

## The Estimation of Saturation Flow and Passenger Car Units (PCU) at Traffic Signals for Sri Lankan Conditions

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**Saturation flow rate** is the equivalent hourly flow rate at which previously queued vehicles can traverse an intersection approach under prevailing conditions, assuming that the green signal is available at all times and no lost times are experienced, in vehicles per hour of green or vehicles per hour of green per lane. The saturation flow on an approach to a traffic signal are very important inputs to methods of estimating delay-minimizing or capacity maximizing signal settings. Procedures for signalized intersection analysis often recommend the use of measured saturation flow rates. However, it is impractical to measure prevailing saturation flow rate for an existing site and it is impossible to measure saturation flow rate for a new signal installation which is yet to be constructed. Hence, the development of a saturation prediction formula based on passenger car equivalents values derived according to local traffic conditions is necessary in order to estimate saturation flow rates accurately at signalized intersections.

**Passenger Car Units (PCU)** are used to represent the varying effects of mixed vehicle types on saturation flows by converting a traffic stream comprising of various vehicle types into an equivalent traffic stream comprising entirely of passenger cars. It has been proved that PCU values have a significant impact on the estimation of saturation flows especially in the presence of high percentage of motorcycles & three wheelers in the traffic stream. PCU values used in Sri Lanka has not updated for a long period of time, but the traffic compositions in roads has changed significantly during recent past, therefore these PCU values are no longer accurate.

Hence, the main goal of this research is to derive the basic saturation flow values of signalized intersections which is suitable for Sri Lankan conditions. The secondary goal is to update present PCU values of the traffic stream at the signalized intersections. The data collection is being presently continued in order to obtain set of more than 2500 data in the selected traffic signals in the city of Colombo, It has now been completed only the collection of about 500 data in two traffic signalized locations.

At present Sri Lankan used saturation flow rate of 1850 pcu/hour which is derived in developed countries. According to the research, this value may differ significantly, and it is about 2000 pcu/hour at the end of analysis of about 500 data. The PCU values which are presently being used in Traffic Signal Design are derived for Multi-Lane roads by Transportation Engineering Division of University of Moratuwa. At the end of analysis of 500 data, it is shown that PCU values are slightly change to these values except that of Three wheelers. The PCU value of three wheelers has changed significantly from 0.8 to 1.3.

### **Keywords:**

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