Selection Criteria for Minor Road Crossings for Expressways

N.Lodwick[1] and W.K.Mampearachchi[2]

Transportation network in a country plays a vital role in economic and social development. Government of Sri Lanka (GOSL) during past few decades has taken every effort to upgrade its transportation by strengthening the countries transportation infrastructure. In addition introduction of high speed links are one of the strategies used in this regard and few of them are now under construction under the jurisdiction of Road Development Authority.

Since the construction of expressways are newer to our country numerous types of problems have been encountered during preliminary and implementation stages causing impediments for the progress with additional project cost. Selection of crossing types for the minor roads for expressways is one of the problems under the above category which has caused severe problems in various stages.

Implementation of secondary crossings for expressway at present does not follow up a pertinent criterion. Most of crossings implemented were based on least cost criteria rather than considering social & environmental aspects have lead the views of public and the relevant authorities that the projects do not follow the guidelines given under Environmental Impact Assessments.

Contemporary outcomes of the above have generated negative impacts for the future projects in the pipeline. Therefore need of a systematic criterion for the selection of crossing types have become a timely requirement.

Objective of this research is primarily aimed at an attempt to identify the cause of impacts with their scale of magnitude at minor crossing locations on expressways and then to resolve the same by addressing them through a systematic approach in finding optimum solution.

No previous research has been found in this regard and was noted that there were no direct methods identified due to its complex nature. Since the area of study observed to be very vast the research has been converged and focused within the scope of Colombo – Katunayake Expressway Project.

Methodology adopted in this process contained a series of literature studies along with case studies carried out at field locations to identify the important factors dealt with the problems. Outcomes of the above have revealed that social, environmental and construction related issues would generate a compound effect in finding the optimum solution for the crossing types.

In this study Analytical Hierarchy Process has been used as a tool to find the optimum solution since it has been widely used for the problems associated with multiple causes of impacts with difficulties in determining the factor weightages.

A network has been established with related impacts along with proposed alternative crossing types. Main impacts were structured in to secondary impacts to make ease for the determination of weightages for the analysis. Introduction of comparison factors between issues were considered in

finding the scale of magnitude of each impact on final solution. Contemporary alternative evaluations were carried out under each impact issue concerned. Final solution was obtained by using the alternative with the highest weighted average for a particular location.

Findings from the above research have revealed that lack of a systematic criteria and negligence has caused severe impacts in selecting minor crossing types. Also it was observed that the final solutions obtained under proposed systematic criteria are equivalent to the final solutions resulted in the relevant case studies concerned.

Methodology proposed in this research will promote a way forward towards finding the optimum solution for secondary road crossings for expressways concerned for future projects. However necessary changes are to be incorporated in par with the issue related to the particular project locations in obtaining the best solution.

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Authors Details;

1. Deputy Project Director, Colombo Katunayake Expressway Project, Road Development Authority, No 200, Pannipitiya Road, Battaramulla. nihalddd@yahoo.com, 011-2933985

2. Senior Lecturer, Department of Civil Engineering, University of Moratuwa, Katubedda, Sri Lanka. wasanthak@civil.mrt.ac.lk, 0112 650 567 (ext. 2024)