



Distributed Antenna Systems Explained

A D.A.S. is a system of managed hubs and remote antennas that distributes a wireless signal to a series of connected indoor or outdoor multi-band, multi-technology radio types. At the head-end of the D.A.S., service providers typically locate base stations to provide the public safety and/or cellular signal. A main hub takes that signal, digitizes it, and distributes it to other hubs and radio antenna via a high-bandwidth fiber optic network or coax. At the antenna, the radio converts the signals from digital to RF and RF to digital.

The “hubs” or head end equipment is typically housed in the IT room (MDF and IDF). By digitizing the signal on the fiber, the D.A.S. can transport the RF signal at full strength to any remote antenna connected, no matter how far away it is from the main hub and base station.

D.A.S. is used in airports, stadiums, public safety, courthouses, police, fire and emergency services areas, office buildings, hospitals and other venues where either cellular services providers and/or public safety radio coverage is highly critical by requiring enhanced coverage or network capacity for public safety, law enforcement or commercial cellular services.

By focusing a signal on a specific area through remote antennas, the D.A.S. delivers higher capacity and consistent coverage over the area it serves. Some D.A.S. projects extend for miles and support thousands of subscribers.

Important Information Concerning D.A.S. for Public Safety and Law Enforcement:

Distributed Antenna System (D.A.S.) Typically consists of 2 separate D.A.S. systems; (1) For Sheriff, police, fire, public service, public safety and game warden. The second (2) is for Commercial Cellular service. These are two independent D.A.S.

Modern construction techniques and materials block or degrade internal and external wireless communications. Distributed antenna systems (D.A.S.) were designed to extend wireless coverage within structures and enable radios and cell phones to work regardless of their position within the building.

With the enactment of IFC 510 in 2009, the fire code was updated with suggested jurisdictional guidelines regarding emergency responder radio coverage. The following are a few important IFC 510 suggested requirements.

1. All new buildings should have approved radio coverage for emergency responders within the building.
2. Radio signal strength requirements must be met in 95% of all areas on each floor of the building.
3. All existing buildings should have radio coverage throughout the building and are required to retrofit the building with radio coverage if the existing wired system is not able to be repaired or is being replaced; or per a timeline as identified by the jurisdiction.

Aside from these guidelines, specific codes are set by County or City requirements (or local authority having jurisdiction). For Public safety, though currently not mandated, it has been suggested that it may



be mandated by the next release of the IFC. Commercial D.A.S. is not required nor mandated, however it should be considered if the cellular service is weak in the area of the location of the facility. We strongly recommend our designs provide for both Public Safety and Commercial D.A.S. design infrastructure.

It has been stated that it is highly probable that with the next release of the IFC that the Public Safety D.A.S may be required, and Commercial Cellular Service is high recommended. To future-proof our projects, we typically plan on Public Safety to meet all requirements of 95% coverage to the complete campus. For cellular service we are planning on covering all areas with little coverage to the Prison/Jail cell areas as an exclusion.

- **Rick Robinson, Technical Consultant**

Rick Robinson is the principal of Media Design Group with over 20 years' experience. The team of Media Design Group has provided designs for:

Public Safety

Emergency Operations Centers (standalone and networked)
Fire Station Design
Police Station
Public Safety Buildings
County Sheriff's Offices and Jails)
Training Facilities
Distributed Antenna Systems (D.A.S.)

Criminal Justice

Courtrooms
Correctional Facilities

Civic & Government

City Halls
Administrative Buildings
Community and Cultural Facilities
Public Works administrative, S.C.A.D.A., board rooms, conference rooms