Improvements in vehicle efficiency, the implementation of new drive-lines, and improved efficiency of transport systems have so far proved insufficient in our efforts in proceeding towards sustainable transport and logistics systems. The difficult task we face is to create the potential for sustainable, safe transport systems and, at the same time, increase effectiveness and efficiency. Future development cannot be conducted by a single industrial, public or academic actor. Mitigating climate impact and reducing risks in the transport sector are serious challenges that require collaboration between various stakeholders, including business and industry agents and the society as a whole. To approach the problems associated with transport development there is a need to simultaneously address several levels in and perspectives on the transport system, taking into consideration the interaction of vehicles and vessels, networks of infrastructures and the demand and supply of transport and logistics services.

Our key challenges:
- environmental impact
- land use
- urbanization
- traffic accidents
- effective transports

Mobility of people and goods is a fundamental part of the modern society and generates tremendous economic and social value. However, growing transport volumes pose challenges such as climate change, environmental pollution and traffic accidents.
OUR VISION
To become leaders in research and education on green, safe and efficient transport solutions.

TRAFFIC SAFETY
Focus is on all aspects of safe road transport of or by people, including safe interconnections to other transport areas and modes.

TRANSPORT EFFICIENCY AND CUSTOMER ADAPTED LOGISTICS
Focus is on all aspects of efficient and effective transport including and connecting several subsystems such as individuals’ mobility, companies’ logistics systems, transport and traffic systems.

SUSTAINABLE VEHICLE TECHNOLOGIES
Focus is on electrification, hybridization, renewable fuels, catalysis, combustion engines light weight materials – and their respective application for different modes of transport.

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Sweden was the first country to express a Vision Zero (no fatalities or severe injuries in traffic accidents) thus making safety a systemic issue. Traffic safety research includes efforts to better understand real traffic environments, countermeasures to avoid accidents and prevent injuries, and actions to mitigate their consequences. Increasing worldwide efforts to develop connected and self-driving vehicles pose new challenges. The emerging technologies bring high hopes for a new paradigm in traffic safety with expectations on a dramatic decrease of accidents. Traffic safety is also a boundary condition for the automated transport system.

Research, innovation and education are targeting high achievement within three active fields:

Field data collection and analysis aims at developing a holistic understanding of occurrence and effects of incidents and accidents; including the assessment of risk and benefit in automated systems compared to the safety levels of human drivers.

Accident avoidance and automation aims at developing new technologies and safety systems as well as developing better understanding of human factor, human behaviour and driver models.

Injury prevention aims at developing increased crashworthiness, advanced adaptive vehicle structures and protective systems. All collision types and all categories of road users are included.
Well-functioning transport systems are essential for the effectiveness and efficiency of logistics systems and thereby the competitiveness of firms as well as mobility for people and quality of life.

The profile includes two highly interrelated active fields, reflecting two main perspectives, where researchers meet to jointly develop multidisciplinary research, education and innovation. These active fields are: Demand for transport services and logistics; and Supply of transport and logistics services.

The two active fields address challenges related to designing, enabling, managing and maintaining efficient, flexible and sustainable transport and logistics systems; as well as understanding the interplay – and facilitating coordination and cooperation – between actors in supply chains, operations and transport networks.

A growing awareness of the relationship between transport efficiency and the environmental consequences of different logistics and transport solutions also spurs the development of the research.
Chalmers has a long scientific tradition and a set of strong research centres in this profile area, which focuses on improving vehicles and vessels towards better fuel economy and less environmental impact. All conventional transport modes are represented.

Four active fields have been identified: Combustion engine research and; electric and hybrid vehicles, both aiming to find sustainable solutions for how to propel vehicles in future; Vehicle concepts and design aiming at reducing propulsion resistance; and Vehicle environmental impact aiming at analysing factors affecting future generations of vehicle powertrains and concepts towards more sustainable vehicle technologies.

In addition to the active fields identified within each profile we are also exploring the potential need for three active fields that cut across the excellence profiles: Future Urban Transport, Long distance transport and Transport System Challenges.
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RELATED CENTRES
Collaboration with industry, organisations and the public sector permeates the majority of our activities. Through close interaction with society we build the conditions for sustainable development, both locally and globally.

The research centres facilitate and coordinate collaboration between academic researchers and industry. In order to develop the impact of our research on society, we will develop additional platforms of interaction with industry and society as well as new ways of organisation and stimulating innovation in order to foster the development of new transport solutions.

The collaboration between academia and industry enhances the exchange of knowledge in both directions. Our researchers collaborate with nearly 400 different companies where the majority of the companies are involved in several projects. Numerous of Swedens leading companies as well as international companies utilizes the results achieved by the researchers within the Transport Area of Advance. The senior researchers have been involved in private and public organisations, both national and international, to support in setting policies and standards.

Collaboration with Science Parks, the School of Entrepreneurship and other actors in the innovation system to which Chalmers is linked create a starting point for these efforts.
University of Gothenburg is an integrated part of the transport research effort – the Sustainable Transport Initiative. Together with the core research group of logistics and transport management at University of Gothenburg, there is a wide range of researchers in fields such as applied IT, law, economics, global studies, psychology, marketing, organization, cultural geography and chemistry, which complements the research groups at Chalmers.
COMMUNICATION AND SUPPORT

For more information of our activities, events and research in the Transport Area of Advance visit our website:

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