WP 3 – Focusing on the Driver  
Key Findings and Results

NON-DRIVING RELATED TASKS (NDRT)
According to our experiments, the following attributes of NDRTs can increase the take-over time compared to not pursuing NDRTs:

- Holding an object (e.g. a mobile device) in one/both hands
- Manual interaction (one/both hands) with mobile electronic devices
- Unusually strong rotations (>90°) of the torso
- Increased effort or multiple steps needed to fully disengage from a NDRT

The following attributes of NDRTs show no consistent effects:

- Visual or visual-motoric tasks (e.g. watching video, reading, texting) without occupation of one/both hands
- Cognitively demanding NDRTs affecting the cognitive transition
- Generally, strong interindividual differences were found concerning how NDRTs influence the driver state

HUMAN-MACHINE INTERFACE
For planned requests to intervene (RtI), multi-stage HMI-concepts have been shown effects of accelerating the disengagement from NDRTs and by this on take-over time. A preview of planned requests to intervene along the route (based on safety server information) helps drivers to self-regulate their engagement in NDRTs. A „NDRT lockout“ simultaneously with the request to intervene can speed up the driver response to the request. A „lockout“ was implemented as a system-initiated interruption of the NDRT performed on the vehicle-integrated infotainment system or on connected portable devices with an additional presentation of the RtI on the respective screen.

RECOMMENDATIONS
Natural behavior, self regulation and motivational aspects of NDRTs must be considered in the experimental design.

A safety assessment of NDRTs with respect to their effects on take-over performance can only be carried out taking into account the details/parameters/aspects of the test scenario (e.g. the available time budget).

The request to intervene (RtI) should be designed to be multi-modal and needs to unequivocally convey the necessity for taking over vehicle control.