

Triad Wireless UbiFi Municipal Wi-Fi System

**Common Sense Wi-Fi designed for Profitability and
Performance**

Rory Conaway

CEO/President

TRIAD WIRELESS

602-426-0542

About Triad Wireless

Triad Wireless is a wireless integrator specializing in RF (radio frequency) data and network public safety designs

Triad also specializes in integrating advanced RF engineering designs and solutions with secured network models

Triad has created the **S.P.I.R.I.T.**[™] (Secured Public Integrated Radio Infrastructure Technology) System to address the unique requirements of public safety

Triad has engineered UbiFi, an elemental Municipal Wi-Fi system focused on core application and price/performance

Where is Municipal Wi-Fi?

First Generation Systems focused on uniformity and performance and have had significant failures

Assumed high acceptance, high-subscriber revenue, and residential building penetration

Attempted to compete with wired services

Poor RF design and gross underestimation of APs per square mile

Overbuilt performance for underutilized areas – unnecessarily expensive

Unrealistic expectations of AP range and penetration

Poor revenue projections and terribly flawed business models

End result – companies failed and went out of business or had to be subsidized by the cities at a loss

Financial Issues of Municipal Wi-Fi

First Generation systems showed the concept is technically feasible but expensive with current mesh products

Operating costs were very high due to maintenance contracts and backhaul costs

Operating costs were also an issue where the WISP paid for leasing of mounting locations

Wired backhaul services added to the cost

Advertisement revenues fell far short of expectations

Current numbers were between 1000-5000 paid subscribers for large rollouts

Technical Issues with First Generation Municipal Wi-Fi

Excessive expectations of system capabilities
Poor bandwidth management
Poor building penetration
Underestimation of number of APs per square mile

Triad Wireless Municipal Wi-Fi Philosophy

System Reliability

Focused on core application – not everything to everybody

Better RF design

More versatile APs

Scalable performance where needed

Deployable costs between 1/5 and 1/10 mesh systems

Eliminate manufacturer warranty costs

Detailed monitoring capability

Supports PTMP network simultaneously

How Does That Happen

Eliminate Mesh

Cost per AP very high

Separate costs for management software

Mesh products are very expensive and come with high yearly warranty costs. Triad eliminates this cost in favor of replacing the radio. No radio repair will cost more than \$100 in parts. Significantly less expensive than \$600 per AP per year warranty. Equipment failure is minimal and can be repaired in a few minutes.

Significant training and setup time

Ignore load balancing – this was a feature that was not even implemented by all the vendors. In addition, routes can be manually changed for areas with higher bandwidth needs within 30 seconds. Monitoring software provides the information needed to make adjustments.

How To Make That Happen

Solid RF engineering

1 watt transmitters on APs don't let you receive signals any farther than 100mw APs but cost a lot more.

Improve the antenna design and make it flexible.

KNOW your RF environment in detail and how the equipment interacts and functions in that environment.

Install minimal functional infrastructure for the application and then go back and add investment after you know where the additional load issues may occur.

Keep the network Layer 2 for flexibility and simplicity.

Eliminate multiple SSIDs.

Develop additional and flexible backhaul strategies.

Triad Wireless Technical Specifications

- 2.4GHz performance – minimum 14Mbps TCP/IP at Gateway AP
- Supports up to 4 hops – more than that, additional backhaul is recommended; although, not needed in low bandwidth areas
- Can support 14-20Mbps at every AP in higher bandwidth applications with minimal costs
- Layer 2 capability
- Bandwidth throttling per AP
- Supports several methods of encryption where necessary
- Laptop ranges of 800 feet or more LOS
- APs can be mounted 1 mile apart or more depending on LOS
- Improved building penetration

Estimated Deployment Costs w/Labor

Single 2.4GHz AP unit w/9dBi omni antenna – \$310

Single 2.4GHz AP with small sector antenna - \$175

Single 2.4GHz AP with large sector antenna - \$415

Dual AP with single 5.8GHz directional backhaul - \$500

Dual AP with single 5.8GHz omni directional backhaul -
\$575

Triple AP with dual 5.8GHz directional backhaul - \$675

Does not include Power Tap for a light pole

These costs include 1 technician for 1.5 hours

**Single 2.4GHz AP unit w/9-12dBi
(depends on zoning) omni antenna**

Parts –

AP w/enclosure/cables - \$175

Antenna

90/120 degree sector antenna - \$60-\$75

Options

Light pole Power Tap - \$100

PoE compatible – no additional cost

Labor to install – Unit needs 12vdc or 110 volts AC

1.5 Man hours with Light Pole Power Tap

Without power tap, depends on power availability
at site

Single 2.4GHz AP with small sector antenna

Parts –

AP w/enclosure - \$140

Nema enclosure only needed for power plug exposure – If power location is weatherproof, system does not need enclosure – delete \$35

Antenna

60 degree sector antenna

Options

Light pole Power Tap - \$100

PoE compatible – no additional cost

Labor to install – Unit needs 12vdc or 110 volts AC

1.5 Man hours with Light Pole Power Tap

Single 2.4GHz AP with large sector antenna

Generally used in rooftop applications

Parts –

AP w/enclosure - \$175

Antenna

90/120 degree sector antenna - \$60-\$75

Options

Light pole Power Tap - \$100

PoE compatible – no additional cost

Labor to install – Unit needs 12vdc or 110 volts AC

2 Man hours with Light Pole Power Tap

Dual AP with Single 5.8GHz Directional Backhaul

Used for Gateway Point

Parts –

2.4GHz/5.8GHz AP's w/enclosure/cables - \$265

Antenna

90/120 degree sector antenna - \$60-\$75

Options

Light pole Power Tap - \$100

PoE compatible – no additional cost

Labor to install – Unit needs 12vdc or 110 volts AC

2 Man hours with Light Pole Power Tap

Triple AP with dual 5.8GHz directional backhaul - \$575

Used for Relay Backhaul Point

Parts –

2.4GHz/ dual 5.8GHz AP's w/enclosure/cables - \$400

Antenna

90/120 degree sector antenna - \$60-\$75

Options

Light pole Power Tap - \$100

PoE compatible – no additional cost

Labor to install – Unit needs 12vdc or 110 volts AC

2 Man hours with Light Pole Power Tap

Deployment Costs

Assumptions

Man hours at \$40 per hour

Power easily available – add \$100 for MetroPole adapter

Does not include any backhaul infrastructure other than the radios, wired or wireless. The system only covers the wireless portion. Additional network infrastructure not included here

Assumes temperatures below 122 degrees fahrenheit. If temperatures are higher than that, the dual and triple units will require more expensive switches. In that case, add \$180 per triple AP up to 150 degrees

Requires a windows computer for monitoring AP's and traffic. Manager and Monitoring software is free (2 separate programs). Monitoring software supports all IP devices on the network.

Backhaul Infrastructure

The system covers the APs and management only. Backhaul infrastructure would be designed based on terrain. A Triad designed backhaul can support a minimum of 54Mbps (real throughput) half-duplex over 36 square miles (LOS) for less than \$2000.

Backhaul is expandable to 100Mbps or more as load increases.

The system can also support PTMP deployment for businesses or locations requiring dedicated bandwidth.