The Context

Previous research (e.g. COST 331[1]) and studies (Improver[2]) have confirmed that the night visibility of road markings is an essential contributor to driver comfort and road safety. However, little or no research has been conducted at European level on wet-night visibility of road markings.

At the same time, as Europe's population is ageing, it is important reassess how our infrastructure is designed. Older people generally tend to have slower reactivity and reduced visual perception making them more likely to be involved in accident than their younger counterparts.

In this context, the RAINVISION project aims to further the state of the art in road markings research by studying the influence of road marking on driver behaviour, by mainly analysing how different age groups (young vs middle vs old) and different gender groups (male vs female) adapt their driving behaviour on the basis of the visibility and retroflectivity of road markings under **all weather conditions**, (i.e. dry, wet, wet and rainy) during **night time driving**.

1 http://cordis.europa.eu/cost-transport/src/cost-331.htm
2 http://ec.europa.eu/transport/roadsafety_library/publications/improver_final_report_sp1_060405.pdf

RAINVISION Consortium

European Union Road Federation

Aximum

3M

Test and Training International

RSMA

EUROPEAN UNION ROAD FEDERATION
ERF

EUROPEAN COMMISSION
Directorate-General for Mobility and Transport

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Influence of the performance of road markings on driver behaviour – Wet night visibility

The RAINVISION approach

Simulation Test

As a first step, the project will implement a simulation study entailing the use of computer simulation technology, to perform a series of tests to study driver behaviour in relationship to different road conditions. In order to assess the difference of better markings for older people, the project has split the participants into three categories, i.e. 20-40, 41-60 and 61 and above Concerning the simulation design, the tests will take into account several parameters, i.e.: different driving conditions (day/night weather dry/wet/wet and rainy); road marking performance; road geometry: straight, curved, smooth uphill and downhill sections, and of course, age and gender. Last but not least, and in order to avoid biased results, test subjects will be specifically pre-selected by means of reactivity, peripheral perception and visual abilities in order to provide homogenous test groups.

Track Test

As a second step, and building on the simulation, the project will conduct a track test trial expected to be launched in March 2013. Participants will drive on a test track, containing several typical road characteristics, like left and right bends or a straight road. Driver performance will be investigated in three test conditions:

1. Condition I: Baseline, no or existing (non-reflective) lane marking
2. Condition II: Site equipped with marking material I (wet night visibility performance product)
3. Condition III: Site equipped with marking material II (enhanced wet night visibility performance product)

To obtain meaningful statistical data, drivers take several runs through specifically chosen road sections, completing the track in 3 different night time driving situations: dry, (1), wet (2) and wet & rainy (3).

Driving comfort safety impact will be measured by lane keeping behaviour (lateral and longitudinal g-forces), speed choice and subjective stress levels (by using a post questionnaire) of drivers. To ensure comparability of results with the simulation tests, the participants will be split into the same age categories.

On- Road Trials

Complementing these controlled environment tests, the project is currently conducting an on road test in the United Kingdom. Based on the collection of data, to date, several high risk sites have been identified in Northern England and high performance wet-night visible road marking have been applied. Accident and driver speed data will then be collected over a full climatic cycle through the discreet installation on DFS cameras, before a detailed analysis is undertaken in order to evaluate the impact of the enhanced markings on accident levels and driver behaviour in terms of speeding.

Handbook of Recommendations

The results of the trials will be analysed and the conclusion will be transposed into a Recommendations Handbook. More specifically, the analysis will focus on the inter-correlation of different factors, i.e. the age and sex of drivers, visibility levels of road marking and weather conditions (dry vs. wet). The conclusions will feed in a recommendations handbook that will be made available to road authorities and stakeholders involved in road safety. The recommendation will adopt a forward looking attitude that will aim to capture how road marking applications will have to change in order to meet the needs of an ageing driver population.

RAIN VISION