TECHNICAL REPORT

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# Intelligent transport systems — The use of simulation models for evaluation of traffic management systems — Input parameters and reporting template for simulation of traffic signal control systems

*Systèmes intelligents de transport — Utilisation de modèles de simulation pour l'évaluation des systèmes de management du trafic routier — Paramètres d'entrée et modèle de rapport pour la simulation des systèmes de contrôle des signaux du trafic routier*



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# Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 204, *Intelligent transport systems*.


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# Introduction

Many kinds of signal control systems are used in the world. Some systems are based on simple time-of-day control while some systems are operated in real time, adaptively controlled in accordance with changing traffic conditions.

When adopting a new signal control system in the field, simulations are often used to evaluate its effect. However, although traffic conditions vary considerably in each country and area, simulations can be operated only with some limited conditions. Some control systems and algorithm achieve good performance only in specific conditions, and sometimes simulations are operated assuming virtual road networks for studying a new algorithm.

By disclosing simulation conditions, it becomes possible to learn whether the signal control systems are applicable to many conditions or good in particular conditions, and whether the conditions are practical or the simulation is for theoretic quality assessment. Thus, this Technical Report aims to provide guidelines for disclosing simulation conditions and results in order to evaluate and compare various signal control systems.

For a fair evaluation of signal control systems from simulation results, this Technical Report describes minimum necessary items of conditions of simulation that shall be disclosed. The items of simulation results cannot be regulated because various kinds of results are created depending on simulators, so this Technical Report shows some examples of simulation results.

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## 1 Scope

This Technical Report provides guidelines for disclosing simulation conditions and results when evaluating the performance of signal control methods, focusing on algorithm that establishes signal timings based on traffic conditions. The following are the main aims of the evaluation of signal control systems:

a) to evaluate the quality of the algorithm in various traffic conditions;

b) to evaluate the validity of the algorithm for specific applications (types of intersection);

c) to establish a fair comparison of the algorithm versus other existing algorithms or other types of control systems;

d) to evaluate the results of the implementation of a signal control system objectively.

When claiming and/or comparing the performance of signal control systems from simulation results, it is necessary to clarify simulation conditions and results so that third parties can objectively judge its fairness and reasonability.

This Technical Report describes minimum necessary items of conditions that shall be disclosed to ensure fair evaluation and does not describe maximum possible items.

## 2 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

**2.1**
**additional lane**
added lane which is branched from another *lane* (2.6)

**2.2**
**clearance time**
time between signal phases during which an intersection is not used by any traffic

Note 1 to entry: It is expressed in seconds.

**2.3**
**cycle**
complete sequence of signal indications

**2.4**
**cycle length**
time required for a complete sequence of signal indications

**2.5**
**detection area**
area where a vehicle detector can count and/or determine the presence of a vehicle

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