



Private Indoor Networks: **Enhanced Cellular Coverage - Fiber Based**

The need to improve cellular coverage is growing every day. Cellular devices and smartphones have become the primary means of communication for employees as they attend meetings and travel between appointments. Also, legislation mandating in-building wireless coverage for cellular, PCS and public safety frequencies is being passed all across the country. Its aim is to ensure that first responders can communicate during an emergency. Unfortunately, building construction materials such as concrete, steel and tinted windows impede the penetration of the cellular signal. The signal can be greatly reduced and is sometimes nonexistent in certain areas of a building.

Features

- Improved cellular coverage
- Multiple enhanced frequencies
- Support for multiple phones/handsets
- Multiple antenna and mounting options
- Support for many carriers

Benefits

- Improves usability of wireless devices
- Enhances productivity
- Provides more minutes of use (MOU)
- Enables in-building reception and transmission of calls for public safety

Real-World Examples

Situation: A state agency needed to provide immediate enhancements to its 800 MHz public safety coverage in several buildings.

Problem: The current public safety frequency allocation of 821-824/866-869 MHz will be moved to 806 809/851-854 MHz due to FCC-mandated rebanding.

Solution: Systems were installed using bidirectional amplifiers (BDAs) that operate at the existing public safety band but can be reconfigured when the new band becomes effective.

Situation: A wireless carrier in a remote region wanted to add service to a small town without incurring a high cost.

Problem: The closest tower site to the town was over three miles away and was not providing service to the area.

Solution: The carrier used a system that took the base transceiver station (BTS) signal from the closest existing tower site and fed it into a custom-designed RF-to-fiber converter. The signal was transmitted over existing multimode cable, converted back in RF and fed into a tower-mounted repeater, which now broadcasts service into the town.

Situation: A stone quarry operator had a constant flow of transport drivers heading down into the quarry.

Problem: The company could not provide signal to transport drivers in the pit area but wanted workers to use a cellular phone push-to-talk feature to communicate with the operations center and with each other. Signal was adequate on the rim of the quarry but was lost at the bottom.

Solution: A standard indoor BDA was installed in the operations building at the top of the quarry. The signal was fed back outside to a panel antenna installed several feet below the edge of the quarry pit to prevent interference with any tower sites above ground. The panel was oriented so that the radiated signal would be focused down into the quarry.

Additional Considerations

- What are the frequency requirements?
- What is the signal strength in dBm?
- What is the floor pan of area to be covered?
- What is the structure type: manufacturing, office, or warehouse?
- How many floors are to be covered?
- What are the vertical chase locations?
- What are the ceiling heights?
- What is the power availability?
- What are the building code restrictions and regulations?

Products

- Bidirectional amplifier
- Antennas
- Cables (standard/plenum, 50 and 75 ohm)
- Connectors
- Couplers
- Power
- Surge suppressors
- Fiber
- DAS system
- Patch cables
- Cable raceways
- Power dividers
- Test equipment
- Tools