Sohjoa Baltic

Autonomous public transport - webinar

Legal obstacles on the way to sound use cases for driverless transport

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Matthias Hartwig, IKEM
Team Lead Mobility | Senior Research Associate

“Regulation must ensure that self-driving vehicles provide solutions to existing traffic problems – not exacerbate them.”

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Tips from a legal perspective

**Get approved:** Plan enough time and resources for approval and permission processes for
- vehicle
- infrastructure
- transportation permits

**Keep informed:** Keep an eye on legislative and administrative framework
- will it allow you the project you are planning?
- will it change?

**Help shaping regulation:** the legislative and administrative framework is not adjusted to driverless driving jet. Your project can help policy makers to learn about important changes to be make driverless public transport possible
Benefits of Automated driving

- Access to comfortable, affordable, accessible, and non-discriminatory transport for all
- Increasing safety of traffic
- Increasing traffic flow and efficiency with less vehicles
- Zero Emission Mobility
  - More space for people, less space for transport, less resource consumption
- Creating new economic opportunities and jobs through technological modernization and innovation
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**Downsides of Automated driving?**

- Cannibalization of public transportation, limited accessibility, less inclusion?
- Safety of the vehicle unproven and difficult to prove, cyber threats and reliability of data transfer, data protection issues?
- Automated vehicles as traffic obstruction, more traffic?
- Increased Emissions and urban sprawl?
- Loss of jobs and public control?
Legal framework for an integrated system of public transport for people and freight

- **Law for a digital world**: Rethinking public transport law due to the new flexibility and availability of vehicles and information
- **Integrated planning of public mobility** guided by three main principals
  - Access to affordable and accessible, and non-discriminatory transport for all
  - Zero emission and minimized consume of resources and space
  - Less consumption of resources and space
- **Regulate integrated systems** for all means of automated transport:
  - Regulation for a more efficient urban freight transport (transportation hubs, autonomous packing stations etc.)
  - Providing an integrated digital infrastructure for all means of automated transport
  - Open standardization and regulation, that includes as many feasible use cases as possible (goal-oriented technology neutrality)

Legal framework for safe, smooth and efficient implementation of vehicles and infrastructure

- **Safety of passengers and road users and traffic flow** to be guaranteed by Vehicle Approval Law for different driving modes and their combination: automated/ autonomous/ teleoperated driving using:
- **Law adapted to machines but safe and predictable for humans**: Vehicles must integrate in mixed traffic safely and predictable but don’t need to simulate the driver
- **Locally limited approval and Modular approval for different technical and road environments** according to use cases and technical capacity
- **Connected driving**: Legal framework for secured data from digital infrastructure and other vehicles (V2X)
- **Responsibilities** regulated for manufacturer, owner and operations manager and integration of control centers

Regulatory goals: safety, performance, zero emission and better mobility for all
Regulatory challenge: divergence of skills still nor realized by regulation

Human
Perception and analysis:
• Intelligence: Superior image recognition and ability to analyze the situation
• Intuition
• Ethical evaluation

Reaction:
• Flexibility
• Personal responsibility

Machine
Perception and analysis:
• Almost unlimited information processing capacities and multitasking capability
• Extensive access to information (internet services, different sensors, C2X)

Reaction:
• Superior reliability/ Program fidelity
• Instantaneous Reaction
Challenges in the approval process
Farewell to dualism: car permit regulation needs to cover traffic code

Paradigm shifts

- Regulation loses its addressee in the vehicle and must turn to other addressees outside the vehicle
- The approach for machines to guarantee safety is different. It can`t simulate a driver.

<table>
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<th>Car permit regulation:</th>
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<td>- Provides vehicle construction and equipment for “normal operation” at technical state of the art</td>
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<td>- Doesn’t regulate “normal operation”</td>
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<th>Traffic code:</th>
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<td>- Addresses the obligations for conduct in traffic to a specific (natural) person</td>
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<td>- Customized to human behavior, perceptive faculty and reaction patterns</td>
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<td>- The vehicle is only a tool to implement the behavior</td>
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Challenges in the approval process

Farewell to dualism: Autonomous vehicle registration under applicable law

- State-of-the-art rules of technology (e.g. ECE standards, ISO 26262) are not complied with

- Derogation only if
  - Alternative structural characteristic technically necessary and justified
  - Functional equivalent available
  - Independent technical assessment of road safety a traffic flow/inconvenience to the surrounding

- Administration and technical monitoring services have no test catalogue and must develop it on their own
Developing a new set of rules for autonomous vehicles in interdisciplinary research

Challenges in the approval process

- Vehicle
- Route
- Equipment
- System
- Technical basis

- Verification of technical equivalence
- Traffic scenarios
- Route segmentation
- Risk debilitation

- Approval
- Special permission
- Regulatory requirement

Accompanying research: Human Factors Research, Jurisprudence
International approach

Vienna Convention on Road Traffic from 1968:
• Traffic rules
• Automated driving functions are considered permissible if they correspond to UN/ECE regulations or can be overridden and deactivated
• Present driver in or outside the vehicle: how much control defines a driver?

Geneva Convention on Road Traffic + UN/ECE Regulation:
• Technical requirements
• ECE Regulation 79 (steering configuration) systems, which do not require the presence of a driver, can’t get a general approval
• Lack of international standards for automated driving functions

WP.29: Working Party on Automated/Autonomous and Connected Vehicles started working on a series of issues

- System Safety
- Failsafe Response
- Human Machine Interface
- Object Event Detection and Response
- Conditions under which the automated system will operate
- Validation for System Safety
- Cybersecurity
- Software Updates
- Data storage and Event data recorder
European approach

- European Law refers to UN/ECE Regulations
- Art. 20 2007/46/EG: Possibility of approval of new technologies through an exemption procedure (limited to series production vehicles)
  - 2019 guidelines on the particular exemption procedure for the EU Approval of automated vehicles
  - Purpose: harmonizing the practice of Member States for the national ad-hoc assessment of automated vehicles
National approaches

- Governments aim to assess and prove safety and traffic flow to a certain level
- Different safety approaches
  Functional Safety vs. SOTIF
- Safety with steward:
  - Steward as driver stays in the center of safety assessment
  - Human Machine Interface and Collaboration
- Safety without driver:
  - Driver as the main addressee of legal obligation and liability disappears
  - Vehicle compliance with traffic regulations must be proven
  - Obligations and liability shift to operator, owner and producer
  - Compliance with driver tasks that demand a present driver?
- Safe connectivity for cooperative, collaborated or teleoperated driving
  - Availability and quality of data as new safety issue
  - Cybersecurity as new safety issue
  - Safety of vehicle, infrastructure and other parts
  - Safety of an integrated overall system?
  - Safety of data in open connected systems?
- Complex administrative competences
  - FI: Traficom, local authorities for route planning
  - DL: KBA, different local and regional authorities, technical testing services (TÜV, Dekra)
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Matthias Hartwig
Team Lead Mobility
Senior Research Associate

T +49 (0) 30 408 18 70-16
M +49 (0) 176-807 295 05
matthias.hartwig@ikem.de

www.ikem.de

Institut für Klimaschutz, Energie und Mobilität e.V.
Magazinstraße 15 – 16
10179 Berlin

Domstraße 20a
17489 Greifswald