

interactive



Accident avoidance by active intervention for Intelligent Vehicles

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Legal Aspects of Active Safety Systems

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Approach and scope of legal evaluation

- **Basis:** Description of functions intended, esp.:
 - Nature of support (informing, intervening, etc.)
 - Traffic situations within the scope
 - System limits
 - Important details (e.g. overrideability)
- **Scope of legal evaluation:**
 1. Type Approval (according to UN-ECE-Regulations)
 2. Regulatory law/Vienna Convention on Road Traffic + product liability (as main focus!)

→ comprehensive introduction followed by function-specific approach
- **Conclusions and recommendations**



Important results: ECE-Regulations

- Concerning ECE-Regulations:
→ leading assumption: Vehicle as such has already been type-approved (since approval covers the ‘vehicle type’) – focus on the systems only!
- **ECE-R 13 (brake systems): No problems identified**
- **ECE-R 79 (steering systems): Issues in case of applications requiring steering interventions**

“ 2.3.4.1: Automatically commanded steering function [...] where actuation of the steering system can result from automatic evaluation of signals initiated on board the vehicle, [...], to generate continuous control action in order to assist the driver in following a particular path, in low speed manoeuvring or parking operations.”

*“**Automatically commanded steering** [...] shall be automatically disabled if the vehicle exceeds the set limit of 10 km/h by more than 20% or [...].”*

*“2.3.4.2: **Corrective steering** function means the discontinuous control function within a complex electronic control system whereby, for a limited duration, changes to the steering angle of one or more wheels may result from the automatic evaluation of signals initiated onboard the vehicle, in order to maintain the basic desired path or to influence the vehicle’s dynamic behaviour.”*

Important results: ECE-Regulations

Issues of non-conformity:

- **Safe Cruise:**

Steering intervention not in line with ECE-R 79 – esp. in case ‘hands-off’ driving is intended for longer. The same for emergency avoidance manoeuvres by steering.

- **Lane Change Collision Avoidance:**

Steering intervention might not be in line with ECE-R 79: The “desired path” of the driver is different from the steering intervention (→no longer “corrective” but “automatically commanded” steering).

- **Rear End Collision Avoidance:**

cf. LCCA: Lane-change steering intervention is not in line with ECE-R 79.

- **Collision Mitigation System (unclear):**

Intended is optimisation of vehicle collision points. ECE-R 79 is clearly oriented towards steering interventions supporting the driver in his task of driving – not beyond.

Important results: Legal evaluation / Vienna Convention

Art. 8 und 13 Vienna convention:

“Every driver of a vehicle shall in all circumstances have his vehicle under control... [...]”

- Advisable to make the possibility to override available to drivers. Conflicting situation otherwise possible. (Advice on system-design for: RECA (Rear End Collision Avoidance))
- Since emergency situations are beyond drivers' possibilities to react appropriately, it has been assumed that these interventions are OK: These situations are characterised by an intervention only in case:
 - Driver is unable to avoid or mitigate the accident by himself
 - Complies with the will of the “carefully acting driver”

→”Put the drivers’ will forward as far as possible”

Important results: Legal evaluation/ Product Liability

- Product Liability largely harmonised in EU-Member States (Basis: Directive 85/374/EEC: liability for defective products) – strict liability regardless of fault on the side of manufacturers
- Vital to keep pace with the ‘state of the art’ in science and technology! Most important for design/ construction (minimum standard e.g.: ISO 26262, Response 3 CoP, etc. → any knowledge available and accessible at the time of marketing is crucial)

Challenge/Risk: False-positive interventions into braking and/or steering, especially if designed “non-overrideable” (cf. RECA – Rear End Collision Avoidance)

→ Strong recommendation to enable the driver to override under all circumstances (cf. Inter alia: Response 3 CoP)

Future work

1. Harmonisation of understanding:
 - Types of automation
 - Automation degrees
2. Legal Evaluation necessary according to national legal situation in other European Member States
(cf. for Germany BASt-Report F83*)

*“Legal consequences of an increase in vehicle automation: Consolidated final report of the project group”

→cf. **BASt Project Group – final report (Booklet “F83”)**

available for download: http://bast.opus.hbz-nrw.de/frontdoor.php?source_opus=587&la=de

Conclusion

- ECE-Regulations: There might be a need to clarify in the technical regulations on the permissibility of certain functions foreseen within interactIVe
- In terms of broad legal assessment: Aspects have been identified that can be taken up for future system development

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SEVENTH FRAMEWORK
PROGRAMME

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