Identification of Traffic Parameters Required to Develop Performance Measuring Schemes for Traffic Signals Full-filling Multi-Stakeholder Objectives

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Abstract

Traffic signal systems are defined as a control measure or a traffic management strategy for road traffic to minimize traffic congestion and control the traffic flow. Today the traffic signal systems have evolved through semi and fully actuated signal systems and towards adaptive traffic signal systems where the traffic data are processed in real-time to predict future conditions using traffic models. Every intersection is a part of a roadway network and traffic signal operations are a special component in traffic management. The actual quality of operation in a signalized intersection is unknown without a proper performance measurement system. Therefore, it is important to develop an appropriate performance measurement scheme where adequate information is provided to the system operators in evaluating the performance of a signalized intersection.

The organizational processes and stakeholders of the intersection are vital components in developing a performance measurement system and their influence on traffic control measures are significant. Different stakeholders require different objectives to be achieved from the traffic signal systems. Different objectives require different parameters to be evaluated to measure the quality of an operation. Therefore, a multi-stakeholder analysis of performance measurement needs to be conducted to identify different objectives and relevant parameters to measure the quality of operation in a signalized intersection. This study is focused on identifying relevant parameters required to measure in determining the quality of operation at a signalized intersection based on multi-stakeholder objectives.

The existing literature has been used to develop the relevance and significance between the parameters and stakeholders. The influences between stakeholders and traffic parameters were developed to identify the most appropriate parameters to be measured to achieve a quality outcome in performance measurement. The outcomes are useful in developing performance measuring guidelines to evaluate traffic signal systems in general. The results show that there are seven main stakeholder groups with different perspectives. 29 parameters were studied considering different views of stakeholder in this study to identify most cost-beneficial and relevant parameters to be measured.

Keywords: *Signalized intersection, Performance measurement, Multi-Stakeholder analysis*

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