



as of December 2013

# MOBILITY DEPARTMENT





### MOBILITY DEPARTMENT

Mobility is a basic human need and a cornerstone of the economy. However, global challenges such as climate change, a depletion of raw materials, an increase in transport volume and urbanisation are forcing us to take a fundamentally different approach. Mobility, for instance, has to meet three key requirements: safety, efficiency and environmental sustainability. The way we respond to these challenges has to be factored into every level of the mobility system: from vehicle and infrastructure to transport system.

Thanks to a staff of around 160 and an integrated approach, the Mobility Department is able to cover those areas of research which are integral to a holistic view of the mobility system. This pool of expertise enables us to address a wide range of emerging topics.

- I Improving transport infrastructure in terms of increased safety and cost-efficiency in the context of operation and maintenance,
- I the optimisation of co-modal transport systems, which encompass all forms of transport (pedestrian, individual and public transport), as well as
- I the development of integrated vehicle concepts featuring electric drive concepts and lightweight construction technologies, both of which are key technologies, are at the heart of our research activities.

Emerging technologies are a crucial part of future innovations. By focusing on these, we help our clients to develop business models and, ultimately, to bring their innovations successfully to market.

In every area the focus is on the development of models, algorithms and numerical simulations, enabling us to map complex systems and interdependencies in the virtual realm and to develop new approaches.

#### BUSINESS UNIT

### TRANSPORTATION INFRASTRUCTURE TECHNOLOGIES

A sound transport infrastructure that works is fundamental to mobility and transport. The Mobility Department's Transportation Infrastructure Technologies Business Unit is focused on research into the safe, efficient and environmentally sustainable structuring of such a transport infrastructure.

Using ultra-precise measuring data on road conditions, route mapping, road space and the structural behaviour of the infrastructure, the team of around 30 researchers carries out infrastructure-based analyses and simulations geared towards improved road safety, cost-effective maintenance management and the greater environmental sustainability of the infrastructure. Furthermore, a high-quality laboratory infrastructure is in place for the validation of simulations and the development of models and algorithms.

Combining data on road conditions with data on accident statistics and also with vehicle-based parameters multiplies the available options in terms of infrastructure-based transport safety analyses and accident prevention. The analysis of the dynamic behaviour of the transport infrastructure, e.g. bridges and critical infrastructures such as hospitals, as well as the modelling and simulation of acoustic properties and emissions, are high priorities.

#### Portfolio:

- I Road Surface and Road Area - Measurement, Modelling and Optimisation
- I Road Safety and Accident Prevention
- I Transport Infrastructure - Structural Dynamics

### BUSINESS UNIT

#### DYNAMIC TRANSPORTATION SYSTEMS

The Mobility Department's Dynamic Transportation Systems Business Unit performs research in traffic systems optimization to enable pedestrians, cyclists, public transport and motorised individual traffic getting from A to B more quickly, more safely and in a more environmentally friendly way - while at the same time ensuring that the entire transportation system continues to work in an optimal manner. This consideration of all traffic modes is the key to efficient mobility systems.

Such complex research issues can be tackled with the business unit's profound experience in the fields of traffic flow measurement, analysis, simulation and control. Data from different sensor sources are collected, analysed, modelled and integrated into complex simulation tools. This allows accurate predictions about travel times or capacity utilisation in order to guide people and traffic flows safely and efficiently - the aim being to balance the optimum of every traffic mode with the entire transportation system optimum.

##### Portfolio:

- | Mobility Data Measurement and Analysis
- | Transportation Modelling and Simulation
- | Transport Logistics and Fleet Management
- | MIFARE™ and RFID Technology

### BUSINESS UNIT

#### ELECTRIC DRIVE TECHNOLOGIES

The shift from the conventional vehicle towards the various hybrid technologies and purely electrically driven vehicles has already begun. The range of micro, mild, full and plug-in hybrids already available or poised for launch is a clear indicator that electromobility is regarded as our biggest short-to-medium-term hope for environmentally friendly mobility.

In recent years, the Mobility Department's Electric Drive Technologies Business Unit has positioned itself as a recognised development centre for electric drive concepts, helping both manufacturers and suppliers adapt to the electric era.

The team of around 35 researchers is focused on optimising not just the energy storage device, i.e. the battery, but also the entire powertrain, from the power electronics to the final drive as well as the vehicle itself, in a bid to extract maximum efficiency.

Using sophisticated simulation methods, experts combine the thermal, electrical and mechanical properties of the various components of the powertrain in order to be able to simulate the entire vehicle as accurately as possible and to optimise it accordingly.

##### Portfolio:

- | Modelling, Simulation and Library Development of Electric Drives and Vehicles
- | Design and Prototyping of Electric Components
- | Testing and Validation of Electric Components

### BUSINESS UNIT

#### LIGHT METALS TECHNOLOGIES RANSHOFEN

The research focus of the Mobility Department's Business Unit Light Metals Technologies, based in Ranshofen, Upper Austria, is centred around new aluminium and magnesium alloys and their fusion with steel parts and composites on vehicles. When developing lightweight components, one of the main challenges lies in the ability to reduce weight while also ensuring passenger safety during a crash.

The use of lightweight materials is one of the fastest growing trends in the automotive industry, which is reflected in the increased use of this technology in vehicle design. The use of light alloys instead of steel means a huge reduction in weight, which in turn has a positive effect on the energy efficiency and CO<sub>2</sub> emissions of vehicles.

In striving to rise to these challenges, the Light Metals Technologies team of around 40 specialists has both cutting-edge simulation tools as well as a unique research infrastructure at its disposal, allowing new metal alloys and bespoke processes for metal forming and the casting of lightweight components to be developed and prototyped.

##### Portfolio:

- | Customised Materials Development
- | Process Development and Optimisation
- | Material Based Design

#### MOBILITY DEPARTMENT - FACTS

Employees:	approx. 160
Locations:	Vienna and Ranshofen
Head of Department:	Christian Chimani

## CONTACT

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