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16th International Conference

Commercial Vehicles 2021

- Truck, Bus, Van, Trailer -

Top Issues:

- Increasing the efficiency of modern commercial vehicles
- Focus on Zero Emissions: electrification, hybridisation, hydrogen drives
- Urban traffic of tomorrow – public transport
- Automated Driving, IOT, Connectivity and Digitalisation

+ Factory Tour and
Test Drive, ECS

+ Exhibition

+ Simultaneous Translation

+ Parallel conference
"Autonomous Trucks"

Note: Your health is our priority!
In order to organize a safe event, we are
in close contact with the authorities and
institutions involved.

With Experts from:

ACEA | ANSYS | AVL | CAN in Automation | Daimler Buses – EvoBus | Daimler Truck | Deutsche Bahn |
DLR | Ebertconsulting | Fraunhofer ITWM | HAWK | IAV | IVECO | KIT | MAGNA POWERTRAIN |
MAN Truck & Bus | Michelin | Schaeffler Paravan | Volkswagen | Westport Fuel Systems | XTRONIC |
ZF Group



An event organized by VDI Wissensforum GmbH
www.vdi-international.com/01TA704021
 Phone +49 211 6214-201 • Fax +49 211 6214-154

September 7 - 8, 2021, Linz, Austria

First conference day
Tuesday, September 7, 2021

● 07:50 **Registration**

● 08:50 **Welcome and Opening of the conference**
Prof. Dr.-Ing. Karl Viktor Schaller, Munich, Germany



Plenary Speeches

● 09:00 **Physical Transport in a Digital World**

- 'Digital Transformation' in the commercial vehicle market
- 'Functional integration' on vehicle level
- 'Innovative vehicle systems' – chassis concepts, propulsion systems and future truck concepts
- Intelligent Traffic
- Green Transport

Dipl.-Ing. Franz Josef Dorfer, Senior Director Advanced Product Engineering MPT,
Co-author: Dr. Karl Masser, both of MAGNA POWERTRAIN GmbH & Co KG, Lannach, Austria

● 09:30 **The future of trucks – the EU-perspective**

- Commercial vehicles on the road to carbon-neutrality
- How and when will alternative powertrains become the best option?
- What charging and refueling infrastructure do we need?
- The political framework on European and national level

Dipl.-Ing. Thomas Fabian, Director Commercial Vehicles, European Automobile Manufacturers' Association (ACEA), Brussels, Belgium

☕ 10:00 **Coffeebreak and visit to the exhibition**



Ways to achieve Zero Emission

Moderation: Dr. Karl Masser, Magna Powertrain Engineering Center
Steyr GmbH & Co. KG, St. Valentin, Austria



Development processes and methods

Moderation: Prof. Dr.-Ing. Jörg Ebert, Ebertconsulting GmbH,
Cologne, Germany

● 10:30 **ZF E-Mobility products and software for Commercial Vehicles**

- Energy efficiency means by thermal control and intelligent control of auxiliary units
- Vehicle charging system and process
- CV e-drive platform
- Maximized modularity with equal components for electric axle and central drives

Dr.-Ing. Daniel Morgenweck, Software development e-mobility commercial vehicles, Development commercial vehicles/E-mobility functions & system integration, Co-authors: Michael Großmann, Dr. Franz Bitzer, all of ZF Group, Friedrichshafen, Germany

Lightweight design and cost reduction with a lean, agile MSCDPS® product creation process

- Intelligent lightweight construction with steel for twist beam axles
- MSCDPS® development process considers the entire product development process
- Material and production cost optimization through NETSHAPE construction
- Large-scale production of fiber composite material components

Prof. Dr. Ing. Jörg Ebert, Managing Director, Ebertconsulting GmbH, Cologne, Germany, Co-authors: Dipl.-Ing. oec. Jan Peckolt, Dr.-Ing. Florian Lenz, both NEMOS GmbH, Duisburg, Germany

● 11:00 **Thermoelectric Generators (TEG) for Heavy-Duty Vehicles as an cost-effective Waste Heat Recovery System**

- Technology for fuel reduction and CO₂-conformity of future commercial vehicles
- Holistic design and evaluation using modern simulation methods
- Worldwide peak values (power density >100W/kg, amortization time <2 years) of the technology
- Possible vehicle applications for diesel, CNG/LNG, H₂ commercial vehicles

Lars Heber, M. Sc., Research Associated and Project Manager, Alternative Energy Converter, Co-authors: Julian Schwab, M. Sc., Timo Knobelspieß, M. Sc., all of Deutsches Zentrum für Luft- und Raumfahrt (DLR e. V.), Stuttgart, Germany

eDrive & Fuel Cell Powertrain Systems Engineering for Commercial Vehicles

- Systems engineering for Commercial Vehicles
- Integration of fuel cell systems
- Process and tool landscape for overall vehicle projects
- Product development

Dr.-Ing. Hubertus Ulmer, Manager eMobility and Systems Engineering, Commercial Vehicles, Commercial Vehicle Powertrain, Co-authors: Dipl.-Ing. Ralf Wascheck, Dipl.-Ing. (FH) Florian Brandau, all of IAV GmbH, Gifhorn, Germany

● 11:30 **Hybridization of Heavy Duty Trucks: Market analysis and technology for High Voltage as well as Low Voltage solutions**

- Architecture of hybrids
- Comparison of high voltage hybrids and low voltage hybrids
- CO₂-reduction of hybrids in VECTO
- Market penetration of hybrids

Dr. Matthias Holzer, Head of Strategy and Portfolio, Truck and Van Driveline Technology, Co-author: Dr. Frank-Detlef Speck, both ZF Group, Friedrichshafen, Germany

Fatigue development of a 10x10 commercial vehicle frame using dynamic- and fatigue simulation, virtual iteration and fatigue testing including road load data acquisition

- Determine dynamic loads via virtual iteration
- Generation of internal forces via MBS
- Development of a taylormade test rig concept incl. durability run
- Generation of synthetical loads from a stochastic signal

Dipl.-Ing. (FH) Daniel Übellacker, Manager Fatigue Testing, Fatigue Testing laboratory, Co-author: Dr., Dipl.-Ing. Thomas Mrazek, both of MAGNA – Engineering Center Steyr GmbH & Co. KG, St. Valentin, Austria

12:00

Data-driven selection of vehicle variants for the E/E integration test

- Consistent use of data from the development process
- Linked modelling of vehicle configurations, components and functions
- Automated selection of configurations for test benches and test vehicles

Thomas Schulz, M. Sc., Technical employee, Electrics/Electronics Development Commercial Vehicles, Co-author: Dr. Simon Herrmann, both Volkswagen AG, Wolfsburg, Germany



12:30 Lunch and visit to the exhibition



14:00 Short break and departure for the test drive (transfer approx. 45 minutes)

**Factory Tours, Vehicle Exhibition and Test Drive**

Please book your participation in the event early as there is a participant limit. Sturdy shoes and FFP2 masks* are mandatory.



*FFP2 masks will be provided.

Source: ENGINEERING CENTER STEYR GMBH & CO. KG, St. Valentin, Austria

Get to know the Magna Powertrain Engineering Center Steyr in St. Valentin better.**Factory tour**

with eMobility Center, road test, strength test, prototype construction, test area and simulation.

Test drive

Various vehicles will be on display at the ECS site, and some of them will also be available for test drives at the test site.

Currently planned exhibition and test vehicles (subject to change):

- ECS ADAS Demonstrator
- Magna eDrive Demonstrator (EtelligentReach and EtelligentEco)
- Rheinmetall HX2 10x10
- Rosenbauer RT
- And other vehicles and demonstrators from other well-known manufacturers and suppliers.

Special features of the ECS test site are the steep slopes (60 % and 40 %), the wading basin, the bad road and 7 km off-road track, as well as the extended on-road test area for autonomous driving (ADAS).

Food and drink will be provided.

Some vehicles can be driven by participants themselves

Following

19:00 Get-together

To conclude the first day of the event, the VDI Wissensforum invites you to a get-together. Take advantage of the relaxed atmosphere to expand your network and have in-depth discussions with other participants and speakers.

Note: We are continuously monitoring the situation during the Corona Pandemic and will consider appropriate concepts for the evening event.

Second conference day
Wednesday, September 8, 2021



Hydrogen propulsion

Moderation: **Dipl.-Ing. Thomas Nickels**, MAN Truck & Bus SE, Munich, Germany

08:30 The potential for a high efficiency hydrogen engine using Westport Fuel Systems commercially available HPDI Fuel System

- Diesel-cycle combustion using Hydrogen HPDI technology
- High efficiency and high performance
- Zero to near-zero greenhouse gas emissions
- Cost-effective CO₂-reduction, particularly for heavy-duty commercial vehicle applications

Scott Baker, Vice President, Engineering, Global Engineering, Co-authors: Dr. Sandeep Munshi, Dr. Jian Huang, alle Westport Fuel Systems Inc., Vancouver, Canada

09:00 E/E architecture and operating strategy: challenges and solutions for energy- and cost-efficient operation of fuel-cell trucks

- CO₂ legislation and electrified commercial vehicles with fuel cells
- Towards zero-emissions through energy management and E/E architecture
- Challenges of complex E/E architectures
- Possibilities and benefits of predictive control structures in energy management

Dipl.-Ing. Johannes Pell, System Simulation Engineer CV, Commercial Vehicle Systems, Co-authors: Dipl.-Ing. Andreas Schilk, Wolfgang Gruber, M. Sc., all of AVL Commercial Driveline & Tractor Engineering GmbH, Steyr, Austria

09:30 Coffeebreak and visit to the exhibition



Transport efficiency

Moderation: **Dr. Thomas Dieckmann**, ZF Group, Commercial Vehicle Control Systems, Hanover, Germany

10:15 Tire contribution to truck sustainability – Roadmap to 2030

- Low rolling resistance tires: Contribution to truck makers CO₂-reduction versus fleets acceptance
- Innovative design, sensors and algorithms: Pushing the limits of tire efficiency and cost of ownership
- Life Cycle Analysis & Environment Product Declaration: Bio-sourced and recycled tire materials
- Tire Circular Economy: RFID & Digitalization as enabler to more efficient retreading services

Dipl.-Ing. Jean-Francois Beaupère, Truck & Bus Original Equipment Tires Global Product Planning, Marketing, **Dipl.-Ing. Frédéric Domprobst**, Truck & Bus Tires Advanced Engineering, R&D, both of Michelin, Clermont-Ferrand, France

10:45 Consumption-optimized planning of transport missions using virtual drives

- European LIFE project Ecotravid on the consumption optimized planning of transport missions
- Detailed calculations of energy losses using real world geo-referenced data
- Realistic vehicle models for trucks, trailers and driver influence
- Measurement campaign with 20 trucks/trailers on real transport missions

Dr. Christine Biedinger, Research Assistant, Mathematics for Vehicle Engineering, Co-authors: Dipl.-Ing. Thomas Halfmann, both Fraunhofer ITWM, Kaiserlautern, Germany, Pierre Cuny, Master, Collecte Localisation Satellites SAS, Toulouse, France



IOT, Connectivity and Digitalisation (I)

Moderation: **Dipl.-Ing. Jörg Lützner**, Continental Automotive GmbH, Schwalbach, Germany

Towards the standardization of a high speed truck-trailer data connection

- ISO 11992 CAN-based truck trailer communication does not provide required bandwidth and features for future application
- VDA FAT explored the use of Gigabit Ethernet for next generation truck trailer link
- International ISO standardization for all protocol layers from physical to application layer is under preparation
- Current state of work and additional contributors to the standardization effort

Dipl.-Inform. Konrad Feyerabend, Global Innovation Domain Manager Connectivity, Product Innovation Connectivity, Co-author: Dipl.-Ing. (TU) Andreas Goers, both of ZF Group, Commercial Vehicle Control Systems, Hanover, Germany

Virtual Validation of ADAS functions – Safety by Design

- Safety of autonomous vehicles
- Virtual testing and validation
- Edge-case validation of sensor technologies
- Physics-based simulations

Petr Fomin, M. Sc., Senior Application Engineer, Sensors and Photonics, Co-author: Günther Hasna, both of ANSYS Germany GmbH, Ismaning, Germany



Urban Traffic in tomorrow's World – Public transport

Moderation: **Ing. Wolfgang Prokopp**, Daimler Buses – EvoBus GmbH, Ulm

Automated and connected city busses – Optimized, needs-based service through intelligent use of data

- Potentials of new technologies in the field of city busses
- Predictive maintenance through Artificial Intelligence and Big Data analytics
- Connected city busses for optimized operational procedures and needs-based service

• Use in scheduled operations - potentials through learning in the fleet
Nicole Rossel, M. Sc., Member of Scientific Staff, Institute for Information Processing Technologies (ITIV), Co-authors: Martin Sommer, Prof. Dr.-Ing. Eric Sax, all of Karlsruher Institut für Technologie (KIT), Karlsruhe, Germany

Successful fleet transformation to eMobility

- Mastering the challenges of eMobility
- Deal with all relevant system parameters of eMobility
- How a 360° consulting approach enables a successful fleet transformation

Dipl.-Betriebsw. (FH) Michael Voll, Head of MAN Transport Solutions Consulting, MAN Truck & Bus SE, Munich, Germany

11:15 Concept study of a heavy-duty axle for trailer with optional electrical machine

- Optional integration of electrical machines in trailer axles
- Energy recuperation in trailers
- Lightweight design with electrical machines
- Benefits of axle framework design

Laurent Matthies, M. Eng., Manager lightweight design lab, Automotive engineering, Co-author: Prof. Dr.-Ing. Christopher Frey, both of HAWK – Hochschule für angewandte Wissenschaft und Kunst, Göttingen, Germany

Health & safety in public transport – Better climate and optimized hygiene in times of Covid-19

- Effects of the pandemic on public transport
- Risk reduction of aerosol transmission through new filters in the HVAC-system
- Complex measures for an increased level of passenger safety in public transport
- Scientific validation of the measures based on new research findings

Dipl.-Ing. (FH) Christoph Glöggler, Product Engineer, Entire vehicle/ Concepts, Product Engineering Entire Vehicle/Concepts, Co-authors: Christian Neuchl, Dipl.-Ing. (FH) Alexander Zaiser, all Daimler Buses – EvoBus GmbH, Neu-Ulm, Germany

11:45 Future chassis solutions: light & intelligent

- Chassis solutions for the next truck generation
- Examples of cost focused light weight solutions for CV
- Digitalization: Smart Chassis Components
- Next generation break and steering systems

Dipl.-Ing. (FH) Holger Bublies, Head of Development CV Chassis Technology, ZF Friedrichshafen AG, Stemwede, Co-author: Dr. Thomas Dieckmann, ZF Group, Commercial Vehicle Control Systems, Hanover, Germany

Autonomous vehicle studies – societal benefits for the mobility of the future with its creative applications of tomorrow

- Opportunities and possibilities from autonomous mobility offer new perspectives and surprising solutions
- Transformation possibilities for the bus of the future from the user and passenger perspective and their requirements
- Fantastic scenarios: Increase in utility value and completely new perceptible quality impression for autonomous buses of the future
- Growth of competition with new smart mobility offers
- Autonomous buses as the most attractive and sustainable mobility option

Dipl.-Des. Stephan Schönherr, Vice President Styling Bus, Styling Bus/ Engineering Vehicle Styling Bus, Co-author: Dipl.-Des. Thorsten Bergmaier-Trede, both of MAN TRUCK & BUS SE, Munich, Germany

12:15 Lunch and visit to the exhibition



Automated Driving

Moderation: **Torsten Klein**, Volkswagen AG, Wolfsburg, Germany



IOT, Connectivity and Digitalisation (II)

Moderation: **Dr. Jürgen Wagner**, MAN Truck & Bus SE, Munich, Germany

13:30 Intelligent Automated Driving Features for Refuse Collection Vehicles

- Hybrid Automated Driving (AD) solution for municipal vehicle applications
- Increased Operation Design Domain (ODD) by efficient cost reduction trade-off
- Intuitive human machine interface concept for the hybrid AD approach
- Automotive standards compliant approach to transfer from prototype vehicle to serial development

Dr., Dipl.-Ing. Thomas Mauthner, Lead Engineer ADAS System Design, PTE/DNA ADAS/AD Feature Integration, Co-authors: Bernardo Henriques, M. Sc., Dipl.-Ing. Gernot Hasenbichler, all of AVL List GmbH, Graz, Austria

Simply Connected. The central, configurable control system for full interlinking across systems for trucks, busses and light commercial vehicles

- Simply connected to the vehicle's body components
- Simply connected to the vehicle's control units
- Simply connected to cloud's platform
- Central, configurable ECU for full interlinking across systems for trucks, busses and light commercial vehicles

Dr. Oliver Treichel, Head of EE Engineering, XTRONIC GmbH, Böblingen, Germany

14:00 Space Drive, safe digital driving and "big data" collecting from the road: Redundant steering technology for fully automated and autonomous driving

Dr. Galib Krdzalic, Chief Innovation Officer, Schaeffler Paravan Technologie GmbH & Co. KG, Pfronstetten-Aichelau, Germany

Standardized body network with cloud connection

- Body network for trail-lifts, for example
- SAE J1939 network for body builders
- Truck gateway to the in-vehicle networks
- Telematics interface for truck/trailer bodies

Holger Zeltwanger, CiA Managing Director, CAN in Automation e. V., Nuremberg, Germany

14:30 Change to plenary room



Plenary Speech

Moderation: **Prof. Dr.-Ing. Karl Viktor Schaller**, Munich, Germany

14:35 Use cases of autonomous transport – today and tomorrow

- Introduction to some pilots of Deutsche Bahn
- Integration into current road transport processes and in combination with rail freight
- Role of digitization for automation
- Future perspective of transport automation

Dr. Chung Anh Tran, Partner Corporate Strategy, Deutsche Bahn, Frankfurt am Main, Germany

15:05 Summary and end of the lectures

15:15 End of the conference



Program Committee



1. row, from left to right

Dipl.-Ing. Matthias Bengl, Iveco Magirus AG, Ulm, Germany

Dr. Thomas Dieckmann, ZF Group/Commercial Vehicle Control Systems, Hanover, Germany

Prof. Dr.-Ing. Jörg Ebert, Ebertconsulting GmbH, Cologne, Germany

Dipl.-Ing. Christof Kerkhoff, VDI e. V., Dusseldorf, Germany

2. row, from left to right

Torsten Klein, Volkswagen AG, Wolfsburg, Germany

Dipl.-Ing. Jörg Lützner, Continental Automotive GmbH, Schwalbach, Germany

Jack Martens, DAF Trucks N.V., Eindhoven, The Netherlands

Dr. Karl Masser, Magna Powertrain Engineering Center Steyr GmbH & Co. KG, St. Valentin, Austria

3. row, from left to right

Herbert Mozer, ZF Group, Friedrichshafen, Germany

Dipl.-Ing. Thomas Nickels, MAN Truck & Bus SE, Munich, Germany

Ing. Wolfgang Prokopp, Daimler Buses – EvoBus, Ulm, Germany

Dipl.-Ing. Uwe Sasse, Fahrzeugwerk Bernard Krone GmbH, Wertle, Germany

4. row, from left to right

Prof. Dr.-Ing. Karl Viktor Schaller, Munich, Germany

Dr. Jürgen Wagner, MAN Truck & Bus SE, Munich, Germany

Enrico Wohlfarth, Daimler Truck AG, Esslingen, Germany

Information on Coronavirus Safety

The health and safety of our customers and employees is our top priority. We have therefore developed a safety concept to ensure protection against the risk of coronavirus. We will closely observe official national and regional regulations and will, of course, comply with current coronavirus protection measures. This may in some circumstances result in some restrictions for participants. For example, it may not be possible to freely move between parallel sessions or the maximum capacity of the conference rooms may be limited.

Congress content provider:

VDI Society for Automotive and Traffic Systems Technology

The VDI Society for Vehicle and Transport Technologies, VDI-FVT in short, has around 28,000 members that are affiliated to at least one of its 8 technical sections. This makes it the second biggest of the VDI's dedicated societies. VDI-FVT is the community for engineers working in the vehicle industry, as well as for engineers dealing with transport and traffic outside manufacturing industries.

Traditionally, a majority of members work in automotive. VDI-FVT is the German affiliate of the world federation of automotive engineers' societies, FISITA, and it is the intellectual sponsor of many big conferences on automotive technology and thus fosters exchange and knowledge transfer both nationally and internationally. It also sponsors Formula Student Germany, awarding VDI membership to all German participants, and promotes other student competitions for transport engineers. VDI-FVT has recently reconstituted technical sections for rail and marine technologies, as well as space- and aircraft. It is putting a strong focus on transport and traffic in general and aims to mediate between technology and society.

www.vdi.de/fvt

Parallel conference

The **5th International VDI Conference "Autonomous Trucks"** will focus on future truck innovations, autonomous transport and the use of new business models. Key topics in 2021 are:

- New regulatory frameworks in Germany and Europe.
- Applications in the logistics value chain and the last mile
- Truck technology for autonomous driving

Presenting companies: AVL, Bain & Company, BrightWayVision, Cyres Consulting, Daimler Trucks, Easymile, Fraunhofer IVI, lightly.AI, Microsoft, P3 Automotive, Robotic Research and Roland Berger.

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Please contact:

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Magna Powertrain Engineering Center in St. Valentin is an internationally acknowledged engineering supplier. Latest development methods and testing facilities enable short development periods and highlights us as a full-service provider. Passenger car, Commercial vehicle and off-road OEMs use our innovation power to work together on the vehicles of the future.

Exhibitors

- Continental Aftermarket & Services GmbH
- ELGO Electronic GmbH & Co. KG
- Magna Powertrain Engineering Center Steyr
- Michelin
- Schaeffler Technologies AG & Co. KG
- ZF Group



ZF Group

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ZF is a global technology company supplying systems for passenger cars, commercial vehicles and industrial technology, enabling the next generation of mobility. ZF electrifies a wide range of vehicle types. With its products, the company contributes to reducing emissions, protecting the climate and enhancing safe mobility. In fiscal year 2020 ZF reported sales of €32.6 billion. The company employs more than 150,000 associates in 42 countries.



Source: MAN Truck & Bus SE

With more than 25 technical presentations, factory tour, commercial vehicle exhibition and test drive!

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I will be taking part as follows (at price per person plus Austrian VAT)

Price per Person plus VAT	16th International Conference Commercial Vehicles 2021	
		<input type="checkbox"/> September 7 - 8, 2021, Linz, Austria (01TA704021)
Participation fee	EUR 1,290.-	
Factory tour and test drive at ECS	free of charge	

www

Participation Fee VDI-Members **Save 50 € for each Conference Day**. VDI membership no.* _____

* For the price category 2, please state your VDI membership number.

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Conference Venue:
 voestalpine Stahlwelt, voestalpine-Straße 4, 4020 Linz, Austria

Accommodation:
 A limited number of rooms have been reserved for the conference participants: Park Inn by Radisson, Hessenplatz 16-18, 4020 Linz, Austria, Phone: +43 732 777 100-3502 oder 3500, Email: reservations.linz@parkinn.com

More Hotels close to the conference venue may be found via our HRS service
www.vdi-wissensforum.de/hrs

Information:
 The price includes coffee breaks and beverages during breaks, lunch and the evening reception. The conference materials will be provided digitally.



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