Evaluation of Impact of Access Roads on Traffic Flow on Arterial Roads in Colombo

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Abstract

The rapid development of Colombo city has resulted in growth in urban traffic. The arterial roads that provide accessibility to Colombo city are experiencing traffic congestions, especially during peak times. The vehicles that enter these arterial roads through closely spaced access roads and exiting vehicles to access roads from the arterial, can be considered as a major contributor to causing traffic congestion. This paper analyses how the close-distance access roads affect the traffic flow on arterial roads. A virtual scenario for a 1km multi-lane arterial road section with separated two lanes in one direction and access roads were connected from the both sides of the arterial road, was created in VISSIM software based on a case study of Galle-Colombo arterial road to replicate local conditions. The flow rate on the arterial road was varied to understand the total delay of the network system and the flow rate of the major arterial roads with varying access road distances. Furthermore, identify the combined impact that can occur within the road network was evaluated by defining an index. The index was defined by considering the total delay of the network system and the flow rates of the major arterials. The recommended distance between access roads to arterial roads was identified as a part of the study. It is recommended that access roads may connect with a minimum of 250m-275m distance between their center lines in a 1km arterial road section for 1000veh/hr to 4000veh/hr volume of arterial flow. One of the findings of this study was when future planners designing urban road network systems, access roads should be connected in above mentioned distance range between their center lines, regardless of the vehicle volume of arterial roads, to minimize total delay of the road network and maximize the through vehicle flow of arterial roads.

Keywords: *arterial roads, delay, VISSIM, un-signalized intersection*

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