

## Wi-Fi Within Sight for Shenandoah

By Chip VanSteenberg, City Administrator, City of Shenandoah

In February 2006, the Shenandoah City Council approved a partnership to install a Wi-Fi mesh network in the city. The idea was to blanket the city with a wireless network that provides unlimited access for municipal services, ubiquitous coverage for Internet access, and the possibility of additional consumer-oriented services in the future.

The cost to install the network was justified by improved efficiencies and additional services that would be realized from city use. Due to a booming commercial sector, the city could provide residents wireless Internet access at no charge. The cost to operate the network was to be covered through a combination of commercial user fees, non-residential user fees, and advertising revenue.

More than one year has passed, and the idea is still not a reality. Based on current estimates, the Shenandoah wireless system should be running by the end of 2007. They say that experience is the best teacher, and we can certainly attest to that. We now know more about starting and operating a wireless system than we did a year ago. We hope the lessons we have learned will help other cities navigate the obstacles to establishing a system of their own.

### Shenandoah Is a Unique Community

Shenandoah is a community of 3,400 people that straddles Interstate 45 just 35 miles north of Houston. We are



nestled near the center of Montgomery County, between the City of Conroe and the 85,000 people who live in the master-planned community of The Woodlands. Covering less than three square miles, Shenandoah is geographically small, but within that territory we have more than 1,000,000 square feet of retail shopping, 35 restaurants, six hotels, three hospitals, and 900,000 square feet of office space. Standard and Poor's recently upgraded the city's credit rating to an "A" based on the strength of the economy, the quality of the development, and the city's prudent fiscal management.

### Ambitious Project

Shenandoah entered into a contract with WaveMedia to provide a turn-key Wi-Fi mesh network. As a local company, WaveMedia brought a unique advantage to the partnership: a well developed network of fiber optic network in Montgomery County and the

Houston area. They will install, test, adjust, and maintain the system, and they will also be the WISP (Wireless Internet Service Provider) for the Wi-Fi mesh.

The network will be developed in two phases. The first phase will cover the residential area. Once that system is up and running, the second phase will be installed to cover the rest of the city.

The first phase calls for approximately 30 Strix radios that connect to WaveMedia's fiber ring at four strategically located injection points. The proposal includes:

- Wi-Fi mesh coverage with one megabit of bandwidth at the interior of every home in the city.
- Two log-ins per household for free access (special software is not needed for access).

- ☑ Splash screens for different virtual networks, depending on the type of user.
- ☑ Free access to visitors, with a time limit of one hour or less.
- ☑ Paid access for longer use in four- to 24-hour increments.
- ☑ Unlimited access for municipal use.
- ☑ A cost of \$80,000 per year to operate the system.
- ☑ A revenue-sharing agreement that allows the city to recoup costs for operations and installation.

## Challenges

The newspapers ran stories about the system, and residents took an interest in the project immediately. They even began making decisions about their current Internet service providers (ISPs) based on what they read. The city was met with its first challenge—*managing expectations* of a leading-edge service. We were very careful not to oversell the capabilities of the proposed system.

Reliability will be a key component of the city's system, but there will be a transition time to work out all the bugs. Residents were advised to maintain their current ISPs while testing the city's Wi-Fi system for at least a month to ensure that it met their needs.

The Wi-Fi system, as planned, will be suitable for all normal residential uses. It will *not* be appropriate for those who need a lot of bandwidth for long periods of time. Those users were advised to make alternate arrangements for their data needs, or a user fee will be required.

A second challenge is the *thick, mature tree canopy* that is predominant in Shenandoah. Our largest residential area is a 35-year-old, heavily wooded subdivision that requires a high

concentration of radios to penetrate the wireless signals into homes. For those homes on the outer fringes of a radio coverage area, some kind of device in the home to boost the signal may be required. The details of who will pay for and maintain these devices have not been finalized.

Finally, the biggest challenge we face is obtaining *permission to mount the Wi-Fi radios on utility and street light poles*. This issue has kept the project on hold for more than a year. Our application to attach to the poles of the electric provider, which operates in several states in the Southeast, sparked a corporate-wide effort to develop a set of specifications for wireless radio attachments. When the standards were released in January 2007, we thought we were finally clear of this obstacle. However, the application required to obtain a permit is bottled up in their

corporate legal office.

In early April, the Shenandoah City Council approved a proposal to install 27 utility poles to bypass the electric company for the time being. This temporary solution added \$14,000 to the cost of the project. We plan to install new, decorative streetlights in the main residential neighborhoods as part of a major improvement project over the next five years. The new poles will be city-owned, and we will be able to attach the radios to them without any approval needed from our electric provider.

The proposed Wi-Fi mesh system has excited our citizens and drawn attention from neighboring communities. We are proud that we will be one of the first cities to offer wireless Internet service at no cost to city residents. The goal is in sight and getting closer. ★



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