



STUDY OF AUTOMATED HIGHWAY SYSTEM

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Abstract - Automated highway system (AHS), which promises an increase in traffic capacity. The core of this protocol to achieve a fully automated highway system is four-layer hierarchical control architecture. Automated Highway System, abbreviated as AHS is newly developed idea which uses different sensors and microprocessors for automatic design process. The management and control of traffic system using roadside controllers and intelligent vehicles is innovative technique for the design of highway system. The Automated Highway System is the design concept introduced to enhance safety, efficiency and many other vehicular as well as user characteristics of highways. This concept has introduced for the improved architectural layout of highway design and also helped in reducing the environmental effects of the vehicles running on the highways

Key Words: AHS Functional Evolution, Incremental Deployment, Reducing Accident Rate, Smart Highway.

1. INTRODUCTION

The problems associated with the annual growth of automobile transport start spreading from large metropolitan cities to small towns. [1] For many years, scientists and engineers have envisioned building an automated highway system (AHS) to increase both the safety and efficiency of the nation's highways. In such a system, the vehicles become driving robots, capable of sensing and reacting to the surrounding environment while the driver is free to do other tasks. Automating the vehicle has significant potential it can reduce accidents caused by driver error and can potentially increase traffic-carrying capacity and fuel economy by eliminating human driver inefficiencies. [2]

1.1 Need and Necessity

- Improvement safety by significantly reducing fatalities, personal injuries, pain and suffering, anxiety and stress of driving.
- Improvement in accessibility and mobility for reducing delays, smooth flow of traffic, making driving more accessible to less able to drivers.
- Ensuring exchange of road and route data as well as other information between the respective

transport information centers and the traffic control in different regions and different states.

- Taking measures required for automated highway systems associated with safety into vehicles and traffic infrastructure as well as ensuring the elaboration of interaction as to safety in person-machine terms.
- Development of alert systems for passengers and road users, development of traffic demand control systems in urban and rural region.
- Fuel consumption and polluting emissions might be reduced by smoothing traffic flow and running vehicles close enough to each other to benefit from aerodynamic drafting.

1.2 Objectives

- Introduce new tools for managing urban transport. Automated highway system will develop tools that can help cities to cross the thresholds that are preventing them from introducing innovative systems.
- Studies will be carried out to show that an automated transport system is not only feasible, but will also contribute to a sustainable solution for the city's mobility problems, now and in the future.
- To study the effect of Traffic volume, Capacity, Road feature, Surface properties on accident rate on highway road.
- To study the defects on highway and annual, monthly accidents rates on the selected highway road.
- To survey and document automated highway system with driver and passenger safety systems on roads.
- The reliable intelligent driver assistance systems and safety warning systems is still a long way to go.
- To study eliminate the more than ninety percent of traffic crashes that are caused by human errors such as misjudgments and in-attention.



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II. LITERATURE REVIEWS

A. Alexander Novikov, Pavel Pribyl

The article describes the potential for capacity increase of a highway section with use of intelligent transport systems. The implementation results in significant reduction of congestion and accident rate decrease on a highway. The problems associated with the annual growth of automobile transport start spreading from large metropolitan cities to small towns. The level of motorization in the Eastern European countries is about 400 vehicles per 1000 persons of the population. The action plan determines the priority fields of activities like Optimum use of automobile road, transport, route data, safety, and incorporation of vehicles into the traffic infrastructure.

B. Prof. Dr.-Ing.habil, Wolfgang Kuhn

Vehicles need to recognize and record the roadway and the associated driving area elements with the help of sensors (stereo cam-eras, radar, laser scanners etc.) in highly automated driving processes; this information then needs to be converted into a digital 3D model in real time. The vehicle

can then locate and orient itself and move in a so-called obstacle-free and restricted 3D area. Localizing the vehicle precisely in the surroundings is often difficult for several reasons: The volume of data needing to be processed in real time, the accuracy of the object recognition process and the multiple disturbances like the weather, daytime and nighttime or the traffic situation etc. To gradually solve the object recognition problems in real time when relying on the available sensors and disturbances, the vehicle should have a detailed prior knowledge of the traffic infrastructure on the planned route before the journey starts; this can take place through highly developed maps (HD maps with separate layers) within its navigation system. The localization of the vehicle can take place faster and more accurately as it compares the prior knowledge and the knowledge obtained from its surroundings.

C. Sanju Meena & Dr. Om Prakash

Highway construction is important part of infrastructural development of any zone and the highway construction process are carried out in a number of ways these days. Automated Highway System, abbreviated as AHS is newly developed idea which uses different sensors and microprocessors for automatic design process. The management and control of traffic system using roadside controllers and intelligent vehicles is innovative technique for the design of highway system. The Automated Highway System is the design concept introduced to enhance safety, efficiency and many other vehicular as well as user characteristics of highways. This concept has introduced for the improved architectural layout of highway design and also helped in reducing the environmental effects of the vehicles running on the highways.

D. Lakshmi Dhevi, Baskar Bart, De Schutter, Hans Hellendoorn

The present a routing guidance approach that can be used in Automated Highway Systems (AHS). Consider automated highway systems in which intelligent vehicles organized in platoons drive to their destination, controlled by a hierarchical control framework. In this framework there are roadside controllers that provide speed and lane allocation instructions to the platoons. These roadside controllers typically manage single stretches of highways. A collection of highways is then supervised by so-called area controllers that mainly take care of the route guidance instructions for the platoons and that also coordinate the various roadside controllers in their area.

E. Nayan R. Wasekar, Prof. Feroz H. Khan

A combination of market forces, cost constraints, and other factors necessitate incremental evolution of a fully automated highway system (AHS) rather than instantaneous deployment. Thus, an understanding of the interdependencies

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