# GREEK DRIVER NEEDS ON ITS IN RELATION TO DRIVER ACCIDENT HISTORY

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## INTRODUCTION

Mobility growth has enhanced our everyday life, but has also triggered the appearance of specific problems, the most important of which are the increase in accident rates, congestion, and environmental pollution. A great number of countermeasures to deal with these problems have been proposed, applied and evaluated. Still, the problems are existent and a new set of tools – namely, the intelligent transport systems – are being employed to treat them [1]. Intelligent transport systems are anticipated to improve road safety, reduce traffic congestion and environmental pollution. Their success however is dependant greatly on their appropriate implementation, for which the needs of the prospect users have to be considered.

This study investigates the attitudes of Greek drivers towards specific intelligent transport systems. A questionnaire survey, within the framework of SARTRE 3 [2], took place in which some of the imposed questions involved the needs and acceptability of participants for these systems. The recorded data were processed and drivers attitudes were identified also in relation to their involvement in traffic accidents, to check whether this comprises an important parameter of the user attitudes towards the investigated systems.

This paper is organised as follows: In the second section of the paper, specific particularities of the sample (ie Greek drivers) are being discussed that may comprise contributing factors of the recorded attitudes. Following that a short description of SARTRE 3 is provided. In the fourth section of the paper, the results in terms of driver needs and acceptability on the investigated systems are being presented. Last, in the fifth section, the main findings of the paper are being discussed.

## GREEK DRIVER PARTICULARITIES

The attitudes of Greek drivers as these were recorded from the questionnaire survey should not be examined as isolated numbers, but should be investigated taking into account significant particularities of this specific driver group.

In particular, the mentality of driver groups as this is established geographically is of great importance. Greek drivers may have different mentality and hence driver behaviour from other drivers and under the light of these differences results may be interpreted in different ways.

It must be noted that a number Greek drivers is not law-abiding [3]. Existing rules of the highway code are often adjusted and tailored to their needs under the notion that ‘they know

better' or 'they are careful' when they violate them. An example is exceeding the speed limit. In the cases that this is a conscious violation the driver argument is that either the posted speed limit is lower than it should be or that they drive carefully even at higher speeds so there is no risk involved. Still, there is a proportion of drivers that acknowledge that this behaviour is risky [4]. Other common violations of the highway code include crossing the junction stop-line during the red signal indication, illegal parking, driving on the emergency lane, overtaking where it is not allowed (using an opposing traffic lane, or a lane right of the slower moving vehicle), using the mobile phone while driving etc.

Another attribute that should be taken into account is the accident rates in Greece. Even though the accident rates demonstrate a decreasing trend through recent years, they are still quite high. More specifically, Greece demonstrates rather high accident rates in relation to other European countries [5]. Hence, road safety constitutes a significant problem of the Greek society, and Greek drivers in general are conscious of its existence.

Last, the familiarisation of Greek drivers with intelligent transport systems also comprises an important parameter. In general, intelligent transport systems are quite recent in Greece. Such developments have only recently been introduced into the market. Common systems that are in use include navigation systems, but only as nomadic devices and not built-in the vehicle. These systems provide only route information and no elements of real-time information are included in their operation, yet. Further to that, variable message signs (VMS) are also operating in the greater Athens area, in a motorway (Attiki odos) in the vicinity of Athens and further south, and in a national road (Egnatia odos) in the Northern part of Greece. The operation of the VMS commenced in 2004. Advanced traveller information systems (ATIS) are also operating in the metro stations indicating the waiting times. The planning and design for the development and operation of such systems at bus stops is also underway. However, the above systems were implemented subsequent to the conduction of the questionnaire survey. What is important is to identify the familiarisation of Greek drivers on intelligent transport systems at the time of the survey.

Greek drivers are using driver assistance systems (DAS), as a significant number of vehicles are equipped with ABS (anti-lock braking system) and some with ESP (electronic stability positioning). However, these are not considered to be advanced/intelligent systems.

A first attempt of the introduction of ITS and more specifically ATIS was made in 1997 in Athens within the framework of the QUARTET PLUS project [6]. A couple of VMS were positioned at dedicated locations, and information on the traffic conditions of downstream routes was provided. Further to that the development of an internet-based traffic map of Athens providing information on traffic conditions and travel times on specific routes using major arteries also took place.

It is apparent that at the time of the conduction of the questionnaire survey, Greek drivers were not familiar with the operation and use of intelligent transport systems. Hence, one would except that their reaction to them would be rather sceptical, as it would comprise the reaction of a first encounter with such new technology.

# SARTRE QUESTIONNAIRE SURVEY

SARTRE 3 is a European Project, which is a successor of SARTRE 1 and SARTRE 2, and is short for 'Social Attitudes to Road Traffic Risk in Europe'. This research (SARTRE 1) was initiated in 1991, and SARTRE 3 started in 2002 and finished in 2004, with the participation of 23 European Union countries. The tool for this research was the conduction of a questionnaire survey, with a sample of around 1.000 participants in each country.

The questionnaire included questions on the driver general characteristics, driving behaviour (speeding, wearing seat-belt, driving headways, alcohol consumption etc), assessment of driving behaviour of other drivers (in relation to the respondents') and other questions on more general issues (environmental pollution, legislation, etc). Furthermore, drivers were asked of their opinion on specific intelligent transport systems and of their involvement in accidents in the past three years. The recorded answers on the two latter question categories were used to identify driver attitudes on intelligent transport systems, and comprise the results discussed in this study.

# ANALYSIS OF DRIVER ATTITUDES

## DRIVER NEEDS

First, the needs of the Greek drivers, as these were recorded from the questionnaire survey were analysed. Five different systems were investigated. These are:

- Navigation system (en-route)
- Congestion warning system (en-route)
- Speed limiting system - mandatory intelligent speed adaptation system that prevents exceeding the speed limit
- Alco-lock system - monitors driver BAC (blood alcohol concentration) and prevents the driver from driving in case it is higher than the legal limit
- Fatigue intervening system – monitors driver conditions, and if fatigue is detected it forces the driver to take a break

The needs of the drivers were established from the question: 'How useful would you find a …?'. The possible answers were: 'very', 'fairly', 'not very' and 'not at all'. Driver needs are investigated in relation to the accident history of the drivers and hence the possible answers are also presented in relation to two accident history categories – namely, drivers that have been involved in injury accidents and drivers that have been involved in damage only accidents during the past three years. It must be noted that this study deals only with the positive driver attitudes towards the systems. Figure 1 illustrates the driver needs for the different systems.

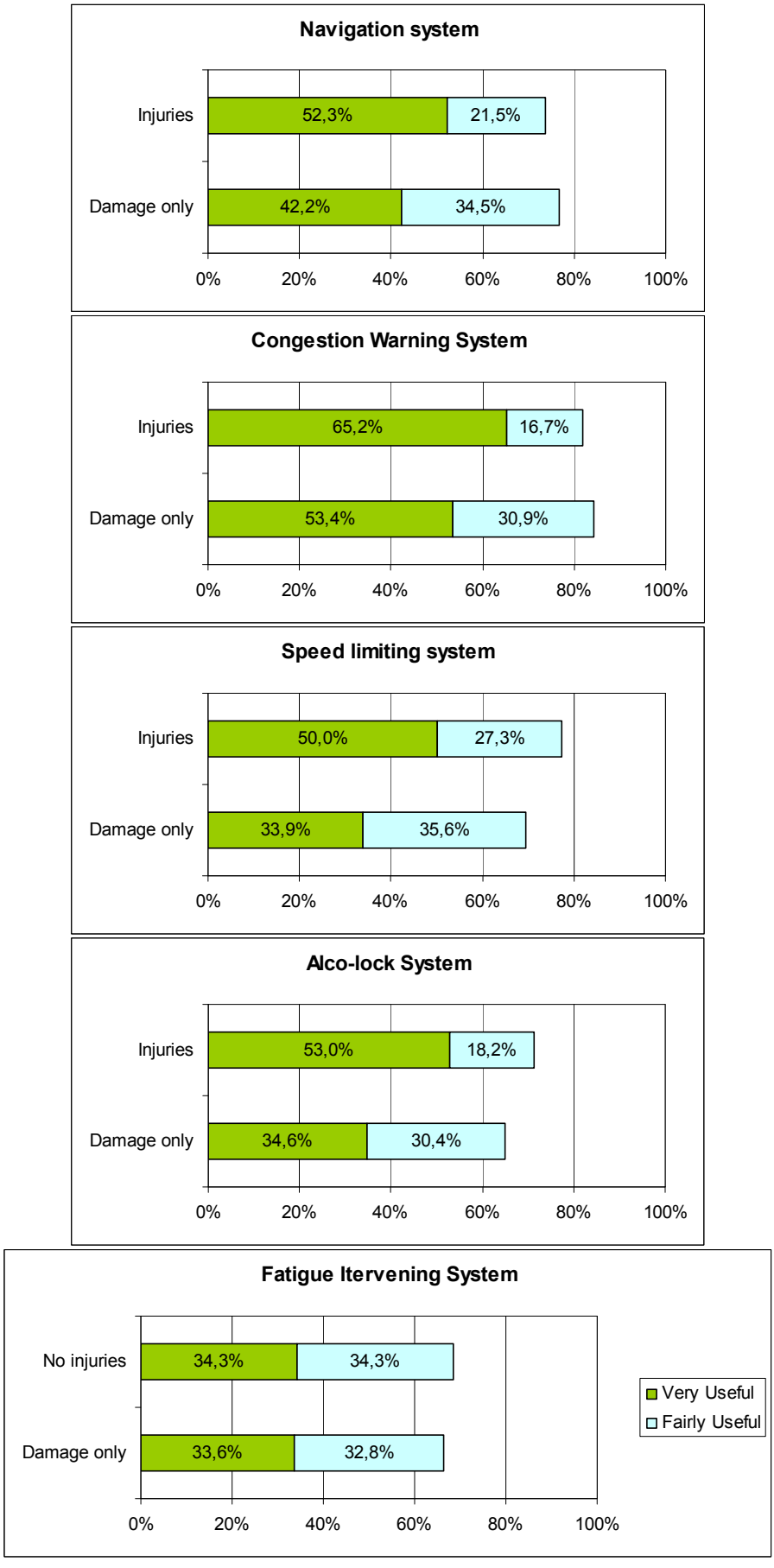


**Figure 1. Needs for intelligent transport systems**

Results show that Greek drivers have a positive attitude towards the investigated new technologies, as their recorded usefulness ranges from 66,4% to 84,3%. Greek drivers also consider information systems more useful regardless of their accident history. The congestion warning system scores most on drivers' preferences, whereas the alco-lock and fatigue monitoring systems score the least.

Further to that, the accident history of drivers seems to influence driver needs on the systems. More specifically, driver needs are increased as the accident severity rates increase, for all investigated systems. Hence, drivers that have been involved in injury accidents tend to have higher needs on the investigated systems than drivers that have been involved in damage only accidents. This increase is higher for the systems that are anticipated to improve road safety (speed limiting, alco-lock and fatigue monitoring).

## DRIVER ACCEPTABILITY

Next driver acceptability on five systems was investigated. These systems are:

- Speed limiting system - mandatory intelligent speed adaptation system that prevents exceeding the speed limit
- Black box that will provide information to identify accident causes
- Black box that will record driver behaviour and could be used from the police as evidence of dangerous driving.
- Electronic identification system that will provide access to specific services (GPS, e-tolls etc)
- Electronic identification system that could be used for enforcement by the police

The question that was used to determine driver acceptability on the specific systems was 'How positive would you be for a …?', and the possible answers were: 'very', 'fairly', 'not very' and 'not at all'. The drivers' answers were also analysed in relation to their accident history, as demonstrated in the previous section. As in the previous section, only answers that indicate positive attitudes of drivers are presented. Figure 2 illustrates driver acceptability on the investigated systems in relation to their accident history.

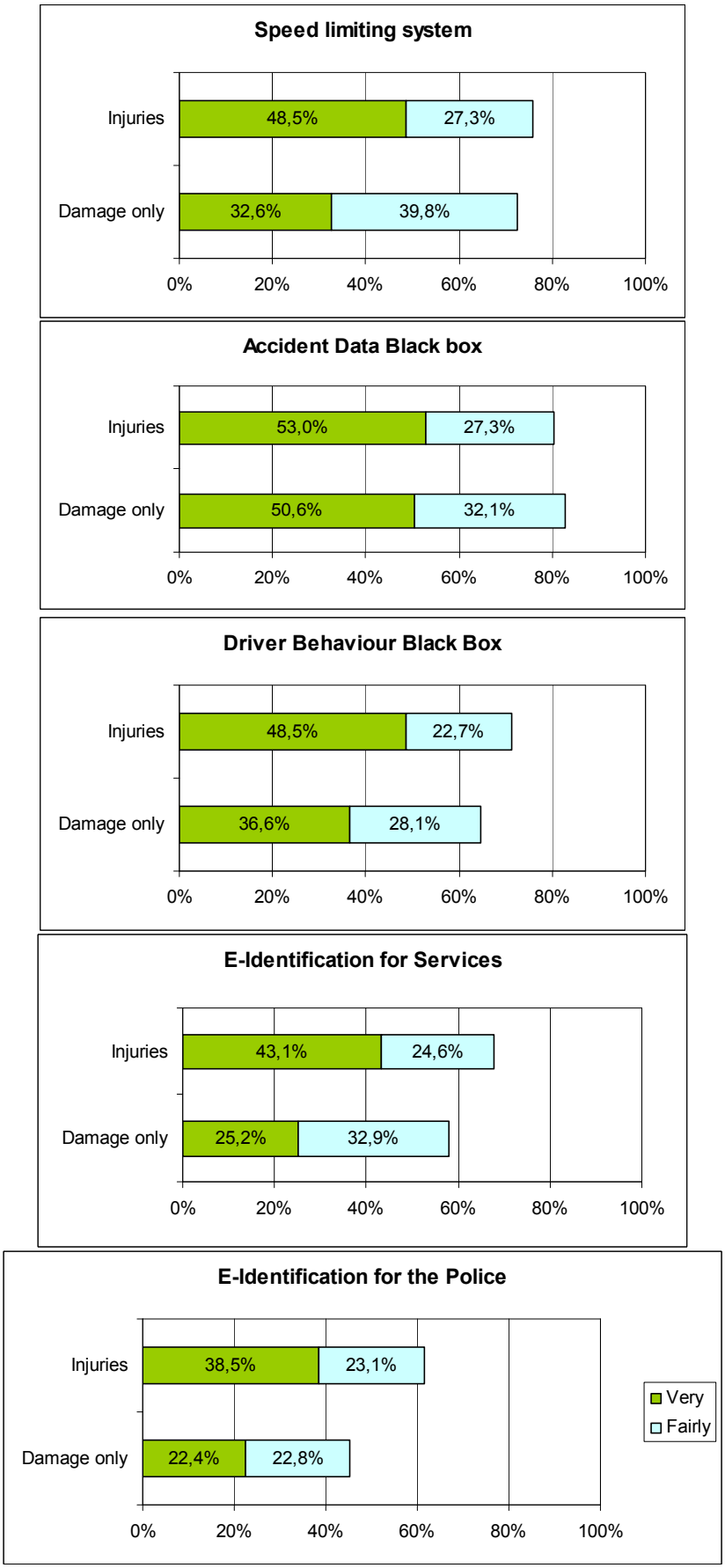


**Figure 10. Acceptability for intelligent transport systems**

Driver acceptability varies greatly between the systems. In particular, the proportion of drivers that are positive towards the different systems ranges from 45,2% to 82,7%. The black box that will help on the identification of the causes of an accident is the most popular system being followed by the speed limiting system. On the other hand, the e-identification system that will monitor driver behaviour and will provide information to the police scores very low in driver preferences, as expected. The order of the systems in driver preferences is the same regardless of the accident history.

Furthermore, for four of the systems (all except the accident black box system) driver acceptability increases with the increase in accident severity.

# CONCLUSIONS

This study presents results on the needs and acceptability of Greek drivers on specific intelligent transport systems. An important finding is that Greek drivers are in general very positive towards the use of the investigated systems, both as indicated from driver needs but also from driver acceptability. It must be noted however, that the calculated positive percentages are quite high in relation to those recorded in the other countries [7]. There are three possible causes that may explain these percentages. A possible cause is that respondents provided the appropriate answers, rather than the ones they actually believe. Another possibility is that the high accident rates in Greece enforce the needs for systems that can protect drivers. Finally, another possibility is that since Greek drivers are not familiar with such technologies they cannot evaluate the impact of their implementation and in particular the resulting reduction of their 'driving freedom'.

The driver attitude on the investigated systems is dependent on their accident history. Hence, drivers that have been involved in more severe accidents tend to be more positive on the use of intelligent transport systems. This indicates that drivers do believe that the use of such systems will improve road safety. In general, drivers believe that they will not be involved in accidents. However, if they have been involved in accidents the significance of such systems becomes more evident.

Finally, based on drivers' attitudes the investigated systems were classified into popular and unpopular systems. This classification is presented in Figure 3.

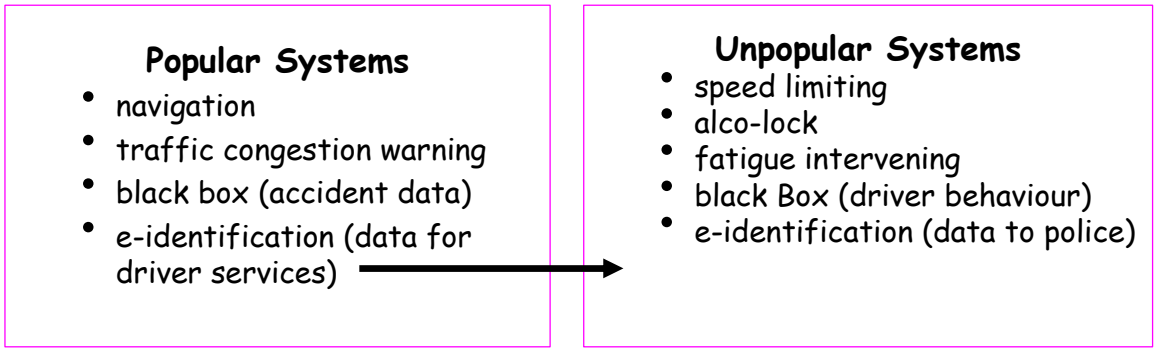


**Figure 3. Classification of systems according to driver preferences**

Drivers' attitudes indicate that more popular systems are the advanced traveller information systems (navigation and traffic congestion warning) as well as the black box that could help identify the causes of an accident, whereas the rest of the systems are classified as the least favourite ones. The e-identification system that could provide access to other services such as GPS-related or e-tolls is also classified as an unpopular system. This might be attributed to the drivers being sceptical to any type of system that identifies their vehicle.

This study is a first attempt to show the attitude of Greek drivers towards specific intelligent transport systems. Moreover the influence of driver involvement in accidents on this attitude was also qualitatively demonstrated. Further research will take place to include in the sample drivers that had no accident experience and to identify quantitatively possible correlations between driver attitudes towards the investigated systems and their accident history.

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