Distributed Antenna Systems: Stats

★ > 56% of all common carrier handset calls are from inside buildings.
★ > 58% of public safety radios are handhelds.
★ >16,000 “High Rise” Buildings in U.S. (> 5 stories)
★ < 3% have DAS

Distributed Antenna Systems: Trends

★ Text Messaging grew 65% last 2 years.
★ Streaming Music & Video load.
  4G LTE: 100 – 150 MBS data rates
★ -95 > -85 > -75 dBm delivered signal levels
★ MIMO (2+ Antennas)
★ Distance to antenna: < 50 ft

Distributed Antenna Systems: Owners

★ Carrier Operator Services (Cellular, PCS, etc)
★ Public Safety (Fire, Law, EMS)
★ Office and Residential Building Owners
★ Industrial/Enterprise (Distribution, Factory)
★ Hospitals (Security, patient telemetry)
★ Hospitality (Ops, security, carrier, WiFi)
★ Transportation (Subways)
★ Military

Distributed Antenna Systems: Problem

GOOD COVERAGE

POOR COVERAGE
Distributed Antenna Systems: Problem

Distributed Antenna Systems: Problem

Distributed Antenna Systems: LEEDS

Leadership in Energy and Environmental Design
U.S. Green Building Council (USGBC)

Glass: PPG Solarban >45 dB attenuation
EMI/RF (walls): TruProtect 40 to 60dB dB attenuation

Bad or Good?

Distributed Antenna Systems: Repeater

Distributed Antenna Systems: Repeaters

Portable, No DAS: 5 – 25 Watt typical range
4 – 5 Floor penetration

Portable / Permanent, with DAS: Whole Structure
Passive DAS
Active DAS (i.e. fiber, inline amps, remotes)
Tap into (share with cell, etc)
Shared DAS

1. Sooner or later public safety provisions will be required in most high rise structures, parking garages, malls, basements, etc.

2. It is possible to share a private DAS system, including installation, with public safety although there can be additional technical and control issues.

3. New DAS systems should have public safety compatibility in the event it is required in the future.

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Neutral Host Priorities

Basic Rule:
- Use the minimum amount of equipment investment and cover the least amount of area that will provide the maximum income per investment dollar.

- Coverage in low traffic areas
- Back-up power
- Restoration/response priority
- DAS alterations

Public Safety Priorities

Basic Public Safety Rule: Providing life critical coverage is more important than cost.

- Coverage in emergency traffic areas.
- Service basements, tunnels
- Stairwells
- Critical fire control areas
- Redundancy, High MTBF
- Fire and Electrical code compliant
- Response and Restoration: 24/7

Compatibility Challenges

The way cellular systems operate is much different than public safety radio systems.

- Cellular; low power handsets.
- LMR/PS; High power, no FWD PWR control
- Cellular: Low nearby sites or BTS in building.
- LMR/PS: Distant high power repeater sites

Public safety handsets overdrive system designed for cellular. Can generate interference (IM), distortion and loss of data.
Sharing Conclusions

Most new Neutral Host systems use fiber distribution because of the bandwidth.

When industrial and/or public safety channels are required, it is often best practice to install separate DAS systems at the same time.

NPRM: Docket 10-4

Wilson is seeking direct sales to consumers, mobile BDAs only.

Service providers, including Sprint Nextel, and consumers have filed over 500 comments before the NPRM.

NPRM Focus has not been on Part 90 users other than Sprint-Nextel.

NPRM: Docket 10-4

New Part 95 signal booster rules are proposed for "Consumer" signal boosters, operating on 'subscriber based services, focused on mobile use.

Requirements include automatic power reduction near cell site and shut down in the event of oscillation.

All this is in latest Wilson mobile BDAs.

National Public Safety Codes

Based on prior local codes: Burbank 1990

Codes, as published in date order:

ICF 2009: Fire Code

NFPA-1 2009: Fire Code

NFPA-5000 2009: Building Code

NFPA-72 2010: Fire Code

IFC 1012: Fire Code

Latest National Public Safety Codes

ICF 2012

Section 510

These codes are copyrighted and can be purchased at

www.iccsafe.org

Latest National Public Safety Codes

NFPA5000 2009

Annex G

NFPA72 2010

Chapter 24.5.2

These codes are copyrighted and can be purchased at

www.NFPA.org
National Public Safety Codes

Latest codes applies to all new and existing structures; retroactive.

Major modifications that require a new fire inspection and C.O.I.

NFPA: 90% Coverage except Critical Areas, 99% in Critical Areas.

IFC 95% Coverage. (IFC)

National Code Highlights

-Certified Personnel

-Pre-approved hardware

-Frequency Change Updates Required

-NFPA: 24 hour backup  IFC: 12 hours

-Annual Inspections

-Grid coverage validation method

National Code Highlights

Alarms to LOCAL fire panel:

- Amplifier failure.
- AC power failure.
- DC power failure.
- Battery charger failure.
- 70% of battery capacity remaining.
- Antenna circuit failure.

Q and A

Thank You

Additional Resources

- National Fire Protection Agency (NFPA)
  www.NFPA.org
- FCC : www.fcc.gov
- International Code Committee (ICC)
  www.ICCsafe.org
- National Public Safety Telecommunications Council
  www.NPSTC.org
- Jack Daniel Company web site:
  www.RFSolutions.com
Distributed Antenna Systems: PS Basic
Distributed Antenna Systems: Repeater
Distributed Antenna Systems: Typ. Host
Distributed Antenna Systems: PS + Host
Distributed Antenna Systems: Fiber Host
Distributed Antenna Systems: Fiber Host
Distributed Antenna Systems: Fiber PS
Distributed Antenna Systems: Fiber PS+Host

CELL BAND A

PCS BAND E

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