IIT MADRAS
Indian Institute of Technology Madras

Technology Transfer Office
TTO – IPM Cell

Industrial Consultancy & Sponsored Research (IC&SR)

ESTIMATING DELAY AND MANAGING TRAFFIC

IITM Technology Available for Licensing

Problem Statement

- Signalised intersections are the major bottlenecks in urban road networks.
- Efficient traffic management at intersections, where vehicles from different directions must navigate is of paramount importance.
- Understanding traffic conditions near intersections with minimal data is the first step for this.

Key Features / Value Proposition

Technical Perspective

- On arrival of one of the plurality of sampled vehicles at the multi-phase intersection, the traffic control system estimate a queue dissipation time based on the determined measure of the shock wave speed
- The system uses the estimated queue dissipation time and the pre-defined duration of a red traffic signal to calculate the total intersection delay.

User Perspective

- Estimates the time it takes for a queue of vehicles to clear a complex multi-phase intersection, taking into account the speed of traffic movement

Technology

The present invention discloses a traffic control system implemented at a **multi-phase intersection**, comprising of :

•Process or executes instructions stored on a non-transitory machine-readable storage medium and the hardware

A processor

•Receive a first set of vehicle attributes corresponding to a plurality of vehicles from sensors and estimate arrival flow, delay, queue length

A traffic state estimation module

- The first sensor is positioned at an upstream point and a second sensor positioned at a downstream point on a first leg of a plurality of legs of a multi-phase intersection respectively
- A measure of time stamp differences of the plurality of vehicles may be determined.
- The system calculates traffic states from these sampled travel time data.

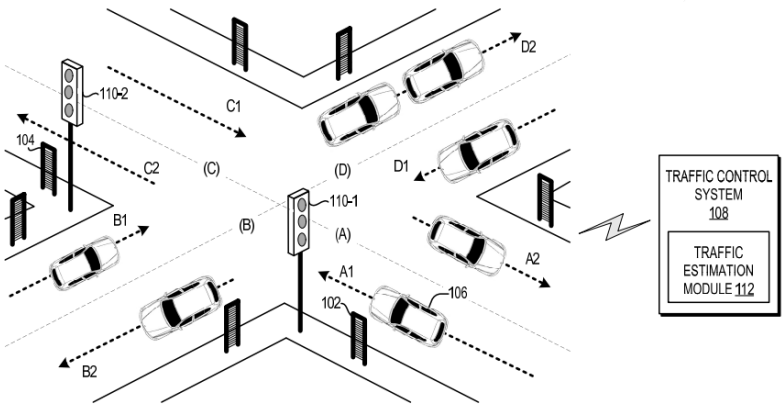

Fig.1 illustrates an exemplary multi-phase intersection for estimating delay based on changes in traffic conditions for implementing a traffic management system

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Shock Wave Speed Calculation:

- **Traffic Estimation Module receives data from two sensors located at different points on the same road segment.**
- **•Further, calculate the shock wave speed, which reflects variations in the time it takes for vehicles to cross the intersection.**

❑ The first set and the second set of time stamped vehicle attributes comprise one of a device identifier and a location of one of a plurality of electronic devices associated with the corresponding vehicle.

❑ The first sensor and the second sensor is one of a Wi-Fi MAC sensor, RFID sensor, or a Bluetooth sensor.

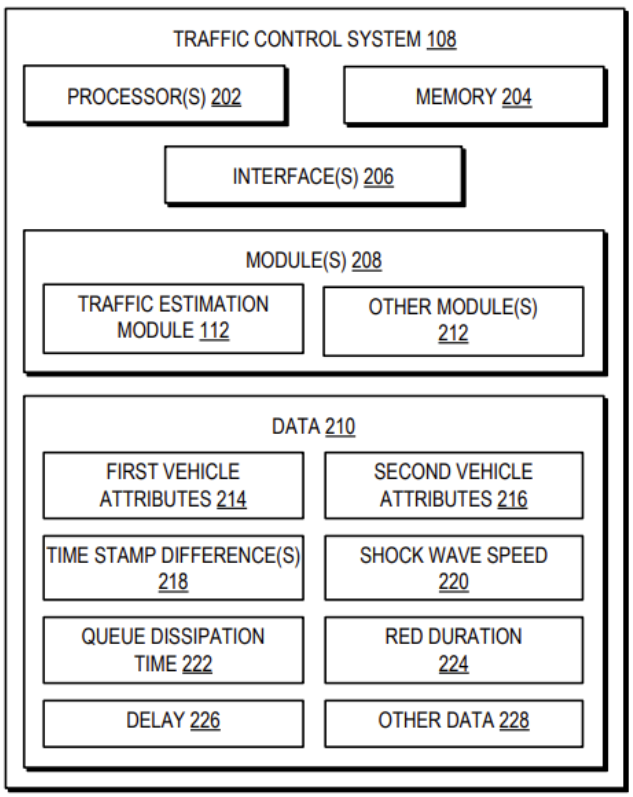

FIG. 2 is a block diagram of an example traffic control system for estimating delay based on changes in traffic conditions for implementing a traffic management system

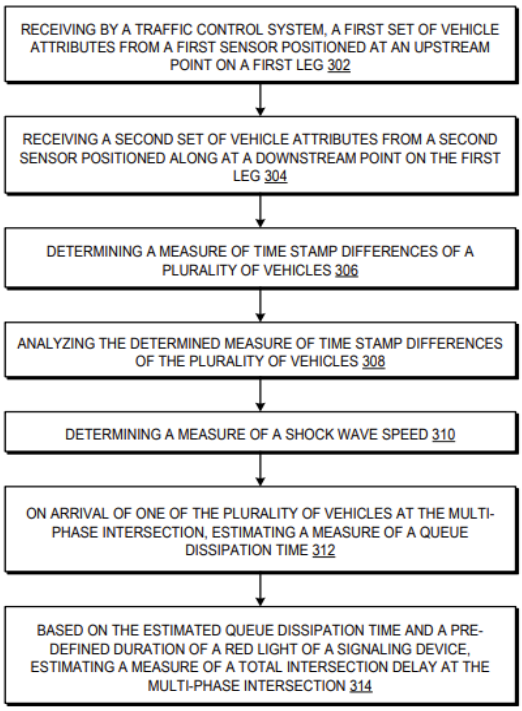

Fig.3 is a flowchart depicting a method for estimating delay based on changes in traffic conditions for implementing a traffic management system

Technology Category/ Market

Category –Automotive
Applications – Transport systems, Automation, Automobiles, Traffic control systems
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%

Intellectual Property

- **IITM IDF Ref. 2095**
- **IN202141033246**

TRL (Technology Readiness Level)

TRL- 5,Technology validated in relevant environment

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