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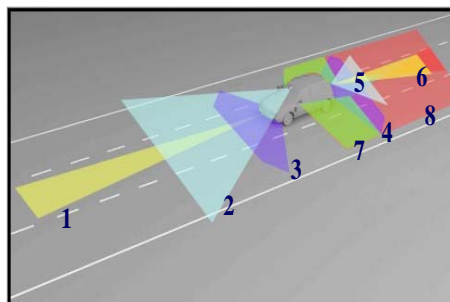
*“Fostering high-tech industry  
development in ICT Sector”*

**OVERVIEW**

Current network linking a car's major systems - engine, transmission, brakes, suspension, etc - already does many things. It helps cars correct skids, brake better, avoid tailgating, warn of unsafe lane changes, etc. In the near future, cars will network to other cars and roadside data systems to spread the word about congestion, road conditions, accidents, etc. A new family of four IEEE standards is bringing that day closer, by ensuring that car and roadside infrastructures can communicate with each other. These standards could do for cars and vehicular transportation what the popular IEEE 802.11 wireless standards did for laptops and networking. The four IEEE standards, which are categorised in WAVE (Wireless Access in Vehicular Environment) communication standard, offer high data rate ( $\leq 27$  Mbps) over short range ( $\leq 1$  km) using 75 MHz licensed spectrum at 5.9 GHz

**PROJECT DESCRIPTIONS**

The WAVE system, once in place, would be designed to make driving easier and much safer. Current cars are only equipped with the passive safety, which relies on traditional sensors, like radars and vision system. This technology can reduce rear-end collisions by tracking obstructions in front or behind the vehicle, automatically applying brakes when needed. This technology, however, has several limitations, namely limited range (sense immediate vehicles), limited Field of View (FOV) and high cost. It is usually ineffective for angled and turning collisions. The existing technologies are inadequate and costly for the overall safety needs of vehicles.



**TRADITIONAL SENSORS**

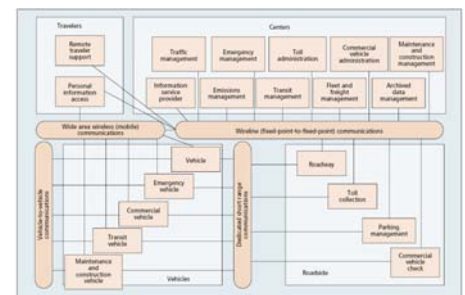
Future cars will be equipped with a low cost WAVE system which can communicate with each other, exchanging data on speed, orientation, perhaps even on driver awareness and intent. This will significantly increase the safety of nearby vehicles, enhance the overall performance of the host car, and perform more effectively automated emergency actions (steering, decelerating, braking, etc), recognise the road signs and conditions, etc.

This opens a new direction towards low-cost active safety by employing cooperative collision warning systems for crash avoidance and collision mitigation, resulting in “360 Degrees Driver Situation”.



**COOPERATIVE COLLISION WARNING**

The extended application of WAVE system is in Intelligent Transport System. With this system, the roadside transceivers could eventually be installed at every traffic light and freeway interchange along major roads. Cars can communicate with each other and the roadway infrastructure, allowing complete, real-time traffic information for the entire network. Emergency vehicles, equipped with longer range (1-kilometer) WAVE systems, will be able to warn vehicles ahead to let them pass and to control traffic lights to give them the right of way.



**INTELLIGENT TRANSPORT SYSTEMS**

**RESEARCH PROJECTS**

- High Performance, Low Cost, Reliable Embedded Systems Development for Intelligent Car using WAVE standard.
- Security of signal transmission in WAVE network.
- Data management for automotive applications using WAVE standard.

**FURTHER INFORMATION**

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