

Estimation of ESAL Values for Low Volume Roads in Provincial Sector

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The demands for the improvement of provincial roads are ever increasing and GOSL has given priority for the upliftment of rural economy through the improvement of rural road network. Funding agencies have shown interest in providing financial assistance for this task. Road design engineers require reliable traffic data and design specifications for detailed design of provincial roads. One of the basic inputs required for the pavement design is the ESAL values for each vehicle category in each road.

The most common method used for the estimation of ESAL values for trucks is the static axle load survey conducted by Road Development Authority (RDA) for national roads however the axle load surveys are rarely done for provincial roads.

Sophisticated equipment and methods are not suitable for the provincial sector as their capacities are limited. Primary objective of this study is to formulate a simple but reliable method to estimate axle loads on provincial roads.

The most important and core analysis of this study is to find out how the vehicle load is distributed among axles. The vehicle load can be estimated using vehicle dimensions, type of material and loading condition. Then this estimated load should be distributed among each axle in a rational manner. Again for the buses, LGVs and Farm vehicles, the average distribution of loads were analyzed irrespective of the type of loading material. This is simply because the, loading type for buses are passengers only, and for farm tractors, it is mostly grains and agricultural products. There is no large variation of load distribution for different type of material in the case of LGVs.

But for the MGV & HGV types, the distributions of load among axles are very sensitive to type of material. Therefore the same analysis was extended for each material type.

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The method introduced for the estimation of ESAL is very straight forward and simple. High technical inputs are not required for the implementation. High-tech equipments are not required. It is quick and easy, therefore large amount of trucks can be measured during the field survey. The survey can be carried out for several days for the same road to see all the traffic variations and seasonal changes. And it can be used for all roads and then CNSA for each individual road can be found.

The accuracy of the findings was checked using actual axle load survey data. It was found that results can be accepted at 95% confidence level. The ESAL is usually estimated based on the sample data. Hence, the proposed method can be used to estimate ESAL values for each vehicle category on all provincial roads with reasonable accuracy.