Project Title: Vehicular Ad Hoc Networks for monitoring and sharing traffic conditions during travel

Project Summary

Vehicular Ad Hoc network (VANET) is one of the promising technologies used for Intelligent Transport system (ITS). VANET supports numerous safety associated applications like pre accident warnings, post-accident warnings and many more. Investigator noticed that there is huge traffic jam on roads and this live traffic information should be floated. To manage the safe and convenient movement of vehicles on road, a live monitoring of road segments is required. During this live monitoring any kind of unusual activity like traffic jam or accidents should be reported to other vehicles on road. Lot of research is already done in this field identifying the mechanisms for giving real time information about road issues to the vehicles. Major issues faced by the existing work are its efficiency and insecure transmission of information from one vehicle to another or to road side units.

Following are the gaps identified from the literature survey carried out:

- The existing road data collection methods are inefficient in terms of speed, security and reliably.
- The existing data collection methods lack the consistency among the different vehicles and road side units on the road.
- Real time decision making at RSU is still lacking in existing methods that makes it difficult to inform same information to other vehicles.
- Moreover, the effectiveness of existing methods can be still improved in trems of throughput, security, packet delivery ratio.

Therefore, investigators are working on an application of VANET providing the live monitoring of traffic on a road segment is done and the collected information is conveyed to the vehicles that are going to pass by this road segment. To accomplish this, every vehicle must be equipped with an On-board unit (OBU) that will collect the information and share it with either the other vehicles OBU or the Road side unit (RSU) that are implemented along the road sides. Network connectivity is a major requirement for communication among different modules. Investigator will add a novel security mechanism for data sharing. Once

the traffic information is communicated, in case of any congestion a decision making is made by the RSU and an alert notification is shared with all the vehicles travelling on the road.

Keywords

ITS, VANET, RSU, OBU, Congestion

Objectives of Project

1) To provide the connectivity among all the vehicles and the Road side unit.

2) To monitor the live traffic on a road segment so that there is no traffic jam.

3) To propose a secure protocol for information exchange.

4) To make decisions based on information collected.

5) To determine the effectiveness of proposed protocol in terms of latency, packet delivery ratio, and possible attacks.

Expected output and outcome of the proposal

1. Authenticity of vehicles connecting to RSU will be performed in order to prove their identity.
2. A secure data collection mechanism is deployed among RSU and vehicle.
3. Any unusual event detected will be reported to RSU and RSU will involve in decision making whether to notify the alarm to other vehicles or not.

Budget (Research Personnel, Consumables, Travel, Equipment, Contingency, Overheads)

ITEM	BUDGET		TOTAL
	1st Year	2nd Year	(In Rupees)
Scientific Administrative Assistant	2,30,000	2,30,000	4,60,000
Contingency costs	1,000	1,000	2,000
Consumable	Nil	Nil	Nil
Equipment	40,000	40,000	80,000
Travel	9,000	9,000	18,000
Total	**2,80,000**	**2,80,000**	**5,60,000**