

TRAFFIC SIGNAL CONTROL

IITM Technology Available for Licensing

Problem Statement

- Inefficient traffic signal management is a common issue at signalized intersections.
- Current signal design method is obsolete and developed for homogeneous and lane based traffic
- Hence, there is a need for a system that can optimize the duration of traffic signals.

Technology

The present invention discloses a **system and a method for minimizing delay at a signalized intersection** by estimating optimal cycle time for traffic signals under heterogeneous and lane-less traffic conditions.

A processor-Central processing unit for executing the system's operations; to compute an **intersection delay model** and develop the **signal control model**

Technology Category/ Market

Category –Automotive

Applications – Transport systems, Automobiles, Traffic control systems, Communication, Automation,

Industry –Automotive/ Automation

Market -The global intelligent transportation system market is projected to grow from \$22.91 billion in 2021 to \$42.80 billion in 2028, at a CAGR of 9.34%

•Estimate the delay experienced by one or more vehicles as they pass through the signalized intersection.

•Optimize the signal control model to determine a signal duration that minimizes the delay

Intersection delay model

Signal control model

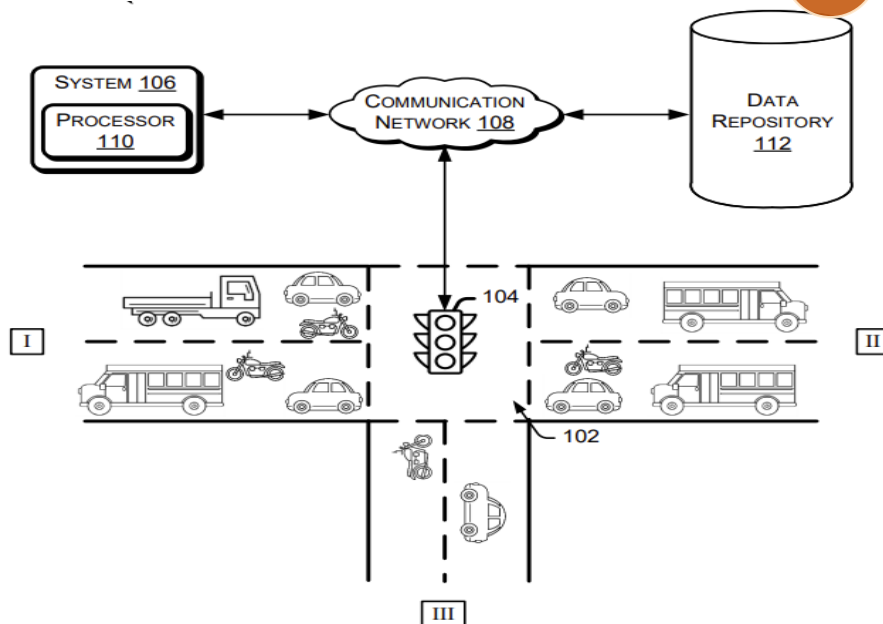


Fig. 1 Illustrate a traffic environment comprising a system, according to an example implementation.

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Images

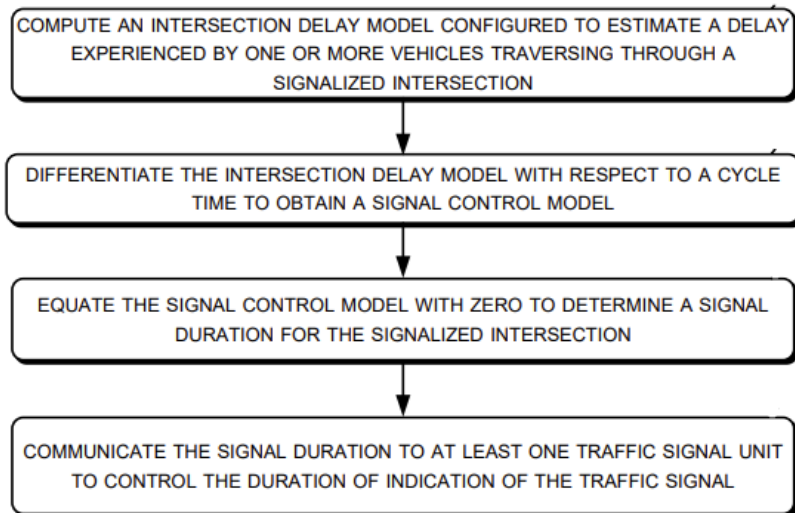


Fig. 2 illustrates a method for optimizing delay at a signalized intersection to estimate optimal cycle time for traffic signals, according to one example implementation.

- ❑ **Intersection Delay Model** is based on the Delay Parameters such as **Saturation Flow Rate in PCU and Number of Parallel Queues**
- ❑ **Signal Control Model** to determine a signal duration for the signalized intersection to **minimise the delay experienced by the one or more vehicles.**
- ❑ The processor is to communicate the signal duration to at least one traffic signal unit, located proximate to the signalized intersection to control the duration of indication of the traffic signal, the traffic signal comprising at least one of a red signal and a green signal.
- ❑ The processor calculates a Passenger Car Equivalent (PCE) value for the vehicles belonging to various vehicle classes.
- ❑ The processor also calculates the number of parallel channels occurring within a single lane

Intellectual Property

- IITM IDF Ref. 2620
- IN 536088 (PATENT GRANTED)

Key Features / Value Proposition

Technical Perspective

- ❑ Manages traffic control in multi-phase intersection, characterized by multiple passages converging to form a complex intersection.
- ❑ The method computes an intersection delay model to estimate the delay experienced by vehicles at a signalized intersection and; a model that differentiate the intersection delay model with respect to the cycle time to obtain a signal control model.

User Perspective

- ❑ By adjusting the signal duration, the system aims to minimize vehicle delay and improve traffic flow efficiency.
- ❑ Ability in standardizing the impact of different vehicle types and lane-less movement.

Research Lab

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TRL (Technology Readiness Level)

TRL-5, Technology Validated in Relevant environment

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