A REVIEW PAPER ON: AUTOMATED HIGHWAY SYSTEM

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Abstract:

An automated highway system (AHS) or "Smart Road" is a suggested intelligent transportation system (ITS) technology that would let cars drive themselves on certain roads. Most people talk about it as a way to ease traffic because it makes following distances much shorter and lets more cars drive on a given stretch of road. The automated highway system will help come up with new ideas that will make it easier to move more people around in a controlled way. These new ideas will use technologies that are less harmful to the environment, safer, and much more efficient than what we have now. Such new transportation methods will be a part of the urban environment in the future. The new movement needs of the future society will be met by these new ways to get around. In our view, new ideas for transportation systems will help urban mobility a lot. These ideas can improve the efficiency of road transportation in dense areas, help meet the goal of zero accidents, and reduce noise and other problems.

Keywords: Traffic Management System, Advanced Traveller Information Systems, Smart vehicle system

1. INTRODUCTION:

As the current transportation system can be used as well as possible, the government tries to solve the problems caused by cars by coordinating the actual flow of road traffic. They also think about keeping access and the surroundings in good shape and making the roads safer. These things happen when the demand for road traffic is fixed in time and place (i.e., there is no demand control). When it comes to the above goals, there are two types of information networks that are involved.

- Traffic Management Systems (Advanced) and
- Traffic Control Systems (Advanced)

1.1 Traffic Management Systems (Advanced)

Advanced Traffic Management Systems (ATMS) are a subset of traffic control systems that are designed to manage traffic on a specific stretch of highway, highway interchange, city street, or rural highway. It is generally agreed that ATMS is less concerned with the traffic performance of the other (parts of) road networks. By serving as many vehicles on the relevant road network as possible while

minimizing the total trip time, ATMS strive to achieve optimal traffic performance at the system level for the area in question. By doing so, ATMs aim towards the system's best possible state.

1.2 Traffic Control Systems (Advanced)

The field of Traffic Control Systems (Advanced) has an 'executive counterpart' in the form of Traffic Control Systems (Advanced). To improve traffic flow in certain areas, ATCS focus on bridges, tunnels, and on/off ramps that are particularly congested. ATCS's goal for these regional hubs is to improve traffic efficiency on the ground. This might be stated as attending to the greatest number of available vehicles in the shortest amount of time, hence incurring the least amount of wasted time. This is how ATCS attempts to find a local maximum.

1.3 Traveler Information Systems (Advanced)

Whereas transportation authorities strive for maximum efficiency in the usage of "their" transportation network, users of that network are likely more concerned with finding the best possible way to get from point A to point B (user optimum). This could be communicated in terms of the shortest possible travel time (or a shortest possible generalized time, encompassing the actual or perceived journey time, traveled distance, etc.) for the duration of their trip. To aid the road user in accomplishing this goal, we identify a third category of transportation telematics systems known as Traveler Information Systems (Advanced**)**. Therefore, the primary goal of ATIS is to supply each road user with the data he or she requires to accomplish his or her unique travel goals, subject to the constraints imposed by the various ATMS and ATCS applications. ATIS works to achieve the best possible results for a wide range of users.

1.4 EXECUTION:

In Japan, we will soon begin field testing an intelligent transportation system that will allow vehicles and infrastructure to communicate with one another to lessen traffic accidents and improve flow. The device wirelessly notifies drivers of potential risk from other vehicles based on data gathered from surrounding vehicles and roadside optical beacons. Nissan's probe server collects city-wide traffic data from the mobile phones of subscribers to Nissan's CARWINGS navigation service, taxi services, and vehicle data collected by mobile phone operator NTT DoCoMo, and then makes that information available to drivers. The data is subsequently relayed to the navigation screen, where live maps displaying the current traffic situation are displayed.

FIG.1 SMART VEHICLE SYSTEM

2. LITERATURE REVIEW:

a) **Praveen Kumar (2005),** He Has discovered Information about fixed-route facilities like offices, schools, hospitals, and points of interest can be widely disseminated through the integration of GIS with other cutting-edge communication computer technologies.

b) **Josh E. Florez (1990),** He invented TIMIPLAN, which solves large multi-modal transportation problems by combining Linear Programming (LP) with automated planning approaches to achieve high-quality answers. Time restraints, resource consumption, and cost functions are only some of the factors that must be considered while planning multimodal transportation.

c) **Maurizio Bruglier (2015),** He has developed a method for managing the city's public transportation networks in the face of unforeseen occurrences, delays, and disruptions in service. A time-expanded graph that takes into account the relationships between the various stops on the available trips is used to represent the city's public transportation system.

d) **Qu and Chen (2008),** The author characterizes the various modes of transportation as an MCDM (Multi-Criteria Decision Making) dilemma. By fusing a Feed-forward ANN with a Fuzzy Analytic Hierarchy Process (FAHP), they propose a hybrid MCDM.

e) **Khattak, H. Al-Deek, & P. Thananjeyan (1998),** He Develop a simulation comparing user choices when different market segments are given different sources of information (ATIS with full compliance, radio reports, and observation).

f) **J.K. Hedrick (1994),** He has focused on interactions between the various layers of the system architecture, as well as control problems associated with entry/exit, merging, and lane change maneuvers. In addition, continued investigations of alternative sensors and vehicle actuators are being conducted

g) **Agostino Nuzzoloa (2014),** He Describe some theoretical and operative aspects of the Advanced Traveller Advisory Tool (ATAT). It can give personalized information to the user by real-time data. It is based on a path choice modeling framework able to provide path alternatives based on personal travel preferences defined according to a learning process.

h) **Baublys (2002),** He Has found transport management and substantiated national transport system development may reveal numerous qualitatively new ideas, which would essentially enable the enhancement of transport efficiency and realization of big, still unused, its economic and technological progress reserves.

3. METHODOLOGY:

- Nissan's upcoming test-phase of their intelligent transportation system will involve vehicle-to-infrastructure connectivity, which will allow for synchronized communication between automobiles and traffic light signals.

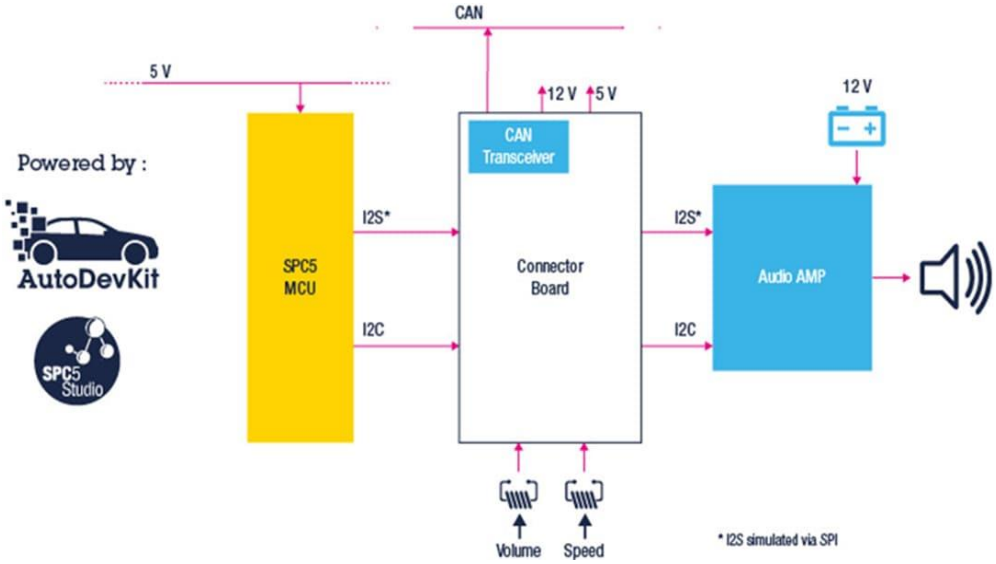

Fig.2 Vehicle Alert

- The essential specifications for the intelligent transportation system experiment are two crossing main roads, one running east-west for two kilometers and the other running north-south for one kilometer, both of which have several intersections and crosswalks. Nissan has equipped the test roads with conventional traffic signals and roadside optical beacons. There is no need to make any adjustments to the automobiles or buses of workers in order to collect traffic data. However, hundreds of company cars will be fitted with Vehicle Information and Communications System units to collect data for the testing of the navigation program.
- An updated electrical system called Distance Control Assist, which makes it easier for drivers to maintain a safe distance from the car in front of them. Using a radar sensor mounted in the front bumper, the device can calculate not only the distance between the two vehicles but also their relative speeds.
- Nissan is working with NIT DoCoMo, Matsushita Electric (a manufacture of consumer electronics), and Xanavi Informatics (a manufacturer of automotive navigation systems and software Nissan is working with NTT DoCoMo, Matsushita Electric (a manufacturer of consumer electronics) to test out an intelligent transportation system..

- The new Nissan navigation system will help drivers make safer and more environmentally friendly choices on the road. The company is releasing a car navigation system that uses ITS infrastructure and other cutting-edge technology to provide alerts for things like school zones, low-visibility junctions, and navigation-linked speed controls. More fuel savings may be possible thanks to the navigation system's suggested faster route estimates.

- This advanced intelligent transportation system research consists of the following process:

  1) The system uses cellular packet communications to wirelessly collect vehicle probe data (including location and velocity) and pedestrian position data.

  2) If an imminent collision is detected between the vehicle and a pedestrian, the ITS will alert the driver.

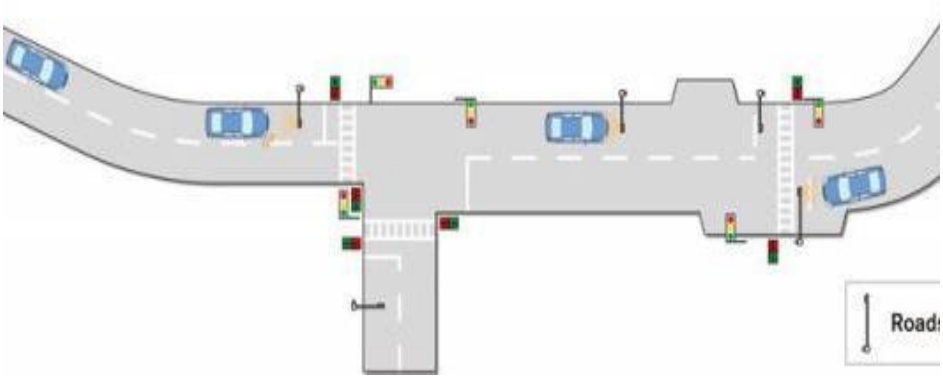

Fig.3 diagrammatic view of implementation of sensors

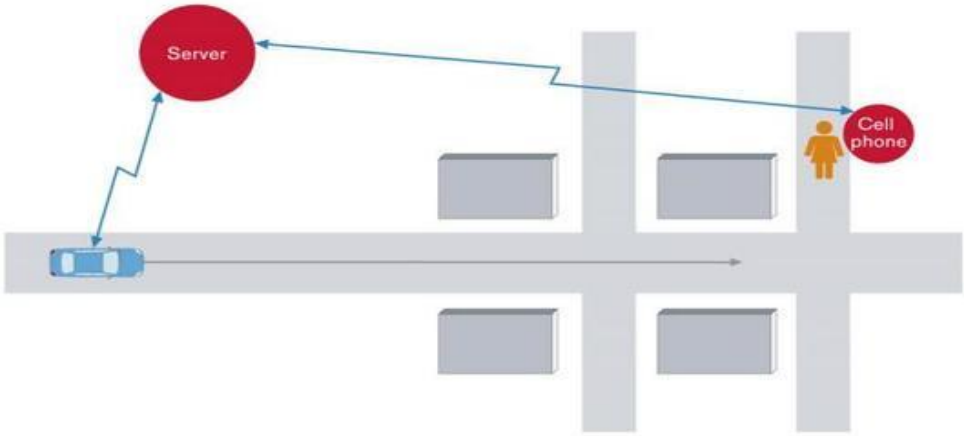

Fig.4 use of cell phone for addressing vehicle

FUTURE SCOPE:

- The priority given by traffic signals at crosswalks greatly reduces the likelihood of a collision involving a pedestrian.
- Install traffic-light detectors in all vehicles
- Congestion caused by stopped vehicles and waiting to turn right at red lights must be reduced.

4. CONCLUSION:

By facilitating the growth of a new industry, automated highway systems did not eliminate jobs. Keep in mind that we planned our automated highway systems to ease traffic. As a result, we can observe that the automated highway system is highly useful in traffic, on right turns, on congested highways, for business vehicles, for lonely road travel, and so on.

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