Objective
- Development and implementation of a digital transceiver for data communication between on-board units (OBU) and transponder (SafeTAG)
- Robust data communication is crucial for reliable system operation
- Robust data transmission mode of the IEEE 802.11p standard has been selected
- Interoperability with other IEEE 802.11p based C2X systems on physical layer is important for system standardization and industrialization

Approach
- FPGA hardware platform for highest flexibility and processing performance has been selected
- High-level development tools for efficient implementation and testing have been applied
- Tests of the transceiver on different wireless testbeds and a channel emulator for comprehensive diagnosis and component characterization have been performed

Results
- Reliable data transmission under severe radio channel conditions has been demonstrated
- Successful system integration of the transceiver core has been realized by Ko-TAG project partners (SIZEDN, TU-München)
- Interoperability with other IEEE 802.11p based C2X devices (simTD, Ko-PER) has been demonstrated

Transceiver Architecture

Test Results

Investigation of channel gain with respect to antenna position and obstruction condition

Investigation of channel impulse response structure respect to antenna orientation

Cross-polarized vs. co-polarized

Co-polarized perpendicular vs. co-polarized parallel