Vehicular Ad-Hoc Network

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VANETs

- Special class of mobile ad-hoc network with pre-defined routes (roads).

- A Vehicular Ad Hoc Network (VANET) is a network where each node represents a vehicle equipped with wireless communication technology. This type of network can improve road safety, traffic efficiency, and many other traffic-related applications, minimizing their environmental impact and maximizing the benefits of road users.

VANET authorities for registration and management
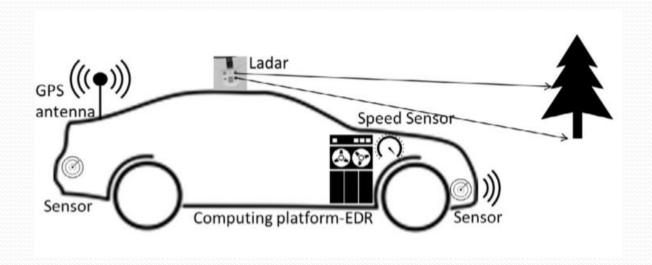
- Roadside units (RSUs)

It is an access points, used together with the vehicles, to allow information dissemination in the roads.

- On-board units (OBUs)

These are installed in the vehicles navigating the VANET and connected to the DSRC wireless network.
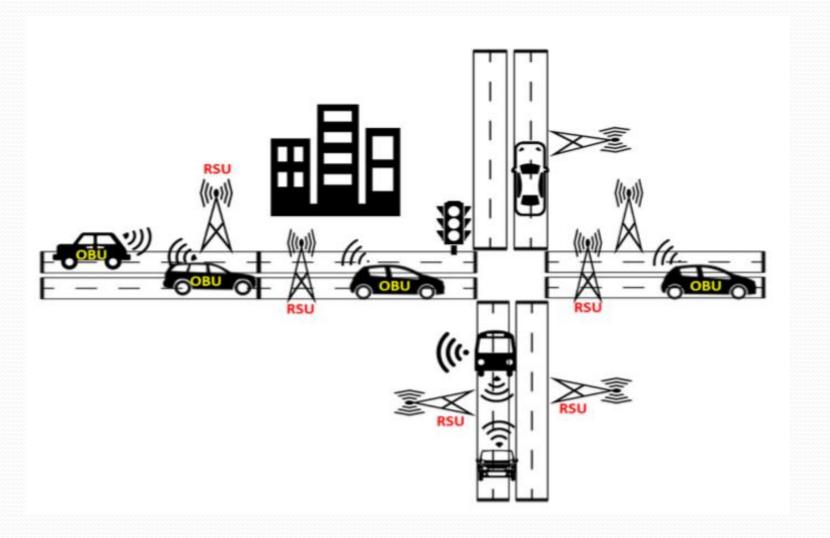
Future vehicle design in VANET

- These equipments are used to sense traffic congestions and status. Then automatically take appropriate actions in the vehicle and share this information with V2V or V2I within the vehicular network.

Communication in VANET

- All vehicles move freely on road network and communicate with each other or with RSUs and specific authorities.

- Using DSRC (Dedicated Short Range Communication) in single or multi-hop, the communication mode is either V2V (vehicle to vehicle), V2I (vehicle to infrastructure) or hybrid.

VANET NETWORK

VANET Characteristics

- Related to Network Topology and Communication Mode
    1. Unbounded and scalable network
    2. Wireless communication
    3. High mobility
    4. Rapidly changing network topology

- Related to Vehicles and drivers
    1. High processing power and sufficient energy
    2. Better physical protection
    3. Known time and position
    4. Frequent exchange of information
    5. The majority of participants are honest
    6. Central registration with periodic maintenance and inspection
    7. Time crucial
    8. Anonymity of the support