

# Innovation Programme



## Summary

High Tech Automotive Systems

Steenovenweg 1  
P.O. Box 1015  
5700 MC Helmond

T +31 492 562500  
F +31 492 562501  
info@htas.nl  
www.htas.nl

# High Tech Automotive Systems: Innovation Programme

## Introduction

The Dutch automotive sector consists of over 200 companies, mainly suppliers, with special strengths in materials, mechatronics, embedded systems and heavy duty vehicles. Academic research and education is concentrated at the three technical universities and several polytechnical colleges. TNO is a top technological institute in the related areas of integrated safety, vehicle dynamics, powertrains, human factors, mobility, logistics and ICT. The sector benefits from knowledge institutes as the Embedded Systems Institute (ESI), the Holst Centre and top ranking cross border institutes like IMEC, RWTH, FEV, Fraunhofer, IKA/FKA.

The Dutch automotive industry joined forces to create the HTAS Innovation Programme. HTAS is initiated by the Federatie Holland Automotive (FHA). HTAS is set-up as an open programme in which industrial partners, knowledge institutes, both national and international, and government can participate. HTAS is based on a common vision and policy that can be summarized as follows:

- > The Dutch automotive industry chooses 'Driving Guidance' and 'Vehicle efficiency' as prime focus areas for growth and innovation.
- > An 'Enablers' programme on Education, Knowledge Transfer and Business Development is needed to support innovation and development of SME as well as growth in employment.
- > The goal is to increase turnover from € 12 to 20 billion and employment with 10.000 FTE by 2015.

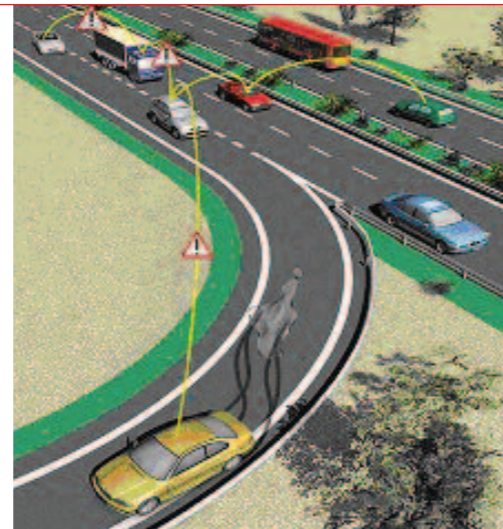
## Driving Guidance

Driving Guidance is the area of automotive ICT. Electronics are put to use for information, entertainment and driver support and will eventually take over driving tasks. The goal is to improve traffic flow, safety and environment.

### The connected car

This is the new world of external systems that connect to the car or vice versa. The car connects to the outside world in a two way communication for improved safety, traffic management (floating car data, road billing), infotainment downloads, internet, repair, security etc. The connection is wireless and increasingly autonomous and will use a multitude of protocols for different purposes. Proposed projects within this work package are:

- > A scalable computer concept to support road pricing, e-call and connectivity of nomadic systems in cars;
- > E-horizon; better fuel efficiency and safety by using navigation information for powertrain control and accident prevention;
- > Advanced navigation functions;
- > Cooperative driving: intelligent sensors and telematics in combination with Galileo positioning and new traffic management algorithms to improve the traffic flow, safety and reduce emissions.



### Vehicle Dynamics Control

Today advanced chassis control systems use motion based sensing of the vehicle body and wheels as input to counteract undesirable vehicle motions. Directly measuring the forces between the tire and the road has not yet been possible. New sensing techniques, including virtual sensors, allow these forces to be measured directly so that preventive actions can be taken earlier and more accurately to improve vehicle handling and stability. New integral chassis control strategies are to be developed for a range of situations and vehicles.

### Integrated Human Machine Interaction (HMI)

The load of new information systems in vehicles aid but also distract the driver. The objective of the underlying programme is the development of a generic integrated and adaptive Human Machine Interaction for vehicles. This will increase driver comfort, reduce workload and decrease traffic risk and thus increase the added value of support and warning systems for the driver. An integrated and adaptive HMI will tune the different functions to each other as well as to the state of the driver. It will have a flexible architecture to be applicable to a wide range of vehicles. Prototypes will be validated in a demonstration truck, a bus and a car.

## Efficient Vehicle

CO<sub>2</sub> emission is a growing concern for climate change. In spite of worldwide research on alternative energy sources the internal combustion engine is expected to be the main propulsion concept for the next 20 years. The prime solution for the foreseeable future is the reduction of fuel consumption.

The focus area 'efficient vehicle' targets an increase of the overall power efficiency of diesel powered Heavy Duty vehicles with 20%. This will be realized by significant improvements in the fields of 'efficient powertrain' and 'light constructions'.

### Efficient powertrain

The demand for an efficient and clean vehicle does not only require optimal subsystems like engine, aftertreatment and transmission, but increasingly calls for an integral control approach of the complete Powertrain. Therefore the content of this programme is structured as follows:

- > Integrated Powertrain Control to optimize the complex interaction of subsystems; a new concept for optimal energy management control a.o. using virtual sensors and navigation information;
- > Advanced Diesel Combustion focuses on research to optimize the combustion process by new in line sensors and real time control, including supporting technologies and new fuel technology;
- > Aftertreatment for heavy duty diesel engines. focuses on mapping of full cycle emissions, new catalysts materials, new filter systems and control strategies;
- > High Efficiency Transmission researches advanced automatic transmissions in combination with heavy duty hybrid traction technology and intelligent system control.



### Light Constructions

The programme 'Light constructions' aims to develop technologies for significant weight reductions in specific areas where, besides fuel reduction, there are additional benefits for other vehicle properties like comfort, vehicle dynamics, safety or noise reduction. The programme will also work on production technology for composites to meet automotive requirements and new areas for plastics to replace metals.

## Enablers

Innovation is not only a matter of technology. A number of non technical issues need to be resolved to support a successful programme:

- > **Education:** In consultation with the industry new specialized automotive education programmes will be developed at the TU Eindhoven and other education institutes to support sustainable growth of the sector.
- > **Knowledge Transfer:** To enhance validation of knowledge into new products this programme will intensify cooperation between knowledge institutes and industry, especially SME's, a.o. by network activities for knowledge dissemination and by large scale demo projects.
- > **Business:** To support SME's in managing the changes in the value chain this programme will focus on new business models and professionalism, on attracting finance for innovation and on marketing support.

## Governance and Finance

HTAS will have a lean organization to execute the programmes with maximum involvement of the contributing partners. The funding partners will form a General Assembly to decide on the annual business plan. The General Assembly will form a Programme Committee to be in close contact with the Programme Office that manages the programmes and finance in line with the business plan. The Technical Advisory Board will advice on new R&D programmes, monitor market developments and provide new input for the Innovation Programme.

The HTAS programme is planned at an overall investment level of 158 million €. The Ministry of Economic Affairs is requested to co-finance the Innovation Programme based on equal funding by industry and knowledge partners. The Ministry will take part in the General Assembly and will have the final decision on co-funding of proposed projects. An operational role for Government is planned to facilitate pilots and demo projects in the area of Driving Guidance.

## Ambitions and Planning

The Netherlands aims to become an international Hot Spot for innovation on Driving Guidance and Vehicle Efficiency. The industry and knowledge institutes are strong, focused, ambitious and committed. The HTAS Innovation Programme lines up with governmental goals. Society needs the innovations HTAS is planning for. The economy will benefit financially, in quality and employment. Together the Dutch automotive industry and government are in an ideal position to create the enablers for innovation and realize an internationally distinguishing programme. Drawbacks are indicated as well as the means to solve them. HTAS is ready for a go.

The programme is planned to start by mid 2007 and run over a 5 year period. Because of the international character of the automotive industry the participation of foreign organizations is actively stimulated.

