ABSTRACT

Traffic signs are used to convey critical information, such as directions, advisories, etc. to drivers. However, common experience indicates that there exists instances of missing a sign due to visual occlusion. Situations leading to missing a sign typically arise from an obstruction in the cone of vision of the driver because of the presence of a larger vehicle ahead of it. The combination of distance headway, vehicle heights, vehicle speeds and sign characteristics, which may lead to occlusion, have been mathematically analyzed in this thesis.

The analysis shows that if a traffic stream is operating in specific regions of a $u_S \times d_0$ (or speed-density for overhead signs) Cartesian space then larger vehicles will occlude a sign from smaller vehicles following or adjacent to them. While studying such occlusions reading times of the signs were also taken into account. Given the expected stream behavior on a road one can determine when vehicles will have trouble reading signs. Further, stochastic analysis is also done to determine the probability of such occurrences. The results from the analysis are used to develop better design standards for signs so that the chances of missing a sign (i.e., inability to read a sign) due to occlusion reduce.

Keywords: Sign boards, overhead signs, sideway signs, occlusion, blockage, design.