

Micro Simulation for Airport Curbside and Roadside Operations at BIA

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Abstract

This focuses on analysis of existing level of service (LOS) of the airport curb side and roadway operations at the Bandaranaike International Airport (BIA) and how micro simulation can be used as a tool for LOS improvements. Considerable amount of research has been devoted to modelling airport terminal operations and performance evaluation. Curb side performance has been proved to be a significant component in the overall LOS of an airport. Curb side and roadway operations were further categorized in to micro level components of (1) departure and arrival porch queue; (2) departure and arrival roadways; (3) access roadway; (4) weaving segment; (5) circulation roadway. Sensitivity of the variables was considered to identify the critical parameters. Simulation of the each component in single model enabled to analyse the impact on overall performance by the each component. The operating characteristics of airport terminal curb side differ significantly from those of most other roadways due to several reasons such as vehicle dwell time and driver behaviour etc. Six different vehicular movements can be indentified at the weaving segment and traffic flow of departure and arrival roadways continuously disturbed by the pedestrian crossings in peak hours. Simulation of aforementioned locations provided useful information for analysis with future demand.

Analysis of vehicular traffic, travel mode choice, curb side roadway vehicle queues, vehicle dwelling times and passenger occupancy level will provide useful information for developing plans for operational improvements as well as for planning future expansions. Using the available data, and the data provided by the model, demand and the capacity of these facilities were evaluated to estimate the existing LOS. Multivariate regression is used to obtain mathematical relationships of user characteristics which correspond to the dwell time. The analysis was done adopting an analytical approach instead of the traditional simplified method given in International Air Transport Association (IATA) manual as a design guideline. Measures were identified to improve the operational efficiency of these facilities and proposed improvements are proposed to ensure good operational efficiency for the forecast future demand. QAT-ACR (Quick Analysis Tool for Airport Curb side and Roadways) can be used to validate the model using available data.

Key words: Airports, Simulation, Level of service

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