

Five Environments Where External Antennas are Essential for Reliable Wi-Fi

There are two types of access points; those with the antennas integrated, and those with ports to connect to external antennas. Access points with integrated antennas exhibit omnidirectional radiation patterns and provide uniform coverage in all directions. However, APs connected to external antennas are commonly needed to provide sufficient coverage and capacity in the following applications:

When ceiling heights are higher than 25 feet

At heights greater than 25 feet, the coverage area directly below the omnidirectional antennas degrades to the point that multipath (signal reflections) will not improve coverage. High gain, directional antennas are needed to provide adequate coverage and capacity below the antenna.

When propagation characteristics are affected by building or natural obstacles

In order to get coverage in areas where physical obstacles and multipath interference are prevalent, such as building materials (concrete, steel) or natural elements (lobbies or interior public spaces with water, trees and bushes) external antennas with higher gains than those traditionally seen in APs with integrated antennas may be needed. Just moving the AP with integrated antennas to a different location to try to improve coverage may create more of a problem than a solution depending on the integrated antenna's coverage characteristics. Through proper selection and placement of external antennas, coverage can be extended easily into these problematic areas.

For hallways, long corridors, aisles, and other structures with spaces in between

Omnidirectional antennas, with their dispersive radiation patterns, have difficulty providing the focused RF coverage needed in warehouse, library and retail store aisles or in hospital corridors. External directional antennas can focus beamwidth between the aisles, and provide excellent coverage and capacity in these environments.

In temperature-limiting areas and environments

Freezers, test labs, and other cold room applications often have operating temperatures that exceed those recommended by the AP manufacturer or the components are not rated to perform in those environments. To protect valuable equipment in these applications, the AP can be placed outside of the environment and the external antenna can be placed within the environment so that wireless service is possible.

For high-density network deployments

High-density networks ensure adequate coverage and capacity for large concentrations of mobile device users by addressing the issues of interference, which is the most significant cause of limited performance in these environments. This is accomplished by "mapping" clients into smaller, radio frequency (RF) cells of operation. These narrower cells are created by using external, narrow-band antennas connected to the AP. Fewer users per AP minimizes channel-to channel interference and maximizes the use of available spectral capacity.