

DESIGN OF WIRELESS COMMUNICATION SENSING NETWORKS FOR TUNNELS, TRAINS AND BUILDINGS

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Abstract—This paper deals with the various assumptions used in the design and analysis of distributed antenna system (DAS) for trains, tunnels and in-building wireless radio coverage. The design includes handover overlap design, base station connectivity, signal reticulation using splitters, couplers, bi-directional amplifiers, attenuators, discrete antennas, radiating cables and opto-electric couplers etc. It is found that signal strength, noise, intermodulation calculated for the up and down links are in compliance with the given specifications and satisfy the required system margin. Our system specifications based on TETRA (Terrestrial Trunked Radio) ensures that the received signal is at least 5 dB higher than the TETRA dynamic sensitivity level and yields 95% coverage of all the used areas.

Index Terms—antenna, signal distribution, wireless network, uplink, downlink, system margin