

Level of Service for Low Volume Roads

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Abstract

Low volume roads in Sri Lanka are mainly under the purview of Provincial Road Development Authorities or Local councils. These roads often do not conform to design guidelines and are those that have been gradually developed over the years. As a result, travel speeds are very low and there are major safety issues prevalent on these roads. Therefore, there is a need to upgrade these roads. It is imperative that the selection of the roads that are upgraded is done based on an objective and consistent methodology, considering the limited budget for road improvement and the economic impact of road investments.

The study proposes a methodology to evaluate the level of service of low volume road considering the roadway characteristics, to be used to make decisions on prioritizing roads for upgrading. It does not account for the pavement condition of the road, as it would come under the maintenance and rehabilitation programs of the road agency.

Sample roads from Western Province were selected for the development of the methodology. The common issues observed were as follows,

- Vertical alignment, horizontal alignment, pavement thickness and curvature transition does not conform to design guidelines.
- Variability in road width
- Lack of shoulder or poor conditions.
- There is no specified Right of way.
- Inadequate provision of structures
- Lack of passing bays and bus bays.

An inventory surveys were carried out on the selected roads to collect roadway characteristics such as width, shoulder condition, curvature, passing bays, alignment, road furniture and road structures based on the common issues prevalent. A questionnaire survey was carried out with senior engineers in the Provincial Authority to assess a) the relative importance of each of the roadway characteristic, by ranking them and assign a weightage, b) give an overall subjective

assessment (an index value out 100) of the road sections in the sample level of service based on their observations.

From the results of (a) seven key parameters were selected based on the rank and the magnitude of the weightage given by the experts for each parameter and the average weightage given by the experts is assigned to each parameter. A rating system is proposed under each selected parameter considering the variation of its characteristics. For example, the rating assigned for road width would be based on three categories such width less than 5m, 5m-6m, more than 6m. The overall level of service for each road is computed as a weighted index, calculated by multiplying of the weightage assigned to each parameter with the rating given based on the roadway characteristics observed in the inventory survey and summing the weighted values for all the parameters selected.

This is compared with subjective LOS assigned by the expert in (b) for the same road section and the ratings and relative weights for each parameter is adjusted to improve the correlation. The developed equation can be applied to assess the LOS of a road section based on its roadway characteristics.

The proposed methodology offers a simplified objective process for engineers to evaluate the level of service of road network based on roadway characteristics that can be compiled from an inventory survey that requires minimum resources. This can be a useful input to prioritize road upgrading projects in a provincial road network.

Keywords: Level of service, Low volume roads, Highway planning

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