THE GLOBAL KNOWLEDGE AND EXPERTISE IN THE DEVELOPMENT OF SMART CARS

Abdulaziz Gulamov Abdullayevich
abdulaziz.gulamov@gmail.com
https://orcid.org/0000-0002-4702-7468
Tashkent State Transport University

Abstract: The article covers the topic of intelligent transportation systems as a highly effective solution to transportation issues prevalent in top nations across the globe. The article explores the successful application of smart transport systems in Japan, China, the European Union, and the United States, and considers the potential for implementing similar systems in Russia. It also offers suggestions for institutional changes that could facilitate the adoption of intelligent transport systems.

Keywords: random network, transportation, Advanced Safety Vehicle, scenarios, modern navigation.

Enhancing the quality of safe and efficient transport services to satisfy the needs of both the economy and populace is a crucial responsibility of the transportation system, in order to optimize the operation of the nation's transport and road network. To accomplish the goal of maintaining citizens' necessary mobility, there are two interdependent methods: building fresh roadways and utilizing contemporary information and telecommunication technologies for managing transportation systems in an organized manner. The Nissan ASV (Advanced Safety Vehicle), a groundbreaking and secure automobile, is at the forefront of automotive safety technology. Nissan is introducing the fourth iteration of their ingenious safety car - the Nissan ASV-4. The primary aim of the system is to utilize advanced communication technology among vehicles in order to minimize the occurrence of accidents. Nissan aims to employ the Nissan ASV-4 to experiment with diverse technologies and gear up for their eventual implementation in everyday business operations. The Nissan ASV-4 alert system utilizes V2V vehicle communication to notify the driver in advance of potential safety hazards on the road, which may be undetectable but can cause risks, allowing the driver sufficient time to react to avoid any unfavorable circumstances. Based on a wide range of data concerning transport incidents, it appears that the majority of accidents tend to happen in the following situations: when two cars collide at an intersection with limited visibility; when a car making a right turn collides with one that has come from the opposite direction; when a car turning left collides with a motorcycle or bicycle traveling alongside it; and when one car hits another from

behind. To help mitigate the risk of such scenarios, modern navigation systems will alert drivers if they detect a potentially dangerous situation.

The V2V technology, which enables cars to communicate with each other autonomously, was created by General Motors as a driving aid system. The V2V technology establishes a wireless connection among automobiles, facilitating the exchange of information concerning their speed and whereabouts. Furthermore, the system perpetually evaluates this information and has the capability to prevent a vehicular collision by alerting the operator beforehand of a potentially hazardous circumstance caused by other automobiles. Essential components of V2V technology involve a microchip, a GPS receiver, and a fast LAN network that enables wireless data transmission. Automobiles equipped with V2V technology communicate with one another in a manner akin to a laptop utilizing a hotspot at an airport or café. This technology relies on the IEEE 802.11 protocol and the wireless local area network (WLAN) connection. The concept behind the V2V system involves integrating a WLAN transmitter and receiver into every vehicle, compelling them to share information amongst themselves. As the Wi-Fi coverage has its limitations, the vehicles take on the additional role of a router, distributing the data to its intended destination. The efficacy of the routing algorithm is contingent on the position of a specific device, and facilitates prompt adaptation to modifications in the entire network's setup. The WLAN transmitter has a coverage area of approximately three hundred meters, however, vehicles can be linked in a sequence to establish a " random network " (ad-hoc network). The exchange of data takes place very quickly, with each message being approximately one kilobyte in size. The V2V network is capable of servicing approximately 200 cars simultaneously, even in high-traffic areas, without experiencing any overload. Furthermore, every component serves the purpose of not just transmitting and receiving, but also transporting information as a "carrier." If a car approaching on a remote road sends a message, the V2V technology can store it in a temporary memory and transfer it to the next vehicle that will likely pass by in a short distance. Automobiles use GPS satellite signals to establish their own position and share this information with other vehicles, alongside additional data such as driving velocity, acceleration, and roadway conditions.

Conclusion: Ensuring that the system is easily accessible for a vast range of vehicles. Intentionally, experts from GM designed a V2V system utilizing reliable, cost-effective components with the goal of making it a common feature among various car models. The significance of this lies in the fact that the efficiency of these systems is directly proportional to the number of cars that possess them. The challenges associated with this system stem from the variations in the acceptable wavelengths of V2V communication channels. In the United States, the government has set aside a specific bandwidth around the central frequency of 5.9 GHz for car radio

communication, spanning a width of 75 MHz In Europe, a 20-30 MHz channel is required for V2V communication to function as the current 10 MHz band is insufficient.

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