

The role of In Building Distributed Antenna Systems(DAS) in Public Safety Networks

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After tragedies like New York City's 911 and Las Vegas' MGM fire, federal, state and municipal authorities have begun to enact laws and ordinances to assist First Responders, Fire, Emergency Medical Services(EMS) and Police in ensuring that there are reliable communications available in buildings and large structures. Distributed Antenna Systems (DAS) are largely the technical method being utilized to ensure consistent and safe communications are available. These systems amplify the signal and distribute it through a series of antennas located throughout a building.

The two most proactive authorities to publish standards are the National Fire Protection Association (NFPA) and the International Fire Code (IFC). The national codes are guidelines to help local or municipal authorities enact standards that provide the proper building codes that ensure that new construction is compliant and that existing structures begin a sincere effort to make sure that communication is available throughout the building including subterranean basements, stairwells, skyscraper rooftops and parking facilities that are often difficult locations to transmit or to receive RF signals.

There are tangible benefits for property owners to comply with the standards established in IFC 2009 or NFPA72 2010. Some of these benefits include:

- Ease of Certificate of Occupancy approval for new construction
- Increased attractiveness of property when leasing and a potential revenue premium
- Differentiator vs. legacy properties that do not have adequate communications
- Wireless offers ubiquitous coverage and often lower cost implementation vs. traditional wired systems that require emergency personnel to plug in at a fixed point
- Potential Insurance Cost Benefit
- Potential to offset cost of increased capacity and coverage for cellular carriers

The current standards require 90% coverage in building but the NFPA requires 99% coverage in critical areas where the IFC requires 95% coverage in critical areas. The definition of critical areas vary and can be modified by local authorities but the standards are very clear regarding new construction and rapidly evolving to include major public and large buildings retroactively. Cities such as Las Vegas and New York are taking a very aggressive and proactive approach to making sure that these standards are enforced. Building owners that do plan properly can suffer significant financial penalties as well as denial or revocation of C.O.I.

Distributed Antenna Systems manufactured by companies such as: Corning/Mobile Access, Tyco/ADC and Commscope/Andrew provide capability to support the RF requirements of Public Safety personnel but there are some basic engineering requirements that must be considered. Some of these considerations include:

- Is the DAS capable of withstanding a fire and for how long?
- Can the DAS operate during power failure?
- Can the system be monitored and by whom so that in case of degradation of service or failure it can be rapidly addressed and repaired?
- Can the DAS amplify and propagate signals below 800 MHz effectively?
- Is it a standalone system or does it also enhance cellular carrier signals?

The certification process varies by location but may require FCC licensed personnel, Fire Marshalls and manufacturer certification for the proper inspection and approval. The FCC is currently conducting a re-banding process which is further complicating existing DAS systems. They are particularly recommending systems in the 700MHz spectrum for public safety

H&M Networks can help plan and implement solutions for both Public Safety and Cellular coverage and capacity. Our engineering staff will consider issues like backup generator power, antenna types, ordinance research and review, and timeframe and budget to implement. These communications are a life and death matter as well as a legal issue. H&M can consult with your organization to ensure proper understanding of existing codes and determine if the solution requires a DAS system and if so which manufacturer is best suited and if cellular carrier signals should be integrated. We then can provide the design and engineering to ensure compliance and then construct the system and provide proactive maintenance.