



### Industrial Consultancy & Sponsored Research (IC&SR)

## A DYNAMIC OPERATION, MANAGEMENT & CONTROL SYSTEM FOR A VEHICLE

### IITM Technology Available for Licensing

#### Problem Statement

- Existing technologies fall short in accurately predicting arrival times due to their inability to handle the dynamic and complex nature of heterogenous traffic.
- Key issues include traffic variability, diverse modes of transportation, loss of GPS/GPRS data, detours etc.
- Hence, there is a need for an advanced system for traffic pattern analysis and arrival time prediction that can overcome the limitations and challenges posed by the existing technologies and patents.

#### Intellectual Property

- IITM IDF Ref. 1207
- IN409992-Granted

#### Key Features / Value Proposition

##### Technical Perspective

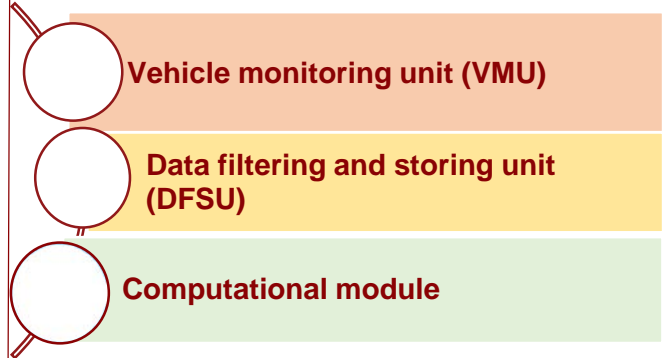
- ❑ Discloses a system mountable on vehicles for predicting trip travel time of the vehicles from an origin to a destination of each vehicle
- ❑ The said system intelligently identifies the overtaking of the buses to give the correct next bus and its arrival time information to the passenger at the location of interest.

##### User Perspective

- ❑ Efficient system that directs operator in real time, speeds with which the vehicle is moving as well as the driving characteristics of the driver such as acceleration and deceleration.
- ❑ The system provides alert about arrivals, speed violations, bunching, and route deviation and navigate for dynamic routing and scheduling of buses and can be for all types of vehicles such as taxi, para-transit, emergency vehicles etc.

#### Technology

##### The system includes:



- ❑ A vehicle monitoring unit (VMU) adapted to receive and store the data of the vehicle which includes atleast a **GPS sensor module** and a **GPRS module**
- ❑ Data filtering and storing unit (DFSU) adapted to store the trajectory data of VMU in a retrievable format where **the trip length is divided into multiple sections and data of vehicles section wise is stored as cluster data**
- ❑ A computational module has three modules:
  - ✓ A **real-time Vehicle status (RVSM) module** adapted to receive, store and process vehicle trajectory data received from VMU and DFSU, .
  - ✓ A **nearest neighbor Search (NNS) module** adapted to determine a cluster-set data using the processed data received from RVSM & to identify the cluster set, whose cluster data from DFSU matches the current vehicle trajectory data of a specific section of the trip length and also plurality of previous sections of the trip length
  - ✓ A **travel time prediction (TTP) module** adapted to predict travel time using processed data from RVSM and cluster set data from NNS

#### CONTACT US

**Dr. Dara Ajay, Head**  
Technology Transfer Office,  
IPM Cell- IC&SR, IIT Madras

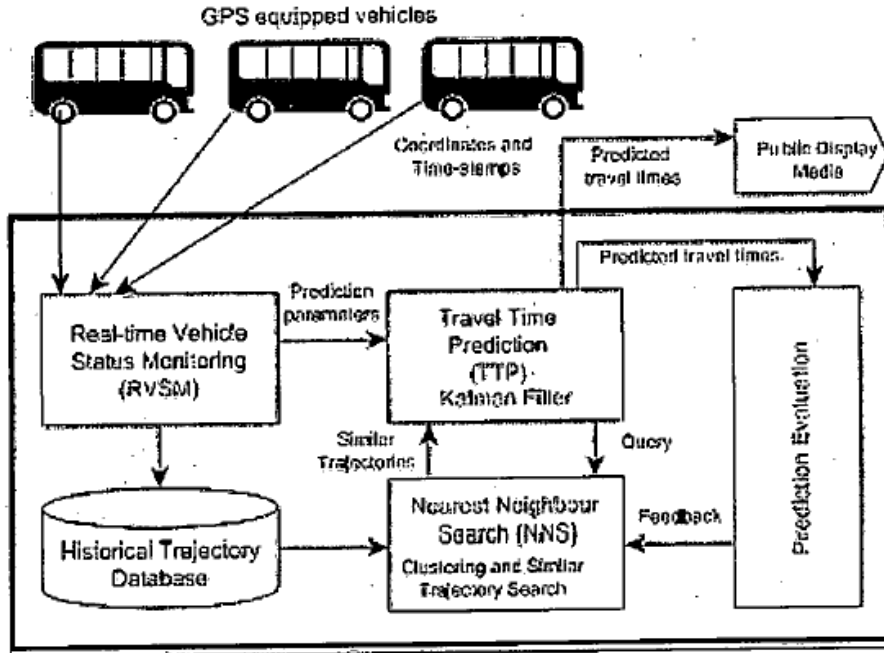
**IITM TTO Website:**  
<https://ipm.icsr.in/ipm/>

**Email:** [smipm-icsr@icsrpis.iitm.ac.in](mailto:smipm-icsr@icsrpis.iitm.ac.in)

[sm-marketing@imail.iitm.ac.in](mailto:sm-marketing@imail.iitm.ac.in)

**Phone:** +91-44-2257 9756/ 9719

Images



**The Method involves:**

**Storing Information**-stores information representing prior travel-patterns of a plurality of vehicles.



**Determining Arrival Time**-The system determines the arrival time at the destination based on data from DFSU at the commencement of travel.



**Receiving Information**-The system receives information in a vehicle monitoring unit (VMU) data as trajectory data with a GPS sensor module and a GPRS module.



**Real-Time Section Wise Trajectory Data**-The system receives real-time section wise trajectory data representing a cluster data of the current travel



**Calculating Travel Time**-calculates the travel time based on the received real-time cluster data.

**Technology Category/ Market**

**Category –Automotive**

**Applications** – Transport systems, Automation, Automobiles

**Industry –Automotive/ Transportation Systems**

**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%

**TRL (Technology Readiness Level)**

**TRL-5, Technology Validated in relevant Environment**

**Research Lab**

**Prof. LELITHA DEVI V**

**Prof. SHANKAR RAM C S**

Dept. of Civil Engineering, IIT Madras

**CONTACT US**

**Dr. Dara Ajay, Head**

Technology Transfer Office,  
IPM Cell- IC&SR, IIT Madras

**IITM TTO Website:**

<https://ipm.icsr.in/ipm/>

**Email:** [smipm-icsr@icsrpis.iitm.ac.in](mailto:smipm-icsr@icsrpis.iitm.ac.in)

[sm-marketing@imail.iitm.ac.in](mailto:sm-marketing@imail.iitm.ac.in)

**Phone:** +91-44-2257 9756/ 9719