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**JOINT LEGAL IMPLEMENTATION ROADMAP
FOR FINLAND AND GERMANY**



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Joint Legal Implementation Roadmap for Finland and Germany

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Joint Legal Implementation Roadmap for Finland and Germany

The Interreg Baltic Sea Programme EU-funded Project “Sohjoa Baltic” researches, promotes and pilots automated driverless electric minibuses as part of the public transport chain especially for first/last mile connectivity. In this Joint Legal Implementation Roadmap the Finnish Transport Safety Agency (TRAFI) and the Institute for Climate Protection, Energy and Mobility e.V. (IKEM) give an overview of the legal challenges that arise in Finland and Germany when implementing automated buses in public transportation.

Each section of the roadmap summarizes the current legal situation in Germany and Finland. Where appropriate, TRAFI and IKEM give policy recommendations on how to modify the legal framework.

The areas of law that are being examined are Car registration law (I), Passenger transportation law (II), Personal legal requirements for the driver (III), Data protection law (IV), Liability law (V) and Criminal law (VI).

In the annex a legal inventory of all relevant regulations in the BSR countries and in-depth explanations on the German legal framework can be found. Furthermore, IKEM describes a best-practice-example from Germany which helps to illustrate the legal challenges as the legal discussions in the German roadmap make reference to this best-practice-example.

I VEHICLE REGISTRATION LAW

1. Necessity and legal basis for the vehicle registration

THE LEGAL SITUATION IN GERMANY

1. Vehicles must be registered only if they are tested on public roads.
2. Vehicle registration requires
 - An official application from the vehicle keeper.
 - Motor vehicle liability insurance coverage.
 - An operating license.
3. Legal basis for the vehicle registration is either § 21 StVZO¹ or § 13 EG-FGV
 - § 13 EG-FGV is to be applied with priority
 - § 21 StVZO is applicable under the following exceptional circumstances:
 - The maximum speed of the vehicle is 25 km/h or less
 - The vehicle is a prototype that was constructed especially for the test operation (§ 3 par. 2 no. 4 EG-FGV)
 - The applicable procedure decides which government agency is competent for issuing the operating license

THE LEGAL SITUATION IN FINLAND

Vehicle Act 8 §

1. A motorized vehicle and its trailer must be registered and appropriately inspected
2. If the above is not followed, the vehicle and its trailer cannot be used in traffic (prohibition of use)

Vehicle Act 66 §

1. General requirements for first registration:
 - Vehicle has been approved in a registration inspection
 - Vehicle fulfills requirements that are in force in Finland
 - Vehicle is not a certified scrap vehicle
 - Proof of payment of vehicle tax, ownership of vehicle and mandatory traffic insurance is presented
 - If the car owner is not a natural person, a person responsible for the use of car is reported.

¹A glossary explaining the acronyms can be found in the ANNEX in the section called “Legal inventory”.

I VEHICLE REGISTRATION LAW

2. Non-compliance with the applicable regulations

THE LEGAL SITUATION IN GERMANY

1. An automated driverless vehicle cannot receive an operating license because it does not comply with European law (e.g. UNECE rules) or international law:

- At the international level, UNECE rules require automated vehicles to be designed such that the driver may, at any time and by deliberate action, override the automated driving function (UNECE Regulation No. 79, 5.1.6).
- The Vienna Convention on Road Traffic (Art. 8) requires every moving vehicle to have a driver.

2. Other regulations may restrict the use of automated functions in vehicles:

- The automatic functions of the automated car must comply with regulations on the driver's behavior.
- Technical regulations requiring cars to have seat belts, a steering wheel, mechanical breaks, and automobile mirrors may present additional hurdles.
-

3 The presence of an onboard “vehicle operator” may resolve some of the legal problems. Even with a vehicle operator, however, UNECE Regulation No. 79 prohibits an automated vehicle from exceeding a speed limit of 12 km/h. In addition, it is impossible to avoid violating some provisions of the German Road Traffic Regulations (StVO).

POLICY RECOMMENDATIONS

1. National law:

- Promoting a change in road traffic law that permits the public testing and use of completely driverless vehicles
- Promoting the adaption of technical regulations to the new circumstances of autonomous driving

2. International Law:

- Promoting the modification of the relevant regulations in the UNECE rules and the Vienna Convention on Road traffic so that driverless vehicles are not forbidden under international law

THE LEGAL SITUATION IN FINLAND

1. As in Germany, in Finland an automated driverless vehicle cannot obtain a car registration due to its non-compliance with European law (e.g. UNECE rules) as well as regulations of the Finnish road traffic law (Vehicle Act).

2. Every vehicle must have a responsible driver, but in testing automated vehicles the driver can be either inside or outside the vehicle.

I VEHICLE REGISTRATION LAW

3. Issuing a special permit

THE LEGAL SITUATION IN GERMANY

1. In exceptional situations, a special permit can be granted to exempt the automated car from existing regulations. Vehicles are eligible for such permits only if technical and organizational measures are adequate to guarantee the “safe and smooth flow of traffic.”
2. The issuing agency can add obligations or other stipulations to the permit to ensure that such measures are in place. Such regulations may apply to the following:
 - Geographic limitations.
 - Time limits.
 - Provisions under which the license can be invalidated.
 - The onboard vehicle operator.
 - Operational safety.
 - Consequences of an accident.
 - Transport of persons.
 - Logbook or other types of documentation.
 - A passenger safety briefing.

THE LEGAL SITUATION IN FINLAND

Testing of automated vehicles (SAE levels 0–5) is possible in road traffic in Finland using a test plate certificate.

Vehicle Act 66 f §

1. An enterprise, agency or other organization engaged in research and development of automated vehicles may apply to TRAFI for a test plate certificate. The certificate entitles the bearer to drive test vehicles, to a limited extent and on a temporary basis, both in road traffic and off-road.
2. For testing in road traffic, TRAFI will issue test plates.
3. A Trade Register extract from the company’s country of incorporation, not more than three months old, must be appended to the application.
4. The applicant must also enclose a trial plan that includes:
 - a general description of the trials
 - technical specifications of the test vehicles
 - information on the road area where the trials are intended to be conducted
 - proof of insurance cover for third party liability
 - description of how road safety will be ensured

POLICY RECOMMENDATIONS

1. National level:
 - Promoting the establishment of a checklist that illustrates all possible legal problems related to the approval of an autonomous vehicle and adequate suggestions to overcome these problems with additional stipulations in a special permit
2. European level:
 - Harmonization of these checklists in a second step

II PASSENGER TRANSPORTATION LAW

1. Need for a passenger transportation permit

THE LEGAL SITUATION IN GERMANY

1. Passenger transportation law is regulated under the Passenger Transportation Act (see Annex A/Legal inventory for Germany/PBefG).
2. Automated buses require a passenger transport permit if:
 - Persons are being transported, and
 - A fee is charged, or
 - Any other financial compensation is provided, or
 - Transport takes place on a regular basis.
3. There are exceptions for passenger transport on private roads and work-related transport of employees on the premises of their employer (see Annex A/Legal inventory for Germany/FrStllgV)

THE LEGAL SITUATION IN FINLAND

- Professional taxi transport or passenger or goods transport needs a permit
- Taxi transport permit
 - Passenger transport permit
 - Goods transport permit

II PASSENGER TRANSPORTATION LAW

2. Requirements for obtaining the permit

THE LEGAL SITUATION IN GERMANY

1. For a vehicle to obtain a permit, it must satisfy the criteria for one of the following categories:

- Line-based traffic is transport that connects a pre-determined starting and end point on a regular basis and allows passengers to board and disembark at certain stops. It does not require a timetable with specific departure and arrival times or the establishment of intermediate stops
- Occasional traffic is transport by taxi, rental car, or rental bus. Taxi transport refers to the transportation of passengers to places of their own choosing in cars that are kept ready for service at officially designated spots. Transport by rental car or bus refers to transportation in vehicles rented by passengers for this purpose. The route and destination are determined entirely by the passengers, and the rental service responds to transit requests at the corporate office or the owner's residence. The vehicle rental must include the services of a driver; taxis and rental cars cannot be driven by the passengers themselves.

2. If a mode of transit does not meet the criteria for one of the categories above, it may be eligible for another type of special permit:

- If a mode of transport does not fulfill all requirements for line-based or occasional traffic, authorization can be granted under the terms of the permit for the mode of transport to which it is most similar.
- For tests of new modes of transport, a special permit can be issued for a maximum period of 4 years.
- Both types of special permits are granted only if operation of the authorized vehicle is not contrary to the public interest.

THE LEGAL SITUATION IN FINLAND

Requirements for a person or a legal person for any transport permit (taxi, passenger, goods):

- is of legal age, competent and has a decent reputation
- is proficient in the field
- is not bankrupt
- no outstanding tax debt or other payment errors
- is allowed to do business
- has duly taken care of all employee payments
- has not been found to be untrustworthy

POLICY RECOMMENDATIONS

National level:

Promoting a more flexible legal framework when it comes to passenger transportation that allows e.g. for the establishment of on demand services with autonomous vehicles without the need of special permits (applies only to Germany)

III PERSONAL LEGAL REQUIREMENTS FOR THE VEHICLE OPERATOR

1. Driving license

THE LEGAL SITUATION IN GERMANY

- The vehicle operator is, by law, the driver of the vehicle. He or she must be in possession of a driving license. The type of driving license required depends on the vehicle weight and length as well as the number of passengers.
- For example, a vehicle operator must be in possession of a Category D1 driving license when operating a vehicle that is 5 meters long, weighs 3.5 tons, and was designed to transport 10 passengers excluding the driver.

THE LEGAL SITUATION IN FINLAND

- Finnish law does not specifically define a driver: instead it uses the term road user.
- A road user is someone who is on the road or in a vehicle on the road or in a tram.
- Therefore, it can be said that a person who is driving and/or operating a vehicle is a road user.
- A person driving a vehicle must have a valid driving license. The type of the license must match the type of vehicle that the person is operating / driving.

2. Transport of passengers

THE LEGAL SITUATION IN GERMANY

- In addition to the driving license, German law demands an additional license for passenger transport under certain conditions.
- The additional license is needed if the mode of transport also requires a passenger transportation permit.
- The German Driving License Regulations (FeV) specify the exceptions to this rule (for example, if the driver has a Category D1 driving license).

THE LEGAL SITUATION IN FINLAND

- A driver does not need an additional license: a combination of an appropriate driving license and transport permit is sufficient.

III PERSONAL LEGAL REQUIREMENTS FOR THE VEHICLE OPERATOR

3. Standards for the driving behavior of the vehicle operator

THE LEGAL SITUATION IN GERMANY

- The vehicle operator must remain attentive while driving and regain control of the vehicle immediately if
 - 1) the vehicle instructs him to do so or
 - 2) he recognizes or would have to recognize, based on obvious circumstances, that the automatic driving functions no longer operate as intended.

THE LEGAL SITUATION IN FINLAND

Road Act 3 §

- A road user must adhere to traffic rules and, additionally, act with care and caution taking into account prevailing conditions to avoid danger and damages.
- A road user must not obstruct or disturb traffic without reason.

4. Special safety training

THE LEGAL SITUATION IN GERMANY

- In addition to the driving license, German law demands an additional license for passenger transport under certain conditions.
- The additional license is needed if the mode of transport also requires a passenger transportation permit.
- The German Driving License Regulations (FeV) specify the exceptions to this rule (for example, if the driver has a Category D1 driving license).

THE LEGAL SITUATION IN FINLAND

- A driver does not need an additional license: a combination of an appropriate driving license and transport permit is sufficient.

IV DATA PROTECTION LAW

1. Regulatory framework

THE LEGAL SITUATION IN ALL EU COUNTRIES

- Beginning on 25 May 2018, the General Data Protection Regulation (GDPR) will be the central EU regulation on data protection.

2. Personal data and lawfulness of processing

THE LEGAL SITUATION IN ALL EU COUNTRIES

- In legal contexts, personal data refers to information relating to an identified or identifiable natural person.
- Processing of personal data is lawful if, for example, the data subject has given consent to the processing, or if processing is necessary for the performance of a task carried out in the public interest.
- Cameras used to facilitate the safe movement of the automated vehicle may capture faces of individual persons, either outside or inside the vehicle. Such recordings should only store movement information that makes personal identification impossible.
- If software applications are used, as in the booking system, passengers must give their consent to the processing of any personal data.

V LIABILITY LAW

1. Liability

THE LEGAL SITUATION IN GERMANY

1. The use of automated vehicles has no negative effect on the legal liability protection of the damaged party. The damaged party has different options for claiming damages:

- § 7 StVG (Defendant: Holder of the vehicle)
- Product liability law (Defendant: Manufacturer)

2. Liability under § 18 StVG is only possible if the vehicle has a vehicle operator

- Shift of liability to the producer in case of vehicles without a vehicle operator

3. There are no specific regulations for driverless vehicles

THE LEGAL SITUATION IN FINLAND

- Directive 85/374/EEC on product liability has been implemented in Finland in the Product Liability Act (694/1990).

POLICY RECOMMENDATIONS

1. National law:

- Promoting a change in road traffic law so that liability for driverless vehicles is clearly regulated

2. International Law:

- Promoting international rules on liability; a good practice example are the rules on product liability

V LIABILITY LAW

2. Insurance

THE LEGAL SITUATION IN GERMANY

- The use of automated vehicles within public road traffic raises no special insurance requirements
- The holder of a vehicle which is used on public roads is forced to have a liability insurance
- The liability insurer has a direct claim against the manufacturer, if the damage is based on a failure of the automated driving system.

THE LEGAL SITUATION IN FINLAND

- Finnish automated vehicle testing uses the normal mandatory traffic liability insurance.
- Traffic liability insurance covers damages to any third party.
- The liability insurer can make a direct claim against the manufacturer if the damage is based on a failure of the automated driving system or the vehicle.

POLICY RECOMMENDATIONS

- Promoting a sufficient insurance particularly for driverless vehicles
- Implementation of an additional compulsory insurance for the owner and the producer

VI CRIMINAL LAW

THE LEGAL SITUATION IN GERMANY

1. Criminal liability in case of accidents may be ascribed to the:

- Vehicle owner.
- Manufacturer and its employees.
- Provider of the necessary data infrastructure.
- Officials at the competent authority for vehicle permits.
- Vehicle operator (if a third party outside the vehicle is harmed).

2. Any claim would most likely allege negligent behavior (e.g., negligent homicide, negligent physical injury) rather than intentional conduct.

3. Most allegations would probably be linked to:

- Deficiencies in the vehicle's technology (soft- or hardware).
- Insufficient maintenance.
- Insufficient safety briefing of the vehicle operator.

THE LEGAL SITUATION IN FINLAND

1. Criminal liability in accidents may be ascribed to the same parties as in Germany (see above).
2. In addition, the official(s) who are responsible for giving out the test plate certificate could be held criminally liable.
3. Intent and negligence are prerequisites for criminal liability.

Annex - Legal Inventory I Relevant Regulations from Germany

| Title (English) | Title (German) | Abbreviation |
|---|---|----------------------|
| Civil Code | Bürgerliches Gesetzbuch | BGB |
| Federal Data Protection Act | Bundesdatenschutzgesetz | BDSG |
| DIRECTIVE 2007/46/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles | - | Directive 2007/46/EC |
| Regulation on the EC approval of motor vehicles and their trailers, as well as systems, components and separate technical units for such vehicles | Verordnung über die EG-Genehmigung für Kraftfahrzeuge und ihre Anhänger sowie für Systeme, Bauteile und selbstständige technische Einheiten für diese Fahrzeuge (EG-Fahrzeuggenehmigungsverordnung) | EG-FGV |
| Driving License Regulations | Verordnung über die Zulassung von Personen zum Straßenverkehr (Fahrerlaubnis-Verordnung) | FeV |
| Verordnung über die Zulassung von Personen zum Straßenverkehr (Fahrerlaubnis-Verordnung) | Verordnung über die Befreiung bestimmter Beförderungsfälle von den Vorschriften des Personenbeförderungsgesetzes | FrStllgV |
| Vehicle Admission Ordinance | Verordnung über die Zulassung von Fahrzeugen zum Straßenverkehr | FZV |
| REGULATION (EU) 2016/679 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (EU General Data Protection Regulation) | Datenschutz-Grundverordnung | GDPR |
| Basic Law for the Federal Republic of Germany (German constitution) | Grundgesetz | GG |
| Passenger Transportation Act. | Personenbeförderungsgesetz | PBefG |
| Compulsory Insurance Law | Pflichtversicherungsgesetz | PflVG |
| Product Liability Act | Produkthaftungsgesetz | ProdHaftG |
| Criminal Code | Strafgesetzbuch | StGB |
| Road Traffic Act | Straßenverkehrsgesetz | StVG |
| Road Traffic Regulations | Straßenverkehrsordnung | StVO |
| Road Traffic Licensing Regulations | Straßenverkehrs-Zulassungs-Ordnung | StVZO |
| Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions (1958 Agreement) | - | UN(ECE) Regulations |
| UN(ECE) Regulations | Wiener Übereinkommen über den Straßenverkehr | - |
| Insurance Contract Act | Versicherungsvertragsgesetz | VVG |

Annex - Legal Inventory II Relevant Regulations from Finland

| Title (English) | Title (Finnish) | Abbreviation |
|---|--|----------------------|
| Civil Code | Suomessa siviilioikeudella tarkoitetaan yksityisoikeutta joka jaetaan yleiseen ja erityiseen yksityisoikeuteen. Yleinen yksityisoikeus jakaantuu henkilö-, varallisuus-, perhe- ja jäämistöoikeuteen | |
| Federal Data Protection Act | Tietosuojalaki | HE 9/2018 |
| DIRECTIVE 2007/46/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles | Euroopan parlamentin ja neuvoston direktiivi 2007/46/EY, annettu 5 päivänä syyskuuta 2007, puitteiden luomisesta moottoriajoneuvojen ja niiden perävaunujen sekä tällaisiin ajoneuvoihin tarkoitettujen järjestelmien, osien ja erillisten teknisten yksiköiden hyväksymiselle (Puitedirektiivi) | Directive 2007/46/EC |
| Regulation on the EC approval of motor vehicles and their trailers, as well as systems, components and separate technical units for such vehicles | Asetus ajoneuvojen hyväksynnästä | 2002/1244 |
| Driving Licence Act | Ajokorttilaki | 2011/386 |
| Vehicle Admission Ordinance | - | - |
| REGULATION (EU) 2016/679 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data | EUROOPAN PARLAMENTIN JA NEUVOSTON ASETUS (EU) 2016/679, annettu 27 päivänä huhtikuuta 2016, luonnollisten henkilöiden suojelusta henkilötietojen käsittelyssä sekä näiden tietojen vapaasta liikkuvuudesta ja direktiivin 95/46/EY kumoamisesta (yleinen tietosuojalaki) | GDPR |
| Finnish Constitution | Perustuslaki | 1999/731 |
| Passenger Transportation Act. | Laki liikenteen palveluista | 2017/320 |
| Insurance Law | Liikennevakuutuslaki | 2016/460 |
| Product liability law | Tuotevastuulaki | 1990/694 |
| Criminal code | Rikoslaki | 1889/39 |
| Road Traffic Act | Tieliikennelaki | 1981/267 |
| Vehicles Act | Ajoneuvolaki | 2002/1090 |
| Road Traffic Registration Regulation | Asetus ajoneuvojen rekisteröinnistä | 2007/893 |
| Decree on the Use of Vehicles on the Road | Asetus ajoneuvojen käytöstä tiellä | 1992/1257 |
| Car Tax Act | Autoverolaki | 1994/1482 |
| Vehicle Tax Act | Ajoneuvoverolaki | 2003/1481 |
| UNECE - UN Vehicle Regulations - 1958 Agreement | - | UNECE rules |
| Vienna Convention on Road Traffic | - | - |
| Insurance Contract Act | - | - |



**LEGAL IMPLEMENTATION ROADMAP
FOR GERMANY**

Legal Implementation Roadmap for Germany

In this Legal Implementation Roadmap IKEM describes and analyzes the current legal framework in Germany for the implementation of automated buses in public transportation. First, IKEM introduces a best practice example that helps to illustrate the legal analysis (A.). Then the legal challenges for bringing automated vehicles “on the road” will be presented (B.).

A. German best practice example

Optimized transport system based on self-propelled electric vehicles (OTS)

An adequate best practice example from Germany is the project named “Optimized transport system based on self-propelled electric vehicles” (OTS 1.0). In this project an automated electric vehicle and the associated system architecture are being tested on the test field / laboratory area Munich-Perlach in cooperation with the Siemens AG. The site is accessible not only to Siemens employees but also to employees of various other companies and their visitors. These can come in contact with the vehicle being tested on the premises.

The project builds on sensor and communication infrastructure that is located on the road as well as on an automatically controlled charging infrastructure. This guarantees that the data for control and navigation not only comes from the vehicle’s own sensors, but also from sensors mounted along the track delivering information about the position of the vehicle. This data is made available to the vehicle via the system platform and the communication infrastructure (RoadSideUnit for Car2x communication, mobile communications) and supplements the vehicle-based information gathering. The goal of this arrangement is to enable a smoother and faster automated driving characterized by a high level of safety.

The test vehicle is intended to drive in full automation in the future. It is comparable to a minibus. The vehicle is propelled by an electric mo-

tor and the charging process is fully automatic. A special feature is the on-board sensor system. Its purpose is to enable the vehicle to move safely in simple traffic situations without relying on the communication infrastructure on the road. Environment sensors are provided by PDC (ultrasonic sensors - parking distance control), LIDAR (laser) and RADAR (short / medium range). Additionally, two cameras are planned. A front camera is used for the visual recognition of objects or traffic signs (insofar as they are not stored digitally in the map). Another camera will be installed for indoor surveillance.

The vehicle itself is controlled fully automatically. For the vehicle operator or the passengers there is only an “emergency stop” function available. In addition, there is a wired “service access” to maneuver the vehicle manually. The vehicle has neither pedals nor a steering wheel.

It has the following external dimensions (L x H x W): 5m x 2.6m x 2.1m. The weight is about 3.5 t. Its maximum speed is 15 kilometers per hour. The interior will be accessible via a ramp and the floor is designed without steps. A parking space for wheelchairs is provided. A “Hold request button” is also available. The vehicle is designed for the transport of ten passengers plus one vehicle operator.

The route that the test vehicle takes is a circuit whereas the parking and loading area of the vehicle are located outside the circuit and connected to it by a single road. The test track is not separated from the “normal” traffic that takes place on the premises. Neither are there any special safety devices (f.e. pedestrian barriers) that would protect the test vehicle from exterior disruptions.

Hamburg Electric Autonomous Transportation (HEAT) OTS 1.0 is taken one step further in a second project called Hamburg Electric Autonomous Transportation (HEAT).

In this project a concept for the insertion of electric automated minibuses into the public

transport system is being developed. The project aims at the implementation of the buses in the “HafenCity” in Hamburg.

The implementation should take place in three stages. First, test drives without passengers and with a vehicle operator are carried out. Secondly, the buses will run with trained passengers who receive safety instructions and a vehicle operator. On the third level, the vehicle should carry out regular trips with trained passengers, but without a vehicle operator as well as trips with untrained passengers and without a vehicle operator in the vehicle.

The vehicles used will be the same model as in OTS 1.0. The core difference is that driverless vehicles will be inserted into the regular public traffic for the first time.

B. Legal challenges for bringing automated buses “on the road”

In this second section IKEM analyzes the main legal challenges for bringing automated minibuses “on the road”. The focus of this roadmap lies on car registration law (I.), passenger transportation law (II.) as well as the legal requirements for the vehicle operator (III.). IKEM also outlines the challenges in the areas of Data protection, liability and criminal law (IV. – VI.).

I Car registration law

1. NECESSITY AND LEGAL BASIS FOR THE CAR REGISTRATION

Vehicles must have a car registration in case of using public road spaces, § 1 StVG, § 3 FZV. In contrast, it is not necessary to have a car registration on private road spaces.

A car registration requires in the first place an official application of the car holder. The car holder has to apply for the car registration at the regional registration authority. Secondly, a motor vehicle needs a liability insurance and, thirdly, an operating license. The

different types of registrations are regulated in the FZV. The ordinance distinguishes between two types of operating licenses.

On the one hand, there is the “type approval”. Its issuing shows that the competent authority considers the type of car to be in line with all relevant legal standards. On the other hand, there is the “individual license”. It represents the approval of a specific vehicle and states that this specific vehicle meets all legal requirements.

These requirements are being concretized in the EG-FGV.

§ 13 EG-FGV states the criteria which have to be fulfilled in order to obtain an individual license. Primarily the legal standards of the European directive 2007/46/EG attachment IV and XI have to be fulfilled. Unless the corresponding provisions of the StVZO are fulfilled. These are, for example, the requirements of having a steering equipment and breaks in place.

§ 13 EG-FGV is not applicable under the following circumstances: The maximum speed of the vehicle is 25 km/h or less or the vehicle is a prototype that was especially constructed for the test operation, § 3 par. 1 no. 1, par. 2 no. 4 EG-FGV. In that case, an operating license can be issued following the stipulations in § 21 StVZO.

§ 21 StVZO states that the holder can apply for an individual license to the competent authority. For a successful application the vehicle has to fulfill the standards of the StVZO and the European standards such as UN-ECE.

An expert opinion has to be added to the applications which describes to what extent the vehicle complies with the relevant technical standards.

In case of § 21 StVZO the competent authority is located at the level of the federal states in Germany whereas § 13 EG-FGV evokes the competence of the authorities at the municipal level.

Application to the best practice example: The test field in OTS 1.0 is a private road space. It is

separated from the general traffic and only employees of Siemens and of the other companies located on the premises have access. Accordingly, no car registration is necessary.

In HEAT the “HafenCity” in Hamburg is clearly a public road space and hence a registration is needed. It will not be issued on the basis of § 13 EG-EGV. The exception of § 3 par. 2 no. 4 EG-FGV is applicable here as the autonomous minibus is a prototype especially constructed for the operation within the framework of the research program in HEAT.

In addition to that, the exception of § 3 par. 1 no. 1 EG-FGV is fulfilled because the autonomous minibus has a maximum speed of 15 km/h. Concluding, the individual approval would have to be issued according to § 21 StVZO.

2. NON-COMPLIANCE WITH THE APPLICABLE REGULATIONS

An automated driverless vehicle will not obtain a car registration due to its non-compliance with regulations of German road traffic law, as well as European law (e.g. UN-ECE rules) and international law.

First of all, § 1b StVG stipulates that there must be a person driving the vehicle (Vehicle operator). Furthermore, many other regulations of the StVO cannot be fulfilled. The StVO states duties for the driver of a vehicle. Hence, in strict sense only human beings can fulfill these duties. The relevant norms of the StVO are to be seen as barriers to the introduction of driverless vehicles as such vehicles cannot comply with regulations meant for human agents. They have to be applied already in the application stages, even though they usually address the driver’s behavior when driving. This is due to the fact, that automated vehicles substitute the driver’s actions by automated functions and their proper functioning has to be ensured before issuing an approval.

On the European level UN-ECE rules also require automated vehicles to be designed such

that the driver may, at any time and by deliberate action, override the automated driving function (UN-ECE rules No. 79, 5.1.6). According to No. 79 2.3.4 the primary control over the vehicle has to remain with the driver. An automated driverless vehicle cannot fulfill the aforementioned requirements. The UN-ECE rules are part of European law and thus relevant for all EU member states.

Apart from this, the Vienna Convention on Road traffic (Art. 8) foresees that every moving vehicle shall have a driver. The Vienna Convention on Road Traffic is an international treaty. Germany ratified and transferred it into German law. The driver is obliged to control the vehicle at any moment when driving. This is not possible in an automated driverless vehicle.

There are also technical regulations that may impede the test operation of an automated vehicle depending on its technical features. The StVZO (§§ 35a par. 1, 38 par. 1, 42 par. 1, 56 par. 1) requires vehicles to have seat belts in place, a steering wheel, mechanical breaks and automobile mirrors; items that an automated vehicle might lack.

Automated vehicles with a vehicle operator are to a certain extent compliant with regulations of German road traffic law, European law and international law. § 1b StVG allows automated driving systems, if the driver can constantly control the vehicle. Similarly, Art. 8 par. 5bis of the Vienna Convention on Road requires a driver that is at all times able to control his vehicle. These regulations can be satisfied with a vehicle operator who has the possibility to override the automated driving system at any time.

In contrast, No. 79 UNECE rules does not allow the use of automatically commanded steering functions at all, if a maximum speed of 10 km/h is exceeded by more than 20 % (UN-ECE No. 79, 5.1.6.1). This means that even with a vehicle operator the test vehicle cannot move any faster than 12 km/h which, depending of the desired result, might heavily compromise the success of the test operation.

Application to the best practice example: the automated minibus in OTS 1.0 has a vehicle

operator. Therefore, it is not facing the legal challenges of a driverless vehicle. The vehicle operator is able to control the vehicle if needed and, hence, fulfills the requirements stipulated by § 1b StVG and Art. 8 par. 5bis of the Vienna Convention on Road Traffic. For the non-compliance with No. 79 UNECE rules and StVO rules the minibus would need a special permit (see below 3.). On the premises of Siemens this is not necessary, because they are considered to be private road space.

In HEAT the vehicle approval process will have to deal with the legal questions arising from driverless vehicles as on the third stage no vehicle operator will be surveilling the vehicle. Therefore, the need of a special permit is even more evident than in OTS 1.0 as there will be additional law infringements (see below 3.).

3. ISSUING A SPECIAL PERMIT

Due to the non-compliance of automated vehicles with the applicable law, a car registration cannot be issued unless the requirements of § 70 StVZO for issuing a special permit can be met. For all regulations which cannot be fulfilled by the automated vehicle a special permit is needed. The competent authority has discretion to issue a special permit in exceptional situations. This presupposes that the vehicle or the test course have special features that distinguish them crucially from regular cases.

The special permit exempts the automated vehicle from the otherwise applicable regulations. Every law infringement has to be compensated by an exception based on § 70 StVZO. The competent authority has to exercise its discretion without any errors in its legal appreciation of the case. It has to take into account all relevant issues of public interest such as the safety and smooth flowing of traffic and on the other hand the interests of the person who applies for the permit.

Consequently it is most likely that a special permit can be granted, if the „safe and smooth flow of traffic“ is guaranteed by adequate technical or

organizational measures. The automated vehicle is not supposed to have any lower standards of safety or other operational issues compared to “regular” vehicles.

The issuing authority can ensure this by adding obligations or other additional stipulations to the permit. The regulations have to be well considered by the authority and ensure a proportionate balance between the private interest of the applicant and the public interest.

There are several possible regulations in different areas:

- Geographic limitations (e.g. avoiding dangerous traffic situations)
- Time limits (e.g. avoiding night time)
- A reservation regarding annulment (e.g. in case of accidents or other safety problems)
- Vehicle operator (e.g. to avoid some of the above-mentioned law infringements and guarantee more safety for the passengers)
- Operational safety (e.g. specific technical requirements for the vehicle such as a speed limit)
- Consequences of an accident (e.g. temporary stop of the test operation until the problem is solved)
- Transport of persons (e.g. limitation of the number of passengers)
- Logbook or other types of documentation (e.g. enable the authority to monitor the test operation)
- Safety briefing of the passengers (e.g. right behavior in case of accidents)

On the national level, it is recommended to promote the establishment of a checklist that illustrates all possible legal problems related to the approval of an automated vehicle and adequate suggestions to overcome these problems with additional stipulations in a special permit. On the one hand, this would be helpful for the responsible authorities. They would be enabled to establish a standardized procedure for the issuing of special permits. On the other hand, the checklist would also be helpful for the applicant. The criteria for the exertion of discretionary power by the authority would become more transparent and the applicant would be informed about which requirements have to be fulfilled by the automated vehicle. Furthermore,

this checklist should be harmonized on a European level. Road traffic law is largely shaped by European and international law and the checklist could harmonize the standards for special permits on a European level.

Application to the best practice example:
In OTS 1.0 no special permit is needed as the test course is located on the premises of Siemens, which are considered to be private road space.

In HEAT a special permit has to be issued. It is very likely that several additional stipulations will be added to the permit. Especially the test course in the crowded HafenCity in Hamburg needs to be tailored adequately in order to avoid as much potential for accidents as possible. Additional road signs announcing the test operation of an automated minibus may be necessary. A reservation regarding annulment in the case of accidents happening might also be included.

II Passenger transportation law

1. NEED FOR A PASSENGER TRANSPORTATION PERMIT

Passenger transportation law not only regulates the transport of passengers, it also sets rules for construction activities within the public road space. The aim is to ensure public security and order with regard to all issues of public transport. According to §§ 1 par. 1, 2 par. 1 PBefG transporting people on a regular basis or for a fee is forbidden unless one obtains the necessary permit from the competent authority.

A fee in the legal sense is not necessarily a certain amount of money. Every financial advantage obtained by offering the transport can be a “fee”. The transportation provider needs a permit too, if the transport is offered on a regular basis. Regular basis means the intention to repeat the transport according to a certain pre-determined schedule.

No permit is needed if the transport takes solely place in spaces that are no public road space. The same goes for employees that are being

transported for work reasons on the premises of their employer.

Application to the best practice example: In OTS 1.0 no permit is needed as only SIEMENS employees have access to the minibuses that run solely on the private SIMEMENS premises and connect internal buildings. In contrast, in HEAT a permit is needed for the transportation of passengers in the automated minibuses. Even if there should be no fee for the passengers, the service is offered on a regular basis and in public road space.

2. REQUIREMENTS FOR OBTAINING THE PERMIT

§ 2 par. 1 PBefG requires a permit for the transportation of passengers by tram, trolleybus or motor vehicles. Motor vehicles are defined as vehicles powered by engine power (§ 4 par. 4 PBefG). According to the PBefG motor vehicles can only be lawfully approved as either line-based or occasional traffic. Therefore, aiming at and fulfilling one of the two modes of transport is coercive for the applying transport provider. Line-based traffic is legally defined in § 42 PBefG as a traffic connection established between pre-determined starting and end points on a regular basis, which allows passengers to board and disembark at certain stops. It does not require a timetable with specific departure and arrival times nor the establishment of intermediate stops. In contrast, occasional traffic (§ 46 PBefG) is defined as either transport by taxi or using rental cars/buses.

The former means the transportation of passenger to places, determined by the passengers, in cars that are kept ready for service at officially accredited spots. The latter stands for the transportation in cars rented by the passenger for transportation. Destiny and route depend completely on the passengers’ wishes and the rental service has to receive the demand for transportation either at the corporate office or at the owner’s residence.

For these modes of transport that qualify as either line-based or occasional traffic a permit has to be issued, if the requirements of § 13 PBefG are met. § 13 PBefG requires that safety

and efficiency of the service are assured, the applicants shall not be unreliable and be technically qualified for executing the service and shall have its place of business within national territory.

For all other forms of transport, a special permit can only be issued if § 2 par. 6 or par. 7 PBefG is fulfilled.

A mode of transport that does not fulfil all requirements of either line-based or occasional traffic, may be authorized according to the regulations of the mode of transport that it is most similar to and if it does not conflict with the public interest, § 2 Par. 6 PBefG. Thus, § 2 Par. 6 PBefG offers a special permit for flexible modes of transport such as “Transport on demand”-services.

Another option to receive a special permit is for the testing of new modes of transport, if those modes do not conflict with the public interest, § 2 par. 7 PBefG. Either new modes of transportation or new transport vehicles can be tested.

The purpose of this rule is to promote innovative mobility solutions that need prior testing in order to be economically, socially and technically sustainable. In comparison to § 2 par. 6 PBefG, § 2 par. 7 PBefG allows a greater difference to the standard transportation types of the PBefG (Line-based and occasional traffic). The decision to issue the permit is at the discretion of the authorities.

Politically speaking, the German national law has certain barriers for new transport modes. The PBefG does not address new forms of transport directly. It is thus not clear under which conditions transport on demand services with automated vehicles can obtain the necessary permit as they fulfill neither the criteria of line-based nor occasional traffic. There is a need for a sound regulation of innovative mobility solutions by law that make the approval of mobility projects more predictable for the applicant and the competent authority. It is recommendable to include specific criteria for automated driving, because this is an area that is so far unknown to the authorities and the approval of

automated shuttles is subject to a major degree of legal uncertainty.

Application to the best practice example: In HEAT the minibuses offer transport on demand, but do at the same time not qualify as a taxis or rental cars. A special permit based on either § 2 par. 6 or 7 PBefG will be necessary.

III Personal legal requirements for the driver

1. DRIVING LICENSE

According to § 4 FeV a driving license is needed for everyone who runs a vehicle on public roads. This requirement is applicable in the case of a vehicle operator in an automated vehicle as § 1a par. 4 StVG states that driver in the legal sense is also the one that activates an automated steering system for controlling the vehicle.

The type of driving license is regulated by § 6 of the Regulation on the right to drive. The decisive criteria for determining the right type are the weight and length of the vehicle as well as the number of passengers that are supposed to be on board of the vehicle. The latter refers to the theoretical capacity of the vehicle and not the actual number of passengers currently using the bus.

As an example, a D1-type driving license is required for a motorized vehicle with 16 or less passengers excluding the vehicle operator and a length of less than 8 meters. In this case the weight is no relevant legal parameter.

Application to the best practice example: The automated bus in OTS 1.0 and HEAT has a length of 5 meters, weighs 3.5 tons and is constructed for the transport of 10 passengers excluding the driver. The vehicle operator in this case would need a D1-type driving license.

2. TRANSPORT OF PASSENGERS

The additional driving license for passenger transport required by § 48 par. 1 FeV is not an own type of driving license, but a supplement to

the regular driving license. It is usually required if the mode of transport also has to be approved through a passenger transportation permit.

An exception from this rule is stipulated in § 48 par. 2 No. 4 FeV. The additional license is dispensable, if the driver is in possession of a D1 or D-type driving license and if the vehicle is not a taxi or rental car.

Application to the best practice example: The automated bus used in OTS and HEAT requires a D1-type driving license and is no taxi or rental car. Consequently, the steward does not need an additional license for the transport of passengers, even if (at least in HEAT) a passenger transportation permit is required for the automated bus itself.

3. STANDARDS FOR THE DRIVING BEHAVIOR OF THE VEHICLE OPERATOR

In Germany the standards for the behavior of the vehicle operator are regulated in the StVG. § 1 b StVG states that the vehicle operator must remain attentive while driving and must regain control over the vehicle without delay if the vehicle asks him to do so or if he recognizes or, on the basis of obvious circumstances, would have to recognize that the automatic driving functions no longer function as intended.

This regulation was recently introduced into German law (2017) and its practicability needs to be confirmed within the next years.

4. SPECIAL SAFETY TRAINING

The operator of an automated vehicle will not have to intervene while driving for a long time, but in conflict situations even more spontaneously. He therefore needs a particularly robust attention and a detailed knowledge of the technical system of the vehicle in order to take control as quickly as possible.

This constant attention, the ability to assess whether an intervention is required or not and the speed of response required to intervene effectively, cannot be expected in all circumstances from a vehicle operator having only a regular driving license.

Therefore, special training and a test should be considered for the future vehicle operators, even if not prescribed by law.

The training must enable the vehicle operator to be well aware of his or her own reactions to critical traffic situations, to maintain a high level of attention during the period of driving and to gain vehicle control quickly even in critical situations. This includes in particular a comprehensive knowledge of the vehicle and the existing control options. Furthermore, the necessary routine in handling the vehicle must not be forgotten.

IV Data protection law

1. REGULATORY FRAMEWORK

On the European level data protection law was harmonized by the GDPR which came into force on May 25th 2018. The regulation is directly applicable in all EU member states and the national legislators will have to adapt national law to its requirements.

As the Sohjoa Baltic mainly takes place after this date, the European regulatory framework is only analyzed with reference to the GDPR. The scope of the GDPR is extensive: according to Art. 2 par. 1 GDPR the regulation applies to the processing of personal data wholly or partly by automated means.

According to Art. 4 No. 2 GDPR processing means “any operation or set of operations which is performed on personal data or on sets of personal data [...] such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction.” In short, the GDPR covers every handling of personal data.

2. PERSONAL DATA AND LAWFULNESS OF PROCESSING

According to Art. 4 No. 1 GDPR ‘personal data’ means „any information relating to an

identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person."

Data is only then to be considered of nonpersonal character, if it can be anonymized in a technically reliable manner. The attribution of specific data to the vehicle operator, owner, passengers or other persons must be made legally and technically impossible.

Processing of personal data shall inter alia be lawful only if and to the extent that at least one of the following applies (Art 6 GDPR):

- the data subject has given consent to the processing of his or her personal data for one or more specific purposes;
- processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller;

Application to the best practice example:

In the best practice examples different types of data are generated:

- Location and navigation data (position, duration and route of the ride, destination, etc.)
- Data on the surroundings of the vehicle (data on other road users as well as pictures of persons)
- Passenger-related data (in particular through accounting and billing systems, such as name, account details, the booked / driven route, etc.)

These different types of data may generate data protection problems according to the legal criteria outlined above:

Location and navigation data is not to be considered personal data in most of the cases. The position of the vehicle or the route it takes does not allow for any conclusion who the passengers are. If there is a vehicle operator, he will be known by name due to his employment con-

tract with the operator of the autonomous vehicle. But it is very likely that the vehicle operator will give his consent to the processing of his personal data or this consent has already been given in the employment contract.

Data on the surroundings is mainly gathered by cameras. This could be problematic in terms of data protection law, as the cameras regularly collect data from third parties. Obtaining the consent of other road users is almost impossible. Therefore, the identification of specific individuals must be excluded by anonymising the persons filmed. For this purpose, cameras may be used, the sensor of which only detects movement information (for example only the following information: distinction human / animal, size, movement speed and direction) and makes the storage of the images that show the individuals' faces technically unfeasible.

Passenger-related data may be gathered by cameras when filming the interior of the vehicle or through the use of Apps when booking the ride. In the first case, the same legal criteria apply as mentioned before in relation to data on the surroundings. The passengers' faces must not be made identifiable through the camera images. If passenger-related data is stored when the passengers book a ride using smart phone applications, the program must ask for their consent and should store as little information as possible.

V Liability law

1. LIABILITY

Damage resulting from vehicle collisions has legal consequences. Liability for damage is imposed on the party responsible for causing it. The liable party is generally the driver, the holder, or the vehicle manufacturer.

If the driver was at fault in the accident, he or she may be held liable for the damage under §18 StVG. Under §18 StVG, the driver is liable if it would have been possible for him or her to intervene in the collision. A party is considered capable of intervention if it has a minimum level of control over the vehicle. If the vehicle

operator of an automated vehicle can stop and steer the vehicle in case of an emergency, he or she satisfies the criteria for minimum control. In this case, the vehicle operator must prove that he or she is not at fault because the damage was caused by system failure. Under §63a StVG, he or she may access the automated vehicle's mandatory data storage system for this purpose.

Without a vehicle operator, however, there is no driver to hold accountable. As a result, §18 StVG is not applicable.

The injured party can also claim damages from the holder of the vehicle under §7 StVG. The holder is the person who pays the bills and has the power of disposal over the vehicle, but is not necessarily the owner or the driver. Under §7 StVG, the holder is held liable without personal fault. The only exception is §7(2) StVG, which exempts the holder from liability if the damage was caused by force majeure. Technical failures of automated driving systems do not qualify as force majeure. Thus, the liability standards for automatic driving systems are not necessarily different from those for vehicles with manual operation.

The manufacturer is liable for damages if the damage results from a defective product. Manufacturer liability is regulated under the Product Liability Act (ProdHaftG). These regulations are based on European Directive 85/374/EWG, which all EU Member States are legally bound to implement.

According to §4 ProdHaftG, the manufacturer is the party that produces the final product, pieces of the final product, or basic parts of the final product. The product is defective if it cannot be used correctly for its intended purpose. Liability is limited to a maximum of €85 million under §10(1) ProdHaftG. Claims based on the ProdHaftG do not require personal fault.

As a result, the manufacturer is always liable for damage caused by driverless vehicles. The injured party is not required to prove any misconduct of, or production error by, the manufacturer. This means that the introduction of automated, driverless cars will shift liability to the manufacturer.

Application to the best practice example: The holder, producer and the supplier can be liable for the damages. The same goes for the vehicle operator in OTS and the first two stages of HEAT. He is legally qualified as the driver of the vehicle and has the possibility of intervention and thus, can control the vehicle if needed.

2. INSURANCE

In order to use a vehicle on public roads, it is compulsory for the holder to have a liability insurance, § 1 PflVG. Only the holder and not the actual users of the vehicle are legally obliged to have a liability insurance. Co-insured are the owner, the driver and the passengers. The liability insurance is used to cover the damages which were caused by the vehicle. It covers personal injuries, material damages and other pecuniary losses.

There are no special insurance laws for automated vehicles in Germany. The normal insurance laws apply also for automated vehicles. The damaged party can raise a direct claim against the liability insurer, § 115 VVG. This also holds for claims based on product liability. Therefore, the liability insurer has regress claims against the manufacturer but only if the damage was caused by a system failure.

It is recommended to promote a sufficient insurance for automated vehicles by law. The liability law was adjusted to automated driving, but this did not include automated driverless vehicles. Neither does the current insurance law. Promoting an additional compulsory insurance could help to insure the legal certainty in case of damages. The risk of breaching the insurance contract or that the insurer considered driverless vehicles to be an increased risk (§§ 23, 26 VVG) could be avoided.

Application to the best practice example: The holder of the automated minibus needs compulsory liability insurance, if the minibuses are driving on a test course which is qualified as a public road space. This applies only to HEAT.

VI Criminal law

1. LEGAL CRITERIA FOR CRIMINAL LIABILITY BASED ON NEGLIGENT BEHAVIOR

Accidents that involve automated vehicles are most likely to be caused by negligent behavior and not by intentional acts. The misconduct of different actors such as the vehicle owner, the manufacturer, the provider of the necessary data infrastructure, the officials at the competent authority for vehicle approvals or the vehicle operator may contribute to these accidents. But only in exceptional cases will the criminal allegations be based on intentional behavior as there are no gains to be expected for any of the named agents in case of accidents. On the contrary, all of them will in the end hope that their misconduct will not result in any damages. Negligent behavior in German criminal law is defined by the following criteria: The agent violates his or her due diligence and this violation foreseeably causes a damage that otherwise would have been avoided.

If, for example, an automated vehicle crashes against another object and the vehicle operator or a third party outside the vehicle gets killed, the aforementioned actors (except for the vehicle operator himself) could be liable for the accident under the conditions described below (2.-5.). The vehicle operator might also be liable if a third party is the victim (6.).

2. CRIMINAL LIABILITY OF THE VEHICLE OWNER

The vehicle owner could be liable according to § 222 StGB for negligent homicide (in case of an injury of the vehicle operator or the third party § 229 StGB penalizing a “negligent physical injury” would be applicable).

The action making the owner liable is the act of handing over the vehicle to the vehicle operator for usage. The handing over might be a negligent act if the vehicle operator is only poorly instructed by the vehicle owner prior to using the vehicle. Due diligence requires the owner to give the vehicle operator a safety briefing about all the automated functions that the vehicle offers including how to turn them off and how

and when to take over the steering.

Negligence might also be established, if the owner does not maintain the vehicle properly. The owner has a duty to maintain the vehicle (§ 31 par. 2 StVZO).

If the vehicle is handed over by the owner under one of the three described conditions and there is a causal link between the accident and the specific misconduct, liability of the owner in a criminal law sense would be the consequence.

3. CRIMINAL LIABILITY OF THE MANUFACTURER

The manufacturer is liable because of negligence if there were construction or fabrication errors that a production process respecting due diligence could have prevented. A poor product description might also establish negligence.

As the life and physical well-being of human beings is at stake, the responsible employee for the production process has to introduce effective measures that ensure the safety of the automated vehicle. If he fails to introduce these measures and this failure results in construction errors compromising the safety of the vehicle which in turn leads to an accident, the legal criteria of negligence are fulfilled.

The liability can also be attributed to employees working on designing or physically producing the vehicle. If they make mistakes during the designing or production process which they could have avoided by complying with standards of due diligence and these mistakes cause an accident later on, the employees are liable. Examples are software errors caused by a bad performance of software developers or a poor construction or installation of hardware (e.g. cameras and lenses) by the engineers of the manufacturer.

Apart from these production-related aspects the manufacturer needs to instruct the buyer properly about the technical features and functioning of the vehicle. Failing to do so is a negligent omission making him liable for all consequences resulting therefrom.

4. CRIMINAL LIABILITY OF THE PROVIDER OF THE NECESSARY DATA INFRASTRUCTURE

Another possible agent that could be liable in case of an accident is the provider of the necessary data infrastructure that ensures a safe moving of the automated vehicle. The provider develops or makes highly precise roadmaps accessible that allow for a safe navigation of the vehicle. It also supplies additional data on the route ahead of the vehicle such as information about traffic congestions, construction sites or other areas of temporary danger. If the data supply fails to inform the automated vehicle as it is intended and as a consequence an accident occurs, the provider is liable for this failure.

5. CRIMINAL LIABILITY OF THE OFFICIALS AT THE COMPETENT AUTHORITY FOR VEHICLE APPROVALS

In extreme cases, even the officials at the competent authority issuing a special permit can be liable for accidents and the caused harm. This is only the case, if the official issues the special permit, even though he was aware or would have had to be aware that the vehicle is likely to have serious safety issues or that it is on the basis of his technical expertise and the information materials about the vehicle not possible to determine thoroughly whether the vehicle is safe or not.

If the safety issues that the official overlooked or consciously omits to examine due to a lack of expertise or information lead to an accident, this entails the official's criminal liability.

6. CRIMINAL LIABILITY OF THE VEHICLE OPERATOR

If the vehicle operator himself is not killed in the accident and third parties outside the vehicle are harmed, the question of his liability may be raised. Two main scenarios come to mind in which the vehicle operator would be liable in the criminal law sense in Germany.

First, if he does not pay attention to the traffic to the degree the law requires him to (§ 1 b StVG). He does not have to be as attentive as

the driver of a conventional vehicle, but always able to steer the vehicle as soon as the vehicle indicates him to do so or if it is obvious that the automated driving function does no longer work as intended. Second, if he does not use the automated driving function, even if it was ready for operation, and an accident could have been prevented by the automated vehicle (e.g. due to shorter reaction times compared to a human being).

Application to the best practice example: Criminal liability might be an issue in case of accidents in OTS 1.0 and HEAT, if the above-mentioned criteria apply. As there are no permits needed in OTS a criminal liability of any state official is out of question.