

LOW-COST COOPERATIVE ROAD WEATHER MONITORING STATION

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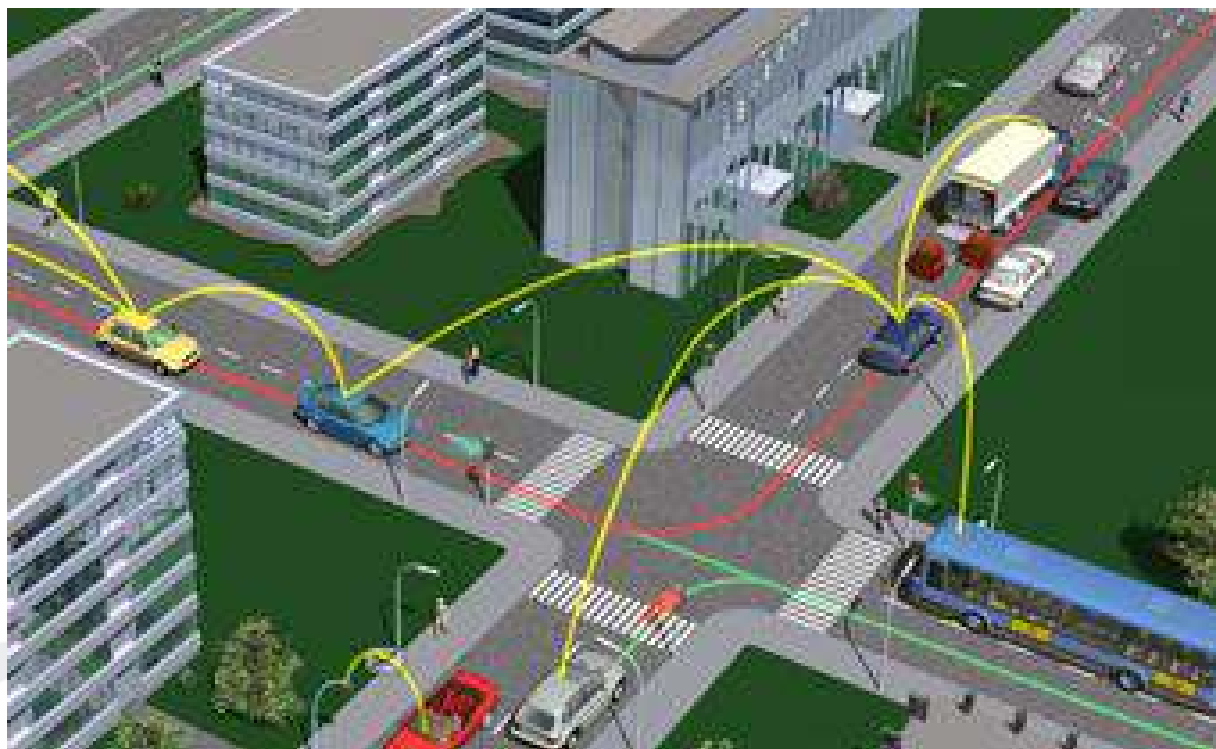
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1. INTRODUCTION

Intelligent Transport Systems (ITS) can be defined as holistic, control, information and communication upgrade to classical transport and traffic systems enabling significant improvement in the performance, traffic flow, efficiency of passenger and goods transportation, safety and security of transport, reduction of pollution etc.,

Cooperative systems are systems by which a vehicle communicates wirelessly with another vehicle (V2V communication) or with roadside infrastructure (V2I communication or I2V communication) with the ultimate aim of achieving benefits for many areas of traffic management and road safety.

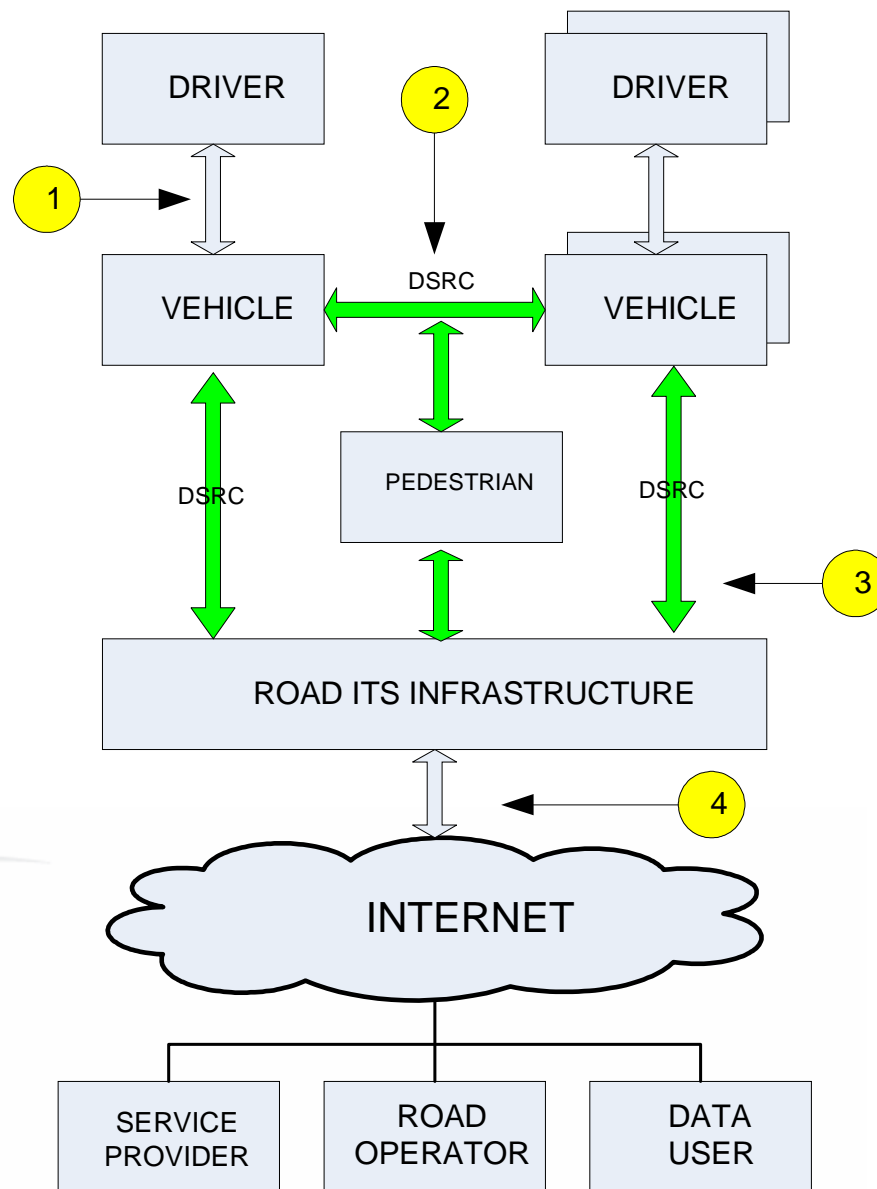


2. COOPERATIVE SYSTEMS IN TRAFFIC AND TRANSPORTATION

Cooperative Systems (CS) are important component of the Intelligent Transportation System architecture.

CS enables a driver (or its vehicle) to communicate with roadside equipment or other drivers (or their vehicles). This information can help improve the road traffic safety and efficiency.

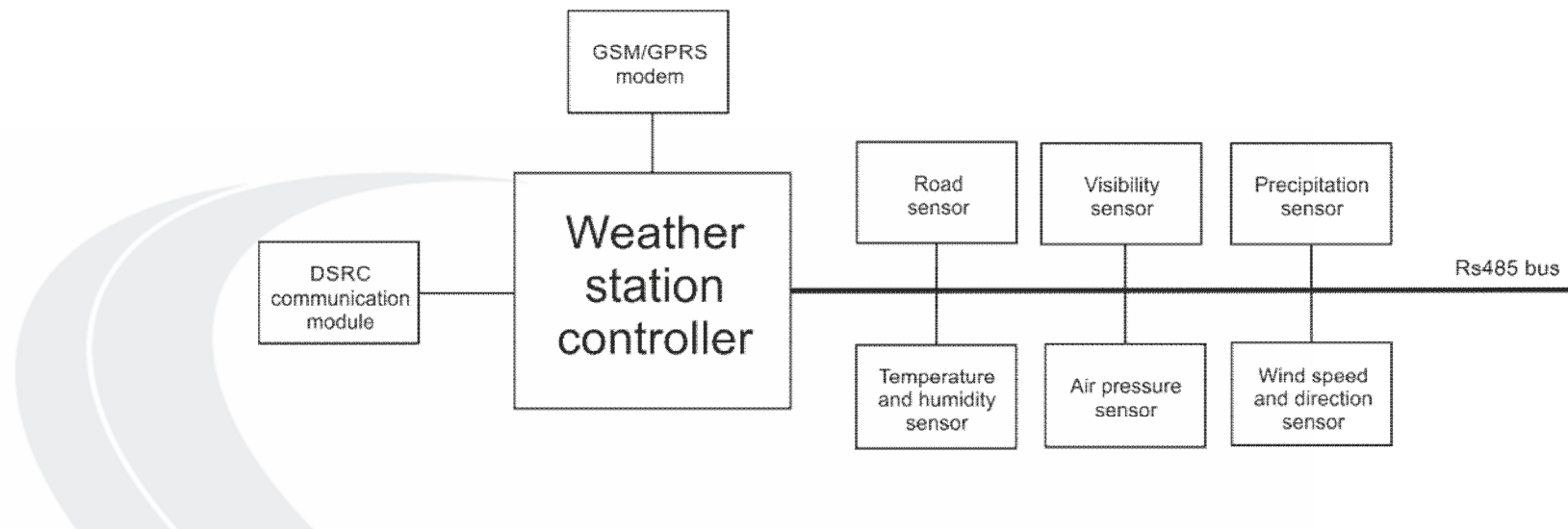
Cooperative system networks are composed of mobile nodes, vehicles equipped with On Board Units (OBU), and stationary nodes called Road Side Units (RSU) attached to infrastructure that will be deployed along the roads.



3. ROAD WEATHER MONITORING STATION

Road weather monitoring station consists of multiple sensors that collect data of atmospheric conditions such as air temperature, visibility, air pressure, wind speed and direction, relative air humidity, quantity and type of precipitation.

This station collects data of road conditions such as surface temperature, temperature beneath the surface.



4. ROAD WEATHER INFORMATION SET FOR DRIVER

Road weather information collected from weather station is sent to central data acquisition server and the data is also stored locally at the weather station.

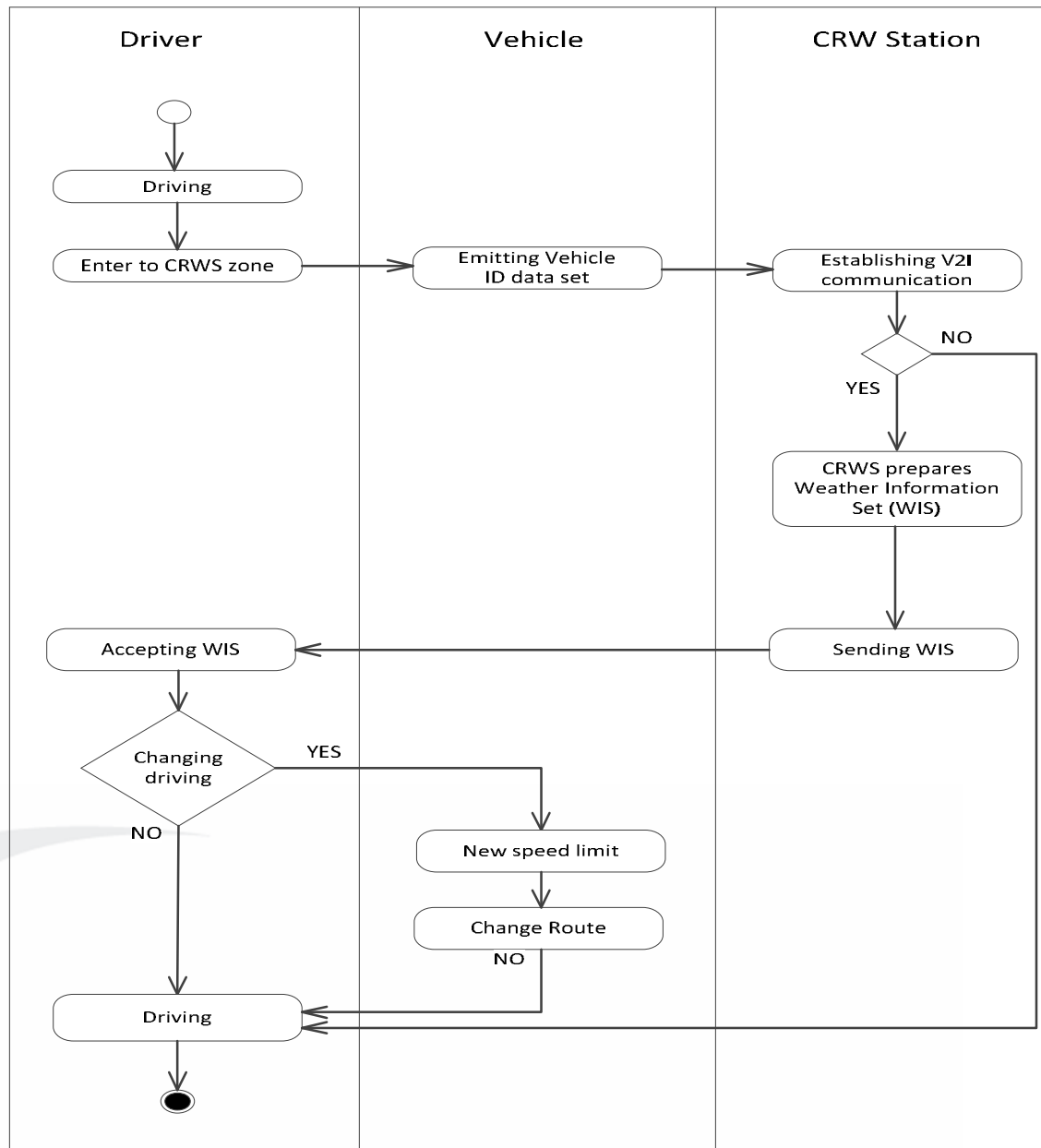
Data on the weather station is processed locally and information about possible bad weather is sent to oncoming vehicles to avoid vehicles entering a bad weather area at high speed or without winter equipment .

The goal is to present data to driver clearly and on time.

There is two ways to present data to driver:

- (simple) to warn the driver that driver can undertake necessary actions without endangering the other members in traffic.
- (extended) data set from weather station and driver can choose information from the menu in the car computer .

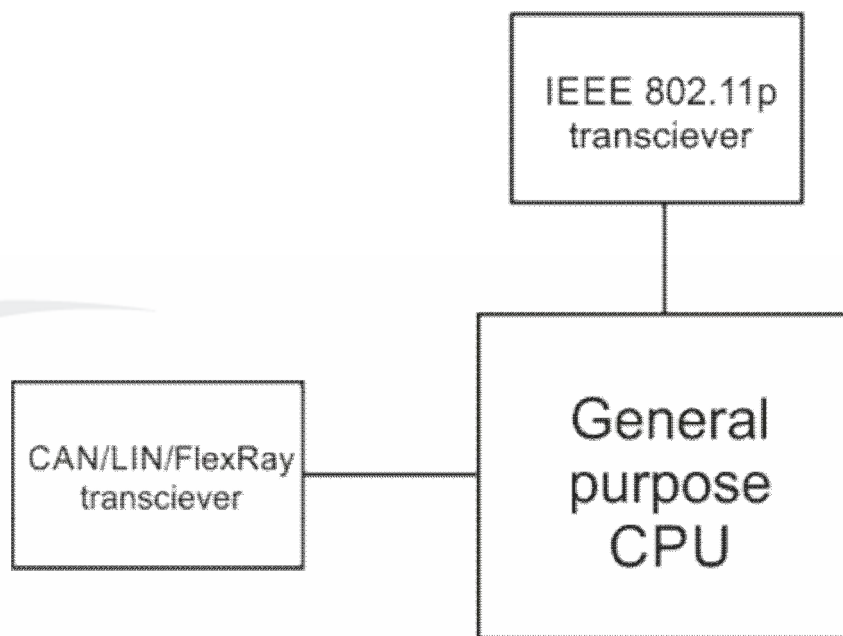




5. COMMUNICATION MODULE

DSRC (Dedicated short-range communications) module for communication with approaching vehicles.

IEEE 802.11 standard body made the new standard as 802.11p WAVE (Wireless Access in Vehicular Environments)



6. CONCLUSION

New cooperative approach for Intelligent transport systems development provides multiple opportunities in the development of new road weather equipments and system.

Various useful information can be generated and transmitted between the roadside equipment and the vehicle.

Many of today's complex pavement condition systems in the vehicle can be significantly simplified by transfer selected information from the road weather station to the vehicle.

Significant research will be guided in the area of information presentation problem to the driver in the vehicle. Here we expect solutions from simple warnings to complex Advanced Driver Assistance Systems (ADAS).

Thank you for your attention!

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