

Third Laureate Research & Development

Project Title: Design and Implementation of Connected Vehicle System

Executive Organization: Academic Center for Education, Culture and Research – Sharif University Branch

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Abstract:

In this project, the know how of using Dedicated Short Range Communications for Wireless Access in Vehicular Environments based on IEEE 802.11P (DSRC/WAVE) is gained. Some cases of connected vehicle operational applications have been designed and implemented in improvement of driving safety, mobility and environmental pollution control. The project is implemented in two parts which are Vehicle to Vehicle (V2V) and Vehicle to Infrastructure (V2I) and has been tested practically on Tehran-Rasht freeway and some parts of Qazvin city as pilot area.

The necessary hardware for running applications including on-board unit (OBU) and roadside unit (RSU) has been designed and fabricated/integrated and also base and application software has been developed. On-board units have been installed on 150 volunteer vehicles which are travelling in pilot area regularly and constantly. Also, by deployment of RSUs in 32 spots, the necessary infrastructure for running applications is provided. These equipments, together with central control room (CCR), which supervises the vehicles' data and message communications, have shaped the connected vehicle system in a consistent architecture.

V2I applications include Electronic Toll Collection, Emergency Vehicle Prioritization, Vehicle Tracking and Traffic Information Collection, Sidetrack-to-Main-Road Arrival Warning, Informing Vehicles about Road Traffic Status at out-of-sight Regions, Informing Vehicles about Traffic Restrictions and Road Weather Information and VMS Panel Updating. V2V applications consist of Emergency Brake Warning, Approaching Emergency Vehicle Warning and Accident Occurrence Warning.

