

***Overtaking motorcycles at***

***collisions with left turning cars***

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Foto

# ÜBERHOLENDES MOTORRAD KOLLIDIERT MIT ABBLIEGENDEM AUTO

15. Juni 2022

# Study approach and data structure

- GIDAS Data 2009-2018 (repräsentative random sample)
- Motorcycles >125 cm<sup>3</sup> n=2108
- 169 cases „accident overtaking and parallel driving of motorcycles“



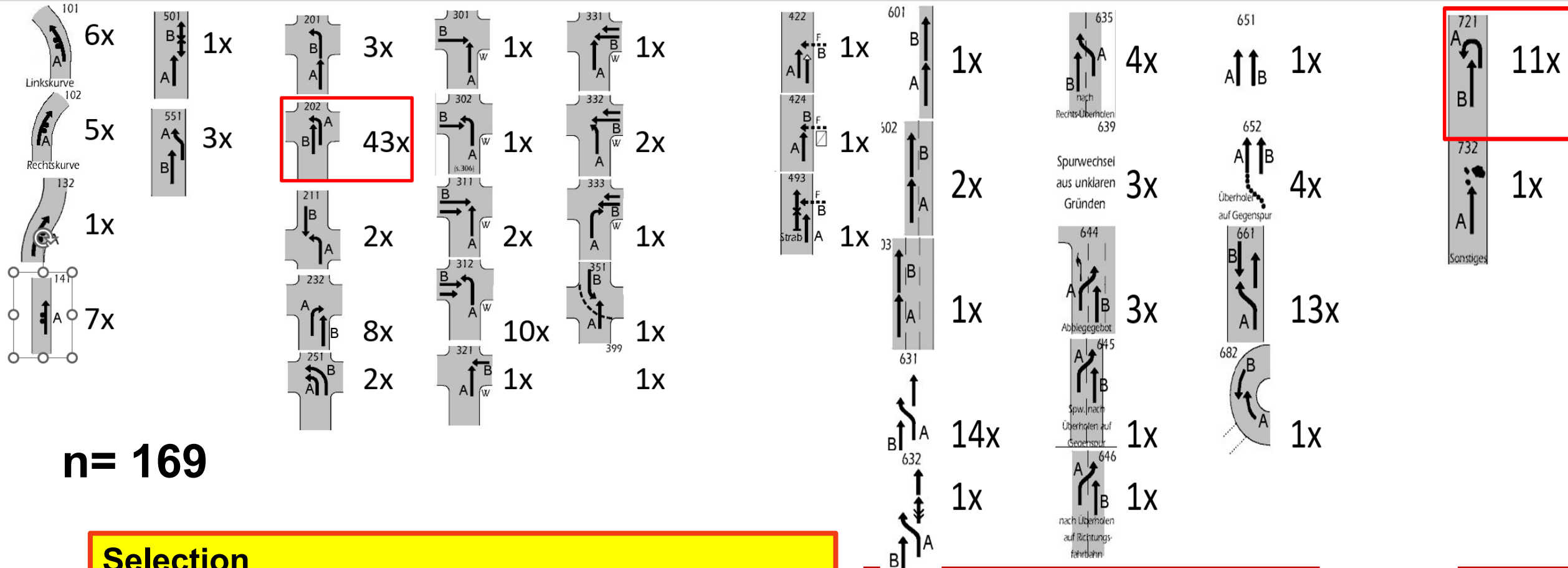
**Selection**  
„ left turning cars & overtaking motorcycles“



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# Accident types in German National Statistics DESTATIS accident overtaking and parallel driving of motorcycles



GIDAS Data 2009-2018

# Study approach and data structure

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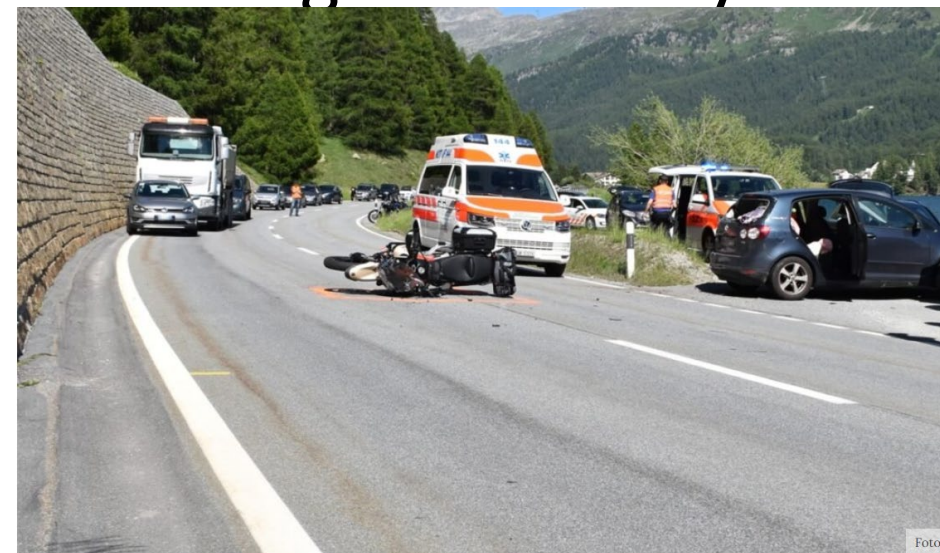
- Type no. 202 (n=43, **25,5%**) und 721 (n=11, **6,5%**)



54 cases



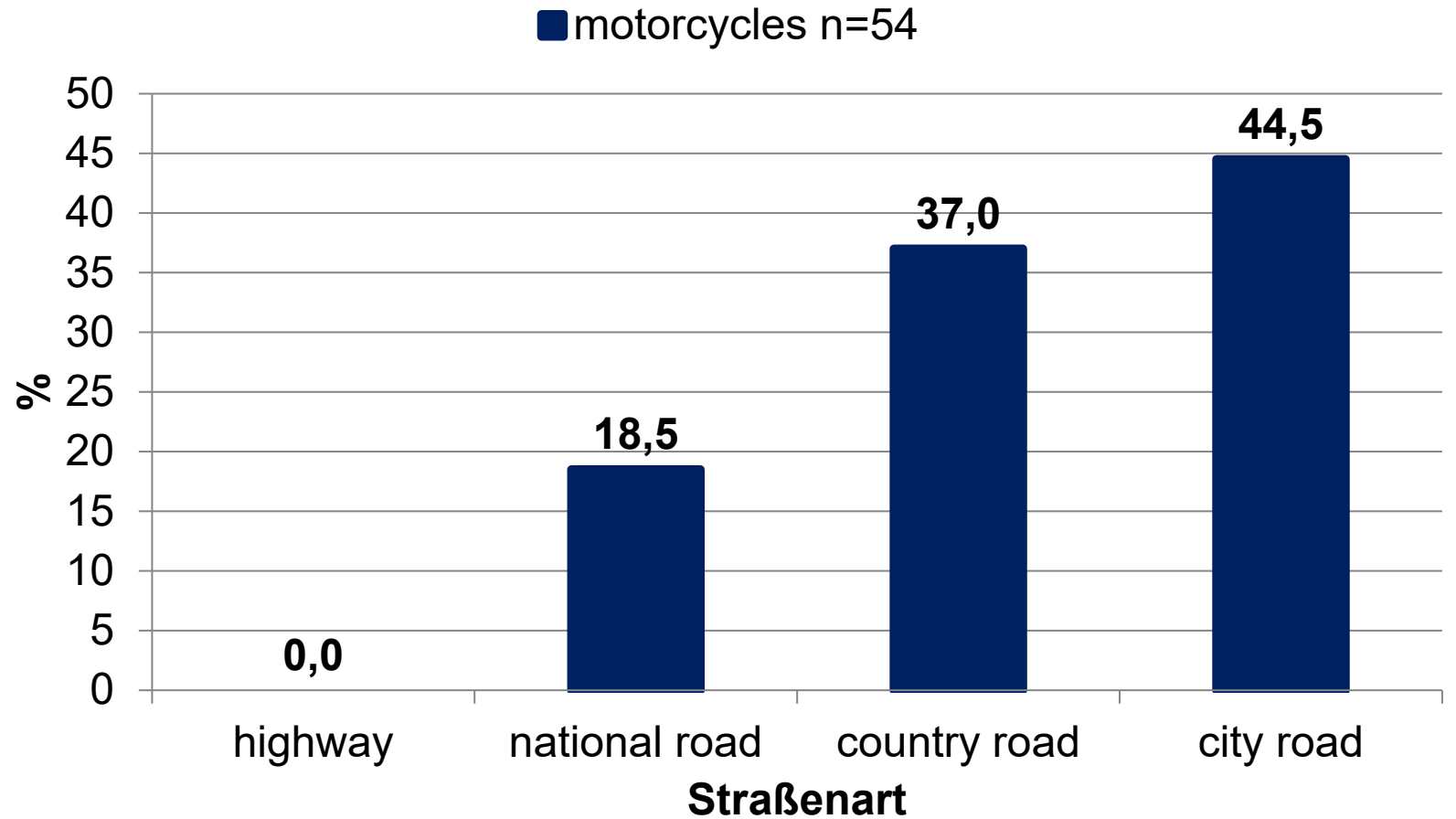
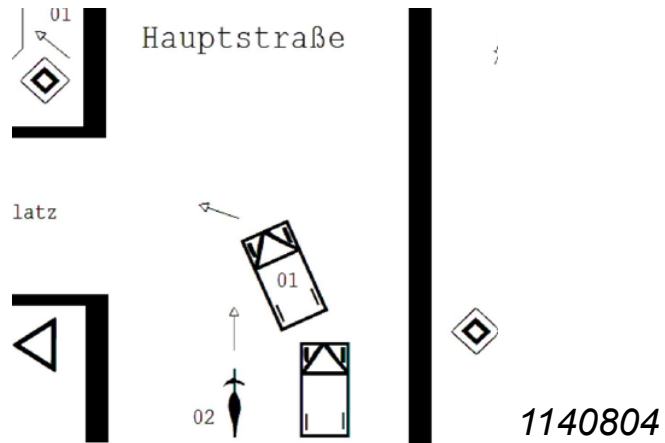
**Selection**  
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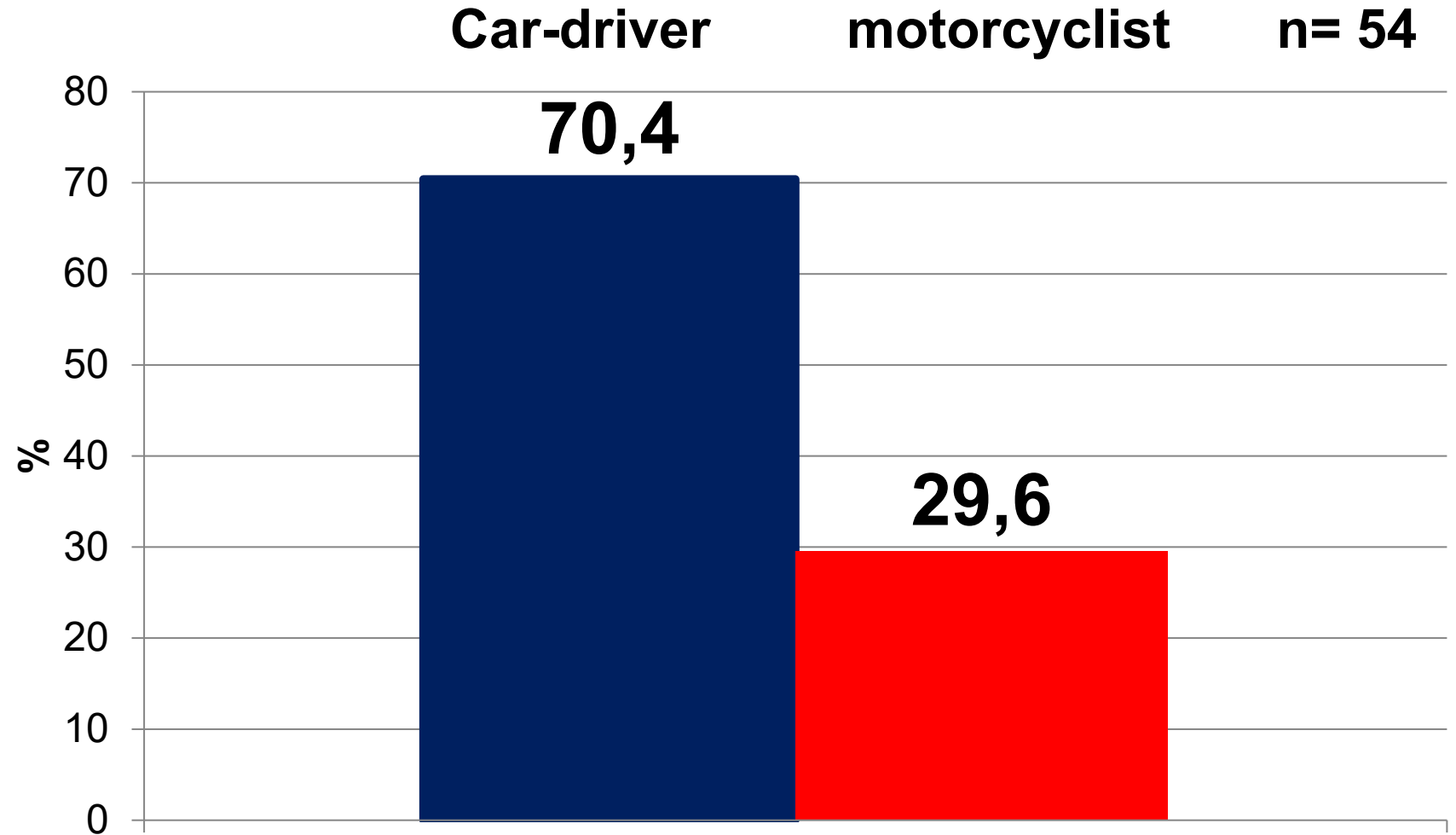
**ÜBERHOLENDES MOTORRAD KOLLIDIERT  
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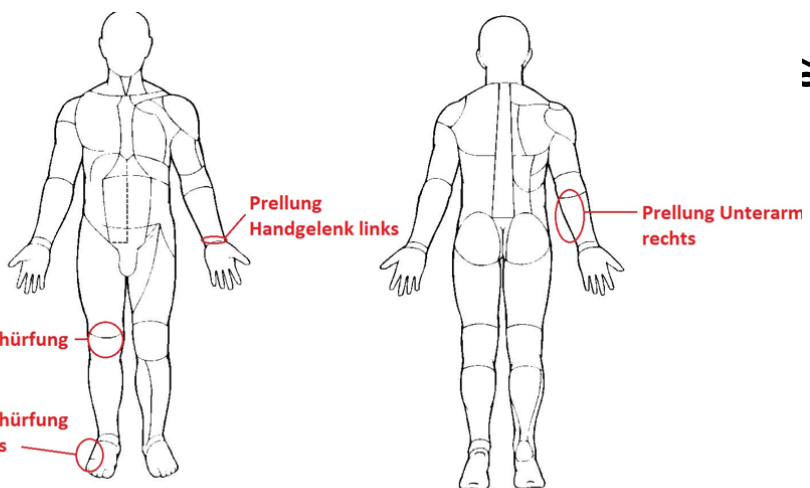
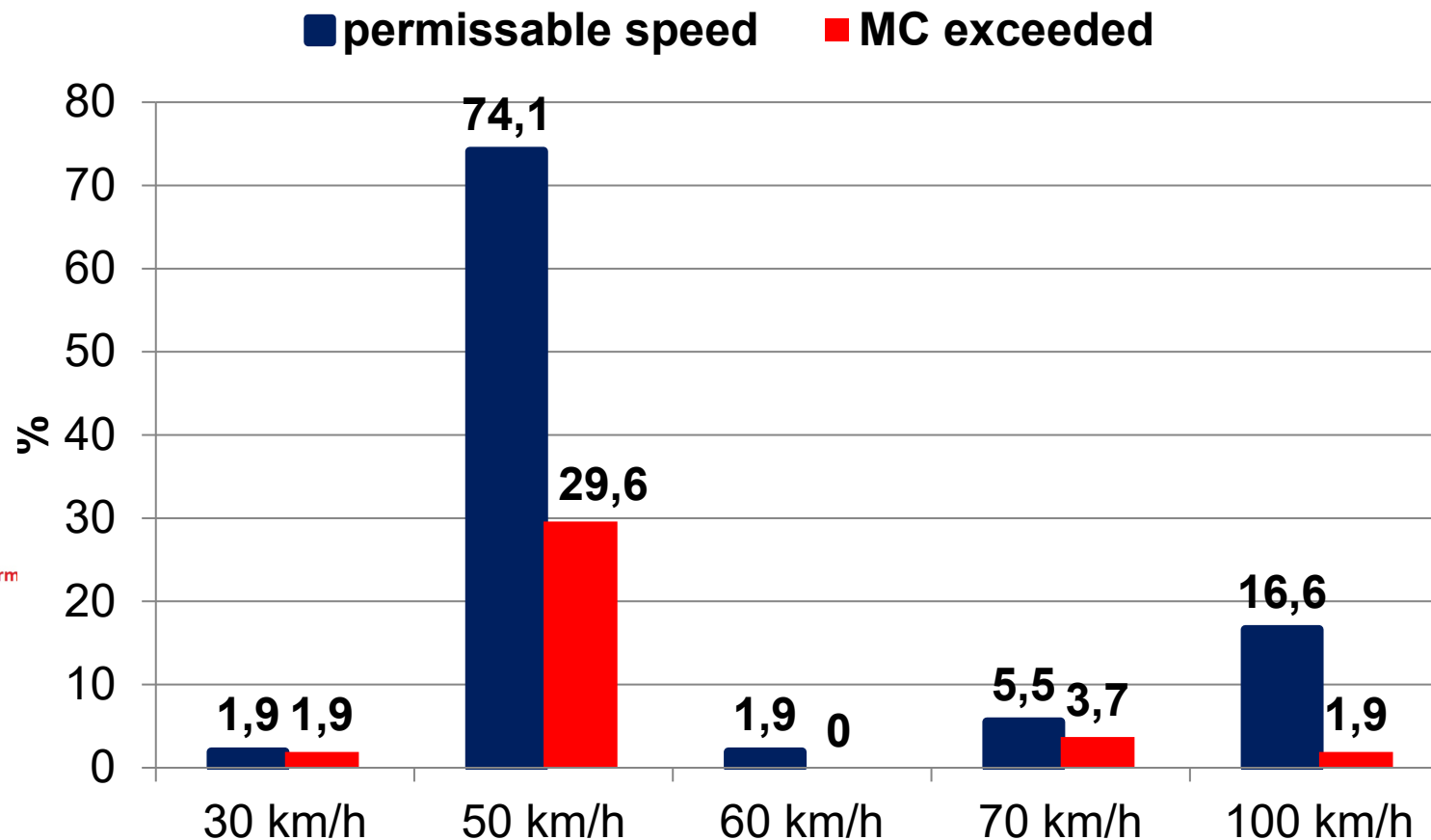
# Kind of road „left turning cars & overtaking motorcycles“



# Guiltiness in overtaking motorcycles accidents at collisions with left turning cars from police assessment

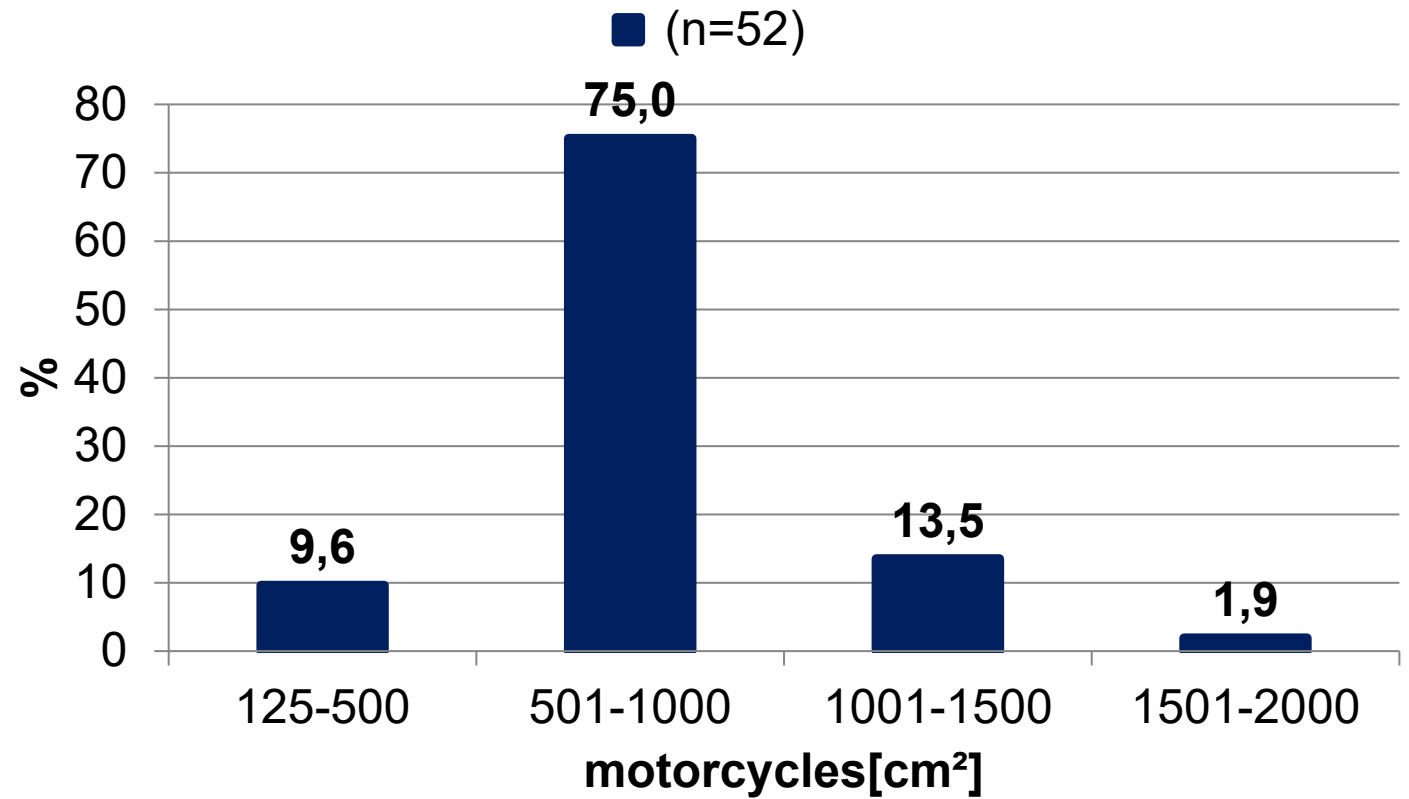


# Permissible Speed exceeded



1150351

# Engine performance CCM of motorcycles



21,2

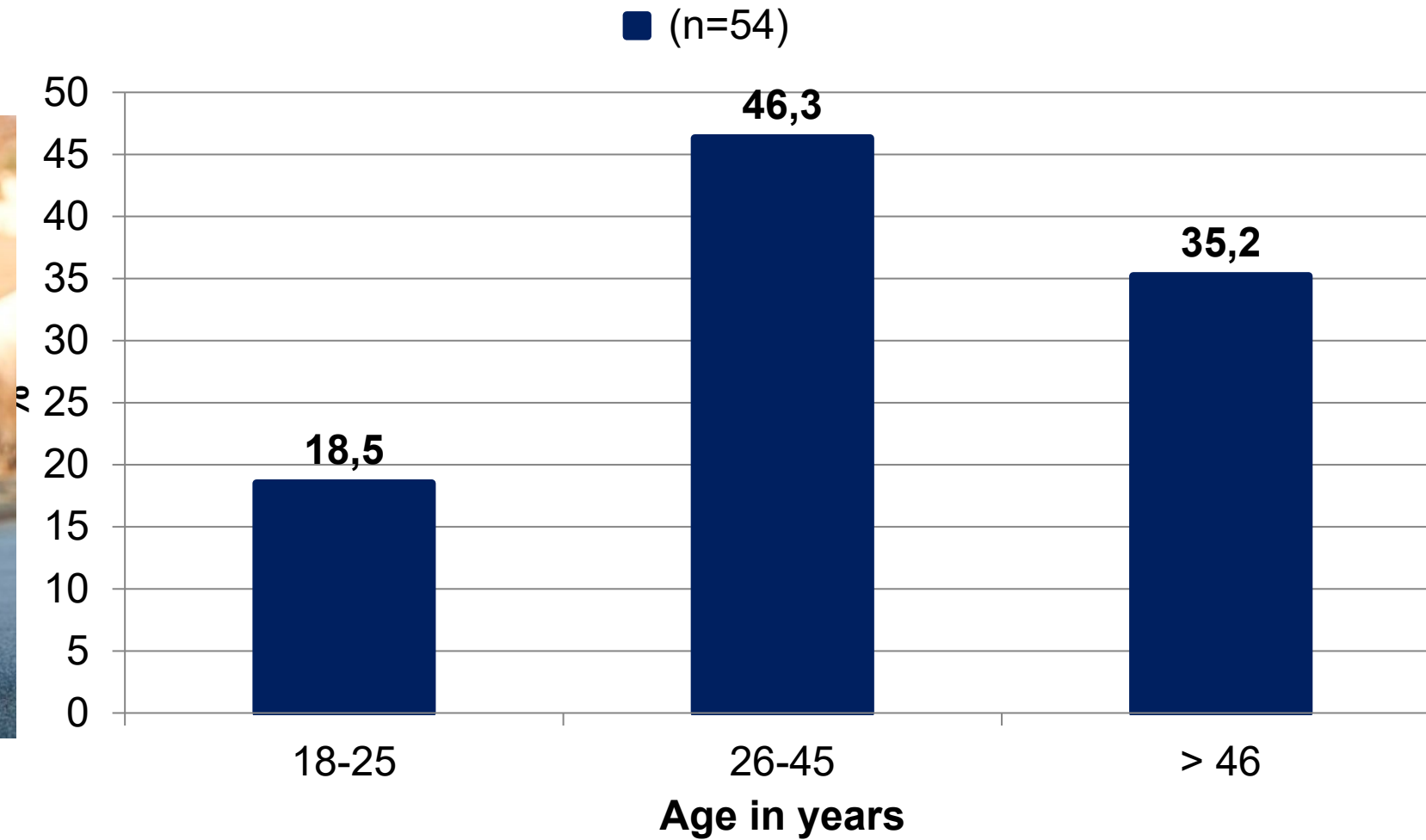
49,9

18,9

*official registered in Germany 2021*

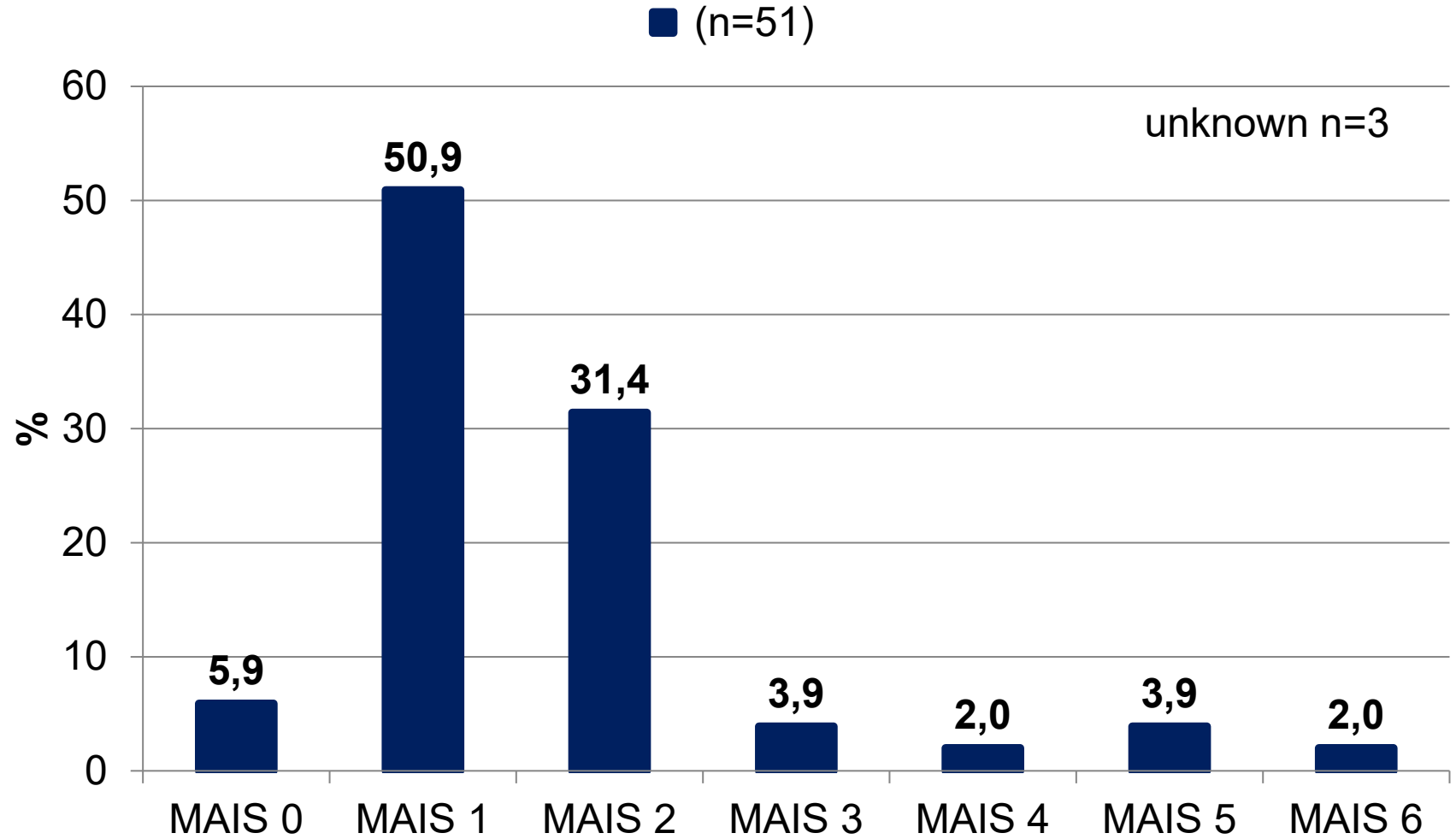
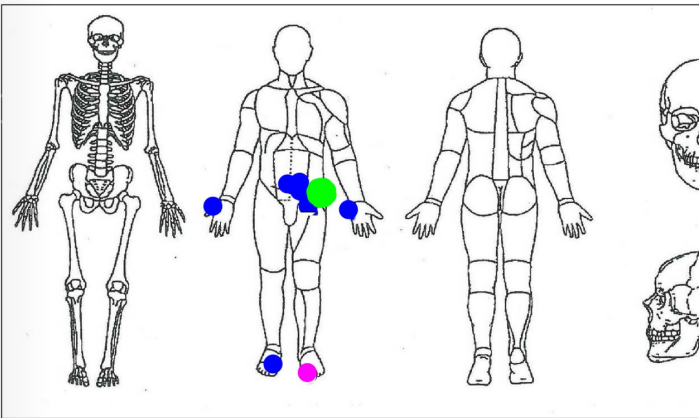


# Age of motorcyclists

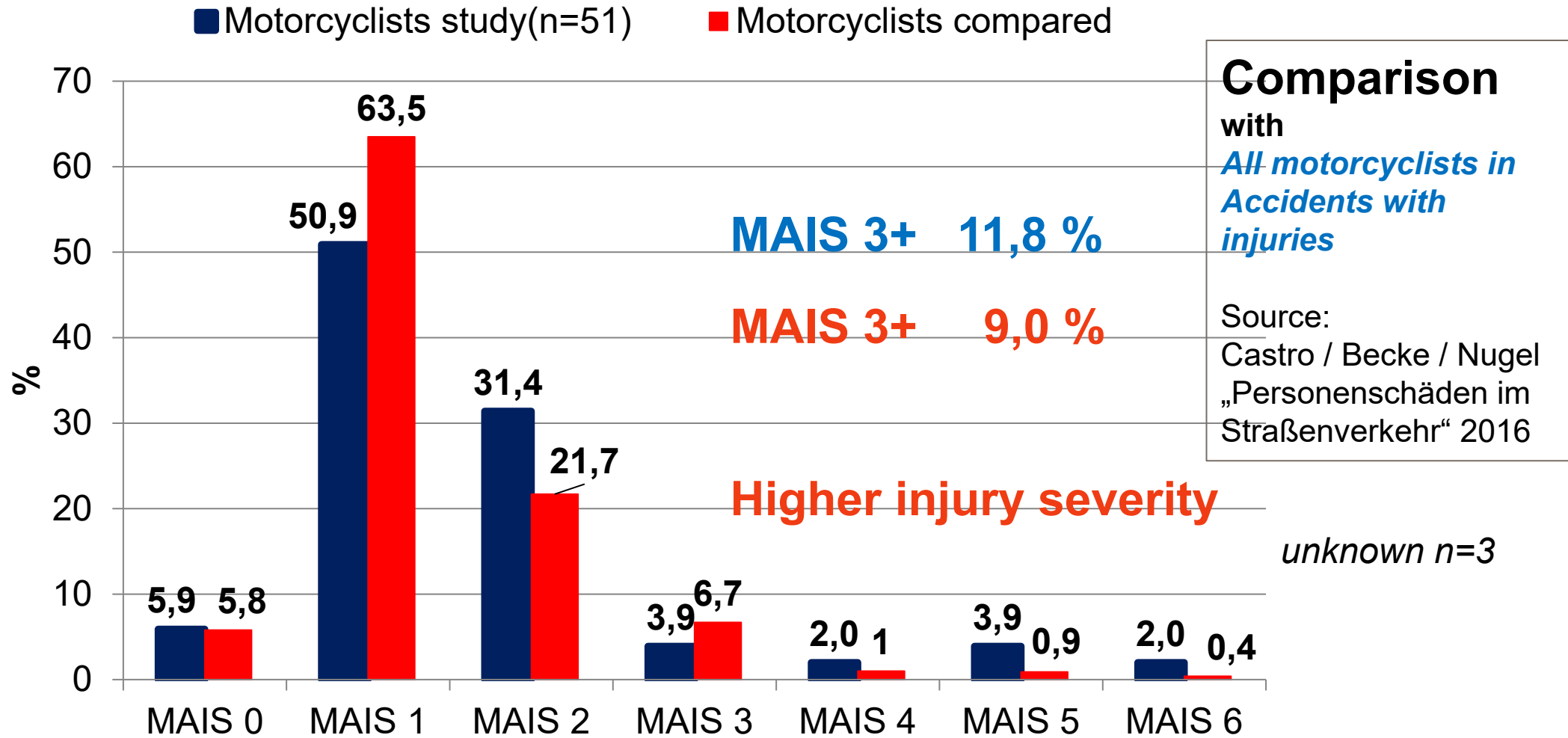


# Injury Severity Motorcyclists Abbreviated Injury Scale

- Schürfung
- Schnittwunde
- Fraktur
- Prellung
- RQW
- Verbrennung



# Injury Severity Motorcyclists Abbreviated Injury Scale



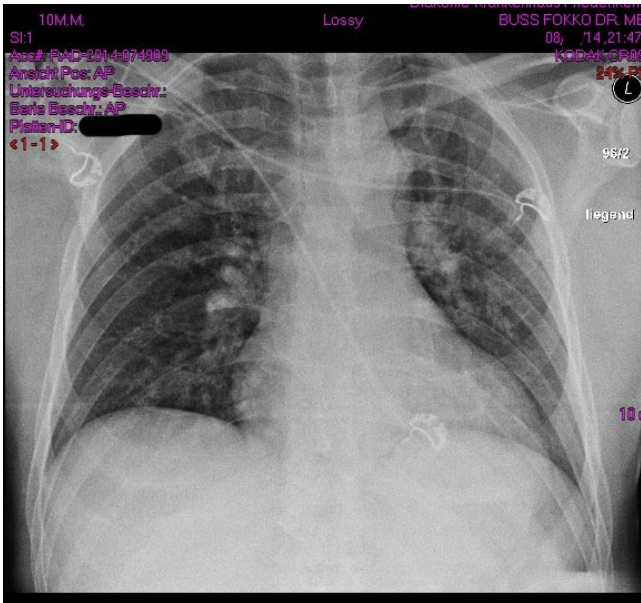
# Injury Severity Motorcyclists Body Regions

AIS	AIS 0	AIS 1	AIS 2	AIS 3+
Head	72,6%	17,6%	7,8%	2,0%
Cercical spine	80,4%	13,7%	3,9%	2,0%
Thorax	58,8%	19,6%	9,8%	11,8%
Arms	30,0%	44,0%	26,0%	0,0%
Pelvis	82,3%	11,8%	3,9%	2,0%
Abdomen	92,1%	3,9%	2,0%	2,0%
Legs	23,5%	58,8%	11,8%	5,9%

unknown n=3

# *High risk in overtaking motorcycles at situations with leftturning cars*

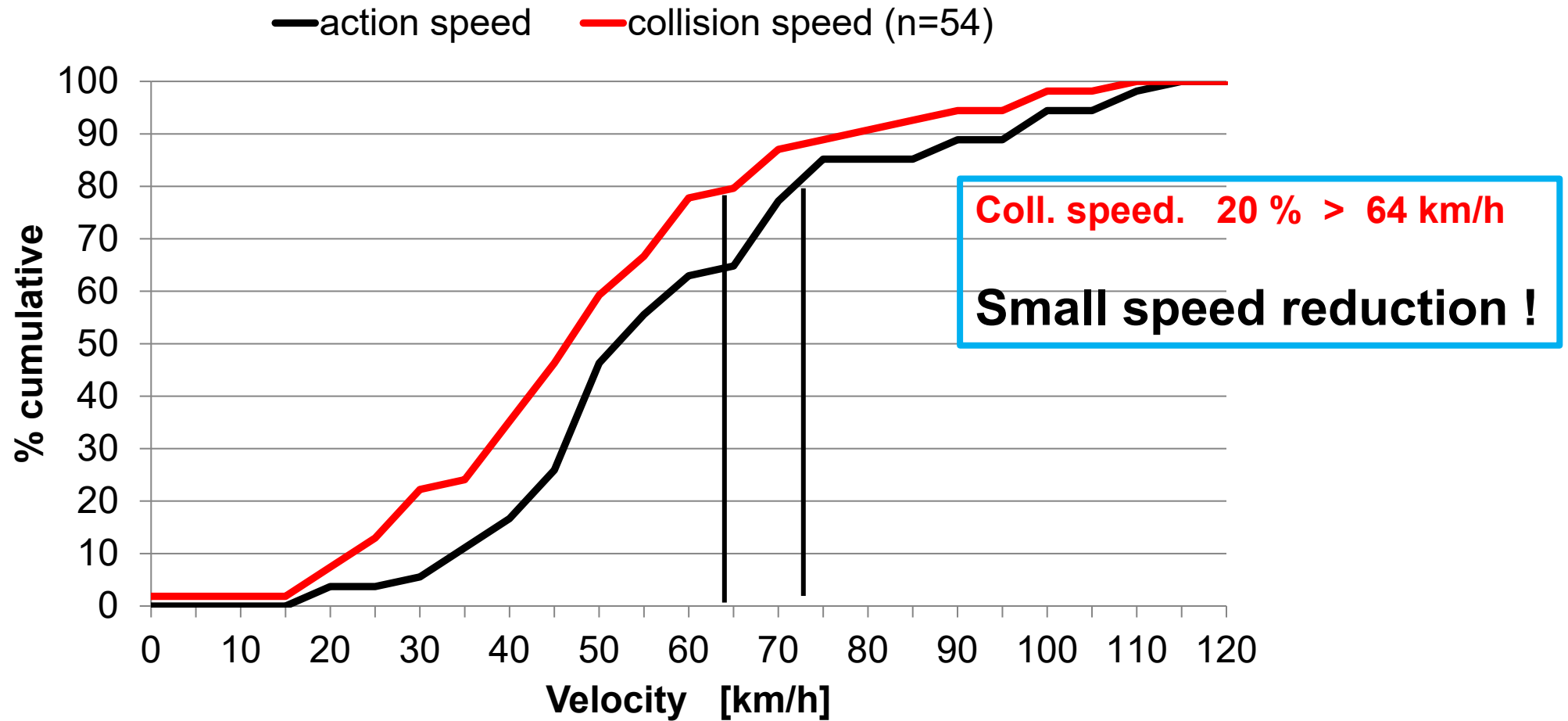
## *Thorax + legs (all extremities)*



30140450

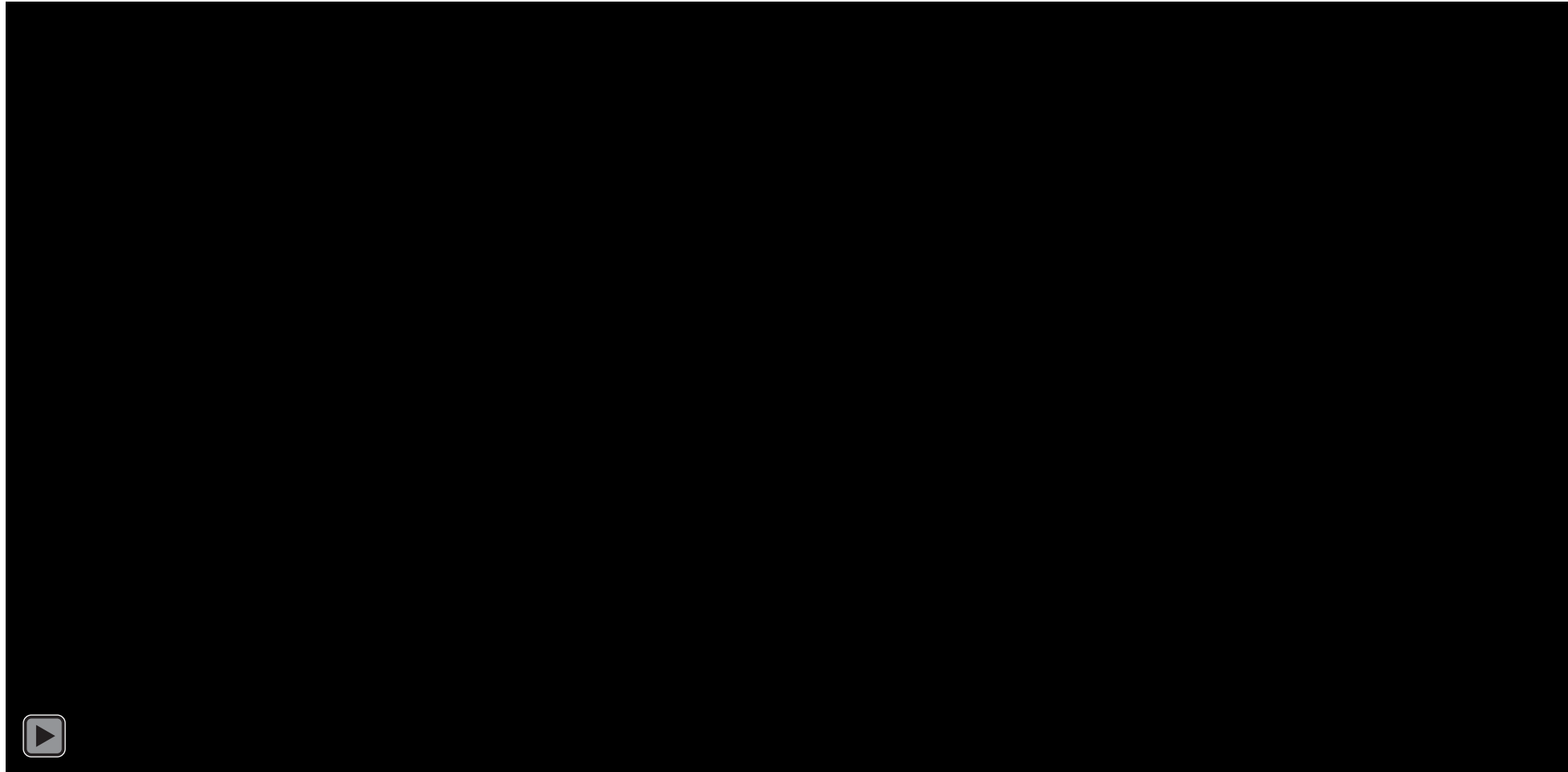
# Motorcycle:

# Driving Speed at Action / Collision Speed

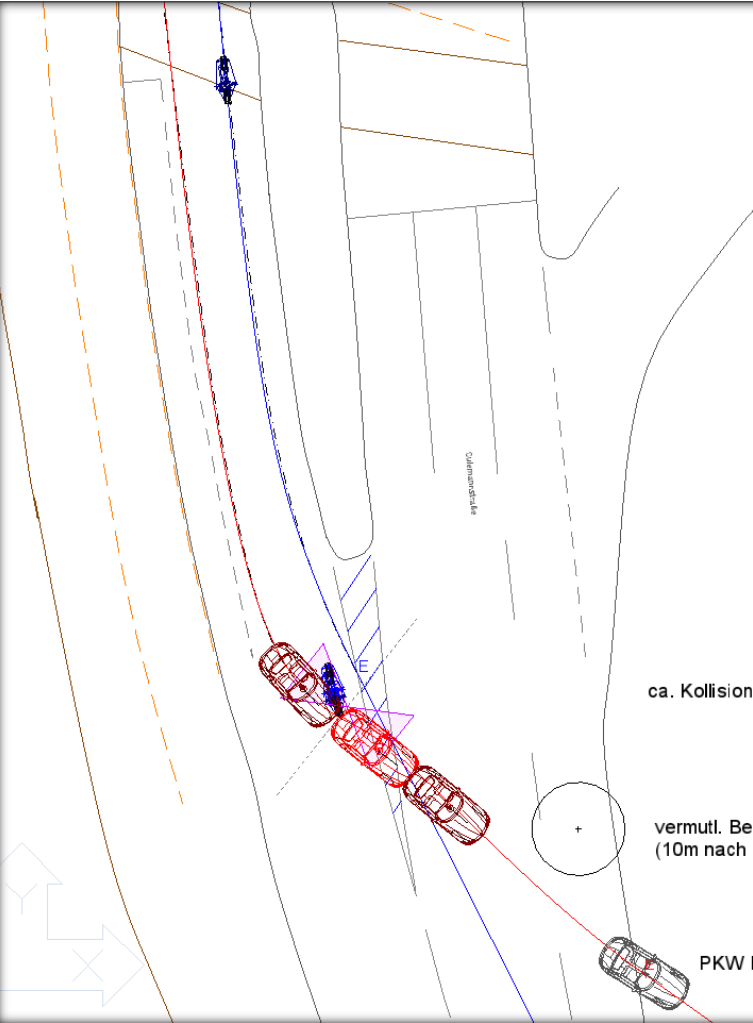


# Accident Reconstruction with PCcrash software

## Distance-Time-Relation



# Distance-Time-Relation „motorcycle overtaking car“

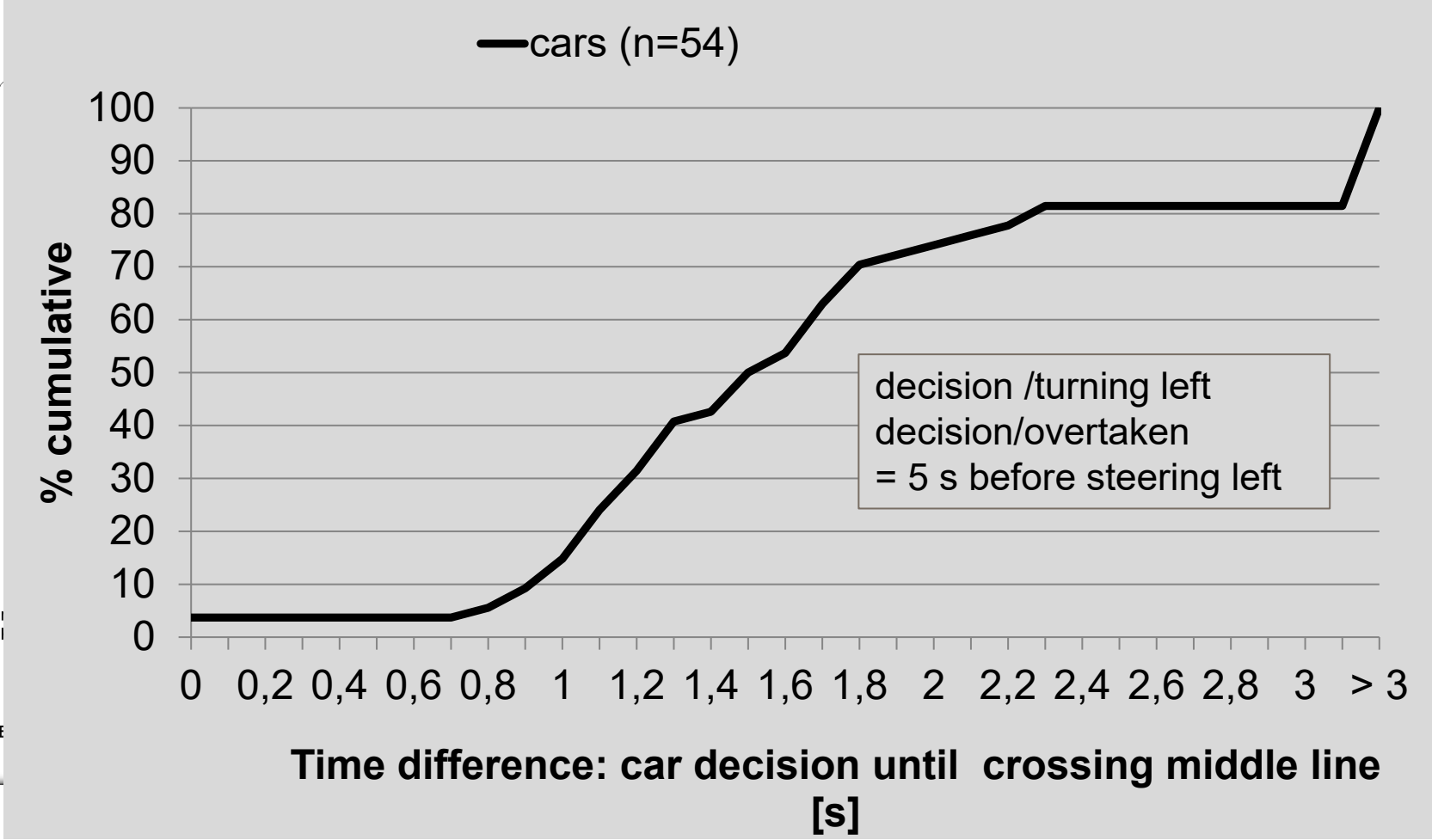


Stoß-Einlauf-Impuls ? x

Fahrzeug: 1 B1 BMW Z4 2 B2 Krad Ya

Einlauf: [red bar] [blue bar]

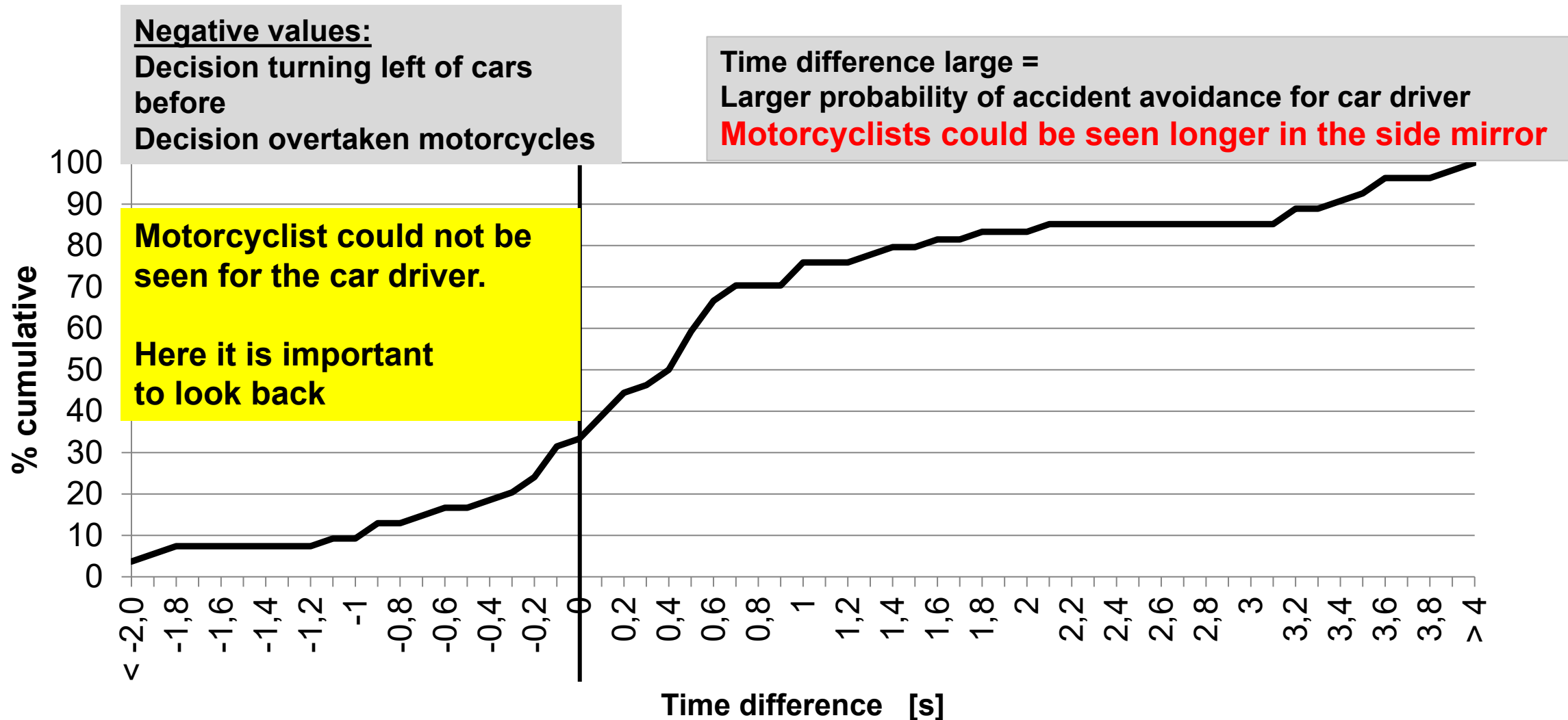
N



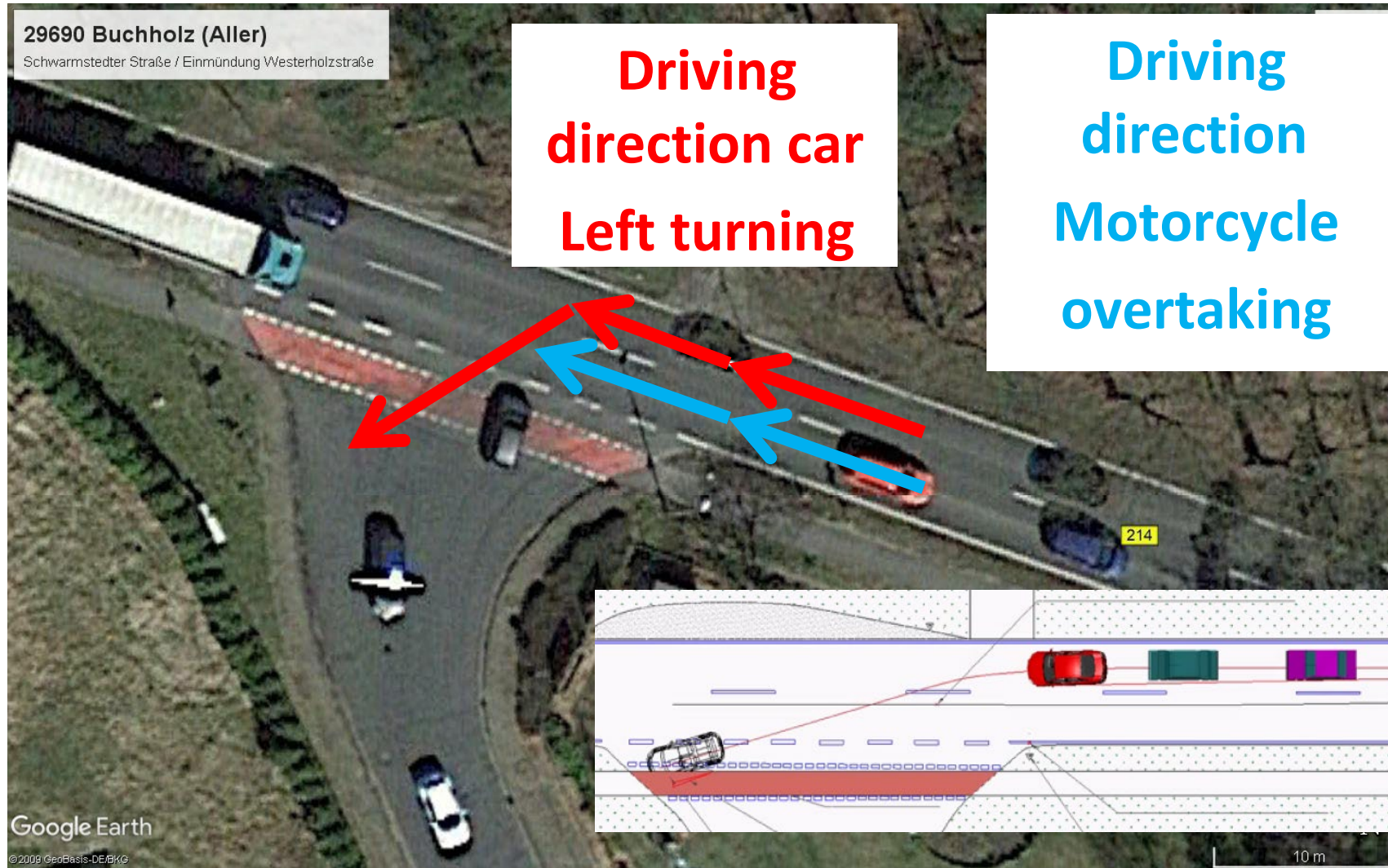


Time difference:

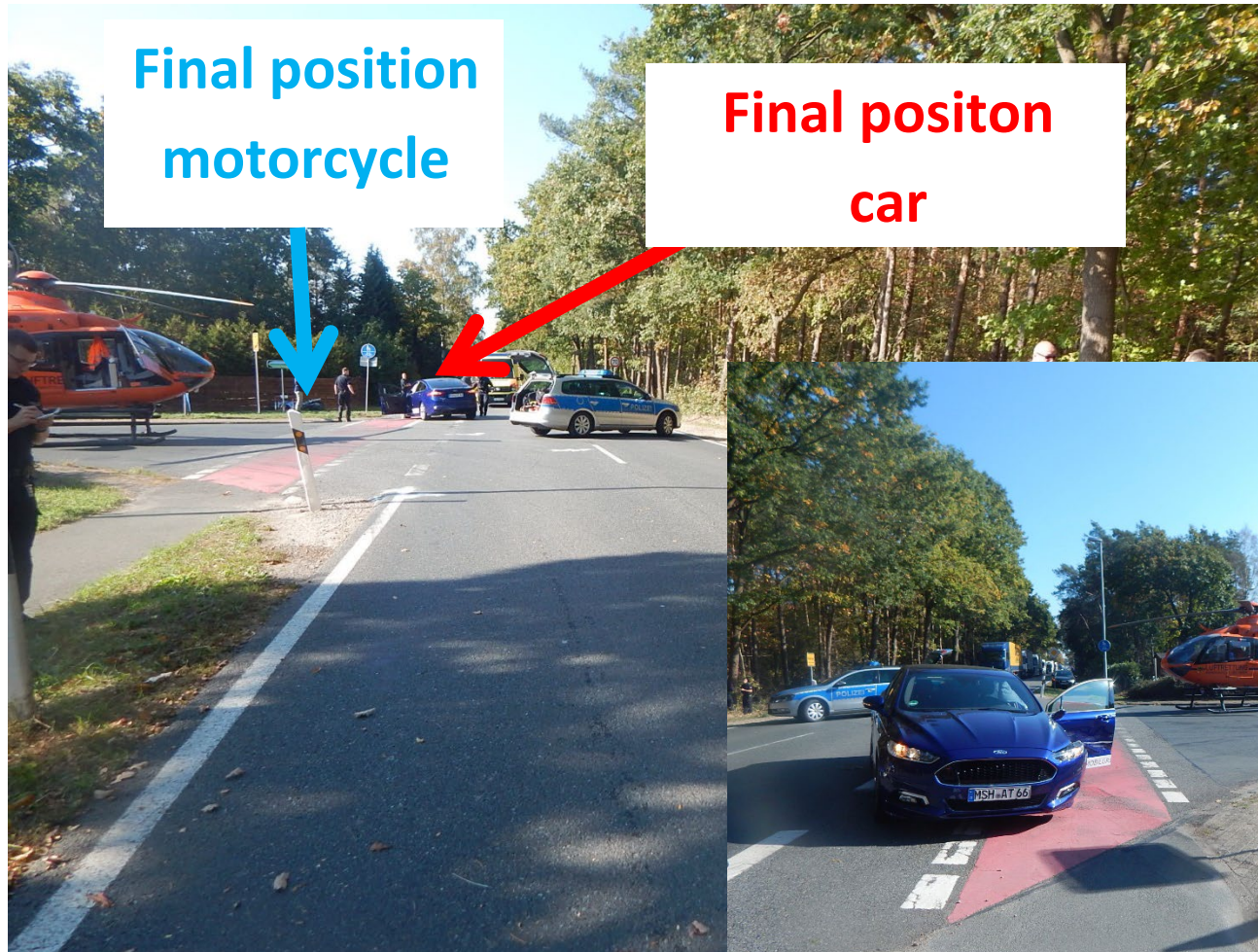
decision car left turn/motorcycle begin of overtaken until crossing middle line



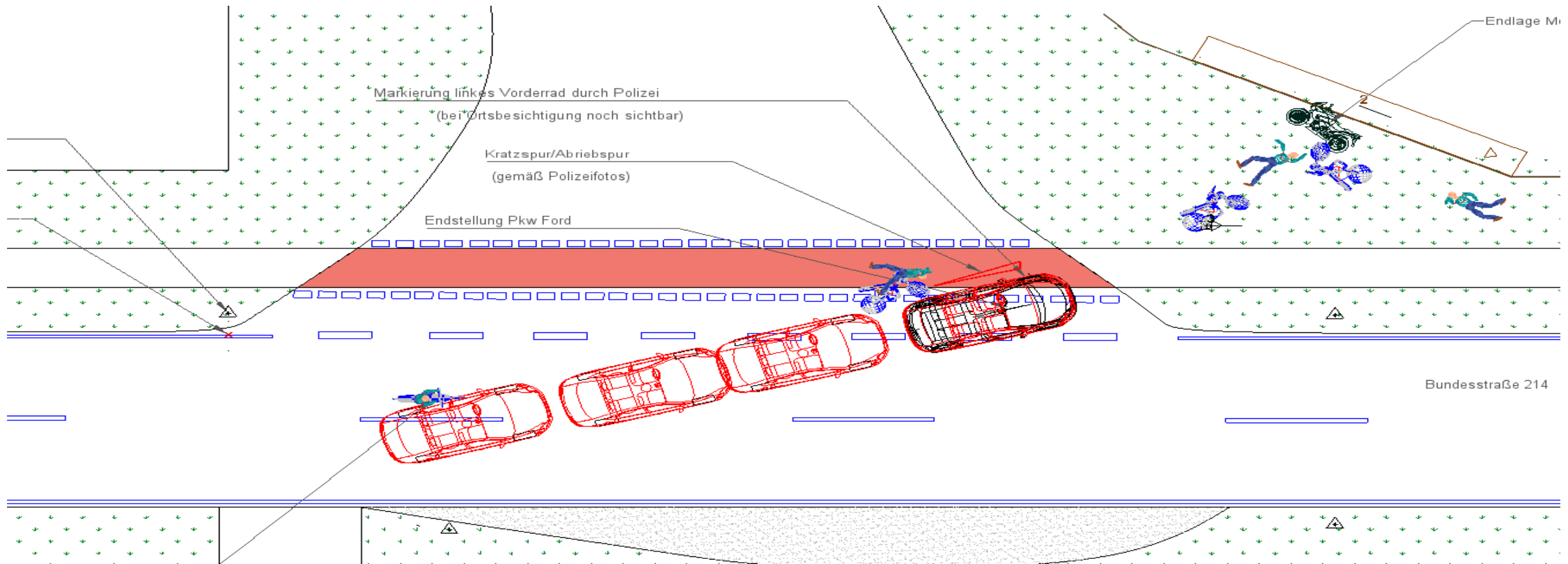
# Example car to motorcycle collision



# Example situation on location car to motorcycle collision



# Example car to motorcycle collision reconstruction

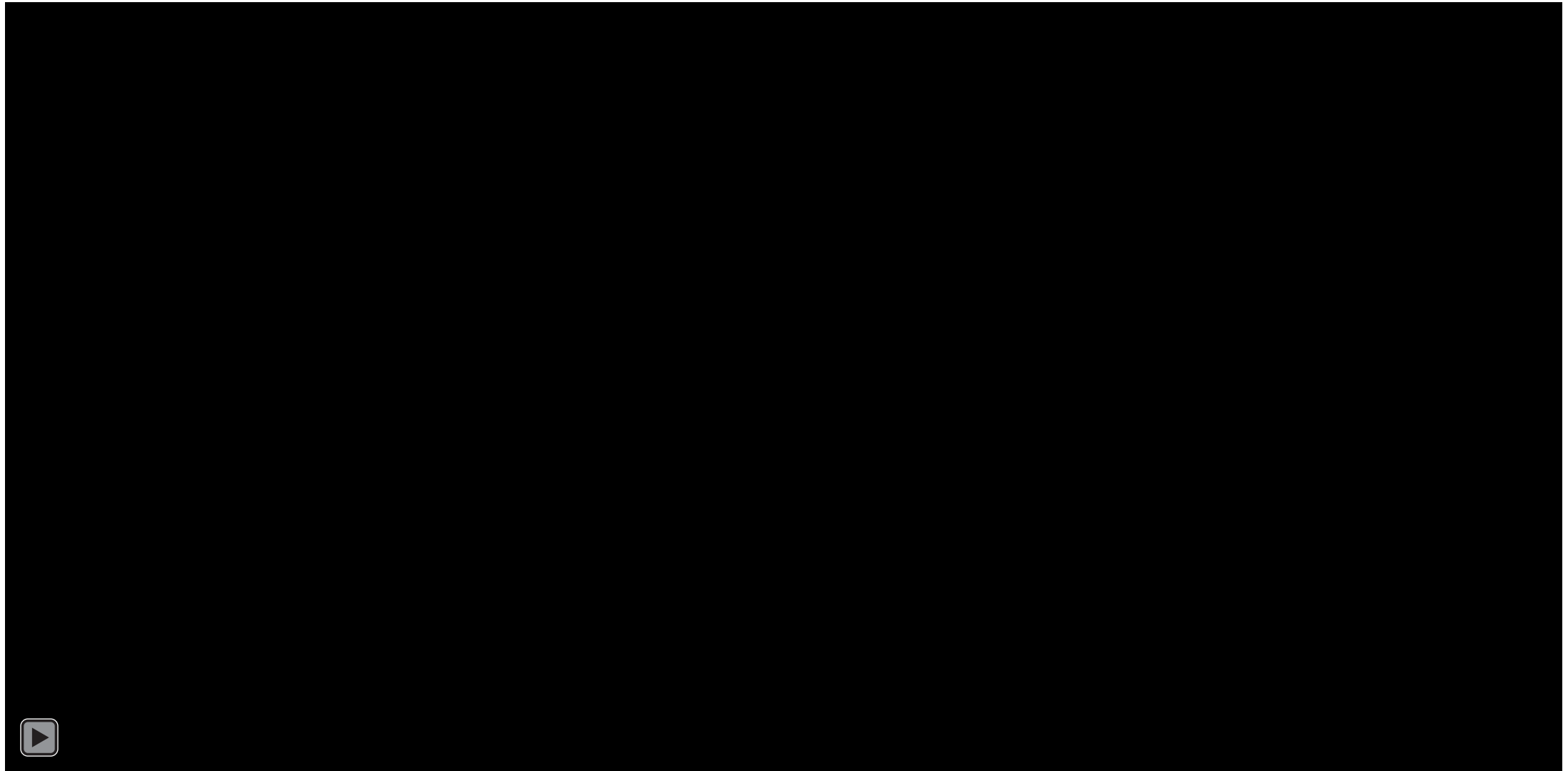


Impact speed car ca. 20 km/h

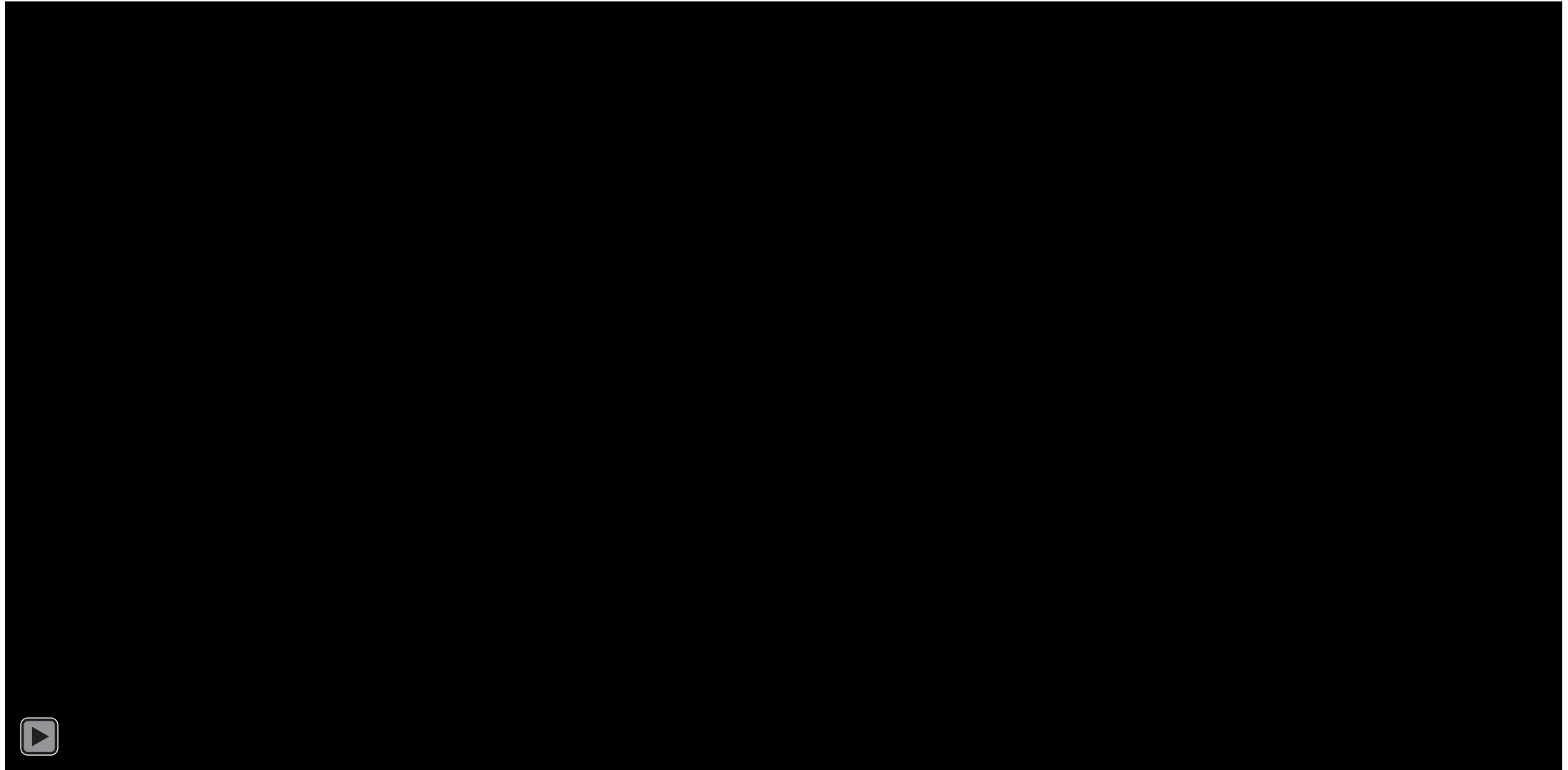
PC crash simulation

Impact speed motorcycle ca. 75 km/h

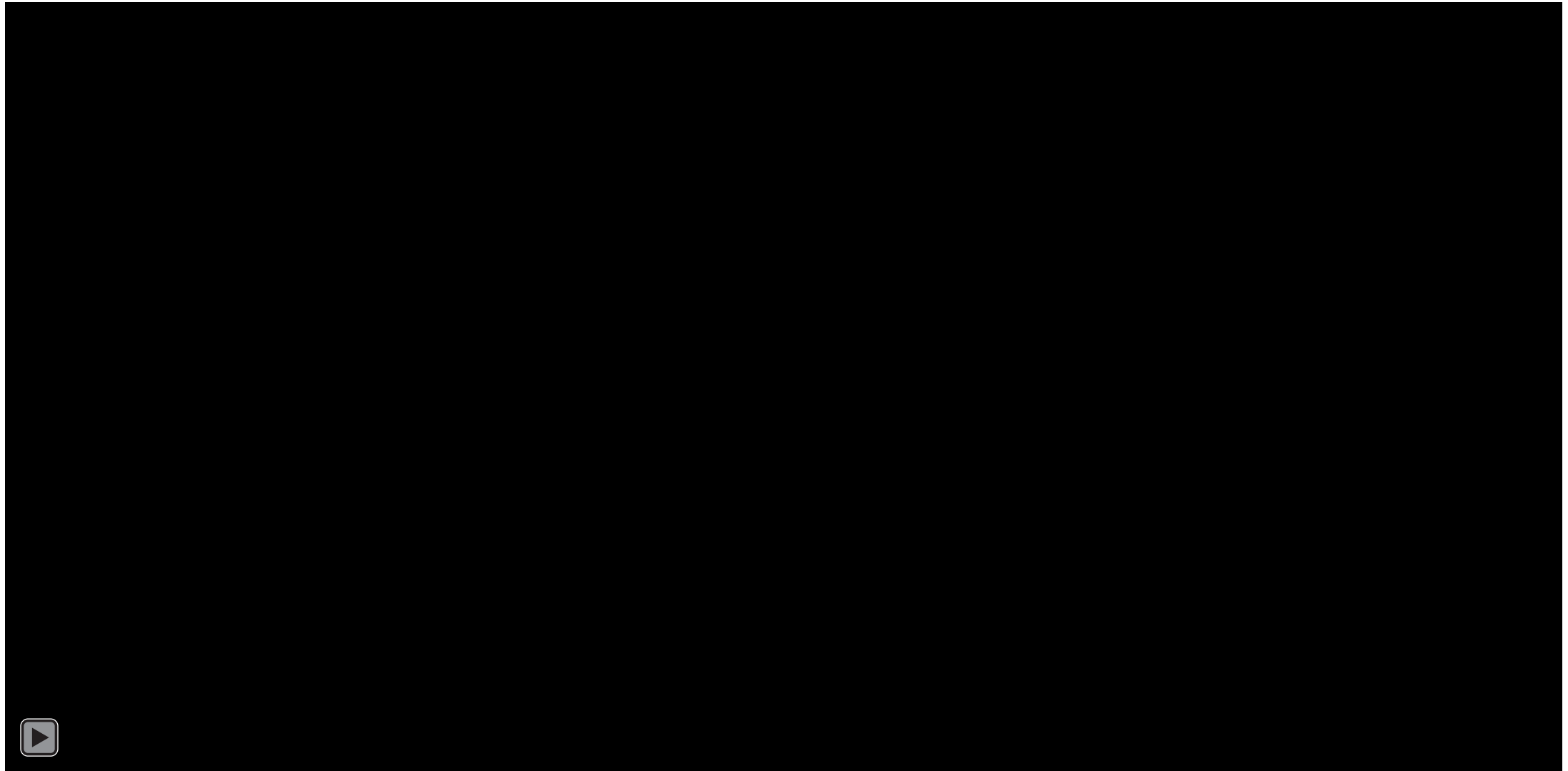
# Example car to motorcycle collision simulation



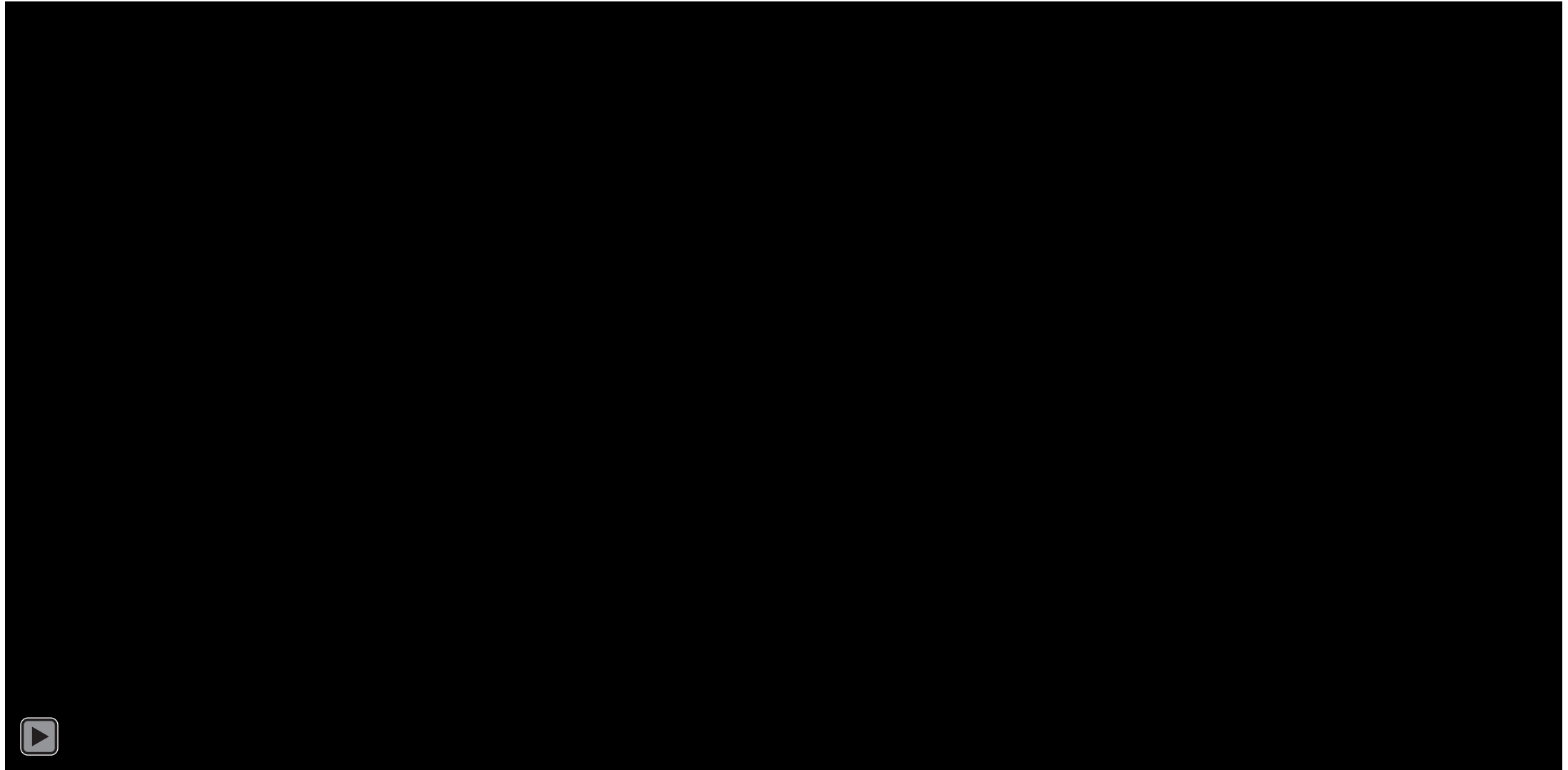
# Example car to motorcycle collision simulation



# Example car to motorcycle collision reconstruction

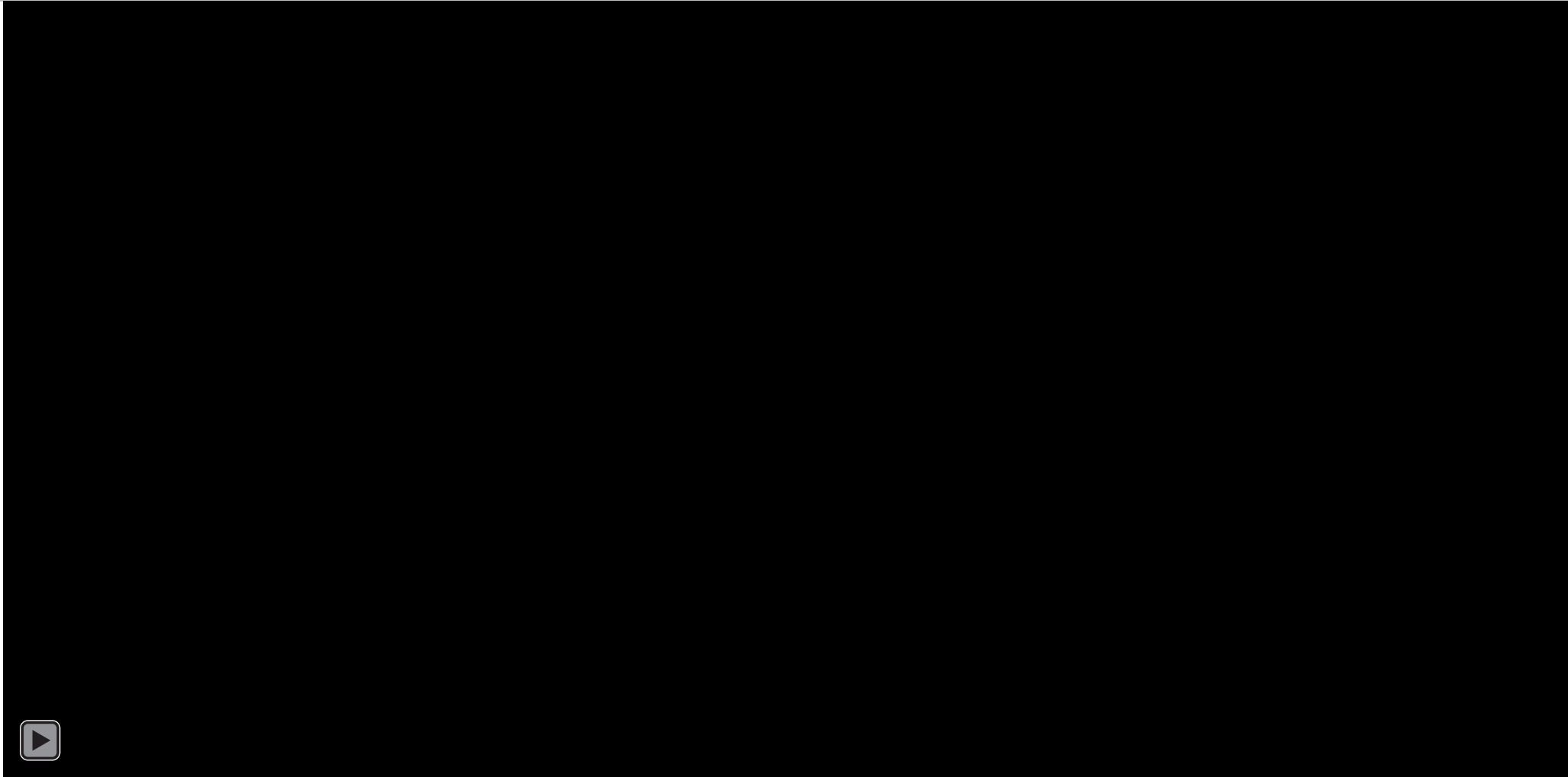


# Example car to motorcycle collision view of motorcyclist

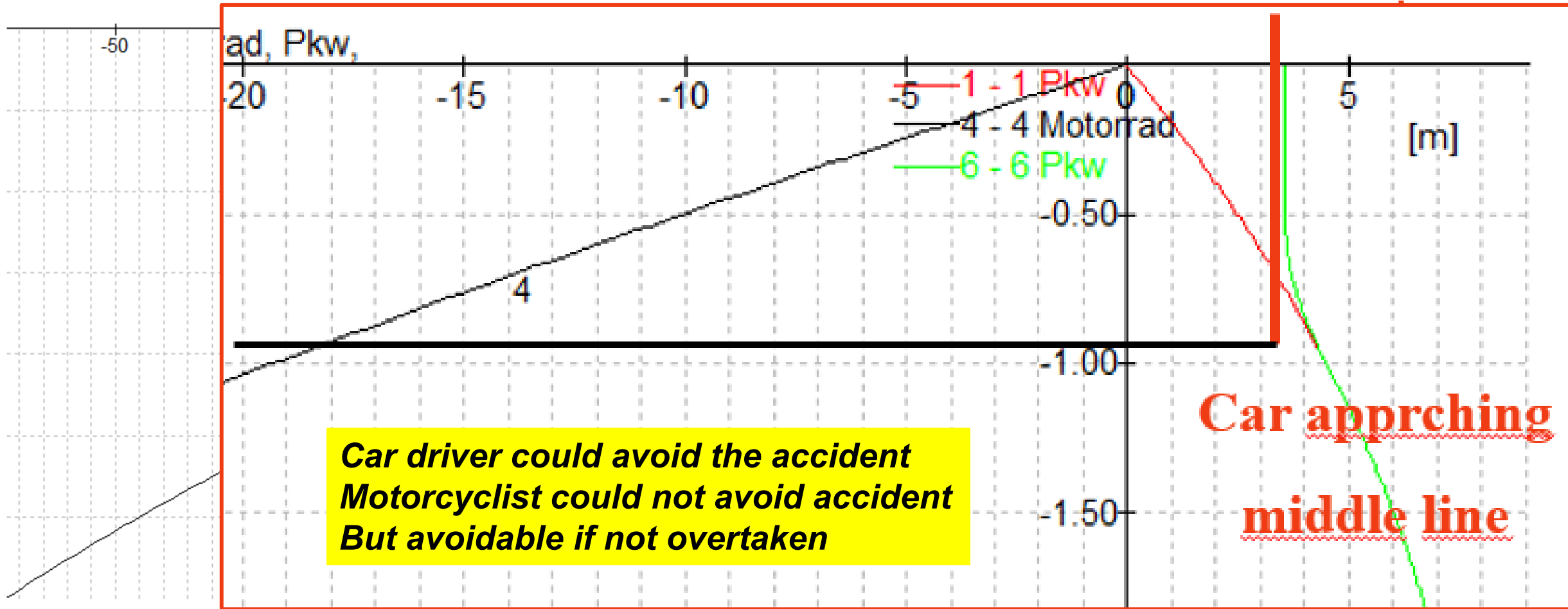




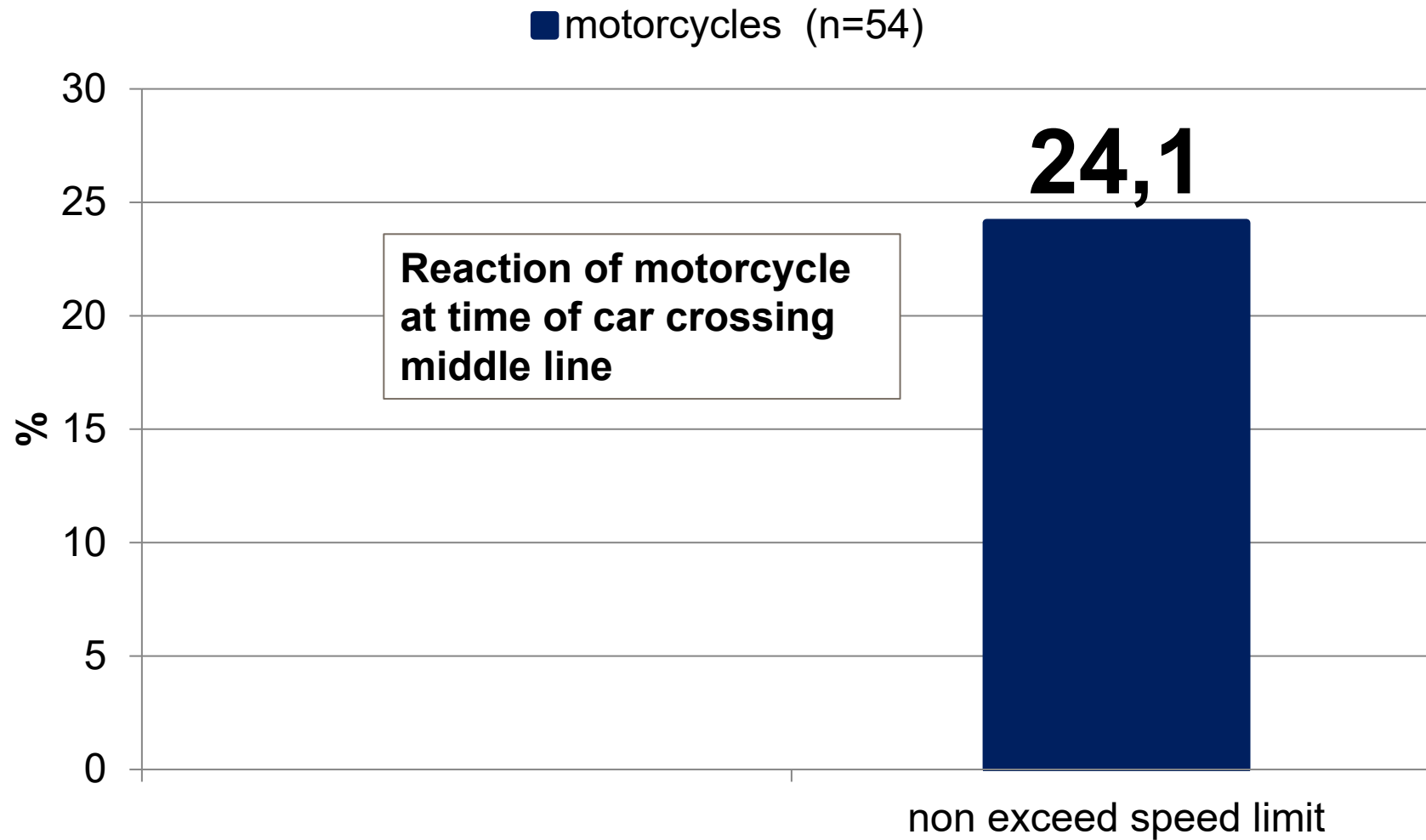
# Example car to motorcycle collision view in mirror of car driver



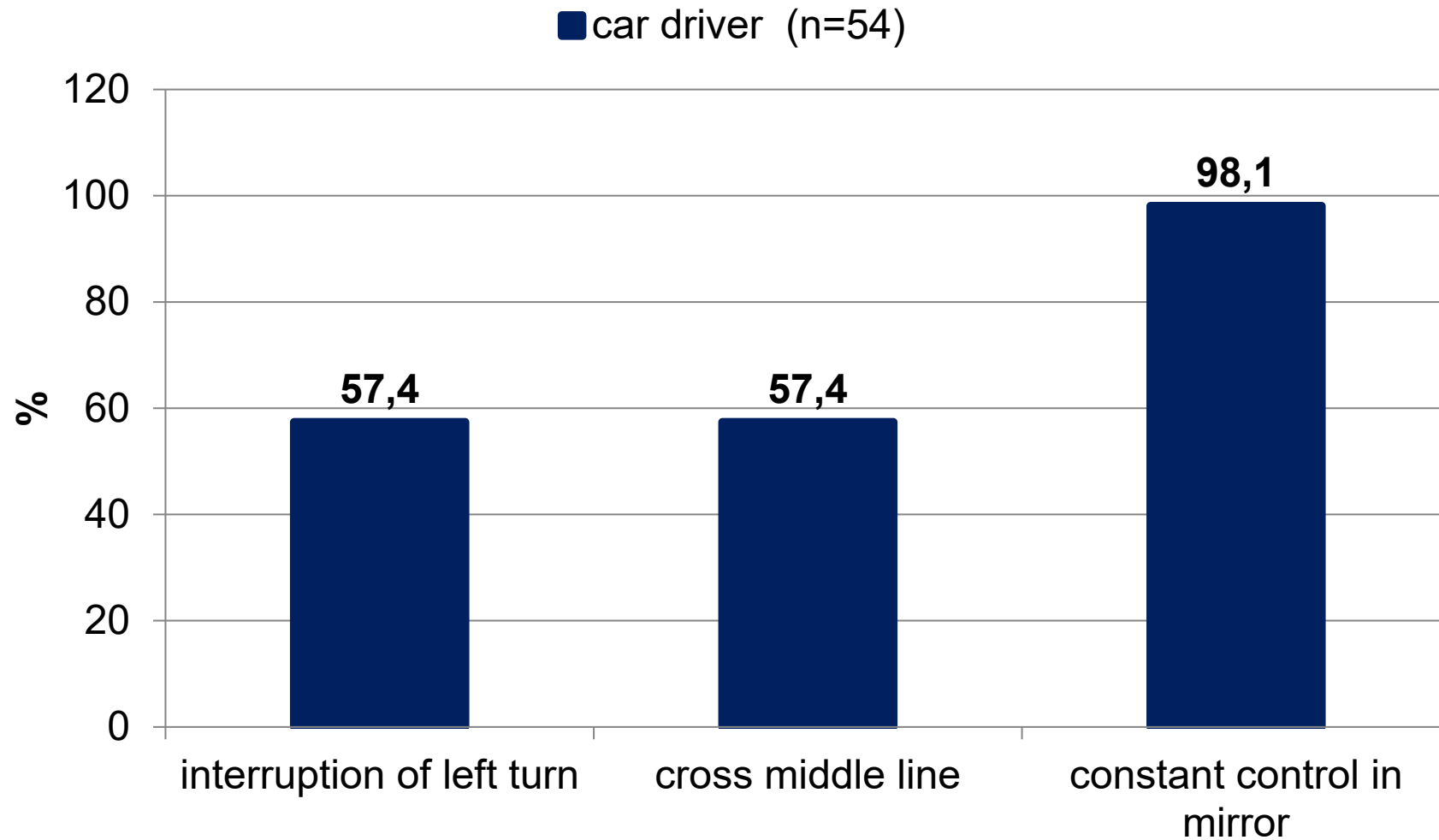
# Example car to motorcycle collision distance – time - relation



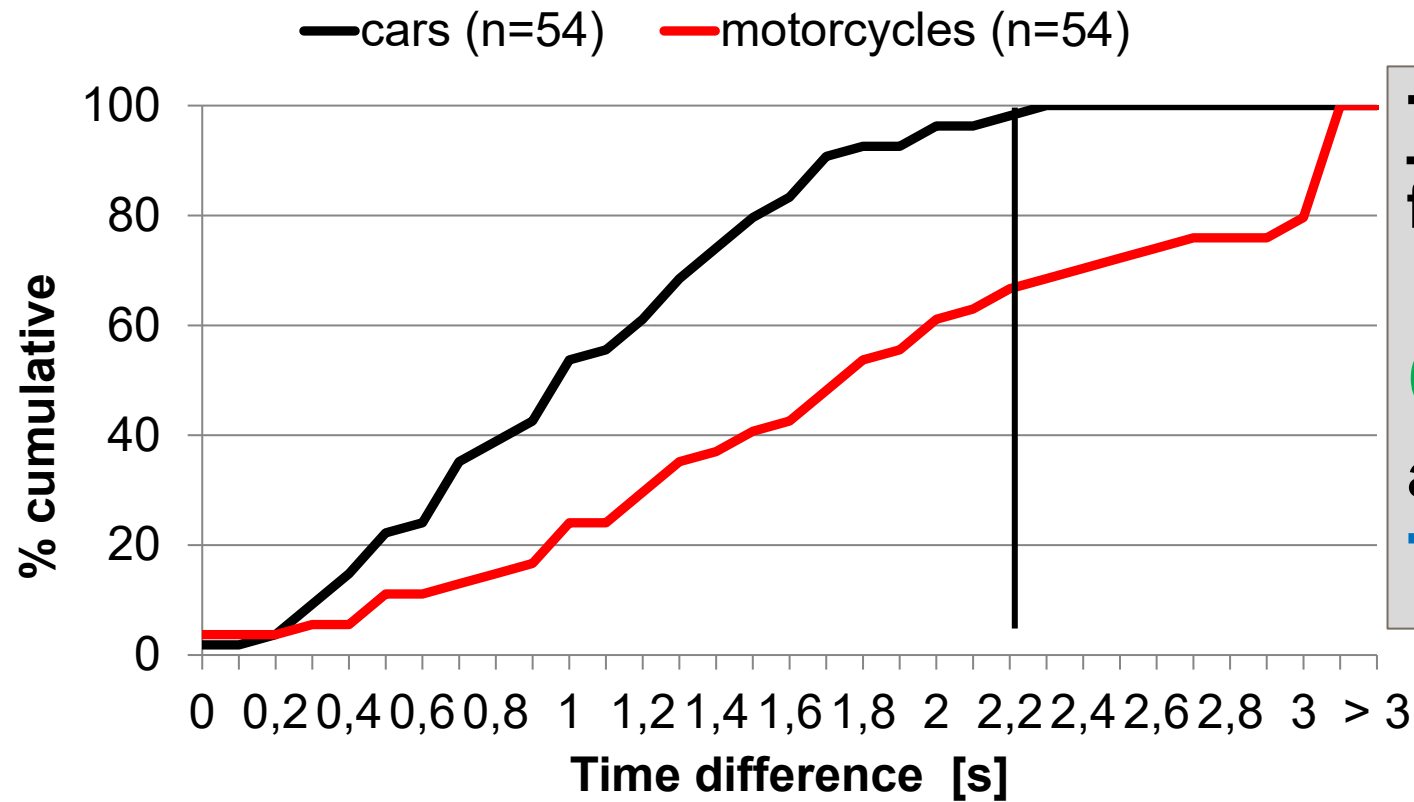
# Result of study      accident avoidance by motorcyclist



# Result of study      accident avoidance by car driver



# Time difference: Crossing middle line Motorcycle at begin overtaken Car at begin left turn



**Time potential**  
for Secure Behaviour

**Observation**  
and

**Technical Assistance**

# conclusion

**Motorcyclists should not overtake in critical situations and long vehicle convoys and be sensitized in areas of intersections or other unclear road situations**

**If overtaken, Motorcyclists have only little possibilities to avoid the accident (potential 20% of the cases when recognizing of a car suddenly turning left at crossing the center line, an emergency braking could avoid the accident very seldom.**

**Car drivers should be very carefully in left turning. They have probability to avoid the accident by looking constantly into the side mirror, at least in crossing the middle line, an avoidance potential of 58% exists here.**

**In principle, a prohibited sign of “motorcycles not overtaken” sign 276 StVO should be installed by the legislator in the area before intersections**

**Left turning movements can be checked intelligently with the help of [assistance systems in the cars as well on motorcycles](#) by a visual, acoustic and haptic warning. They are able to control the whole driving movement.**

# *Thank you very much !*

*To the audience*

*For your attention*

*To BAST & MHH & TUD*

*For the allowance to use GiDAS data*

