10:30 AM – 11:45 AM

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Public Safety DAS 101

DAS 101 – Focus on PUBLIC SAFETY

By Gregory Najjar

Public Safety DAS 101

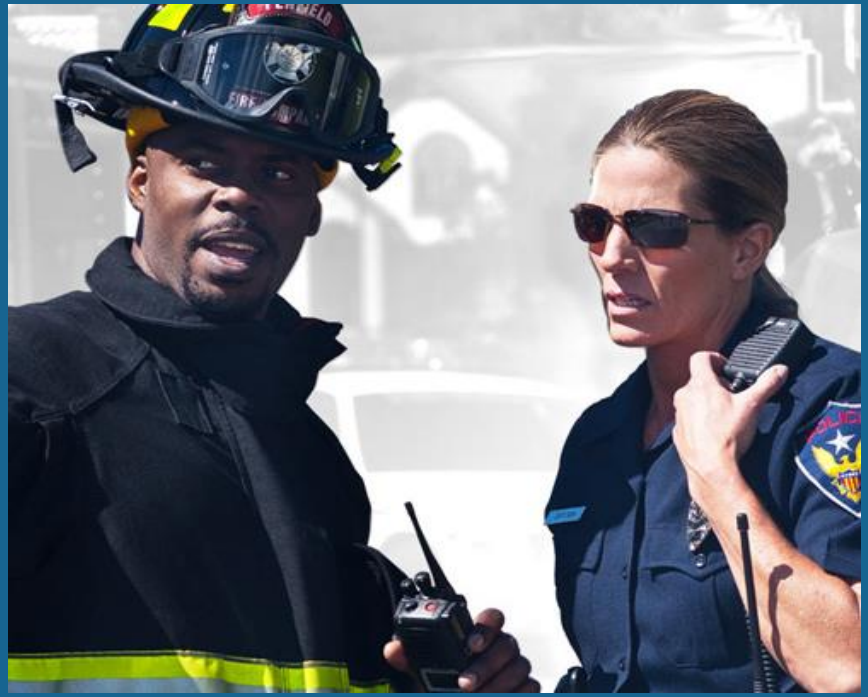
- Interest in mobile coverage inside buildings and venues has grown significantly over the past few years and reliable communications for public safety/first responders are becoming mandatory.
- Individual municipalities typically provide oversight or governance for DAS regulations for public-safety communications.
- These regulations apply to any new buildings or major renovations.
- Communications are required throughout the facility and building owners must ensure coverage needs are met before obtaining an occupancy permit.
- National Fire Protection Association (NFPA) and International Fire Code standards apply to public-safety DAS.

Cellular DAS vs. Public Safety DAS

- Coverage in public-use areas with lots of capacity for data usage (social media, smartphones, etc).
- Commercial DAS networks do not require redundancy or battery backup.
- Cellular use higher frequency bands therefore more antennas are needed. More antennas = more cables = more cost.
- Devices are used in high traffic, common/public areas. # of concentrated users wilil be higher on average.
- Combining Cellular with PS DAS has various challenges (cost, design, AHJ approval).

Public Safety DAS Characteristics

- A public-safety DAS is focused on providing ubiquitous in-building voice coverage/communications for first responders.
- The system is designed to work in unique locations (stairwells, basements, utility and HVAC rooms).
- A public-safety DAS requires redundant equipment and fiber paths, and battery backup.
- Since a PS radio generally operates at a lower frequency, its signal travels further so it can require fewer antennas to cover a building.
- A PS DAS is considered off-air, and in contrast to a cellular DAS there is no backhaul providing additional/unique capacity inside the building.
- All radio users are still operating off the original channels from the radio's source.



PS DAS Process & Requirements

- Contact the Local AHJ
- Communication/Coverage testing is part of the approval process for obtaining certificate of occupancy
- For new construction - bid to GC’s experienced with PS DAS installs.
- Specialized GCs can work on PS DAS in parallel with building construction.
- GCs work with electricians who in turn work with DAS OEMs on design, cost, install and testing.
- NFPA 72 Fire Code Section 500
- Interpretation for Coverage and Testing

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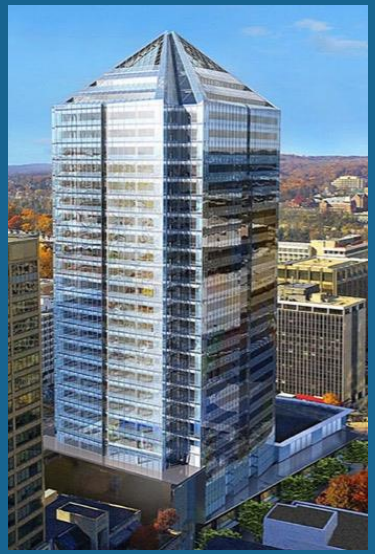
Things to consider for a combined or separate PS DAS:



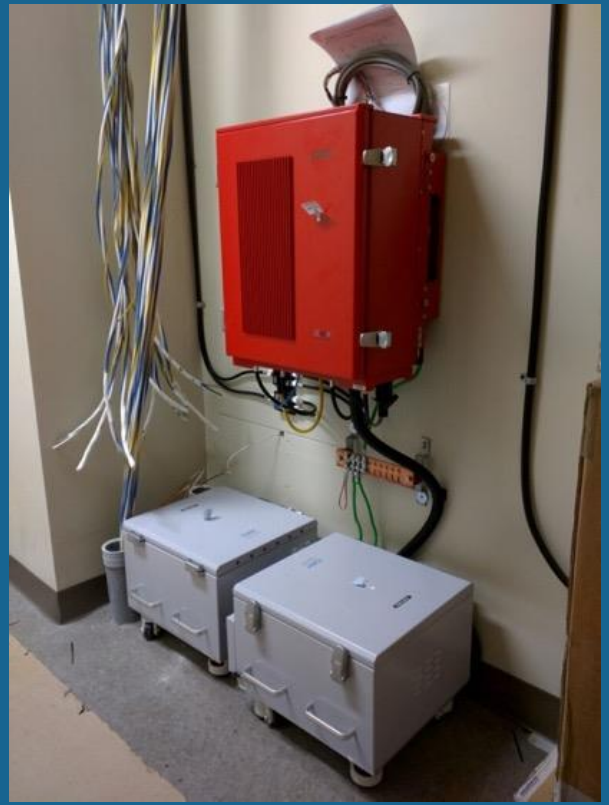
- The Frequencies Required
- Coverage
- Design
- Passive vs Active System
- Fire Ratings 2 hour | 4 Hour
- Aesthetic and Architectural Requirements
- Budget

NFPA - Compliance

- System Coverage: 99% coverage in critical areas designated by the local fire department
- -95 dB Minimum signal Strength: IFC and NFPA requires -95 dB of signal level regardless of the frequency
- NEMA-4 Enclosures: Dust, water, and corrosion-proof NEMA 4 compliant housing
- System Monitoring Alarms: to provide real-time monitoring of system's readiness. Power/Battery /Antenna /Equipment failure/ battery charging
- Battery Backup: In case of main power failure (likely at a fire), 12/24 hours of run-time (minimum)
- Antenna Isolation. NFPA stipulates antenna isolation requirement of 15 dB higher than the gain of the amplifier.
- Class A or Class B Amplifier: channelized or wideband

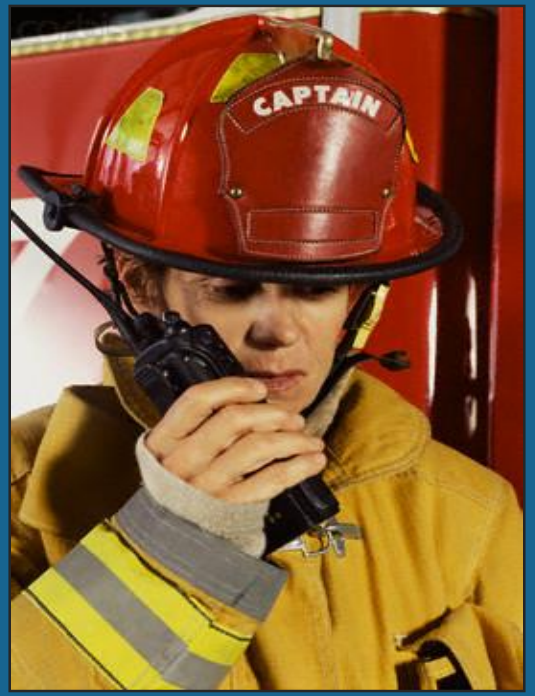
NFPA - Compliance (cont’d.)

- Different DAS interpretations to the national codes (NFPA, IFC) by AHJ
- Code is becoming wiser across all regions



Future Bands and Technologies

- Future Frequency Changes: Need to support future frequency requirement. IFC and NFPA promote equipment that supports VHF, UHF 700 and 800 MHz
- Selection of products that already cover from VHF to 800 will provide savings in the future
- Choose products that are “modulation agnostic” modulation techniques can change in the future
- Single mode fiber is preferred among DAS active solutions

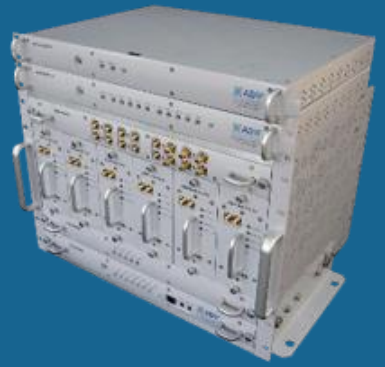


Public Safety Product Lines

Off Air Repeater

Questions to ask:

- Frequencies: Does it support bands - 700/800 MHz and VHF/UHF?
- Is it NFPA Compliant?
- Does it offer NEMA 4X compliant enclosure suitable for both indoor and outdoor environments?
- Does it have filtering options to mitigate interference?



Digital DAS

Questions to ask:

- Frequencies: Does it support Commercial & PS bands - 134 MHz to 2690 MHz?
- Modularity: Does the equipment support commercial and public safety on the same system?
- Expandability: Can I pay for bands that I need now and easily upgrade in the future?
- Does it have filtering options to mitigate interference?

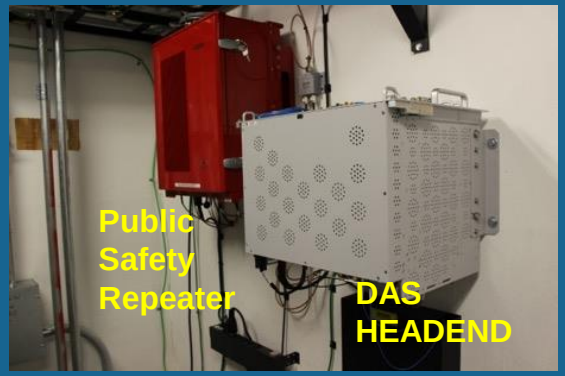
Case Study: Public Safety DAS – Critical Coverage Requirement

Site A: Consolidated Forensic Laboratory (CFL)

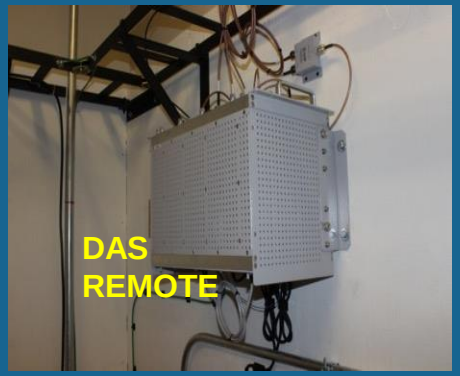
- Located in Washington D.C.
- 290K Sq. Ft. Coverage Area
- LEED Silver Design
- Police and EMS Staff
- Radio Service Required

Tenants and Visitors require robust public safety service

DAS and Repeater Installation Photos



4th Floor
West



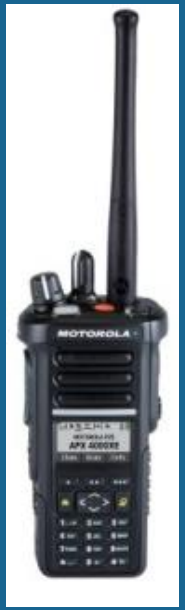
3rd Floor
East

1st Floor
West

- 700 MHz, 800MHz, and UHF Support
- Only PS repeater NEMA4X-rated, due to budget
- No batt back-up ➔ building already has centralized back-up power

DAS Requirements ‘to think about’

- Coordinate with AHJ, walk testing ➔ frequencies?
- Future proof - VHF, UHF, 700MHz (Band 14?), 800 MHz, and 900MHz
- NEMA4X-rated? (typically)
- Battery Back-Up ➔ 12hrs/24hrs
- DAS deployment in phases?
  - PS DAS ➔ additional Commercial layer (separate fiber)



Thank You.

For more information, contact sales@adrftech.com