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HIGHWAY

GLOBAL ROAD TRANSPORT TECHNOLOGY UPDATE

OPTIMIZATION

Self-driving trucks - closer to reality

In ten years' time trucks are going to be different from those of today. According to Rikard Orell, design director at Volvo Truck Corporation (www.volvotrucks.com) and one of the brains behind Concept Truck 2020. Long distance haulage for the future: long rigs, controlled by autopilot, driven non-stop in nose-to-tail convoys on green super-motorways linking the continents. This is the vision of the future that generated the ideas behind the Volvo Concept Truck 2020 design concept.

"That is the whole point," says Orell. "Progress is getting ever faster. Because of this our vision for the future is not that far away. Much of the technology in the Volvo Concept Truck 2020 is already available; other technology needs to be developed. One needs to dare stride firmly into the debate, demonstrating what one can and will do. Just tinkering at the edges runs the risk of progress slipping away." As road transport expands it must also become safer and more efficient. Volvo's design concept contains ideas about how that can be achieved. Some of these ideas can be integrated into production today, while others are there to arouse interest and start a discussion.

One of the goals is to link vehicles together wirelessly into long

(continued on page 3)

TELEMATICS

Secure system for monitoring transport of goods in real time

To monitor goods at all times, from point of origin to destination, in a secure way and in real time is exactly what a team of researchers from the Public University of Navarre (UPNA; www.unavarre.es) and the TB-Solutions (www.tb-solutions.com) enterprise have achieved. This development is within the remit of the Intelligent Transport of Intermodal Goods (Transporte Inteligente de Mercancías Intermodal or TIMI; www.ctc.es) project and the team is now working on the commercial development of their product.

The aim of the TIMI project is to develop new technologies that enable the creation of a future generation of devices, systems, and tools in order to make intermodal transport (by land, sea, rail, or air) more intelligent. TB-Solutions requested UPNA to develop the required software and this collaboration has now borne fruit.

The required hardware has been devised and the software installed in the sensors, the devices located in each goods container having the function of transmitting information in

(continued on page 2)

GREEN TECHNOLOGY

eCoMove kicks off!

The ERTICO's (www.ertico.com) eCoMove project is officially under way. This 3-year research project will develop, test, and validate a number of "Green ITS" technologies and applications, using vehicle-to-vehicle and vehicle-to-infrastructure communication to integrate for the first time systems to support "eco-driving" with those for "eco-traffic management."

In the eCoMove vision, the "perfect eco-driver" will in future travel through the "perfectly eco-managed" road network. The project's core concept is that a combination of cooperative applications for eco-driving and for eco-traffic management can—for any given trip by a particular driver in

a particular vehicle—help to approach the theoretical least possible fuel consumption (and thus carbon dioxide

(continued on page 2)

IN THIS ISSUE

Optimization	1
Telematics	1
Green Technology	1
Research	5
Safety	7
Tolling	8
Connectivity	9
Navigation	10
Government Watch	10
Calendar	12

Secure system for monitoring transport of goods in real time

(continued from page 1)

wireless mode. As José Javier Astrain from UPNA explained, “with this device, I know what goods are being moved by which truck and in what conditions of temperature, luminosity, etc. If and when it arrives at a customs post, who has been involved in this customs check and if they have been given the green light; I know if there are hazardous goods and if they are driving along an authorized route or not, etc., and I can arrange that, when the container arrives at the port, I don’t have to do any paper-

work and the container can be loaded on board directly.”

“One of the greatest difficulties faced was interpreting the information, given that if there are, for example six containers, I don’t want to share information with any others than those of my company; this information must not be sent or intercepted without being coded and having a security mechanism.” This is what TB-Solutions has worked on in devising a system that guarantees the information being transmitted and interchanged is intact and secure. “We are the first to develop this type of tool certificate,” pointed out Mayte Hurtado, managing director of TB-Solutions. “That we know of, there is no-one else in Europe.”

Hurtado emphasizes that this system enables the optimization of financial, human, and logistic resources, because the chain of supply is enormously optimized. For example, in the transport of foodstuffs, it is impor-

tant that there is no handling thereof and that the goods arrive in the condition as has been agreed.

“It can occur,” added Astrain, “that three trucks carrying fruit make contact with the operator at the same time in order to give updates on incidents: one load is not in such a good state, another might be making better time than expected, etc. This information, in real time, enables the company to take decisions ahead such as, for example, diverting the container with the more delicate load of fruit to a closer destination.”

The sensors, communicating with each other and also transmitting data to a central control, register any incident happening during the journey. Even if they are going through an area without coverage, such as the English Channel or a tunnel, the information continues to register and, when the truck re-enters a zone with coverage, this is transmitted to the central control. The devices have been successfully tested in the port of Valencia, with real containers. The PORTEL project will now be presented to those who wish to provide added value services for their specific needs. **TIH**



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GREEN TECHNOLOGY

eCoMove kicks off!

(continued from page 1)

emissions)... and this without compromising the quality of mobility of people and goods.

In reality, vehicles, drivers, and traffic management systems fall short of this ideal, and much fuel is wasted and carbon dioxide unnecessarily emitted. The eCoMove innovations target the two main sources of this avoidable fuel consumption, i.e. trips by private vehicles and those by goods vehicles, and tackle energy inefficiency in three domains: driv-

ers’ behavior, route choice, and traffic management.

The eCoMove applications are intended to bring major improvements to road transport energy use by using the latest vehicle-to-infrastructure communication technologies:

- A dynamic ecoSmartDriving “virtual coach” that provides advice to adapt driving behavior for minimum fuel use, but also personalized recommendations based on

(continued on page 3)

(continued from page 2)

driving experience for eco-driving optimization;

- Dynamic eco-pre-TripPlanning and on trip Green Routing tools to select the lowest energy route;

- An ecoDriver Coaching System that combines dynamic eco-driving support with training and incentive systems for commercial vehicle drivers;

- An ecoFleet Planning & Routing application combining eco-driving support and logistics planning for commercial vehicles with energy-efficient traffic control measures, e.g. selective priority for trucks;

- An ecoAdaptive Balancing & Control system that applies local energy-optimized strategies for traffic control, e.g. traffic light coordination based on a map of energy “hot-spots”;

- ecoMotorway Management measures that combine eco-support of individual vehicles with energy-optimized traffic management measures on the interurban network.

When combined, these mainly independent but interacting applica-

tions can potentially deliver up to 20% overall fuel savings and CO2 emissions reduction.

These important innovations are enabled by the use of cooperative information exchange: drivers and road operators can benefit from extra, real time information—such as vehicle fuel consumption data, speed, route destination, traffic signal phase data, etc.—which help them to drive more economically.

The eCoMove data collected from individual vehicles do not need to be personalized, indeed they must be anonymous, so that no individual personal data are communicated. As a general principle throughout the project, only minimum data will be collected and communicated, which are necessary to enable the application. Where detailed driver behavior data need to be stored and analyzed on board the vehicle, they will not be linked to that driver’s personal data.

Issues of data privacy and data security will be analyzed during the requirements definition and validation phases. A methodology for ensuring personal data security and privacy protection will be embedded in the

high-level architecture and data management processes. Due to its complexity and large scale, the eCoMove project is composed of “sub-projects” developing solutions for eco-driving support for car drivers, for trucks and eco-freight and logistics management. A third sub-project is developing applications for cooperative eco-traffic management and control, while the “core technologies integration” sub-project both ensures technical coordination across the project and develops common core technologies.

A dedicated sub-project will validate the eCoMove developments, assessing the potential impact of eCoMove solutions on driver behavior, mobility, traffic network efficiency, and environmental issues, and examine the costs and benefits of deployment. A full evaluation of cooperative traffic management strategies needs a high penetration of equipped vehicles, which cannot be achieved in reality at the eCoMove test sites. For that reason, a simulation environment will be set up to test and validate the eCoMove applications. **TIP**

OPTIMIZATION

Self-driving trucks - closer to reality

(continued from page 1)

trains that rush across the continents at 90 km/h. “This will be possible when the transport sector’s vision of green corridors becomes reality,” says Rikard Orell. “Here heavy goods vehicles are separated from other traffic, driving in their own lanes, like a railway but without rails.” There are advantages. Road safety increases, transport services require less space, and wear on the roads decreases. Fuel consumption and carbon dioxide emissions drop when a truck is in the slipstream of the vehicle in front. The

driver can rest behind the wheel while the truck drives. If this is counted as idle time, transport times can be cut, deliveries will be made more quickly and drivers can get back to their families and friends earlier.

The driver is at the center of Volvo’s world. It goes without saying that a design concept from Volvo Trucks contains a great many ideas about the development of the driver environment. In the Volvo Concept Truck 2020 the driver environment is spacious, airy, and free of disrup-

tion. “We have replaced the traditional dashboard with a thin film panel on which information is tailored to suit the driver,” says Orell. “The panel is operated like a touchpad, just like an iPhone. We have saved a lot of space that way.” Another space-saving idea is the sleek driver’s seat with its thin, ventilated mesh backrest, more like a modern office chair than a traditional driver’s seat. Behind the driver is a futon sofa which folds out into a wide, comfortable bed in the evening. The lighting in the cab is divided into zones customized for the driver’s various in-cab tasks, or for resting.

Around the driver are large areas of glass providing good visibility out of the vehicle and even into it.

(continued on page 4)