



MAN contributes to UR:BAN project with research into assistance systems for efficient and safe urban mobility

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Researchers to present current status in Braunschweig:

- **Human Factors in Traffic: interaction between driver and vehicle**
- **Networked Traffic System: the Green Wave assistant**
- **Cognitive Assistance: all-round visibility for commercial vehicles**

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As part of the UR:BAN research project, MAN is looking into ways of making commercial vehicles safer and more efficient for city driving. After two years of working on UR:BAN, researchers will be presenting the results of the first phase of the project on 14 May in Braunschweig, Germany.

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Eberhard Hipp, Head of Research at MAN Truck & Bus, is coordinating the research project: "The traffic situation in cities is getting more complex all the time. Road users are driving in very dense traffic conditions, which makes reaction times short. Our aims in this project are to analyse traffic movement using innovative systems and new technologies, and determine driving strategies to optimise fuel consumption, identify dangerous situations and protect drivers from possible human error."

"In doing so, we hope to make a significant contribution towards increasing efficiency and safety on the roads. All our research is centred around the driver," explains Hipp.

Human Factors in Traffic

The Human Factors in Traffic sub-project involves MAN researchers exploring how vehicles can most efficiently provide information from assistance systems to the driver in busy urban traffic and how the cockpit can be designed so as to display exactly the right information to the driver in any given traffic situation.

In urban driving, communication between vehicle and driver is extremely important: traffic is dense and so drivers have to maintain high levels of concentration in order to react to situations which change much more

The MAN Group is one of Europe's leading industrial players in transport-related engineering, with revenue of approximately €15.7 billion in 2013. As a supplier of trucks, buses, diesel engines, turbomachinery, and special gear units, MAN employs approximately 53,500 people worldwide. Its business areas hold leading positions in their respective markets.



rapidly than in out-of-town driving. Cars and commercial vehicles already have numerous electronic assistance systems to support drivers. The benefit to drivers and other road users is that assistance systems are always alert – they never get tired, so they can always warn the driver and intervene in an instant should the situation arise. While the abundance of systems is set to expand still further, it is still important that drivers do not get overwhelmed with displays and warnings from assistance systems. Consequently, one of the key research topics at MAN is the interface between driver and vehicle (human-machine interface).

The aim of the MAN researchers is to keep distractions to the driver to a minimum. Information must be reduced to the minimum required and then conveyed to the driver in an intuitive manner.

In the first stage of the project, MAN has been working with professional drivers using a driving simulator. The researchers have been determining the information needed by drivers in the unfamiliar situation in which their truck automatically sets its own speed in the city.

Karlheinz Dörner, Head of Research into Driver Assistance and Electronic Systems: "This gives us a realistic picture of the information HGV and bus drivers need and expect in order to be able to drive safely and understand vehicle systems. For example, we can learn how to give drivers information from a Green Wave assistant in a way that they can make best use of it.

"Then we can apply that in designing specific aspects of the human-machine interface. This includes both the hardware, in other words controls, displays, audible and sensory warnings, and the software, for example when information is displayed and in what level of detail. The result should provide the driver with a relaxed, efficient and safe driving experience in urban traffic", Dörner sums up.

This sub-project ties in with the other areas MAN is exploring within the UR:BAN project: the Green Wave assistant and all-round visibility. The driver-vehicle interface is a very important part of these projects, too, and is being given particular attention. In the second phase of the project, researchers will present a prototype cockpit showing off the results of their work.



The Green Wave assistant

In the Networked Traffic System sub-project, MAN is developing a Green Wave assistant. The aim is to optimise the use of the green traffic light phases on main inner-urban routes in order to save on fuel and time.

Anticipatory driving saves on fuel – this is especially true in the case of trucks and buses, as it takes a large amount of energy to get a 40-tonne vehicle from a standstill up to a speed of 50 km/h. Frequent stopping and starting in inner-city streets diminishes the high efficiency of modern commercial vehicles.

This is something the MAN developers want to change. "You can save a lot of fuel by getting the vehicle to move at exactly the right speed so as to make it unnecessary to keep stopping and pulling away," says Walter Schwertberger, Group Head of Research into Driver Assistance Systems at MAN. "This is the idea behind the Green Wave assistant. The traffic light system wirelessly transmits its switching intervals to the vehicle via a server. The vehicle then takes this data and comes up with a suitable strategy to enter the green light phase for the planned route. In other words, the vehicle automatically chooses its own most appropriate speed."

For this to happen, the necessary communication infrastructure first needs to be set up: servers need to be able to transmit information from the city's traffic light management system. The UR:BAN project is working with two model cities: Düsseldorf and Kassel.

All-round visibility for commercial vehicles

In the Cognitive Assistance sub-project, MAN is working to advance the development of an all-round visibility system to meet the complex requirements of buses and trucks in urban traffic.

Bus drivers in urban areas face special challenges as they negotiate narrow inner-city streets. These include letting passengers on and off safely at bus stops, handling road junctions with pedestrians and cyclists, streets with bottlenecks, oncoming traffic and lane changes.

"The camera system is designed to give the driver an easily comprehensible overview of the situation around the vehicle," says project manager Walter Schwertberger. Researchers are working to optimise a bird's eye view display of the vehicle environment especially for commercial vehicles. The focus here is also on conveying information to the driver in a



way that matches the needs of the traffic situation. The system automatically selects an appropriate camera view for the given driving situation – for example, the front right corner of the bus when pulling into a bus stop (for left-hand drive vehicles).

The project is engaged in essential groundwork to meet the needs of commercial vehicles, with complex technical hurdles to be overcome, such as how to combine images from a number of cameras into a single display which the driver can then easily take in at a glance, and also how to correctly display changing angles in articulated buses. The research project is not concentrating on creating warnings for specific hazards, rather the objective is to develop a system that gives drivers the best overview in complex driving situations, e.g. reversing.

The UR:BAN research project

UR:BAN is a joint initiative involving 31 companies, universities, research institutes and cities. They are working together to develop driver assistance and traffic management systems to enhance mobility in urban areas. The objective: safe and efficient urban traffic – which flows freely. The overall budget allocated to the project is €80m, with the German Federal Ministry for Economic Affairs and Energy (BMWi) providing 50 per cent of the funding. Cities are the focal point of EU traffic policy, as 70 per cent of Europeans are city-dwellers. UR:BAN will run until 2016.

Further information on the UR:BAN research project is available at www.urban-online.org