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Analysis for traffic/road and vehicle/cargo tracking/planning systems (TRVCTPS) in the road transport within the scope of smart cities

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ABSTRACT

In the cities, the traffic/road and the vehicle/cargo density constitute a complex problem area. Trip computers, provide information about vehicles and travel. To the extent that this information can be interacted with the traffic and road condition, it will be easier to make an instant travel flow plan and to update the status. However, the depth of interaction is still quite uncertain. Generally, there is a one-way and limited flow of information, and interaction is more focused on obtaining and evaluating information. It is known that vehicles will start to be self-directed (autonomous) in future. It is seen that these expectations force the traffic/road-vehicle situation interaction and management infrastructures to improve through monitoring. The study explores technologies that prioritize traffic/road and vehicle situation interaction within the scope of smart cities. It also evaluates developments in other smart solutions related to the traffic/road and the vehicle/cargo situation tracking/planning (TRVCTPS) from a relational perspective. Especially, the difficulties of disaster and humanitarian aid logistics, can be exceeded, albeit at micro levels, thanks to the development of early warning systems by relevant technologies and institutions, and the implementation of advanced problems and solutions.

Introduction

It is known that hardware and software technologies are developing very fast in recent years and artificial intelligence applications are increasing rapidly in every sector. The network technologies are also developing in the new era after Industry 4.0 and technology are creating a new network society on the way generation after generation. Monitoring systems are also affected by all these developments.

Recent developments in urban informatics from e-government to m-government applications and increasing the dimension of public participation in governance topics were given in a previous study [1]. In those years, this approach was epitomizing new kinds of intelligent approaches.

Smart cities should reflect approaches that always consider interdisciplinary qualities. In a previous study, the focus of the urban space was to begin to examine the problematic systems within this framework. In particular, the transportation sector was chosen as the focus [2]. This paper was published as an ongoing article later and this method will support systematic and sustainable applications in the future [3].

In the cities, to the traffic/road and the vehicle/cargo density constitute a complex problem area in the road transport. The trip computers provide information about the vehicles and travel. To the extent that this information can be interacted with the traffic and road condition, it will be easier to make an instant travel flow plan and to update the status. However, the depth of interaction is still quite uncertain. Generally, there is a one-way and limited flow of information, and the interaction is also focused on obtaining information and evaluating it within the system.

Material and Method

The study explores technologies that prioritize to the traffic/road and the vehicle/cargo situation interaction within the scope of smart cities. It also evaluates developments in other smart solutions related to the traffic/road and the vehicle/cargo situation monitoring from a relational perspective.

The main system is named as Traffic/Road and Vehicle/Cargo Tracking/Planning System (TRVCTPS) in this study.

Research Motivation or Question: Traffic/Road and Vehicle/Cargo Tracking/Planning Systems (TRVCTPS) are developing, how should we evaluate this progress?

The importance of the logistics sector in disaster management is given below and an introduction to the tracking systems has been made.

Logistics in disaster management

Tracking systems are mostly related to the logistics field in connection with freight transportation. Especially, the difficulties of disaster and humanitarian aid logistics, can be exceeded, albeit at micro levels, thanks to the development of early warning systems by relevant technologies and institutions, and the implementation of advanced problems and solutions [4].

Logistics plays a very important role in three phases of disaster management. Cozzolino calls this the "Humanitarian Logistics Stream". Disaster Management Circle: It completes its cycle with Preparedness, Reaction, Reconstruction phases and with the measures phase. [5]. While 7 correct understanding in logistics in enterprises, the focus in disaster logistics is on 3 main elements: quantity, time, and place.

Traffic/Road and Vehicle Tracking/Planning Systems (TRVTPS)

The Traffic/Road and the Vehicle/Cargo Tracking/Planning Systems (TRVCTPS) are related with the different independent systems below. We can understand the technological developments related to tracking systems by briefly introducing those systems with their sub-systems approaches.

1. TTS-Traffic tracking system

Vehicles are tracked for control to the traffic bottleneck in the flow. Vehicles also decide and join waiting queue according to the traffic bottleneck in the flow.

A system approach had been given a study before especially for the bridge traffic bottleneck [6].

1.1 IS-AI TTS- Intelligent Signaling- Artificial intelligence traffic tracking system (EDS)

EDS decides to intelligent signaling for according to the traffic bottleneck in the flow.

2. VTS-Vehicles Tracking Systems

Vehicles are tracked with a central system for logistic operations.

2.1 AV- Autonomous Vehicles

It is known that vehicles will also start to be self-directed (autonomous) in the future. It is seen that these expectations force the traffic/road and the vehicle/cargo situation interaction and management infrastructures to improve through tracking/planning. Considering that in the future, vehicles may begin to be self-managed (autonomous), these forces road communication and management infrastructures to develop. However, the technologies process of autonomous vehicles and “how they will affect driving activities, their impact on planning decisions such as optimum road distance, parking and public transport supply” are still under discussion. Many carriers and urban planners, researchers, and politicians have become more familiar with the technical nature and utility of vehicle automation. But even so, there does not appear to be any consensus yet on the resulting impact or the actions of those responsible [7]. In the other hand some systems are quite independent. A figure gives relation between the technology and systems below (Figure 1).

2.2 LTS- Lane tracking systems

For example, Lane tracking systems are an accident-preventing approach. Lane assistance is often included as part of the safety package. The price rises as similar solutions are also packaged with other additional options.

3. RDTS-Road damage tracking system (instant tracking of road damage with sensors)

RDTS has not any sub-systems yet. May be created in future. Also new systems are coming continually.

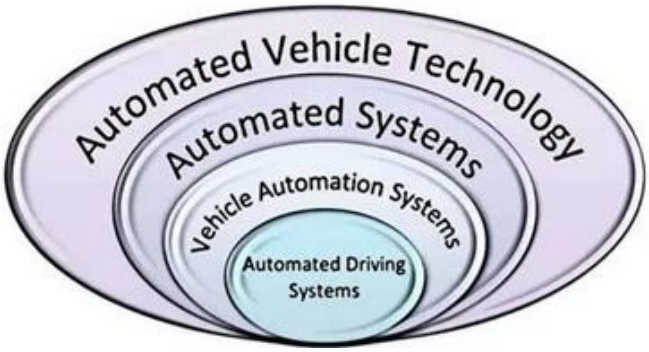

Figure 1. Automated Vehicle Technology and related Systems.

Results

As it is seen, it is clear that we are not ready to prevent the chaos on the roads without planning and management, as we need to think about critical times such as disaster management.

Discussion

Question: Traffic/Road, Vehicle/Cargo, Tracking/Planning Systems (TRVCTPS) are developing, how should we evaluate this progress in case of a narrower perspective within a consolidation approach?

Conclusion

The independent solution steps (LTS, etc.) instead of the sub-systems in a main hierarchical structure works by alone. But society need more integration in the traffic/road, vehicle/cargo, tracking/planning systems in future. Because quantity in vehicles/cargo increasing more and more in over the traffic/road capacity limit.

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