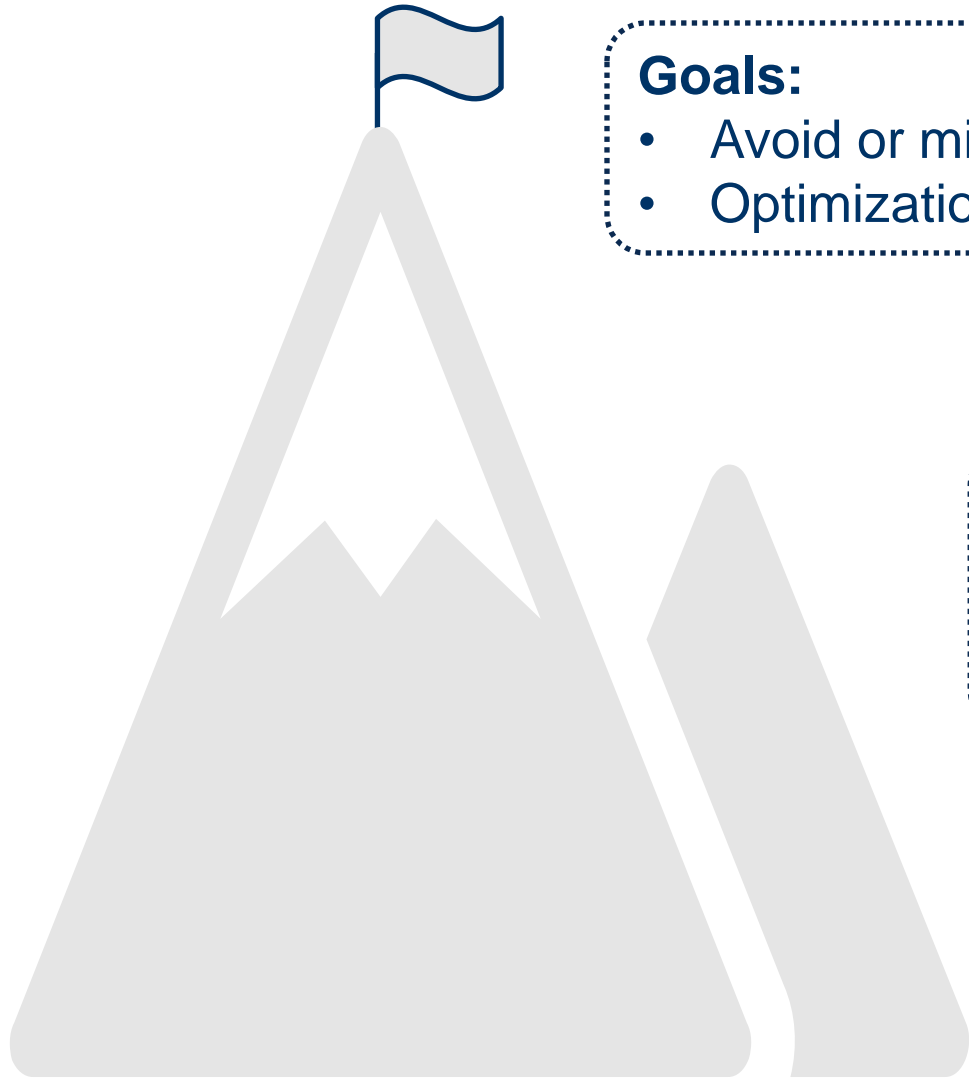


REAL TRAFFIC ACCIDENT SCENARIOS FOR VERIFICATION AND VALIDATION



Motivation

Motivation



Goals:

- Avoid or mitigate traffic accidents
- Optimization of ADAS/AD functionalities

Method:

- Derivation of (highly) critical scenarios and edge cases for simulation environments and assessment of ADAS/AD functionalities

Starting point:

- Detailed accident database



VUFO – Our Company

VUFO – Our Company



Founded in 2005



Area of Dresden



29 Employees



31 Students



Accident
investigation



> 500 Projects



> 200 Publications



Advanced training



Consulting



> 22.000
Accident records



Affiliated company of
TU Dresden AG



QM certificated

| Data source

Data source – in-depth accident research

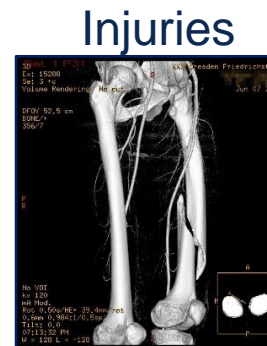
Investigation area



Source: OpenStreetMap



Information



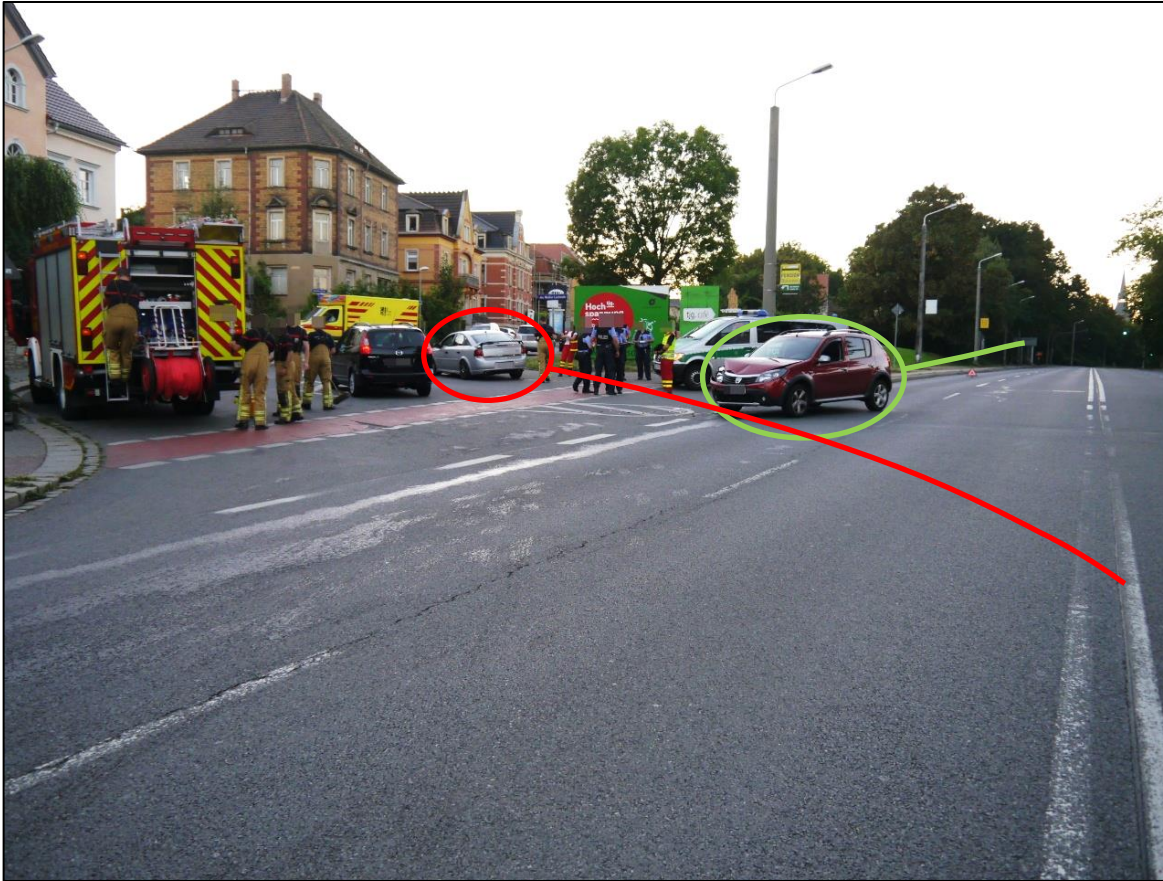
Database



Data source – in-depth accident research

Example case for scenario Left-Turn-Across-Path / Oncoming-Traffic

Accident scene



Deformations



Documentation of the environment



Data source – in-depth accident research

Data processing of accident data

Accident sketch

3D Laserscan

Manual measurement



Detailed mapping of the environment

- Road markings
- Objects, e.g. buildings, trees
- Temporary local changes to the road layout, e.g. construction site markings
- Driving trajectories of the participants

Reconstruction of the accident with PC Crash®



Reconstruction of the course of events and simulation of the collision based on:

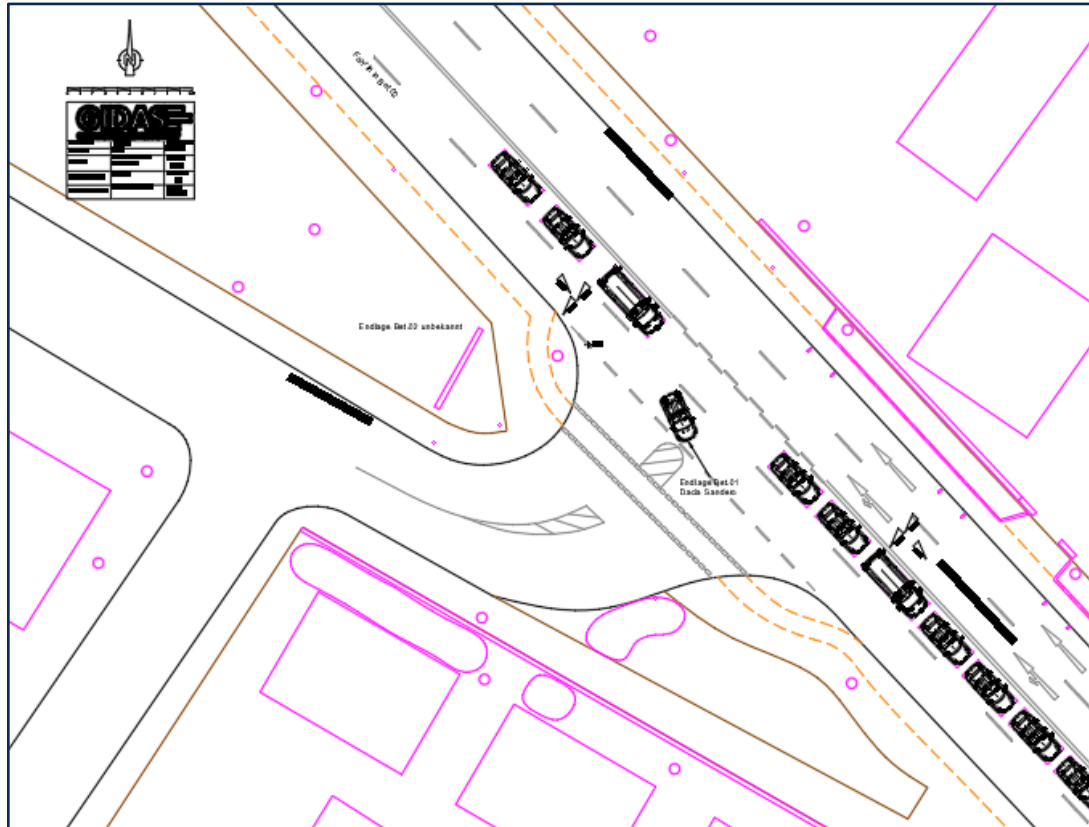
- Brake or skidding marks
- End position of the participants
- EDR recordings / electronic vehicle data
- Interviews
- Evidences of the accident, e.g. vehicle parts, blood marks



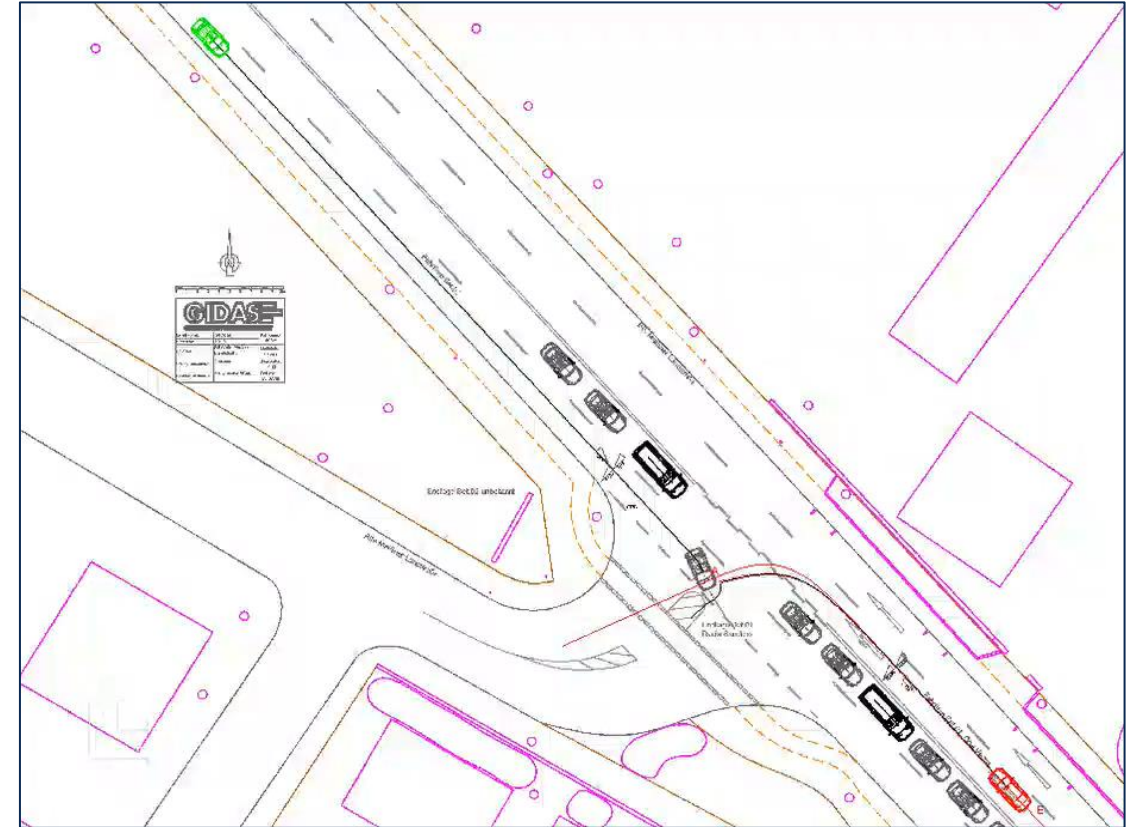
Data source – in-depth accident research

Example case for scenario Left-Turn-Across-Path / Oncoming-Traffic

Accident sketch

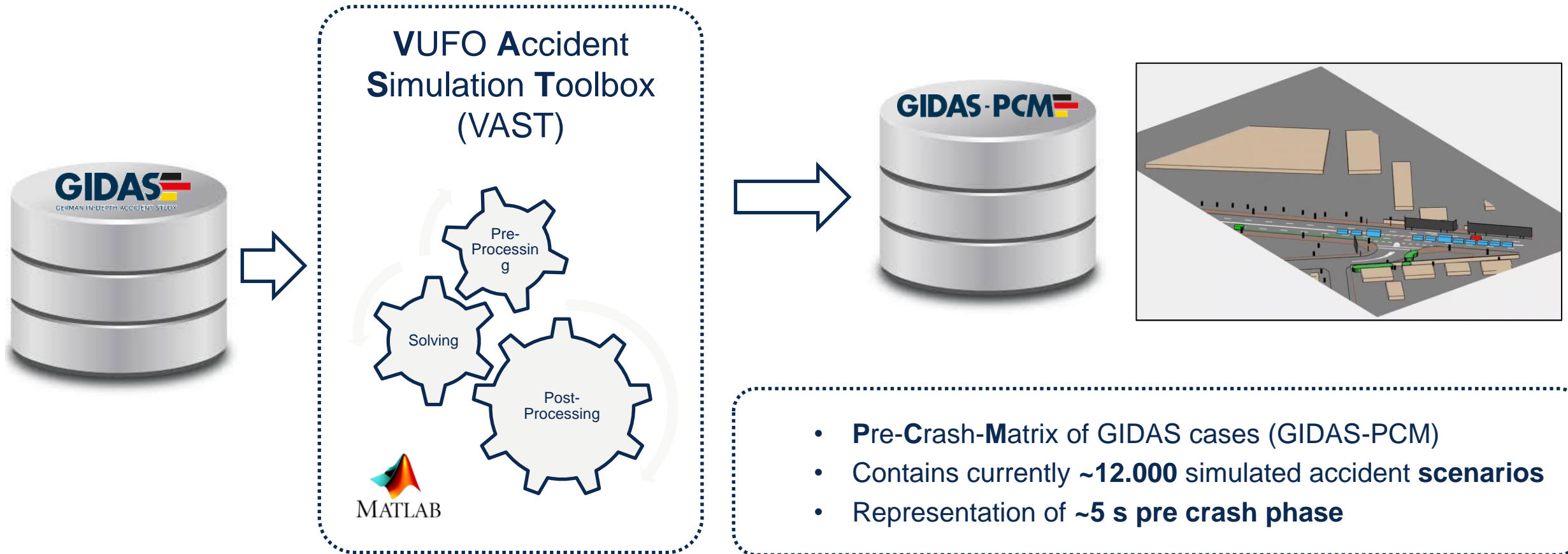


Reconstruction of the accident with PC Crash®



Data source – in-depth accident research

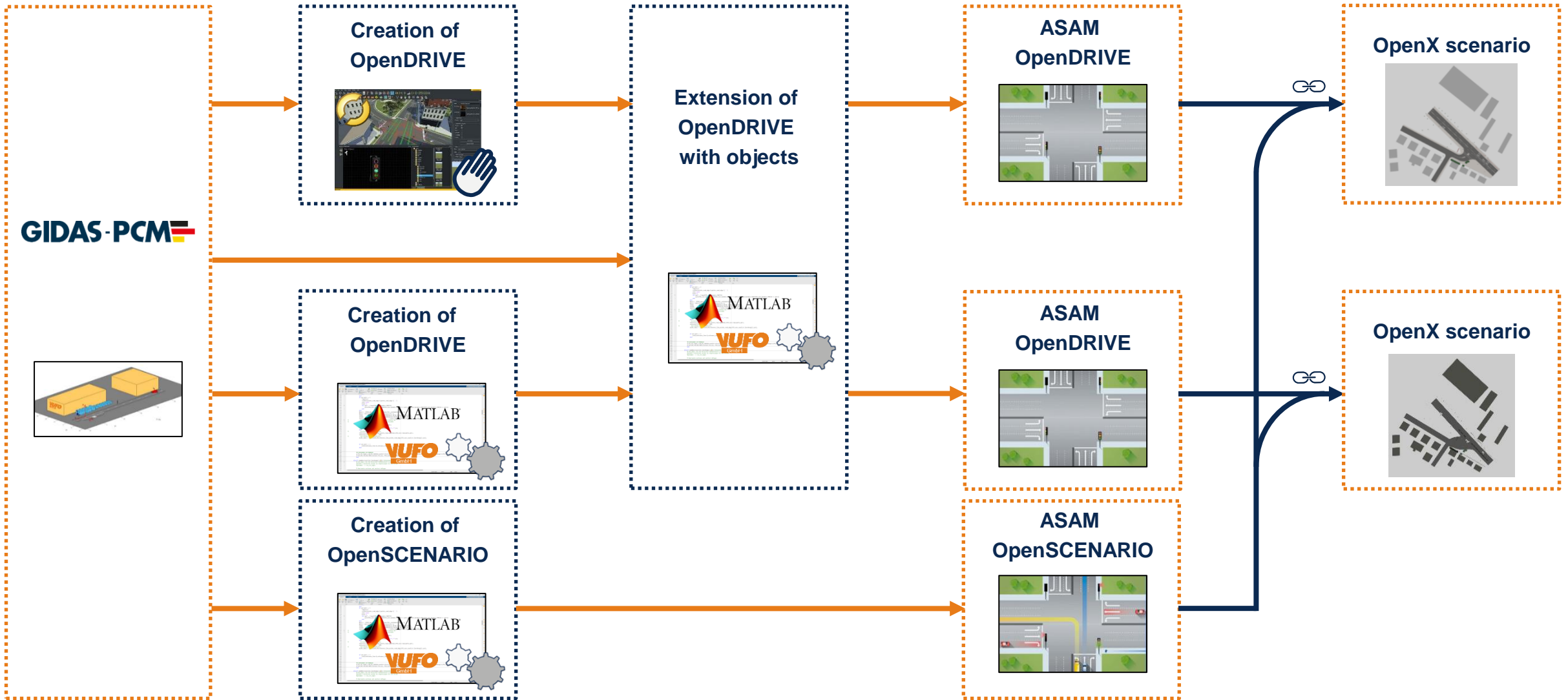
Derivation of accident scenarios



- **Pre-Crash-Matrix** of GIDAS cases (GIDAS-PCM)
- Contains currently **~12.000** simulated accident **scenarios**
- Representation of **~5 s pre crash phase**

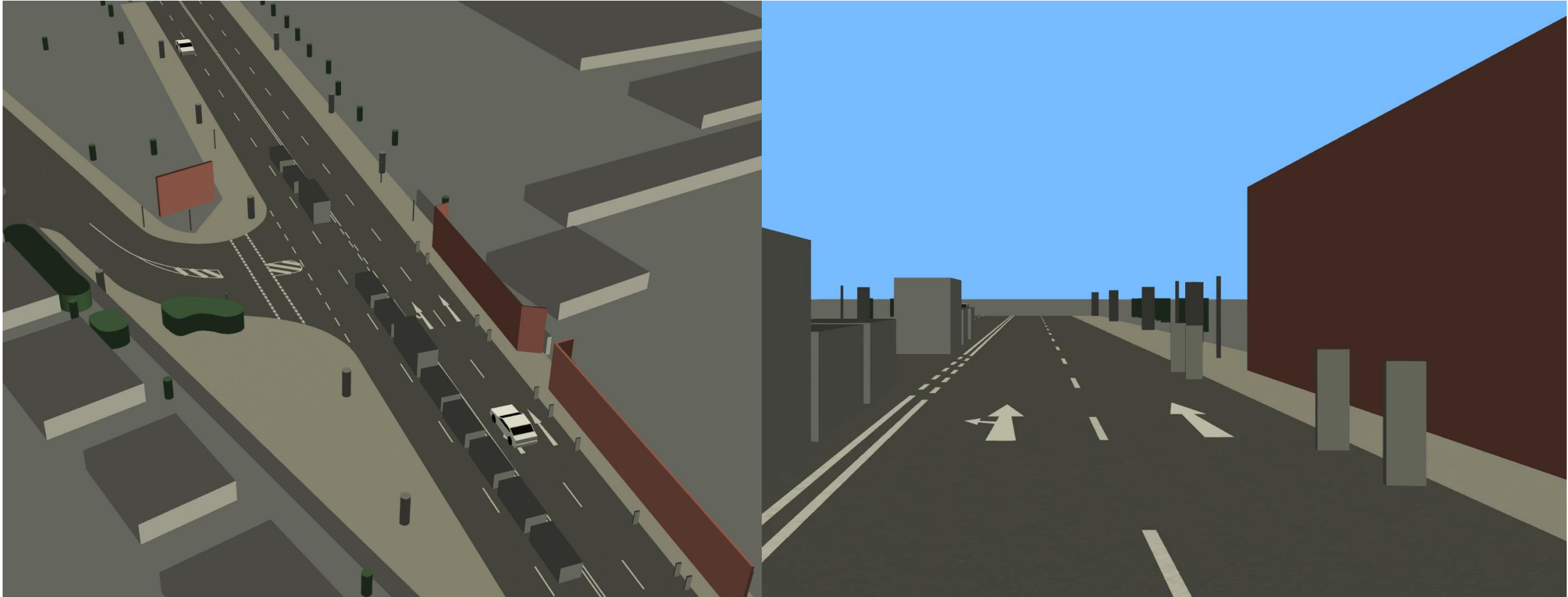
| Scenario generation

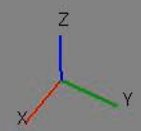
Workflow for converting GIDAS into simulateable formats



Scenario generation – OpenDRIVE / OpenSCENARIO

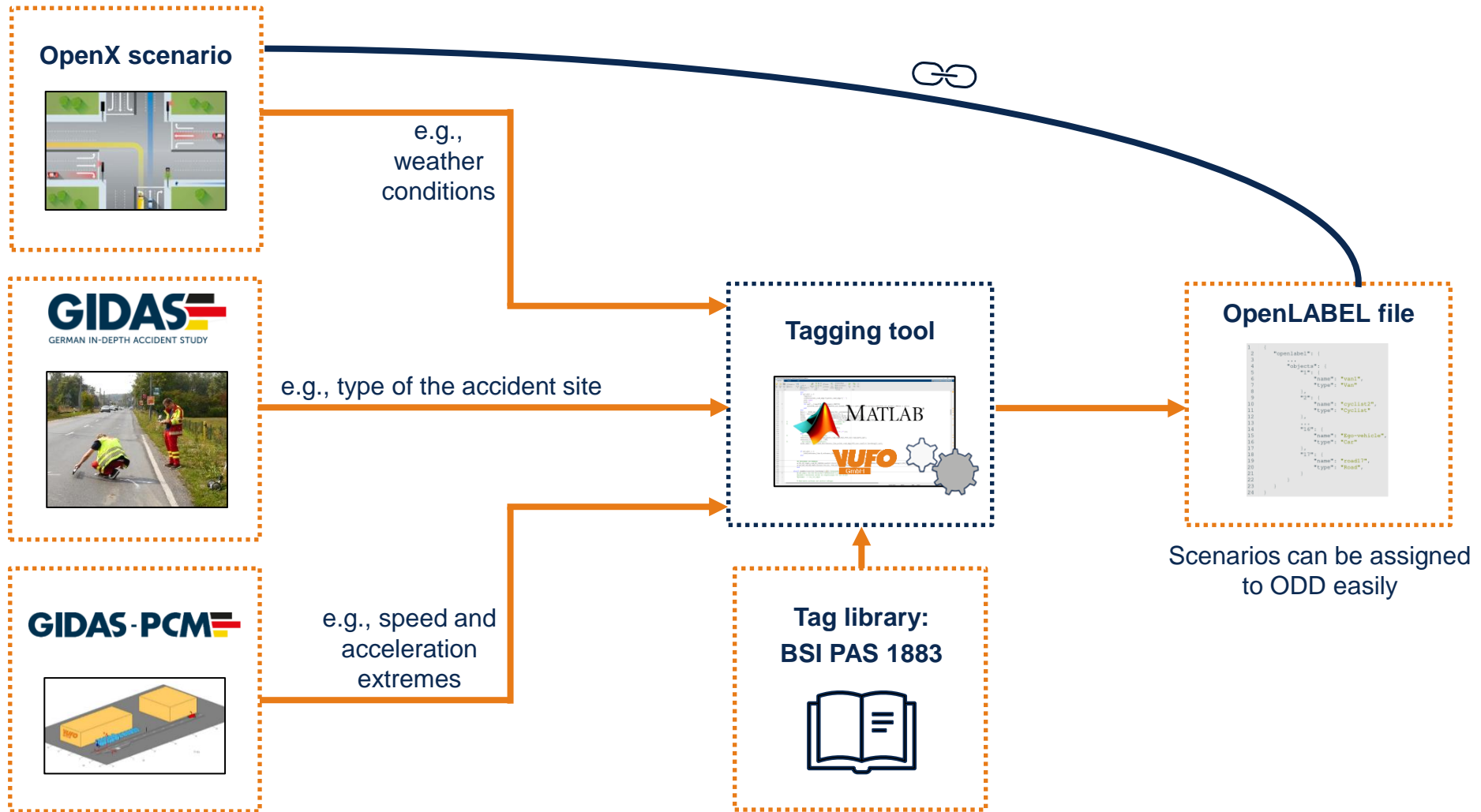
Example case for scenario Left-Turn-Across-Path / Oncoming-Traffic



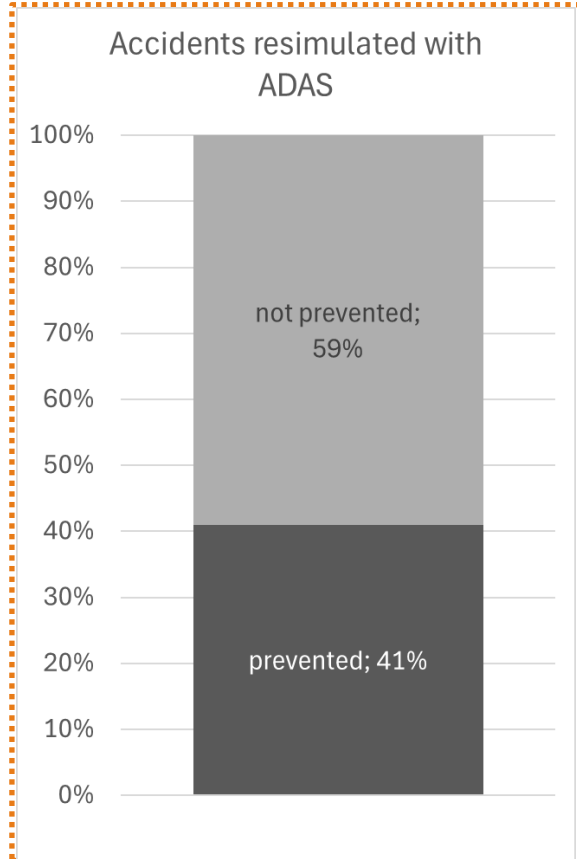


| Scenario enrichment

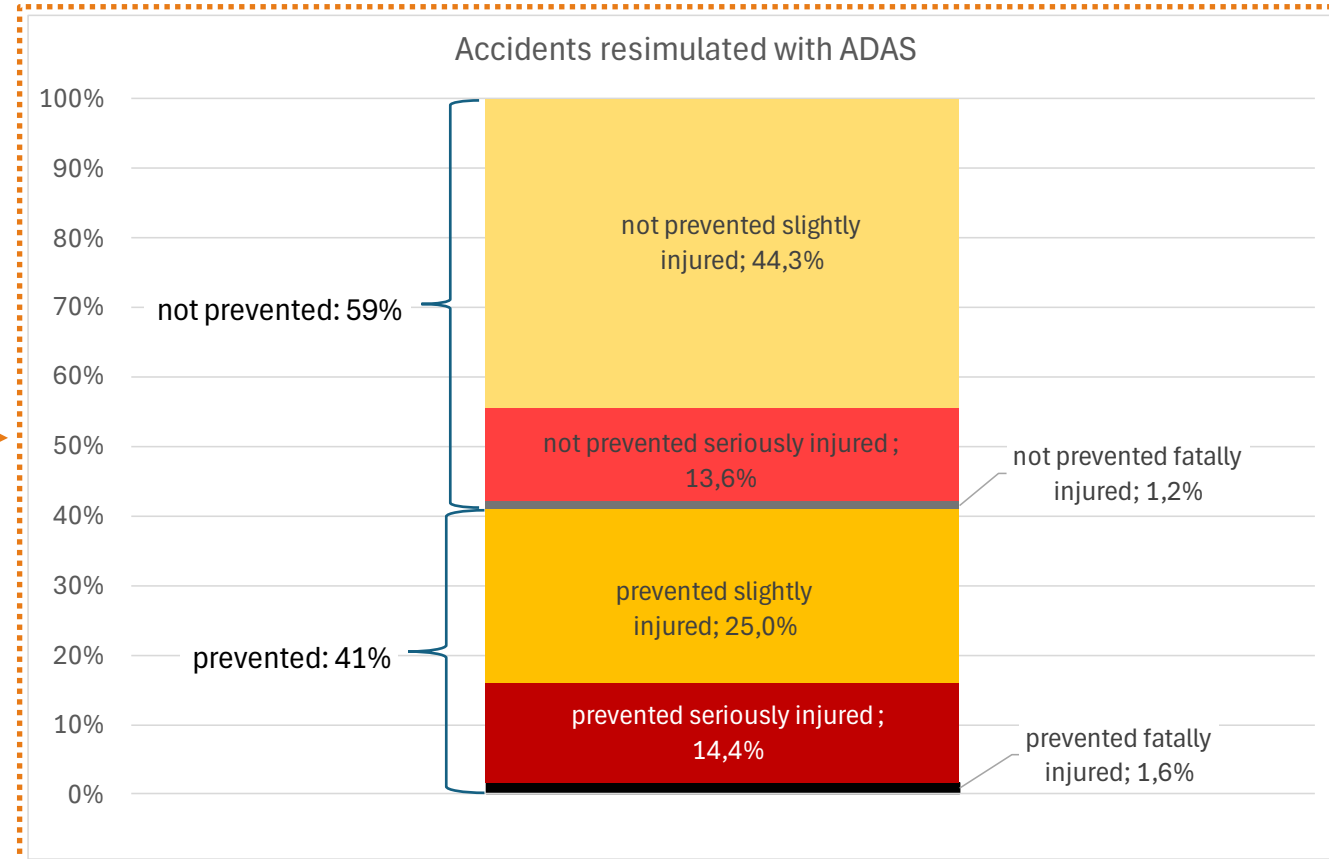
Tagging process



Combination of scenarios and results of resimulation with GIDAS data



GIDAS information about injury severity



| Advantages of real accident scenarios

Advantages of real accident scenarios from GIDAS

- Edge cases that actually occurred in real traffic
- Accidents are representative for Germany
- Additional metadata from GIDAS enables easy assignment to ODD
- Benefit estimations for mitigated injuries and fatalities are possible

ARE YOU INTERESTED? PLEASE FEEL FREE TO CONTACT US!



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| Questions