REAL-TIME ASSIGNMENT AND OPERATION OF DEDICATED LANES FOR CONNECTED AUTOMATED VEHICLES

IITM Technology Available for Licensing

Problem Statement

- In the present and future scenarios, with an increasing number of connected automated vehicles (CAVs) on roads along with regular vehicles (RVs), **maintaining a steady traffic flow to reduce traffic congestion** is a **challenging task**.
- Further conventional techniques for both dedicated & general-purpose lanes are not sufficiently addressed by researchers and practitioners. Conventional techniques **do not** take into **consideration varying penetration rates, road geometry, number of dedicated lanes, & traffic demand conditions** while implementing the dedicated lane strategies.
- This patent provides techniques for real-time assignment & operation of dedicated lanes for the CAVs using traffic flow theory concepts.

Technology Category/ Market

Technology: system & method for real time assignment & operation of dedicated lanes for connected automated vehicles;
Industry: Automotive & Transportation Industries;
Applications: Transportation agencies and automotive companies.
Market: The global connected Car (CAV) market is projected to grow at a **CAGR** of **13.4%** during forecast period**(2024-2030).**

Technology

- Claimed a **system for real-time assignment & operation of dedicated lanes for CAVs** based on different penetration rates & traffic flow levels. (Refer Fig.1a)
- Further explains a **method** for real-time allocation of dedicated lines for CAVs & **method** for **generating reference plots** for **assignment** of **dedicated lanes** for CAVs.(Refer Fig.1 and Fig 2)

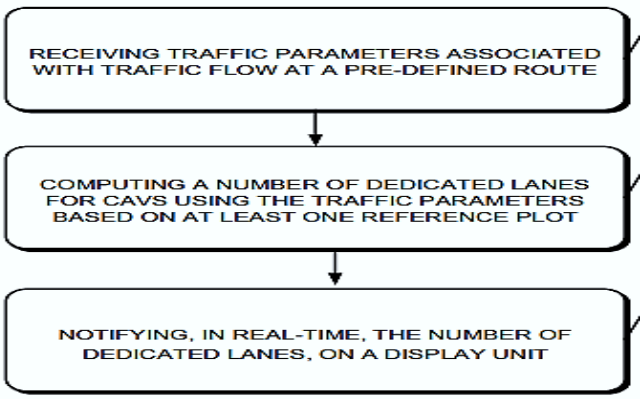

Fig.1 illustrates a method for real-time allocation of dedicated lanes for CAVs;

- Said system comprises a **processor** coupled to a **display unit**, & **a lane assignment engine** coupled to the processor & other associated units.
- The operation of claimed system is illustrated in the smart chart:

Using input parameters **generate phase diagram** (1st & 2nd phase diagram) & **classify into two/more zones** based on a penetration rate of CAVs on the pre-defined route & **determine a locus of maximum traffic flow** with respect to each of the zones.

Identify a **beneficial region** (indicating assignment of dedicated lanes**)** using locus of maximum traffic flow & based on that **generate a reference plot** for **assignment of dedicated lanes for CAVs**

Intellectual Property

IITM IDF Ref. 2507;
IN Patent Application No. 202341050812

TRL (Technology Readiness Level)

TRL- 3/4, Proof of Concept ready, tested and validated in Laboratory

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Industrial Consultancy & Sponsored Research (IC&SR)

Key Features / Value Proposition

❖ *Technical Perspective:*

- The classification engine may use the **input parameters associated with RVs & CAVs** for **predefined route** to generate first phase & Second phase diagram, wherein said classification engine may **store the information pertaining** to the two or more **zones** (wherein zone includes one or more plurality of regions having **beneficial regions**)
- Claimed system **dynamically adjusts** the number of dedicated lanes, **ensuring** that CAVs can **travel in the most efficient & safe manner possible**, thereby **increasing the traffic throughput**.
- The present invention provides a **robust yet less complex, more feasible,** & **affordable technique** for real-time assignment of dedicated lanes for CAVs.

❖ *Industrial Perspective:*

- Subject application capable of **delivering applications** (e.g. **cloud applications**) for managing dedicated lanes for CAVs.
- By using present system, **congestion in movement of CAVs** may be **prevented** & **average travel time** may be **improved.**

Images

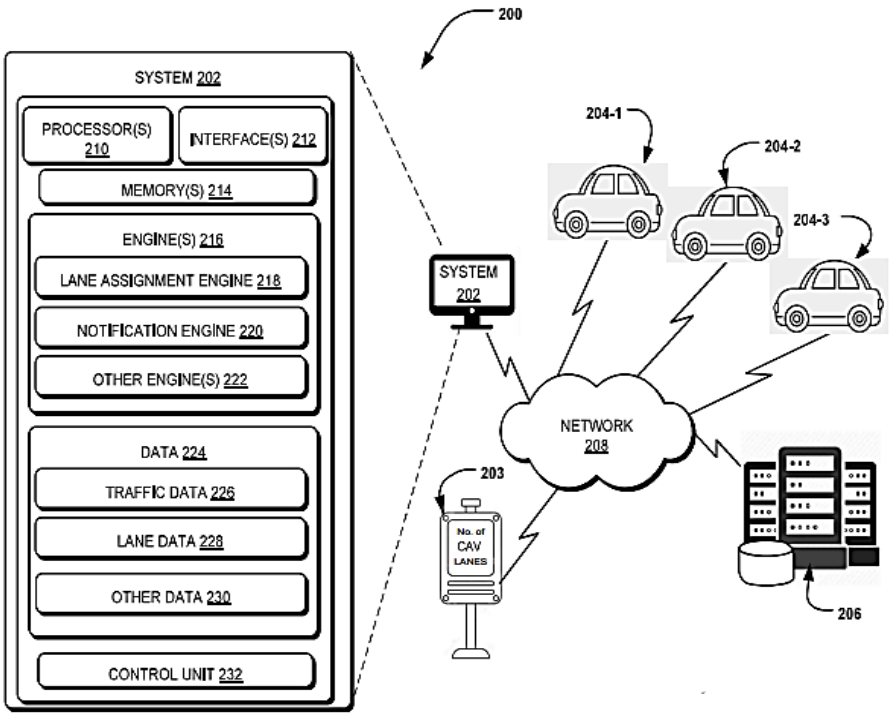

FIG.1A: : Illustrates a network environment for real-time allocation of dedicated lanes for CAVs;

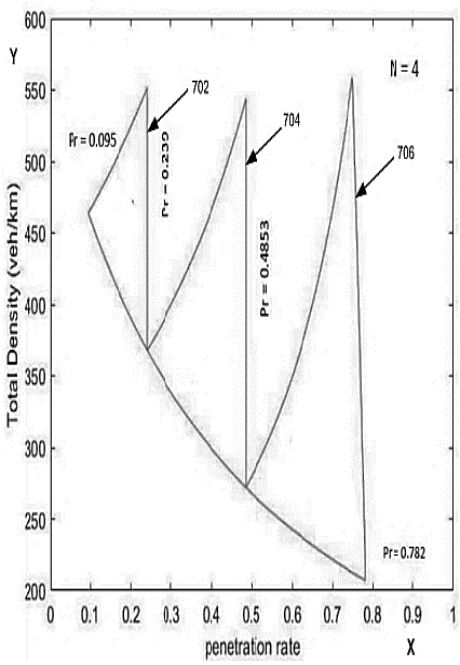

FIG.2: Illustrates a reference plot for assignment of dedicated lanes for CAVs;

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