



## Identifying ITS Opportunities for the HA Technologies Newsletter: March 2009

### ■ ITS RADAR INTERNATIONAL PROJECT

This project is providing intelligence for the Highways Agency on ITS developments in Europe and around the world. It is carried out by TRL and AECOM on behalf of the HA. The project summarises key information for decision makers and practitioners on activities related to Intelligent Transport Systems (ITS). The project covers specific areas of key interest to the HA.

Regular newsletters are being produced, covering information which is in the public domain. For more information about the project and the services provided, the web site can be reached at: [www.highways.gov.uk/itsradar](http://www.highways.gov.uk/itsradar).

To contact us and let us know what you would like this project to deliver please email us at: [ITSRadarInternational@trl.co.uk](mailto:ITSRadarInternational@trl.co.uk)

### ■ ABOUT TECHNOLOGIES

Intelligence on developments in new and emerging technologies relevant to ITS are reported on. Technologies deployed in various other arenas are reviewed and their applicability in the world of transport is analysed.

Intelligence is gathered which demonstrates links between promising pilots, ideas and concepts and deployed ITS tools. This service enables earlier consideration of new technologies and in addition identifies cases where consideration has been given to new ideas, but may be held in abeyance due to the associated 'risks'.

### ■ MEETINGS

#### **Communication Technology for Intelligent Transport Systems 9 March 2010**

Source: <http://www.theiet.org>

The Communications Technology for Intelligent Transport Systems seminar organised by IET is taking place on 09 March 2010 in IET London, Savoy Place. The seminars will be about communication and transport-related issues with emphasis on congestion, vehicle-to-vehicle communication and informed travelling.

#### **ITS Radar International will monitor the outcome**

Keywords: Cooperative vehicle systems, Traffic information, Traffic management, Training

## **Papers from the Smart Environment Interest Group (SEIG) Conference now available**

Source: ITS United Kingdom [www.its-uk.org.uk](http://www.its-uk.org.uk)

Papers from the Smart Environment Interest Group (SEIG) Conference that took place in November 2009 are now available on CD. The CDs are free to members of the ITS United Kingdom and to non-members who paid to attend the conference. SEIG provides a forum for ITS (UK) members to investigate use of ITS to benefit the environment and discuss members' opinions on this topic.

Keywords: Environment, Training

### ■ HOT TOPICS

## **Augmented reality system lets you see through walls**

Source: [www.newscientist.com](http://www.newscientist.com)

It is now possible for drivers to see through buildings and around blind corners to help to minimise the risk of collision with hidden obstacles. The prototype of an augmented reality system was presented at the International Symposium on Mixed and Augmented Reality in Orlando, Florida.

The prototype combines images from two cameras: one that captures the driver's view and the other that monitors the "invisible" view beyond the visual obstruction. A processor within the vehicle then combines the views and projects what is hidden from the driver's view. Existing CCTV cameras could be used to provide the view of invisible scenes, whereas the driver's view could be monitored by cameras mounted on cars.

Keywords: Incident, In-vehicle systems, Monitoring, Safety, Traffic information

## **Construction of Intelligent Transport Systems centre underway**

Source: '[ADVANCE Showing](#)', Thinking Highways, Vol. 4, No. 4, pg. 76-79

Following the [ITS Radar International article](#) announcing the start of construction at innovITS ADVANCE, this article provides further information about the new, €30m innovITS ADVANCE Intelligent Transport Systems development centre. It will provide a safe and secure environment for the development of advanced ITS technologies to aid with their implementation.

The InnovITS ADVANCE facility will consist of fully instrumented urban road network and motorway circuits with a dedicated demonstration suite and control centre, making it possible for the UK to become a leading player in the ITS world. The test centre will be equipped with a wide range of telecommunications networks (such as GSM, GPRS and WiFi) and monitoring systems to enable ITS systems to be tested in a realistic simulated 'real-world' traffic scenario. In addition, the centre has been recently awarded a £6.5m grant from the regional development agency Advantage West Midlands.

Keywords: Communications, Policy, Traffic Centre

## **Automated vehicle classification in India**

Source: 'Passage through India', Tolltrans 2010, pg. 52

A new Automatic Vehicle Classification (AVC) system, developed by Tecsidel with software development from Ashoka Technologies, has been deployed in India as a part of toll road project managed by Ashoka Buildcon.

In India, the National Highways Authority of India (NHAI) divides vehicles into four toll classes. There is a diverse variety of vehicles using India's highways, so any AVC system needs to shrewd at classifying a vehicle that it may not have many examples of in its database.

The improved AVC system, designed specifically to perform well with the Indian classification system, is based on double-wheel detection and 3D vehicle profiling, leading to an improved and more accurate vehicle classification. Vehicle profiling focuses on classification of two-axle vehicles by means of an overhead laser scanner and intelligent shape-recognition software. Double wheels are identified with use of oblique treadles (mechanical switches that are actuated by the vehicle's tyres). Thanks to this latest technology the number of vehicle classification errors was reduced by 80%.

Keywords: Identification, Payment

### ■ PROJECTS

None to report

### ■ RECENT PUBLICATIONS

## **Full colour modular VMS as an alternative to static signs?**

Source: 'Spread the message', Tolltrans 2010, pg. 68-69

Until recently, Variable Message Signs (VMS) were only used to present basic tolling information in the US because of their limited display capabilities, complex requirements and high cost. Now several transport departments in the US are using high-resolution full-colour VMS to replace many of the static signs. Recent changes in products available to cause this change include:

- Lower unit costs (a single controller can operate six panels)
- Simplified maintenance (panels are modular, self-contained and weigh as little as 11kg)
- Maximised panel lifetime (panels include redundant power supplies and operate at an appropriate temperature without the need for ventilation to maximise LED life)
- Signs use the standardised National Transportation Communications for ITS Protocol (NTCIP)
- Local control is possible without a need for a laptop via an auxiliary control panel

- Easily mounted on to existing static signage supports.

These VMS can display bright logos or traffic signage symbols which are easily recognisable by drivers and improve motorists' reaction time. They also allow agencies to dynamically arrange lanes for Electronic Toll Collection (ETC), close lanes or alter payments taken in each lane.

### **This type of sign may be applicable to dynamic lane signage for managed motorway applications in the UK**

Keywords: Emergency, Incident, Payment, Safety, Traffic information, Traffic management

### **SatNav on US phones with real-time and predictive congestion information**

Source: 'INRIX launches Traffic! Pro Navigation Tool', [www.roadtraffic-technology.com](http://www.roadtraffic-technology.com)

The US-based INRIX (known in the UK as ITIS Holdings) has released a navigation application for iPhone and iPod Touch users. It provides information about the optimal routes to take, estimated arrival times and an estimate of the best times to leave to arrive at a destination on time. It allows users to save favourite routes and popular destinations as well as to be informed about current and forecasted traffic, incidents and events. It claims to offer accurate, real-time information that covers over 260,000 miles of US and Canadian roads.

Keywords: Communications, Geographic Information

### **Cambridge University develops cheap, high-density traffic sensor network**

Source: 'Time for change', Intertraffic World, Annual Showcase 2010, pg. 52-56

The University of Cambridge has carried out research into sensor and network technology design as a part of the Transport Information Monitoring Environment (TIME) project. It aims to build an appropriate sensor technology and reusable software components to distribute, process, and store sensor data in real time, taking into account privacy issues and commercial interests.

Their prototype sensor is a low-resolution thermal camera with image processing on-board to detect vehicle speed and flow. It is mounted on a lamp-column and feeds off the lamp's power supply. Communication is via a wireless mesh. The prototype is estimated to cost £40 and has been shown to work through heat, rain, cold and snow in the last year.

Keywords: Communications, Enforcement, Traffic centre, Traffic management

## **Advanced Driver Assistance Systems moving to video sensors**

Source: 'Visual effect', Vision Zero International, January 2010, pg. 70-71

Early and prototype Advanced Driver Assistance Systems (ADAS) often used radar and other 'beam' based sensors as it is easier for a computer to interpret the data that it produces. Improvements in video cameras and faster, cheaper processing power have meant that video cameras are increasingly being used to deliver the same or better driver assistance systems such as adaptive cruise control or incident prevention systems. Using camera technology also has the benefit that the reaction of video-based systems is more understandable and predictable to drivers as they have the same view as the human eye. In addition, the same camera can be used by many different systems and applications, improving flexibility.

Cameras are already being used to measure the parking spaces in parking assistance systems. In the future, they will supplement/replace mirrors and classify detected objects.

Keywords: Incident, In-vehicle systems, Monitoring

## **ITS systems help satisfy SANEF's customers**

Source: 'Frank Bruno', ETC Vol. 4, No 4, pg. 30-32

SANEF is a French company that runs several tolling schemes around Europe, but their base is the 1,743km of tolled motorway that they operate in France. They collect data from a wide range of sources including inductive loops, radar, Automatic Number Plate Recognition (ANPR) and from their own toll tags. Bruno Corthier, SANEF's Head of Telematics, perceives Intelligent Transport Systems (ITS) as vital for providing information for customers to improve customer satisfaction.

SANEF delivers information to users via a number of channels, their Variable Message Signs (VMS) VMS display travel time and congestion information, but are quite expensive, so SANEF have installed low cost, double-sided VMS. Drivers can check conditions on the motorway via an FM radio station (which also broadcasts in English) or before they leave via the internet. The average time for incident information to be detected and reach these delivery channels is 2 minutes, which may help to explain why 89% of users surveyed were satisfied with the information provided.

Keywords: Traffic information

## **Advanced Driver Assistance Systems for all**

Source: 'Assistance for all', Vision Zero international, January 2010, pg. 56-57

Camera and radar-based driver assistance systems have been shown to be invaluable for increasing road safety, but awareness of such technologies and their high costs are still impeding their deployment. Driver Assist Systems (DAS) not only minimise the number of accidents, but also reduce fuel consumption and CO<sub>2</sub> emissions. Estimates from the Dutch government

suggest that if just 3% of vehicles were fitted with Adaptive Cruise Control, 4,000 rear-end accidents would be prevented per year.

Lane Departure Warning (LDW) provides a warning when a car drives off course and LDW together with automatic emergency braking will become mandatory in-vehicle system for trucks in Europe from October 2013.

Keywords: Freight, Incident, In-vehicle systems, Safety

### **Traffic control becomes cooperative**

Source: Intertraffic World, Annual Showcase 2010, pg. 68-70

Cooperative Vehicle Highway Systems (CVHS) enable vehicle-to-vehicle and vehicle-to-infrastructure communication making it possible to (amongst others):

- prevent accidents
- track dangerous goods,
- allocate loading bays, and
- reserve car park spaces.

The latest systems under development utilise accurate positioning and fast wireless communication and help to improve traffic management and hence reduce pollution and enhance driver safety. If the traffic light controller could communicate with oncoming vehicles, it could collect information on the types of vehicles approaching and manipulate traffic lights accordingly to minimise the total fuel consumption. A driver could also receive a notification from traffic lights to slow down to avoid stopping at an intersection further down the road.

Drivers can also be warned about hazards and appropriate incident prevention action can be taken by both in-vehicle and infrastructure systems. For example, if the traffic light controller were to warn a driver about a situation that required hard braking by the driver, the vehicle's onboard system could automatically warn following cars to help prevent rear-end shunts.

Keywords: Cooperative vehicle systems, Driver information, Incident, In-vehicle systems, Safety

### **Self-piloting vehicles**

Source: 'Future Vision', Intertraffic World, Annual Showcase 2010, pg. 118-121

In the longer-term future, vehicles are expected to become fully automated, enabling drivers to relax, read a book or take a nap. However, there have already been some demonstrations of self-piloting vehicles. Heathrow is soon to get a 'Personal Rapid Transit' system using 'podcars' to drive users around the airport site.

The advantage of these self-piloting vehicles is that they can make better use of road-space and react faster and in a more co-ordinated fashion than a

human driver. A fully automated highway could all but eliminate road accidents.

At the moment, technology is only advanced enough to assist drivers, but it is a step along the way. Nissan is developing a distance control-assist system that helps drivers to keep the appropriate distance from vehicles in front and automatically applies brakes when needed.

Keywords: Cooperative vehicle systems, Incident, In-vehicle systems, Safety

### **Machine vision for traffic management**

Source: 'Seeing machines' Traffic Technology International, January 2010, pg. 20-23

Machine vision is increasingly being used to help analyse traffic-related video images to collect data and to help with traffic management. The author describes some of the newest and most useful camera ranges offered by a number of producers that are suitable for ITS applications. There is an increasing range of small, cheap but high performance cameras that will operate in a wide range of conditions. These are used for Automatic Number Plate Recognition (ANPR) and vehicle detection at junctions as a replacement for induction loops. However, as machine vision and the camera hardware improves, more applications are being found.

Keywords: Enforcement, Identification, Monitoring, Traffic Management

#### **■ GLOSSARY**

AVC	Automatic Vehicle Classification
CCTV	Closed Circuit Television
CVHS	Cooperative Vehicle Highway Systems
DAS	Driver Assist Systems
ETC	Electronic Toll Collection
IET	Institute of Engineering and Technology
ITS	Intelligent Transport Systems
LDW	Lane Departure Warning
NHAI	National Highways Authority of India
NTCIP	National Transportation Communications for ITS Protocol
SEIG	Smart Environment Interest Group
TIME	Transport Information Monitoring Environment
VMS	Variable Message Sign