation for future technology advances and growth, the city knew it had to upgrade its wireless infrastructure—without tapping into taxpayer dollars to foot the bill.**

"Every city has the same types of issues. What makes them different is how they approach it," says Mark Keil, CIO for the City of Chattanooga. As a progressive city that is no stranger to relying on technology to solve real-world problems, Chattanooga was looking for a solution that would allow its employees to service larger areas and be more effective at their jobs—while providing a platform for even further innovations. "We are a very progressive city," says Rodger Jenkins, President and Chief Executive Officer of Excalibur Integrated Systems, Inc. "While there's always an opportunity to fix problems, sometimes people do

things because they're thinking ahead." Already, over 56 wireless applications are being put in place in Chattanooga. But, as Keil puts it, "government is not based inside a building. We cover every inch of our region. Having all of these applications was great, but we found out very soon that every single entity or organization was vastly improved if you were able to deliver a high level of communication."

## SOLUTION

**A complete wireless infrastructure solution from Motorola with over 400 AP 7181 802.11n mesh wide area access points planned including One Point Wireless Management software. With over 175 access points currently installed, this combination of hardware and software is giving Chattanooga the tools it needs to continue on its quest to be one of the most technologically advanced cities in the country—if not the world.**

### CUSTOMER PROFILE

**Agency**
- City of Chattanooga, Tennessee

**Industry**
- Local Government

**Solution**
- Over 175 AP 7181 802.11n mesh wide area access points installed of over 400 planned
- One Point Wireless Manager

**Features**
- Superior throughput, network reliability, high network capacity
- Improved efficiency and cost savings through application integration across government departments
- A solid infrastructure foundation for new innovations and technologies

The City of Chattanooga worked with Excalibur Integrated Systems, Inc. over several years before identifying the right solution to meet its tough requirements, and its perseverance paid off. Jenkins comments on the process, "We interviewed a lot of cities, we visited them, put a project plan together—and then we honed in on the best technology to use." With the new Motorola mesh network in place, city employees can instantly access data, video and voice communications from wherever they may be in the region. "The quality has been good and we've been exceptionally pleased with the throughput and the distance that we're getting out of it," reports Jenkins.

> **"The combination of the fiber backbone and the wireless mesh gives our city an infrastructure capable of providing something truly remarkable and efficient, making our vision a reality."**
>
> Ron Littlefield, Mayor, City of Chattanooga

## RESULT

**The City of Chattanooga has experienced increased efficiency in every department that's using the new wireless network, leading to higher productivity, lowered crime rates and impressive cost savings. Additionally, Chattanooga's recent technological advances contribute to its growing reputation as a tech-savvy city and are attracting new businesses—and jobs—to the area.**

Chattanooga is reaping the benefits of its new mesh infrastructure but some of these gains can be hard to quantify. Keil explains, "When you're operating a city, ROI can't just be about how much money you saved. ROI could also come in the form of a saved life." Video surveillance, for example, provides officers with knowledge of what's occurring during a crime, so they have a better understanding of what type of situation they may be walking into. The city is up and running, deploying over 56 applications using the wireless network, but Keil knows that this is just the tip of the iceberg. "We had great applications before the mesh, but it's like we were driving 60 miles per hour. Now, we're doing 120 miles per hour because we're no longer thinking about what kind of infrastructure we need to support these applications. Our wireless made it so that bandwidth is no longer a bottleneck to the deployment of innovation."

## CHATTANOOGA: A PROGRESSIVE CITY WITH AN EYE ON TECHNOLOGY

With a visionary Mayor and a driven Chief of Staff, Chattanooga has embraced communications technology with open arms. This paradigm shift landed the city on the Intelligent Community Forum's short list of Intelligent Cities in 2011. "If you're going to be in the top seven cities in the world, you have to have something distinctive about you," said Keil. "And, I believe we showed them that the key to a smart city is smart government."

The city's unique approach to addressing problems with technology has won the buy-in from both municipal employees and citizens. By illustrating the real-world benefits of new technology, the city helped employees and citizens understand what it will mean for them, gaining their support. In terms of city employees, Keil states, "We challenge our people to think about what problems they have or what they want solved, rather than focusing on technology. We ask them to think about the purpose of what they want in their mission, and we solve it with innovation."

## ONE NETWORK, MANY USES

Right now, the City of Chattanooga's network supports over 56 different wireless applications across the city's departments. "The city is amplifying and expanding its services by doing things smarter and faster rather than throwing more people at the problem," says Jenkins. Police officers are using the technology for video surveillance, ID verification and to testify in court while out on the street. Building inspectors are using the mesh network to access plans and to file reports. Fire personnel can now tell where caustic chemicals are located inside buildings before going inside. Interoperability has been achieved in a region-wide Homeland Security radio system that spans state lines. The list goes on and on—and continues to grow. Jenkins concludes, "The city's employees have been encouraged to reach out and find new ways to use the system better to gain efficiency."

## THE INVESTMENT IS PAYING OFF

"From an economic point of view, there's no doubt the new technology had an impact," says Jenkins. There are many examples of this. After analyzing the time savings afforded by the new wireless capabilities, the city feels it's achieved the equivalent of putting 18 new officers on the street—and this is because officers can now handle many of their administrative duties while on the street, away from their desk. By taking advantage of the mesh system to eliminate the need



"With the mesh network it's fascinating to see that you have the city acting very innovatively to roll out lots of different applications."

J. Ed Marston, Chamber of Commerce, City of Chattanooga



Mesh access points

to physically wire each of the city's traffic control units, Chattanooga has been able to cut the costs of its new traffic incident management system by at least half. And, by hooking up every street light in the city to the mesh network, studies show the city will save over a million a year in tax dollars.

While these cost savings are significant, other factors contribute to ROI as well. Keil explains, "Certainly we need to figure out ways to save money, but there are other aspects to consider such as reduced crime rates or improved safety for firemen. These are things that cities deal with every day and we're finding that technology can help solve these issues." In one test case scenario, police officers were sent out with 17 warrants. Thanks to improved communications, the team was able to make 35 arrests, more than doubling their productivity. Another example? The city had its police department monitor the surveillance cameras at a local park. Within a week, a murder suspect was caught, a stolen vehicle was brought in and two illegal weapons were taken off the street. All of this proves that not only is the new wireless network improving productivity and efficiency, it's also promoting a safer community.

## CHATTANOOGA'S CHOICE: MOTOROLA

After years of studying other cities' wireless solutions and building a business plan, Chattanooga was ready to purchase equipment with the guidance of the team at Excalibur Integrated Systems, Inc. "Chattanooga was looking for a vendor who had a sustainable business model—a larger, stable company," said Jenkins. "We knew it would be at least five or six years before we could move to new technology, so long-term sustainability was important." That left two players on the board, but in the end, the city went with Motorola's mesh solution.

"Motorola had just released the AP 7181 when we first met. We realized really quickly that this product was exactly what we were looking for and that we could build on it," said Jenkins. Keil adds, "Motorola had newer technology than other vendors. The solution from Motorola also had built-in smarts, and didn't require people smarts. We needed a solution that wouldn't be hard to implement—but would meet hard technical requirements."

So far, the city has been impressed with the reliability of the network. "I don't want to jinx it, but it's almost scary because we've had no failures up to this point," said Keil. He also said that even though a tornado ripped through the area leaving many without power for weeks, none of the AP 7181 units came off their poles or sustained any damage from rain or wind— a testament to the equipment's physical quality.

Mesh access points

## CREATIVE FINANCING

"The City of Chattanooga—particularly its Chief of Staff—has been ingenious about funding this project. If you look at putting a mesh network inside of the City of Chattanooga and doing it right, you may be talking about a $15 to $25 million dollar project. It is a big project. Most cities don't have that kind of money lying around," said Jenkins. Ultimately, the city was able to fund the project through a combination of Federal grants and savings gleaned from the efficiencies gained from the new network.

When it came time to apply for various government grants—the Homeland Security grant, the Smart Grid grant and the Department of Energy grant to name a few—the city made sure to include the wireless infrastructure in its proposals. This allowed Chattanooga to procure the lion's share of the project's funding. The city was also able to put the budget dollars saved from its traffic incident management system towards the new technology. And, since police officers and other mobile city employees would no longer need cellular air cards in their vehicles, the dollars set aside for that cost were also used toward the network infrastructure.

Selling the solution to key stakeholders didn't hurt, either. "What's the purpose of a new solution? Why are we doing it? By taking the rationale down to this common denominator, we've made it easier to fund new technologies by going to multiple sources and generating excitement around the project," explains Keil.

## BECOMING A ROLE MODEL

Many cities across the nation are now looking to Chattanooga for ideas on how they can improve their own wireless networks. "Many cities are taking a cue from our solutions and are adapting our ideas to meet their unique needs," says Keil. Chattanooga is one of the few cities to offer a full gigabit of access to all of its residential and business customers. Additionally, according to Jenkins, "Our police force is one of the finest in the nation. Our SWAT team has been recognized as number one in the nation several times over the last five or six years. Other cities send their police departments here to get trained because of all the efficiencies we've gained through technology." In light of these achievements, and the city's constant drive to innovate, Chattanooga will be a city to watch for years to come.

## A CITY POISED FOR THE FUTURE

"You can easily find larger cities around the country than Chattanooga, but you can't find a more progressive city," said Jenkins. The new technology is improving the city's culture and quality of life and is playing a role in convincing the city's younger residents to stay in Chattanooga versus relocating to a larger or more modern city. More importantly, it's attracting new businesses and residents.

"I can't tell you how many companies and start-ups have come to the city and have talked about our wireless mesh and fiber networks," said Keil. "They get excited about their own ideas and how they would use the technology." Jenkins adds, "The number of jobs—and the quality of jobs—is increasing. We're seeing the average income per job is increasing. There are many, many ways the new wireless network is having an effect on us as a city. It has made a great economic impact and a great efficiency impact on the departments that are using it."

## THE NEXT PHASE

"This has been a dream project," says Keil. "I've been able to fund it. I've been able to implement it. And everyone has just been ecstatic about what the new network allows them to do. I have 175 access points installed and I'm not stopping." Keil continues, "We're about to go region wide. We've got the low-hanging fruit, and now we're moving on and expanding." The city is deploying roughly five new AP 7181 units a day. Now, Keil is continuing to look for vendors with products that can go wireless to help solve even more of the city's problems. Jenkins adds, "We believe that wireless will be just as important to this city in the future as power, phone service or utilities like cable TV and water. As new information and technology comes out, you have to keep updating and upgrading to move forward."

Next on the radar? An LTE solution for the region's rural areas. "We're not thinking small," says Keil. "Everything is tied together, nothing is a standalone project. It's that dream … that concept … of what we're going to be able to do that keeps us going."

The Intelligent Community Forum selected the City of Chattanooga as one of its **Top Seven Intelligent Communities of the Year** for 2011. The awards are presented annually by the independent think tank as part of its annual summit, *Building the Broadband Economy.* The ICF also recognized the city for having the "Coolest Broadband App," which is used for enhancing public services ranging from smarter traffic controls, enhanced coordination of first responders and many other services.

For more information on how Motorola's Wireless Mesh Network Solutions can improve your city's communications technology, please visit us on the web at www.motorola.com/mesh

**MOTOROLA**