The purpose of this paper is to get a better understanding of the path loss (PL) in near-ground scenarios, as wireless sensor network will be more common in the future and this can require that antennas is placed near ground, which can complicated the calculations of the PL.

Furthermore it will develop a simple PL model, by conducting measurements of the PL, at two different locations; a school gym and an empty parking lot. Two types of antennas, a rectangular patch- and a monopole antenna, were used both at 858 Mhz. The measurements were performed at both horizontal and vertical polarization, at different heights and distances.

Four different PL models have been investigated, to get a better understanding of the different conditions given for the PL models: Ground wave (GWPL), Friss free space (FSPL), approximated two-ray ground reflection (ATRPL) and the Norton surface wave (NSPL). The PL results obtained from the measurements are used to estimate the accuracy of the different PL models, and to explore the applicability of the PL models.

The measurements indicates that the polarization, antenna type and environment, have a less influence compared to the distance and the heights of the antennas. The results validate the conditions of the PL models coverage areas, as different tendencies is seen, in the different area, that follows the models. The GWPL fits best to the results, even with the biggest coverage area, but have the disadvantage of being complex and is needed of some complex surface constants. When getting close to the ground the result is depended on these complex surface constants, where a wrong measurement of the constant can give a big offset, which influence both the GWPL and NSPL.

A new PL model is developed based on the ATRPL and the NSPL, still subject to the condition of the ATRPL model, to the cases of near ground antennas. The models coverage area is the same as ATRPL, but also take the parameter of the surface wave into account, from the NSPL. The prediction accuracy of the proposed model exceeds therefore the individual PL models, while still cover the same area as the ATRPL.