

King Saud University
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**Assessment and Calibration of SYNCHRO for
Riyadh Traffic Conditions**

By

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Abstract

Traffic simulation models have been widely used in both transportation operations and traffic analyses because simulation is safer, less expensive, and faster than field implementation and testing. The need for simulation programs has become more important in cities where rapid growth takes place such as Riyadh, which has more than 580 pre-timed signalized intersections with various peak hour times during the day. Therefore, the need for calibrating simulation models to local studies is urgent in order to minimize error between modeled results and the real life.

The main objective of this research is to calibrate one of the very common simulation models used in Riyadh called Synchro/SimTraffic, commercially known as Synchro, focusing on local road traffic conditions by using empirical data from several pre-timed intersections in Riyadh. The calibration has been done on microscopic simulation model SimTraffic.

To achieve this objective this research conducted field studies to collect traffic data from related organizations and calibrated key parameters that have the greatest impact on the calibration process.

The study has reached to several results, these are (1) Four important parameters of simulation model were calibrated: travel speed, turning speed, headway factor (a measure of saturation flow rate) and driver type. The results with these calibrated values showed no discrepancy between the field observed MOE's and the model simulation MOE's. (2) In order validate the calibrated model; it has been applied on another site chosen in Riyadh using a different data set. The results of the validation showed that the differences between the field observed MOE's and the Synchro/SimTraffic simulation results are within the acceptable range. (3) The intersection approaches in Riyadh appear to have high saturation flow rates. This finding supports results from other studies indicating that driving behavior in Riyadh is aggressive. A deeper understanding of driver behavior mechanism is essential to all traffic studies and traffic simulation in particular. (4) The Percent error between simulated and observed values was about 7% after calibrating the four parameters while it was more than 18% for the default parameters.