

## Effectiveness of Vehicle-Actuated Signals for at Grade Four Legged Intersections in Sri Lanka: A Comparison Study Against Existing Fixed-Time Traffic Signals

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The goal of traffic engineers in recent years is trying their best to get the most out of the systems that they develop. By designing most efficient systems, using the advancement of electronics the overall costs of transportation should be slightly easier to manage.

In Sri Lanka, it is anticipated that the prevailing fixed-time traffic signals would be replaced by modern actuated traffic signals in near future. This study has been carried out to evaluate the efficiency of vehicle-actuated signals against prevailing fixed-time traffic signals prior to their implementation.

Several existing signalised intersections in the capital city were carefully studied with their geometric and traffic turning movements. A traffic simulation was programmed in Microsoft Excel in such a way to generate traffic for a typical intersection in an urban area. In order to characterise real dynamic condition of traffic flow, various traffic volume combinations were selected among North-South and East-West through-traffic and other turning movements (Left-turns, Right-turns & Heavy vehicles) were randomised within their permissible limits. Numerous calculations for Cycle time, Vehicle-delay, Pedestrian-delay and Critical movements of different traffic combinations were computed by exploiting a renowned Australian Software called "*Signalised (and unsignalised) Intersection Design and Research Aid [SIDRA]*".

The outcomes of analysis were compared in graphical and tabular forms for the efficiency of *fully-Actuated Signals* against *fixed-time Signals*. It has been found that the replacement of fixed-time traffic signals with fully-actuated signals for stand-alone intersections shall not produce any major enhancement (reduction in delay) to the existing at grade four-legged intersections, which have three standard-approach lanes including right turn-bays with optimum length and two standard-exit lanes. Moreover, it is sensible that semi-actuated signals would be a better alternative for certain signalised intersections where major roads (continuous high demand) meet with minor roads (very stochastic or very low traffic demand).

**Key words:** *Fully-actuated Signal, Pre-Timed Signal, SIDRA*

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