

## **A Truck that Keeps Track in Congestion**

**Volvo's prototype Automated Queue Assistance (AQuA) supports truck drivers in traffic congestion through numerous sensors that monitor the surroundings and take decisions autonomously**

**Gothenburg / Borås (Sweden), June 21, 2011.** Traffic queues are an increasing problem in terms of urban and non-urban traffic management. Everyday trucks and cars are getting caught in traffic for hours trying to deliver goods or go to work. Volvo Technology and other research partners developed the prototype of an Automated Queue Assistance (AQuA) as part of the EU funded R&D project HAVEit. The research vehicle is presented at the Volvo test track in Hällered near Borås (Sweden) on June 21 and 22, 2011 together with six other vehicles that demonstrate the potential of highly automated driving. The AQuA system relieves the driver of the monotonous task of driving in traffic queues. When the system is activated the driver can lean back, relax and monitor the system's performance while the assistant controls the vehicle.

"Those traffic queues are not only environmentally unfriendly but also a challenging task for drivers as many traffic accidents can occur in these monotonous circumstances as the driver's alertness gets reduced. It is therefore crucially important that we develop appropriate solutions to optimize the traffic in those complex situations", says Achim Beutner, Volvo Technology specialist in semi-automation for enhanced safety & fuel efficiency and Volvo's HAVEit project manager.

The AQuA truck is equipped with numerous sensors that collect information about the surrounding environment and provide a better view on the road and on other vehicles around the truck. Based on this information the system can decide on appropriate acceleration, deceleration and steering and thus, calculate driving speed and steering activity accordingly. The vehicle is controlled automatically, follows the queue and stays in the lane. The alertness level of the driver is monitored at all time by an inboard camera and if the driver is getting drowsy or distracted the system will issue a warning.

The fact that human mistakes are solely or partly to blame in a big majority of all traffic accidents shows that there is a big potential for automated driving to increase traffic safety. Today active safety systems are getting more and more common on the market making

traffic safer for both drivers and other road users. In the future highly automated functionality will be even more supportive, making it possible for the driver to be more focused when his or her attention is really needed”, Achim Beutner adds.

The AQuA truck illustrates the idea behind the whole HAVEit project, as it brings together the know-how of Volvo as an OEM with other suppliers and scientific institutions in order to generate sustainable solutions for the future of driving. During the technological development of the AQuA truck Volvo Technology worked closely together with specialists of other HAVEit partners and was able to bring together their expertise for efficient and effective driving. The demonstration truck is equipped with laser scanners from SICK, lane and object camera, side radars and driver monitoring camera from Continental, infrared vehicle to vehicle (IR-V2V) communication technology from EFKON, a hands-on-steering-wheel sensor from Volkswagen and a driver attention algorithm from the Wuerzburg Institute of Traffic Sciences. In addition, the German Aerospace Center (DLR) contributed a mode selection unit and the University of Athens, Institute of Communications and Computer Systems (ICCS), a sensor data fusion algorithm.

At the HAVEit Final Event technical experts from Volvo Technology will demonstrate and explain the AQuA function of the truck by an autonomous driving maneuver in congestion. Once the system detects a congested traffic situation ahead, the driver can choose to hand over control of the vehicle to the system. The system will then control the truck’s movement and adjust it to follow the traffic directly ahead with a safety distance, stopping when necessary, and continuing as the traffic moves slowly ahead (Stop and Go). Once the system senses that the congested situation is subsiding and traffic begins to move along at normal speeds, the system alerts the driver to then once again take over from the system. Alongside this, the human machine interface which displays the system state for the driver will be shown. In the future, skills in interaction design and programming will gain importance to check the driver’s involvement in order to avoid traffic accidents. It will be presented what happens if the driver does not respond to system warnings – then, the system will ask the driver to take over the driving task again.

“It will still take several years before we see highly automated driving around us on the road in a larger scale. However, many parts of the AQuA function will be used to improve current active safety systems or for development of semi-autonomous functions that support the

driver”, says Beutner and concludes: “The HAVEit project was an important milestone, but also after the successful completion of HAVEit Volvo’s engagement towards highly automated driving and traffic safety will continue unchanged with high priority.”

## **About HAVEit**

The EU funded R&D project HAVEit („Highly Automated Vehicles for Intelligent Transport“) is set to develop research concepts and technologies for highly automated driving. This will help to reduce the drivers’ workload, prevent accidents, reduce environmental impact and make traffic safer. Launched in February 2008, 17 European partners from the automotive and supply sector as well as from the scientific community collaborate in the project. In total, investments of EUR 28 million were made into HAVEit, EUR 17 million of which were EU grants and EUR 11 million were contributed by the 17 partners, of which EUR 7 million are invested by the automobile industry. The HAVEit consortium consists of vehicle manufacturers, automotive suppliers and scientific institutes from Germany, Sweden, France, Austria, Switzerland, Greece and Hungary:

Continental, Volvo Technology AB, Volkswagen AG, EFKON AG, Sick AG, Haldex Brake Products AB, Knowllence, Explinovo GmbH, German Aerospace Center (DLR), Ecole Polytechnique Fédérale de Lausanne (EPFL), University of Athens, Institute of Communications and Computer Systems (ICCS), University of Applied Sciences Amberg-Weiden, Budapest University of Technology and Economics, Universität Stuttgart, Institut für Luftfahrtsysteme, Wuerzburg Institute of Traffic Sciences GmbH, Institut National de Recherche en Informatique et en Automatique (Inria), Institut français des sciences et technologies des transports, de l’aménagement et des réseaux (IFSTTAR).

For further information please visit [www.haveit-eu.org](http://www.haveit-eu.org).

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Our customers include all Volvo Group companies and Volvo Cars but also some selected suppliers.

We participate successfully in national and international research programmes involving universities, research institutes and other companies in the industry.

Volvo Technology is formally a business unit within the Volvo Group, with ~500 employees and is located in Sweden, France, North America and Asia.

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