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# ROUNABOUT DESIGN TECHNIQUES FOR SRI LANKA

A report submitted in partial fulfillment of the requirement for the degree of M.Eng (Highway and Traffic engineering)

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## ABSTRACT

Roundabout is one of the effective and relatively low cost method of intersection control. Roundabouts function on the simple principle where vehicles give way to those from the right. They are particularly suitable for junctions where there is considerable space to locate a roundabout and the flows in all roads are approximately equal. Properly designed roundabouts also has a very good safety record.

Roundabouts should be designed to ensure a smooth flow of traffic that is expected in each arm. The capacity of the roundabout depends on the number of entry and circulating lanes. When the number of vehicles increases, the degrees of saturation for entry arms increase and when it is above 0.8, there is a considerable chance for congestion. Therefore, when the number of vehicles increase, it is necessary to improve the roundabout by making suitable geometric, entry and circulating lane changes.

The roundabout capacities can be predicted by using techniques developed in Australia or Great Britain. The Australian method takes account of factors like geometry of the roundabout and drivers ability to accept gaps when calculating the capacity. The British method is primarily based on the geometry. It is shown that the Australian method can be more useful for designing busy roundabouts in Sri Lanka since it allows the use of low approach and circulating velocities, calculation of capacity, delays and queuing lengths. Delays and queuing lengths can be very effectively used to determine the most suitable lane when marking arrangements to segregate the traffic to minimise the delays. Lane marking should preferably ensure almost equal queuing lengths since drivers tend to take the shortest queue.

Two busy roundabouts in Colombo, one at Slave Island junction and the other at Ingurukade junction have been used as case studies to present various capacity improvement measures available for the roundabout designer to reduce congestion at a busy roundabout.

Similar measures can be adopted at other congested roundabouts in Sri Lanka. If such measures fail to bring adequate improvements, more costly measures like traffic lights can be considered instead of roundabouts.

For the proper functioning of roundabouts, it is necessary to have disciplined drivers who would comply with the traffic rules at the roundabouts. Thus, it may be necessary to carry out educational programmes through national media to educate the drivers. Non compliance of traffic rules at roundabouts can often lead to congestion and even to dead lock situations.

**KEY WORDS:** ROUNDABOUTS, INTERSECTION CONTROL.

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