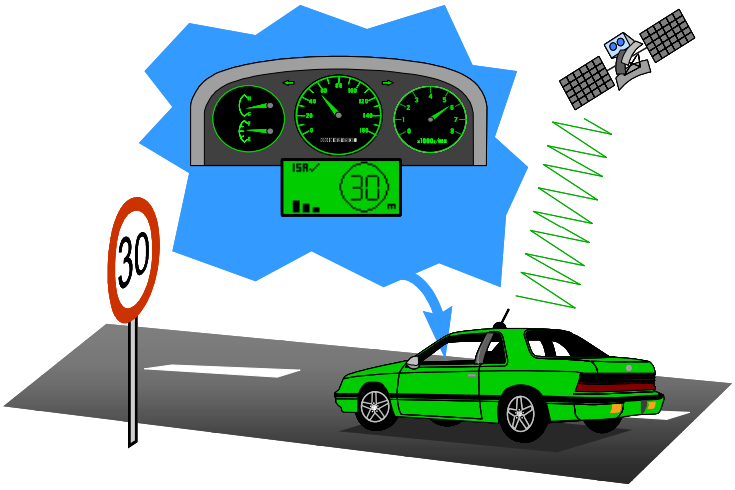
isa - UK

intelligent speed adaptation

Project Summary

THE SYSTEM



Intelligent Speed Adaptation (ISA) is one of the most promising Intelligent Transport Systems in terms of its potential impact on safety. It is a system by which the vehicle "knows" the permitted or recommended maximum speed for a road. The standard system uses an in-vehicle digital road map onto which speed limits have been coded, combined with a positioning system which could be GPS, i.e. the satellite Global Positioning System, but could also be GPS enhanced with map matching and dead reckoning. ISA can take various forms:

- In terms of intervention level, it can be advisory (the driver is informed of the limit and of violations), voluntary (the system is linked to the vehicle controls but the driver can choose when to have the system enabled), or mandatory (no override is possible).
- The speed limit information can potentially be extended to incorporate lower speeds at certain locations in the network and even in the future variation with current network conditions, based on weather, traffic density, the presence of incidents etc.

PREVIOUS WORK

The External Vehicle Speed Control project was funded by DETR between 1997 and 2000. It studied acceptance of ISA, investigated technologies to realise ISA, carried out simulation modelling to look at side effects, and conducted user trials both in a driving simulator and on real roads with a converted car. The major prediction from the previous project is that ISA in its most compulsory and versatile form, i.e. a mandatory system that can change allowed speed limits with current conditions, will achieve a 36% reduction in injury accidents across the UK and a 58% reduction in fatal accidents. ISA trials have taken place in Tilburg in the Netherlands and Aalborg in Denmark. Large-scale trials have been completed in four locations in Sweden (see http://www.isa.vv.se/index.en.htm).

TASKS OF THE PROJECT

The ISA-UK project began in January 2001 and has a duration of 52 months. The project is funded by the Department for Transport (DfT) and the project partners are the University of Leeds and MIRA Ltd. The main tasks of the project are:

- To investigate user behaviour with ISA by means of set of field trials
- To study overtaking behaviour with ISA in a driving simulator
- To prepare an ISA design for motorcycles and large trucks and to build a demonstrator of each
- To prepare a system architecture for a mass production configuration of ISA
- To have an input into relevant standards activities at an international level
- To carry out a process of technology watch throughout the project duration
- To further investigate the costs and benefits of ISA

THE FIELD TRIALS

Twenty vehicles will be equipped with ISA and data collection capability for the field trials. The field trials are planned to start in April 2003 and will each last for 6 months. Four successive trials are planned:

1. West Yorkshire, private motorists
2. West Yorkshire, fleet
3. Midlands, private motorists
4. Midlands, fleet

The Yorkshire trials will precede the Midlands ones. The West Yorkshire area is centred on Leeds and thus is mainly urban; the Midlands area is mainly rural and small town.

The trials are designed to be non-intrusive — the vehicles will behave like "normal" cars apart from the ISA feature, data will be logged automatically, and summary data will be collected daily through a GSM link. The ISA is overridable by the drivers. The intention is to give drivers ISA support for almost all their regular driving.

THE VEHICLES

The vehicles selected for the trial are Skoda Fabia 1.4 litre petrol estates. These vehicles were selected after an appraisal of the alternatives in the small family car sector. They have a major advantage to the project work in that they have an electronic throttle (throttle-by-wire) whose signal can be modified by the ISA software. The map software, provide by NAVTECH Professional Services, is based on a digital road map covering the whole country, although speed limits will only be provided for all the roads in the specific trial areas and for the national roads elsewhere. The aim has been to provide an ISA system that is as close to the "feel" and design of a production system as is possible for reasonable cost.

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