

ADAPTIVE TRAFFIC SIGNAL CONTROL

IITM Technology Available for Licensing

Problem Statement

- Fixed time traffic signals lead to extra delays if the traffic is varying within and across cycles.
- Further vehicles of different types and sizes, forming mixed traffic conditions increases complexity in traffic management.
- Adaptive traffic signals can take into account the varying traffic demand and optimize the signal timings.

Key Features / Value Proposition

Technical Perspective

- ❑ A system and a method for adaptive traffic signal control for optimizing delay experienced by vehicles at an intersection under mixed traffic conditions.
- ❑ Works in real-time and can dynamically operate the traffic signals and reduce delay in crossing intersections

User Perspective

- ❑ Implementation of the system resolves traffic congestion and provides improved traffic management
- ❑ Cost effective, large infrastructure not required and are ideal for both homogeneous and heterogeneous traffic conditions.

Technology

The systems includes:

- A plurality of probe vehicles generating time stamps
- A traffic controller that couples with point-to-point detectors

- ❑ The point-to-point detectors are **sensors** installed near the intersection of roads, and there is at least one detector located near each road **connected to the intersection.**
- ❑ The point-to-point detectors **records and generate time stamps for vehicles** as the probe vehicles pass the detectors
- ❑ Further the **Traffic Controller** is capable of :
 - ❖ **Receiving Time Stamps**
 - ❖ **Calculating Vehicle Crossing Time**
 - ❖ **Determining Average Queue Forming Shockwave (QFS) Speed**
 - ❖ **Estimating Total Intersection Delay**
 - ❖ **Optimizing Signal Timing**

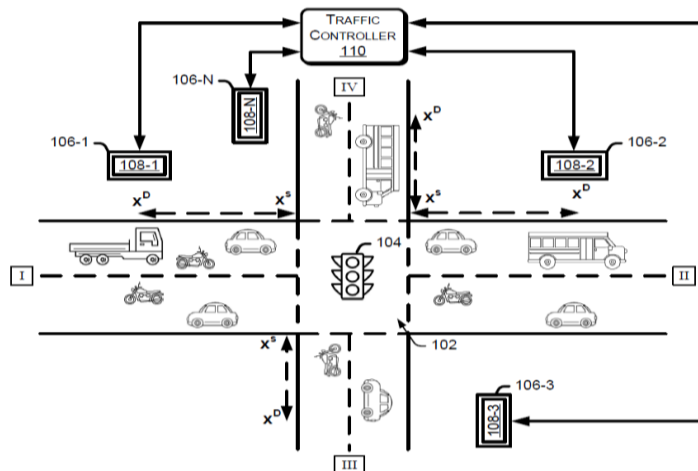


Fig. 1 illustrate an environment, according to an example implementation.

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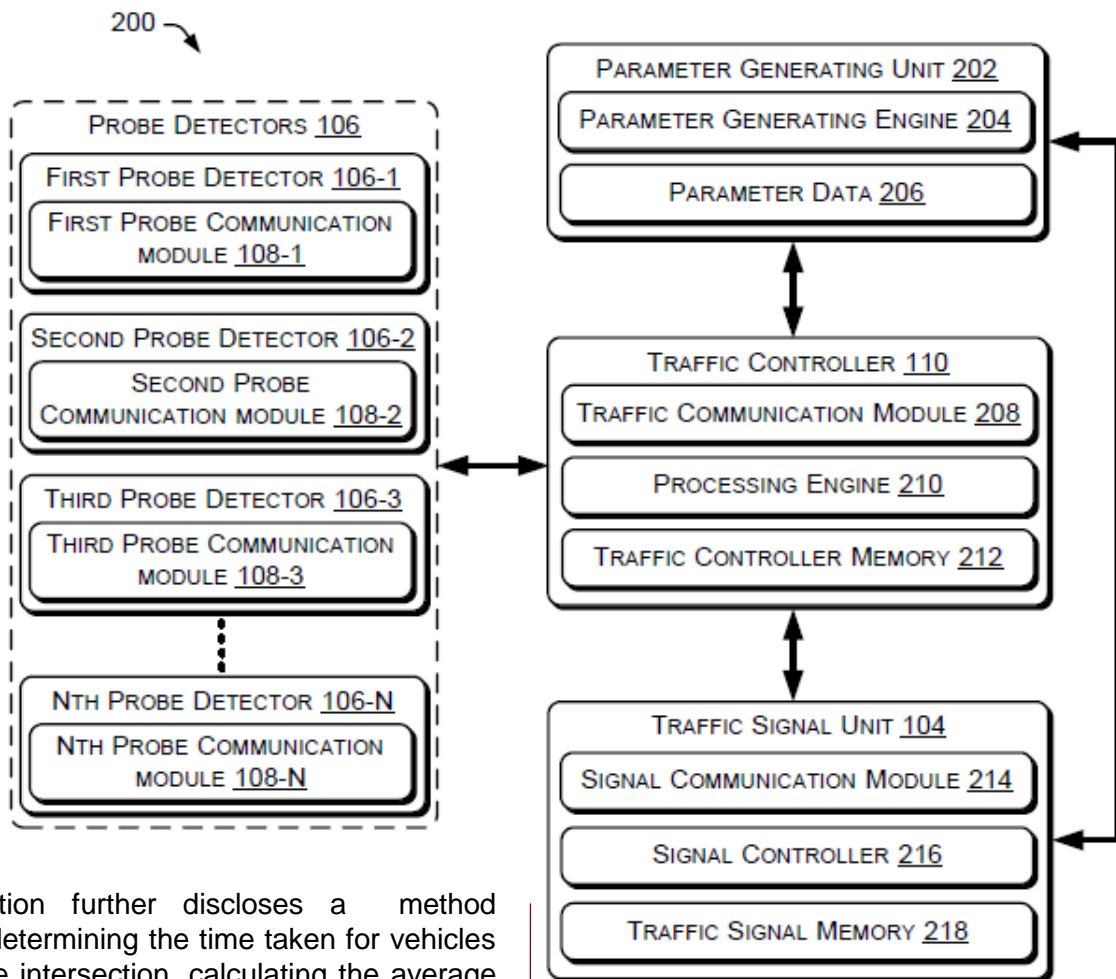
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- The invention further discloses a method involving determining the time taken for vehicles to cross the intersection, calculating the average speed, estimating total intersection delay, and optimizing signal timings to minimize delays.
- The composite traffic flow parameters include various data related to vehicle classes, composite free flow speed and composite queue discharge speeds, and jam density, saturation flow rate, free flow time etc.

Fig. 2 illustrates a block diagram of a system, according to an example implementation.

Intellectual Property

- IITM IDF Ref. 2410
- IN449731-Granted

TRL (Technology Readiness Level)

TRL-5, Technology Validated in Relevant environment

Research Lab

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Technology Category/ Market

Category –Automotive

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

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%

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