Automated Valet Parking (AVP)

Legal Framework and National Approval
Kraftfahrt-Bundesamt / Type-Approval

Agenda

- Legal Framework
- National Approval
  - General Information
  - Details and Scope
  - Drop-Off / Pick-Up Process
  - Internal Preparation
  - Assessment Process
Legal Framework

- **July 2021**: Entry into force of the legislation amending the existing *Road Traffic* and Compulsory Insurance Acts (Act on Autonomous Driving)

- **July 2022**: Entry into force of the *Ordinance* regarding the Act on Autonomous Driving, enabling the …
  - … operation of automated/autonomous vehicles,
  - … *subsequent activation of automated/autonomous driving functions in dual-mode vehicles post-registration*,
  - … testing of automated/autonomous driving functions.
Legal Framework

Section 1h Road Traffic Act
(Subsequent activation of automated and autonomous driving functions)

(1) If (...) autonomous driving functions (...) are installed in a motor vehicle, the issuance of an approval for the operation of this motor vehicle (...) shall only be permitted if it can be ruled out that the deactivated (...) autonomous driving functions will interfere with the approved systems.
Section 1h Road Traffic Act
(Subsequent activation of automated and autonomous driving functions)

(2) The activation of an (...) autonomous driving function (...) **shall only be permitted on the basis of a special approval** issued by the Federal Motor Transport Authority. (…) The Federal Motor Transport Authority **shall publish the technical requirements that have to be complied with in this respect.**

Federal Motor Transport Authority = KBA
Legal Framework

Section 4 para. 6 Ordinance

(6) The national operating permit for the subsequent activation of automated or autonomous driving functions is issued by the Federal Motor Transport Authority provided that the technical requirements laid down by the Federal Motor Transport Authority are met.

➢ Enables the KBA to approve an AVP system if it complies with the technical requirements published by the KBA.
The Technical Requirements Catalogue (TRC) for AVP has been released on October 17, 2022 by the KBA.

Source: https://www.kba.de/dl_anforderungskatalog_AVP_en.pdf
On the **November 18, 2022** the KBA granted the **first national approval** for the **autonomous driving function** **Automated Valet Parking (AVP)** **in dual-mode** and **already registered vehicles**.
National Approval / Details & Scope

- **Market**: Germany only

- **Parking area(s)**: currently limited to the parking garage P6 at Stuttgart Airport
  - Further roll-out for other car lines and parking facilities requires extension of the national approval.

- **Type**: infrastructure based AVP

- **Max. speed**: 4 km/h
  - max. allowed by TRC: 10 km/h + 2 km/h tolerance
National Approval / Details & Scope

- **ODD:**
  - Drop-Off / Pick-Up zone within the approved parking facility
  - Technical personal (AVP Operator) available
  - Mixed traffic in one direction
  - Weather conditions (e.g. no icy road or air temp. lower than -20 °C)

- Multi-lateral concept between vehicle manufacturer, AVP infrastructure provider, parking facility owner, parking facility operator
National Approval / Details & Scope

- Reporting provisions on a weekly basis with cumulative statistics about:
  - Ratio and total number of succeeded/aborted AVP drives
  - Number of Minimum-Risk-Maneuvers
  - Distance driven autonomously
  - ...

- Ad-hoc reporting, e.g. in case of accidents with VRUs
**National Approval / Drop-Off & Pick-Up Processes**

1. **Reservation via smartphone application**
   - (requires registration and pairing with vehicle)

2. **Park and leave the vehicle at the Drop-Off zone**
   - Initiate the parking process via smartphone

3. **AVP Infrastructure takes over control and parks the vehicle**
   - You are free to leave the Drop-Off zone

1. **Initiate Pick-Up via smartphone application**

2. **AVP Infrastructure takes over control and returns the vehicle to the Pick-Up zone**

3. **You are free to leave the parking facility**
National Approval / Internal Preparation

- **04/2018**: First discussions with Vehicle Manufacturers about AVP

- **10/2019**: First workshop with BMDV, KBA, Technical Service and a Vehicle Manufacturer seeking for approval

- **02/2021**: Start of drafting process for a TRC lead by KBA based on Industry input/feedback and intensive discussions with the BMDV and the BSI (German national Cyber-Security agency)
National Approval / Internal Preparation

- **06/2022**: Presenting the draft version of the TRC within the German national working group on Level 4 systems for registered vehicles (including Authorities, Industry, Technical Services) and call for review

- **10/2022**: Official release of the TRC

- **11/2022**: First national approval
National Approval / Assessment Process

- **Practical tests** witnessed and performed by a Technical Service.

- **Additional tests** conducted by KBA with the focus on:
  - Collision Avoidance
  - Object and Event Detection & Response (OEDR)
  - Minimum-Risk-Maneuver (MRM)
National Approval / Assessment Process

- **Audits** have been performed by the
  - **Technical Service**, e.g. in regards to
    - Software-Update and Cyber-Security
    - Functional Safety
  - **KBA** in regards to
    - Cyber-Security together with the BSI
    - the initial assessment for Vehicle Manufacturers of Level 4 systems
Thank you very much for your attention!

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