

The Influence of Traffic Volume on Wheel Path Distribution and its Relationship with Pavement Design

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ABSTRACT

The amount and type of traffic in Ethiopia is increasing and changing at an alarming rate. This leads to the construction of road infrastructure, which necessitates the design of roads that are both economical and safe. Nowadays, flexible pavement roads are widely constructed, but surface failure occurs before the expected design period, posing a critical issue in the country. The study's main goal is to investigate a design traffic load factor (DTLF) for the road project that was not addressed during the design period. The study's objectives are to investigate the effect of traffic volume on heavy vehicle wheel path distribution across a carriageway width, to investigate the effect of the presence or absence of lane markings on heavy vehicle wheel path distribution on rural two-lane road pavement design, and to propose design traffic loading factor (DTLF) for the various variables that affect wheel path distribution. The design of flexible pavement in Ethiopia is based on the prevailing soil and material conditions as reported by the Ethiopian Roads Authority (ERA) Pavement Design Manual (Low and High volume), with the results compared to that of the AASHTO Structural Design Pavement manual. Finally, the thicknesses obtained with both design guides were compared. For the design of a two-lane rural road, the ERA high volume design manual recommends one directional traffic load for the pavement structures.

Keywords: Traffic, Lane, Road, Pavement, Design