

Design of A Composite Traffic Control System at Kpakungu Roundabout Minna, Niger State

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Abstract

A composite traffic control method is proposed to control traffic and ease congestion especially during peak periods at Kpakungu roundabout in Minna, Niger state. Reconnaissance survey of the roundabout was carried out to note predominant directions of traffic flow from each approach to the roundabout; manual counting of traffic for five working days was done between 7:00 am to 12 noon and 3:00 - 7:00 pm daily. The result of the survey shows that congestion occurs at the roundabout between 7:45 - 9:30 am and between 5:00-6:30 pm every day. Results also show that the peak hourly traffic flow rate occurs between 8:00 and 9:00 am, and 5:00 to 6:00 pm daily. The result of the traffic count was then forecasted for 2-years using data on annual vehicle registration in Minna for 2011 to 2015 obtained from the Niger State Board of Internal Revenue Service. The Webster method of signal timing was used to design traffic signals that will optimally allocate right of way time to conflicting traffic streams. A 5-phase signalization of 90- and 97-seconds cycle lengths were proposed for morning and evening peak periods, respectively.

Keywords: Congestion, Peak periods, Traffic count, Traffic signals.