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Traffic Congestion Management System (TCMS)

VMS can auto display information about road congestion and display information about the alternative routes to commuters to take nearest safe exit.

Variable message signs (VMSs), as one of the important ITS devices, provide real-time traffic information of road network to drivers in order to improve route choice and relieve the traffic congestion.

Variable message signs, as an advanced traffic guidance system, can provide real-time traffic information in road networks to help drivers choose the routes with lower traffic volumes.

Thus, the vehicles can be distributed reasonably in road networks so as to improve the performance of traffic system.

With the assistance of VMSs, the road capacity can be increased noticeably and the utilization efficiency of downstream off-ramp can be enhanced.

Methodology

Bluetooth sensors are deployed alongside the roads with some distance from the traffic lanes. The sensors run on rechargeable batteries and can capture and store MAC addresses of the Bluetooth devices and their time interval in a removable memory card.

Traffic congestion is tracked by calculating travel time of vehicles at beginning of a section and the end of that section with help of sensor i.e Bluetooth

By calculating vehicle real travel time between two sections with Bluetooth technology, System measure traffic congestion and provide an accurate record of real-time traffic to commuters through VMS.

System Components

- Linux based Web and dataset Server
- Android Application
- Digital Map
- Variable Message Sign (VMS)
- Bluetooth, ANPR and RFID Reader

Communications

- Fiber Optic
- Twisted Pair
- Cellular Digital Packet Data

Power Requirements

- Wiring
- Circuit Breakers
- Power Supply
- Battery Backup
- Grounding

System Features

- System captures valuable data at all times of day and night without needing personnel in place.
- System estimate the traffic congestion correctly and in real-time at low cost.
- Predict of severe traffic Jams will happen shortly.

System Benefits

- It can help to minimise travel delay, exposure to congestion and improve travel reliability when using the road network.

Travel Time Savings

- The chief objective of VMS is to divert traffic flow when congestion occur due to an incident happens ahead and to increase the effective capacity of the freeway during incidents by encouraging vehicles to take alternative routes. Therefore, the travel time saving for drivers is one of chief benefits of VMS systems.
- Reducing fuel consumption
- Suggesting optimal alternate route
- Emission reduction
- A good route guidance strategy can ease traffic pressure and environmental pollution effectively.
- Safety Improvement
- System can help to reduce the duration and severity of congestion, which should reduce occurrences of crashes. The variation of average number of crashes on each segment is considered as the measurement of safety improvement.
- Frustration avoidance due to long queues.

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