Application Note: Does the white dome impact wireless coverage?

Oberon's enclosures with white ABS plastic domes secures the wireless access point in an aesthetic ceiling enclosure. These enclosures are truly a universal because any wireless LAN access point from any manufacturer will fit inside the enclosure. This simplifies future moves, adds, and changes. The enclosures door is an impact resistant, UL Classified (UL-94 V-0, 5VA) ABS material, and the otherwise all steel enclosure is designed to satisfy NEC paragraphs 300-22 and 300-23 for use in the air-handling space above a suspended ceiling.

The dome is nearly Radio Frequency (RF) transparent, so access points with non-detachable antennas or body integrated antennas may be mounted inside the enclosure. This ABS material does not absorb or reflect Radio Frequency (RF) signals very strongly. The walls of this dome are about 1/10 of an inch thick (0.10"), so that they are almost transparent to the wireless access point's wireless signals.

To verify this transparency, Oberon engineers performed a "site survey" comparing coverage of a Wireless Access Point (WAP) without an enclosure, versus a WAP inside Oberon's Model 1059-00 enclosure and mounted in the ceiling. In both cases, a Cisco 1242 wireless access point with directly attached dipole "rubber-duck" style antennas is used. The access point is set to a rather low power (+2dBm) to simplify the survey.

The site survey is performed using AirMagnet wireless LAN survey software. A wireless LAN adapter in a mobile laptop is associated with the access point and walked through the coverage environment. The survey environment is a 4,000 sq. ft. office /lab area with many walls, and steel wall joists, doors, cubicles, dividers and cabinets. The software records received signal strength (RSS) throughout the office environment, and generates the heat maps indicating the RSS at the client device.

The first comparison surveys are performed with the access point operating in the 2.4 GHz band. The location of the WAP can be seen in the lower left corner of the heat map. The software is set-up to truncate the heat map when the RSS drops below a -90 dBm fringe. The gray area in the heat maps indicates where RF signal strength is below the -90 dBm level.

In both cases- without an enclosure (Fig. 1) and within the 1059-00 enclosure (Fig. 2), the WAP covers approximately ¾ of the office space (about 3,000 sq. ft.). This is typical coverage at 2.4 GHz in this type of office/lab area. The heat map indicates there is *very little difference in coverage area between the enclosed and un-enclosed WAP at 2.4 GHz.*

The second comparison surveys are performed with the access point operating in the 5 GHz band. The location of the WAP can be seen in the lower left corner of the heat map. In both cases- without an enclosure (Fig. 3) and within the enclosure (Fig. 4), the WAP covers approximately ½ of the office space (about 2,000 sq. ft.). This is typical coverage at 5 GHz in this type of office/lab area at this low power setting. The heat map indicates there is *very little difference in coverage area between the enclosed and un-enclosed WAP at 5 GHz.*

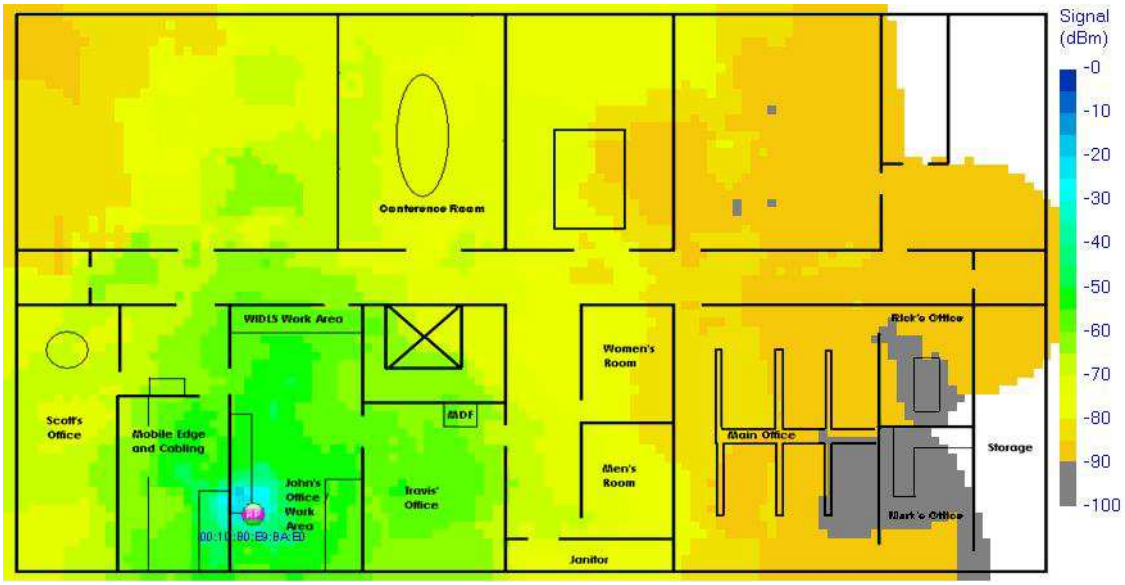

Fig. 1 1059-00 Site Survey Test with Cisco 1242 at 2 dBm Tx Power (August 18, 2010) 2.4 GHz <u>without enclosure</u>

Fig. 2 1059-00 Site Survey Test with Cisco 1242 at 2 dBm Tx Power (August 18, 2010) 2.4 GHz <u>with enclosure</u>

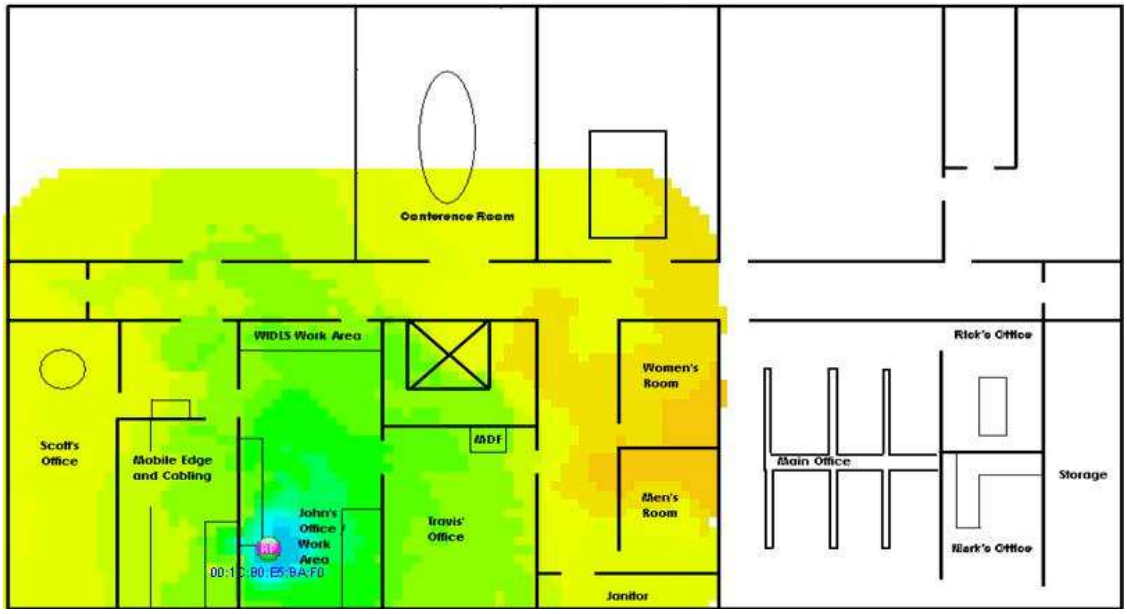

Fig. 3 1059-00 Site Survey Test with Cisco 1242 at 2 dBm Tx Power (August 17, 2010)
5 GHz <u>without enclosure</u>

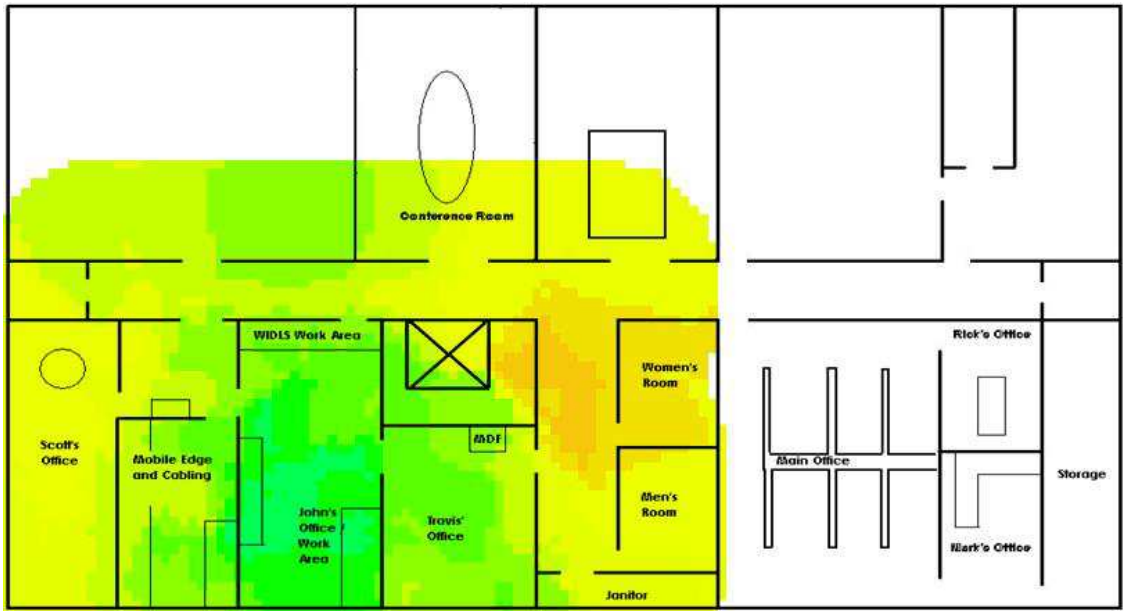

Fig. 4 1059-00 Site Survey Test with Cisco 1242 at 2 dBm Tx Power (August 17, 2010)
5 GHz <u>with enclosure</u>