

› OVERVIEW OF MAIN ACCIDENT SCENARIOS IN CAR-TO-CYCLIST ACCIDENTS FOR USE IN AEB-SYSTEM TEST PROTOCOL

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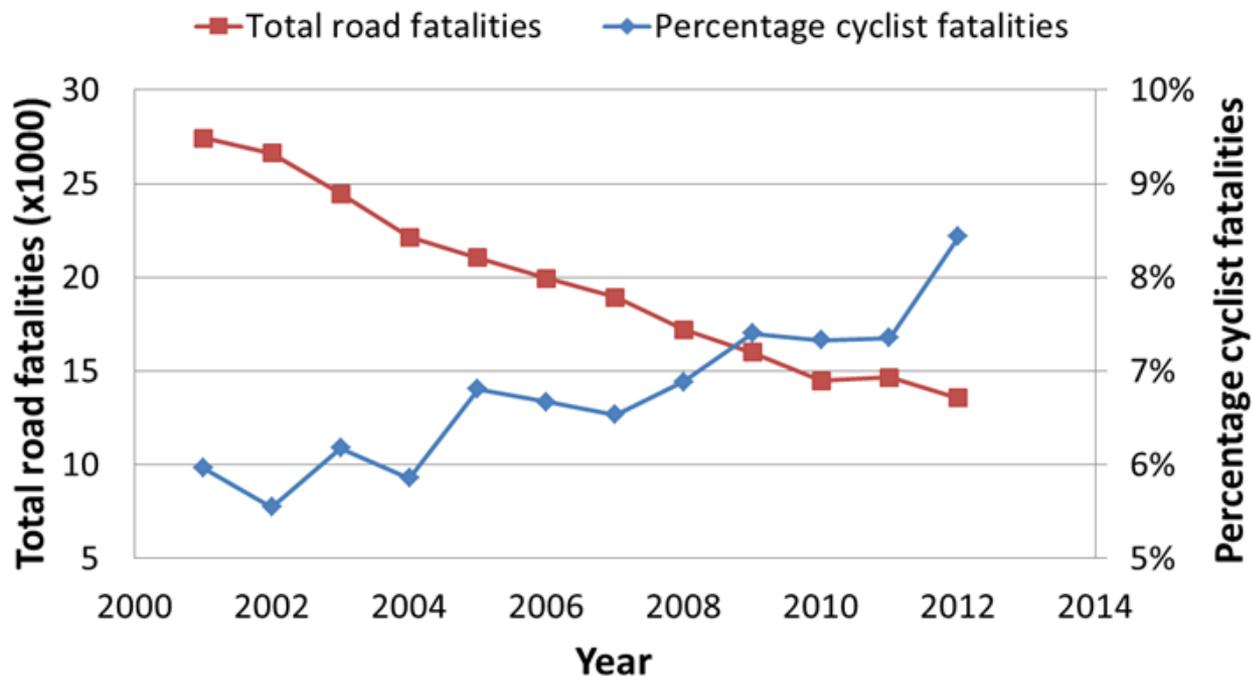
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INTRODUCTION





OBJECTIVE OF CATS PROJECT

- › Prepare the introduction of a protocol for consumer tests of Cyclist-AEB systems on board passenger cars.
- › Propose a test setup (incl. hardware) and test protocol for Cyclist-AEB systems based on technical/scientific considerations.
- › Base the tests on analysis of most relevant cyclist accident scenarios in EU countries.
- › Timing:
 - Start : 2014 Q2
 - Finish: 2016 Q1 (to be in time for Euro NCAP time line)
- › In this presentation, the results of the accidentology WP are reported, prioritizing the cyclist-to-car accident scenarios.



APPROACH



- › Study databases for 6 European countries;
- › Select severe car-to-cyclists accidents --> fatalities, seriously injured;
- › Provide overview of distinguished accident scenarios;
- › Determine the distribution of scenarios in the different countries;
- › Prioritize scenarios & indicate how many fatalities and seriously injured are covered.

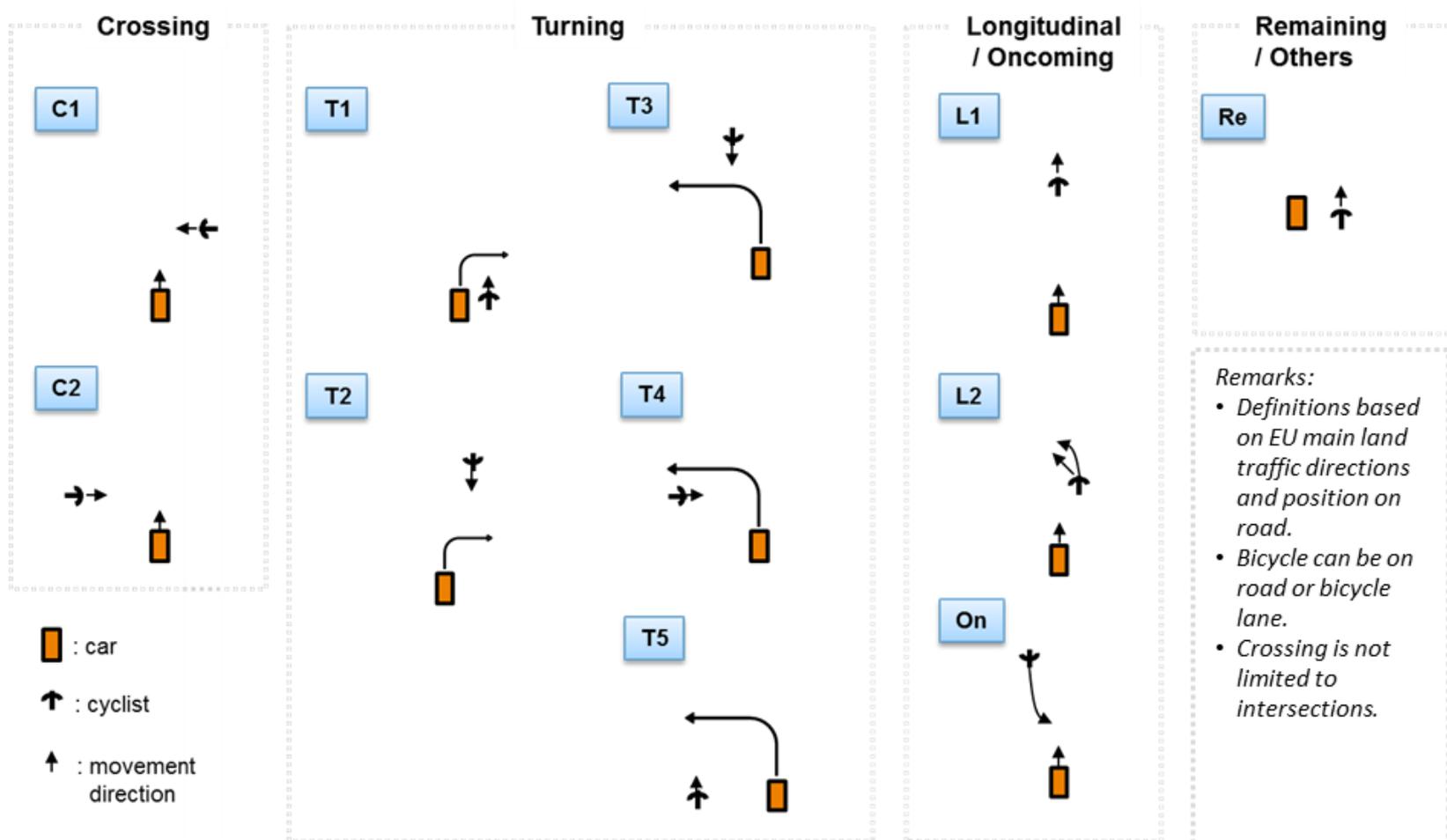


OVERVIEW OF DATA SOURCES

| # | Country | Source | Killed (K) | | Seriously Injured (SI) | | Period |
|---|-------------|------------------------------|------------|-----|------------------------|-------|-----------------------------|
| | | | definition | n | definition | n | |
| 1 | France | LAB | Fatal | 72 | severely injured | 620 | 2011 |
| 2 | Germany | GIDAS based PCM | Fatal | 11 | AIS2+ | 360 | 1999-2012 |
| 3 | Germany | GIDAS | Fatal | 12 | AIS2+ | 514 | 2006-2013 |
| 4 | Germany | National accident statistics | Fatal | 345 | AIS2+ | 11964 | 2008-2012 |
| 5 | Italy | FIAT internal database | Fatal | 23 | AIS2+ | 17 | 2003-2014 |
| 6 | Netherlands | BRON | Fatal | 902 | seriously injured | 10854 | 2000-2013 |
| 7 | Sweden | STA/STRADA | Fatal | 104 | AIS2+ | 435 | 2005-2014 K 2010-2014 SI |
| 8 | UK | STATS19 | Fatal | 116 | seriously injured | 2699 | 2008-2010 |



DISTINGUISHED CAR-TO-CYCLIST SCENARIOS

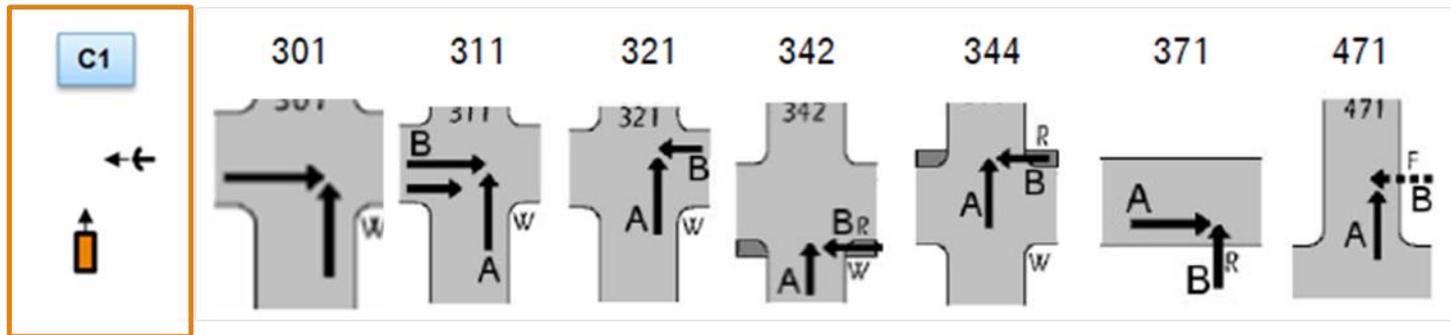


› Check if all relevant scenarios are covered



CONVERSION OF DATABASES TO CATS SCENARIOS

› Germany

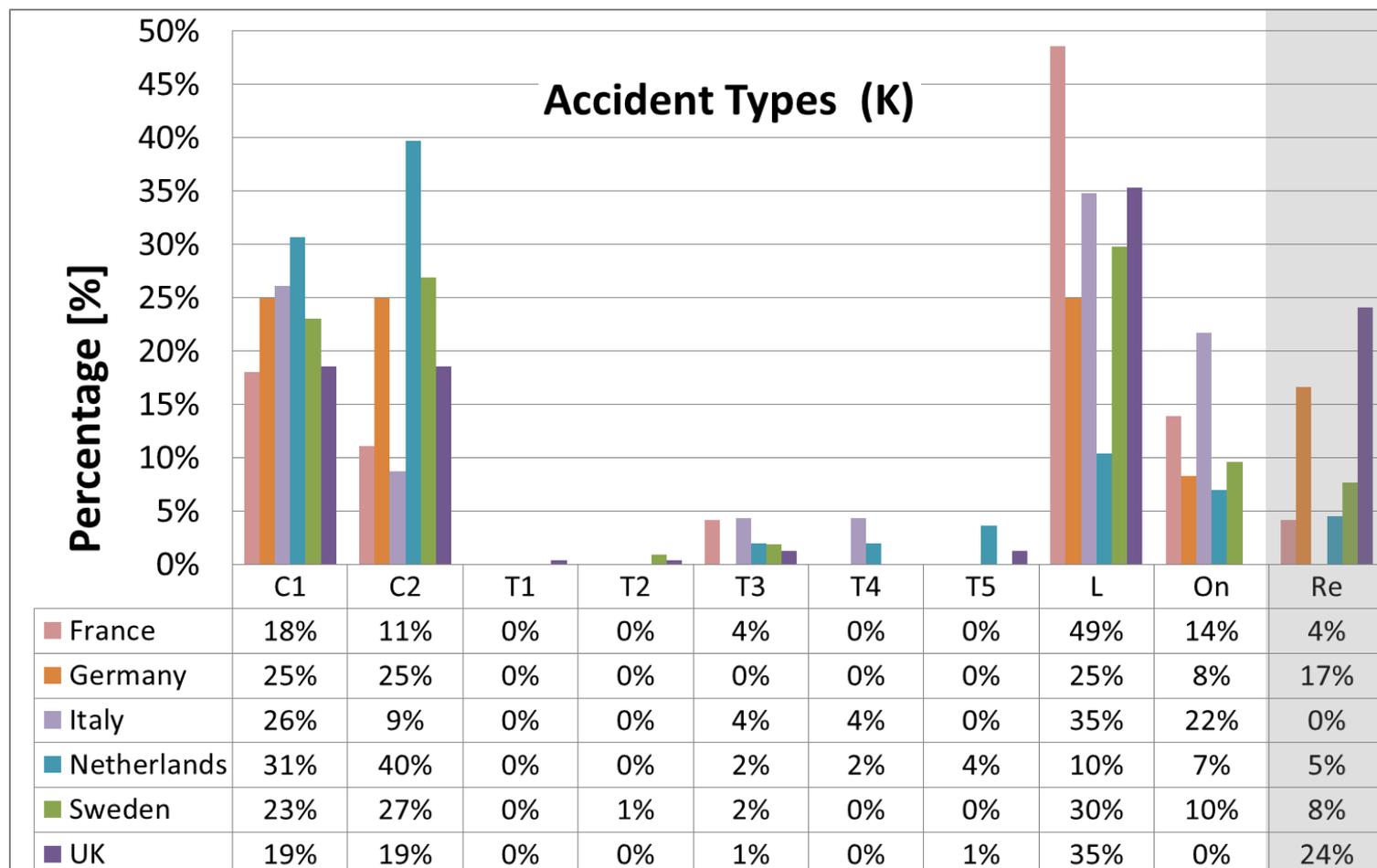
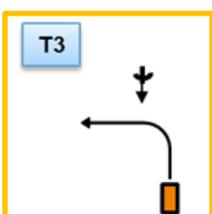
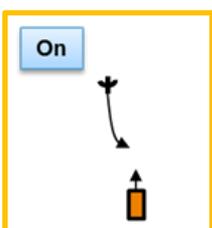
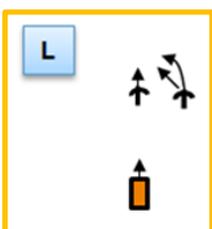
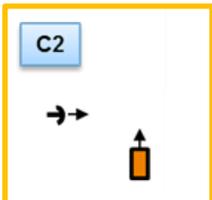
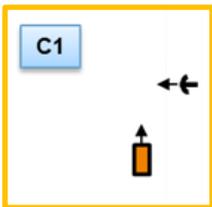


› The Netherlands

| Manoeuvre | # fatalities | CATS scenarios | Distribution |
|---|--------------|----------------|----------------|
| Side impact on crossing | 327 | C1 / C2 | 50% C1, 50% C2 |
| Other side impact | 190 | C1 / C2 | 50% C1, 50% C2 |
| Right side impact with crossing vehicle | 85 | C2 | 100% C2 |
| Rear end collision without turning | 75 | L1 / L2 | 50% L1, 50% L2 |
| Frontal without lane change | 63 | On | 100% On |

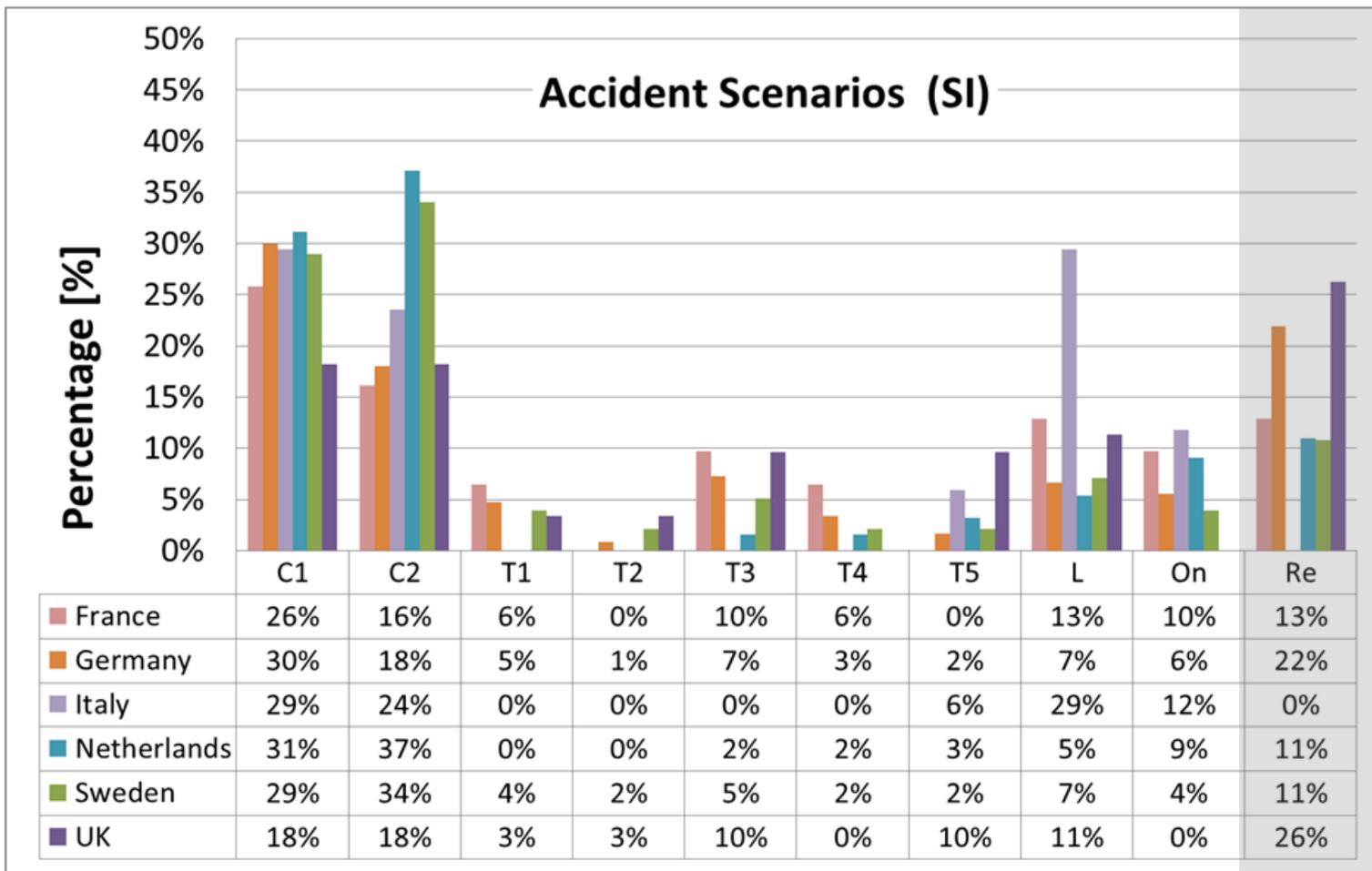
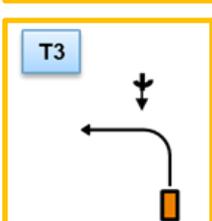
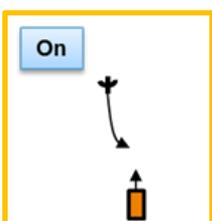
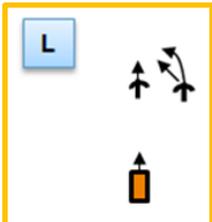
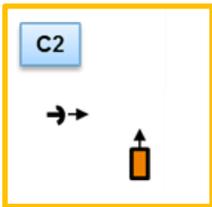
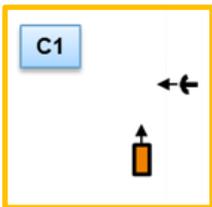


SCENARIO RELEVANCE PER COUNTRY (fatalities)



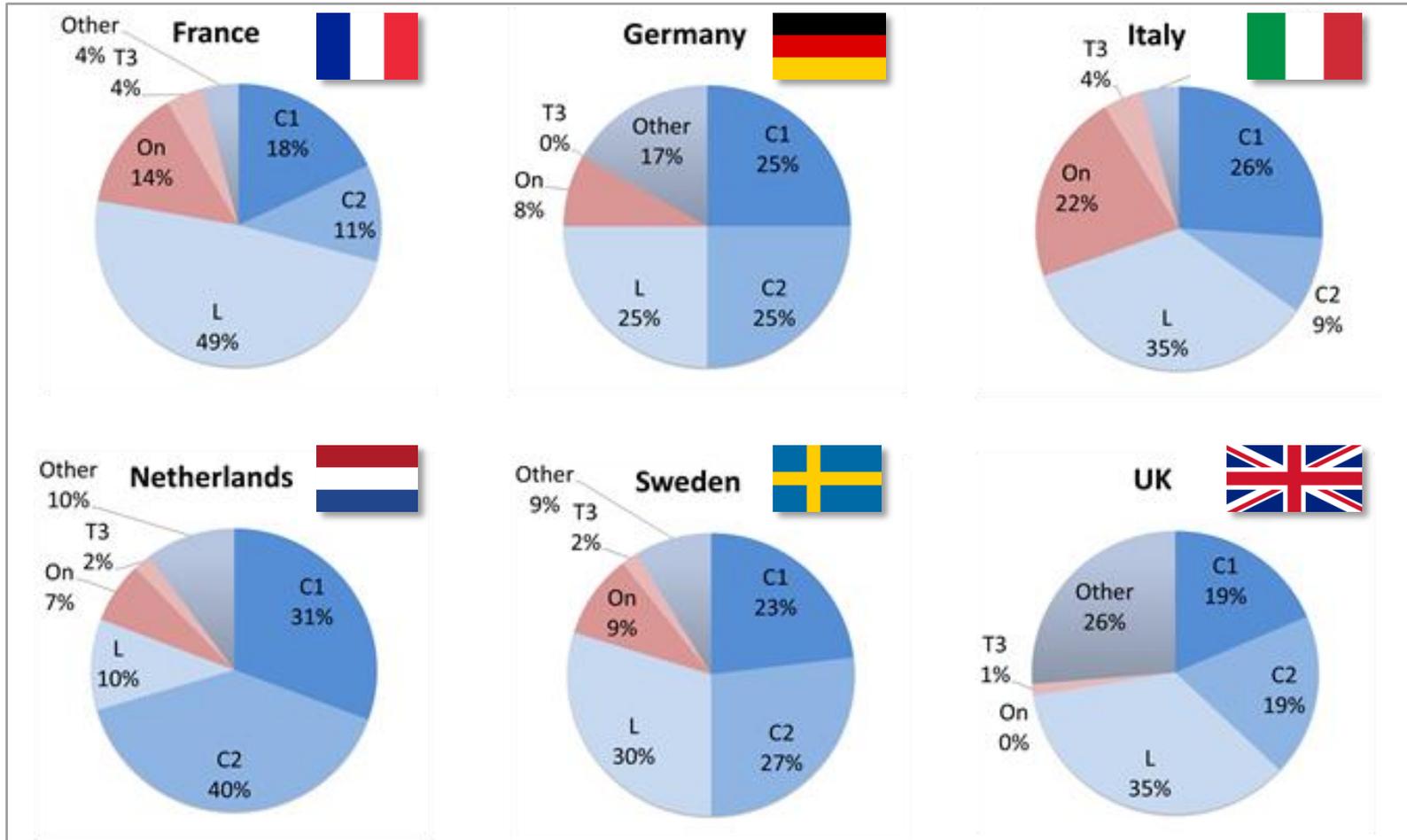
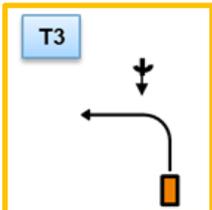
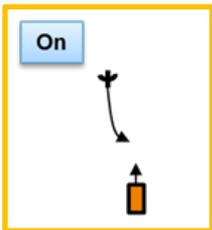
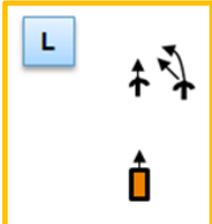
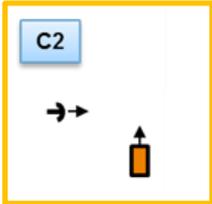
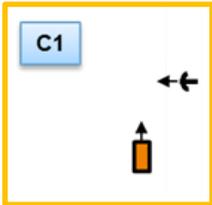


SCENARIO RELEVANCE PER COUNTRY (seriously injured)



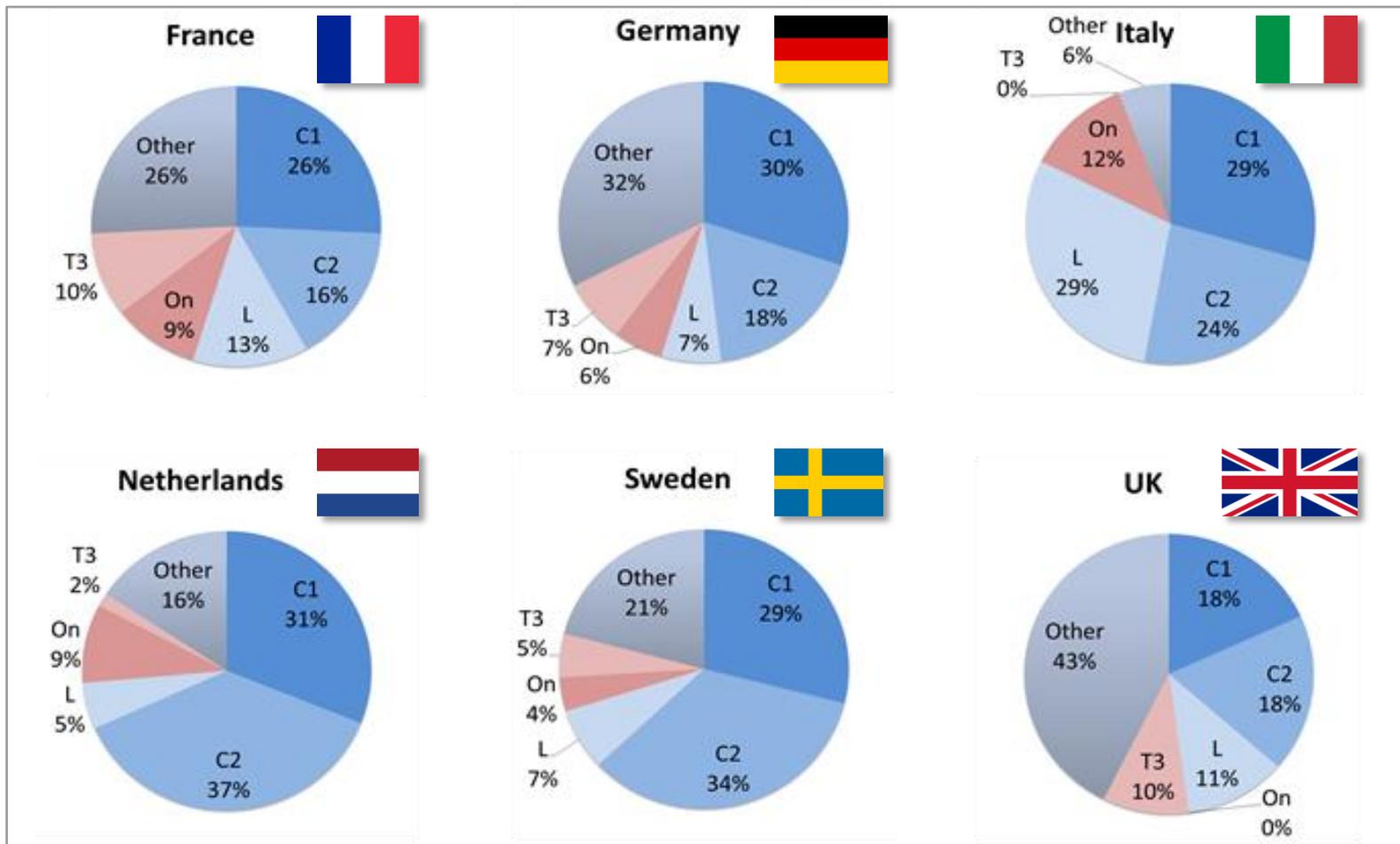
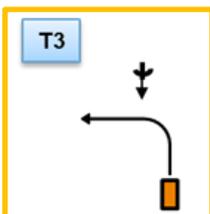
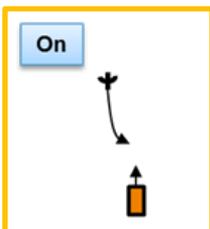
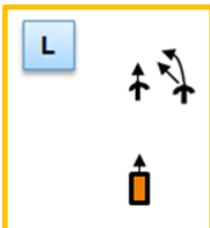
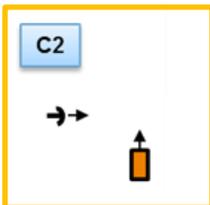
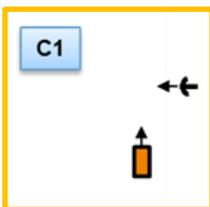


SCENARIO RELEVANCE PER COUNTRY (fatalities)





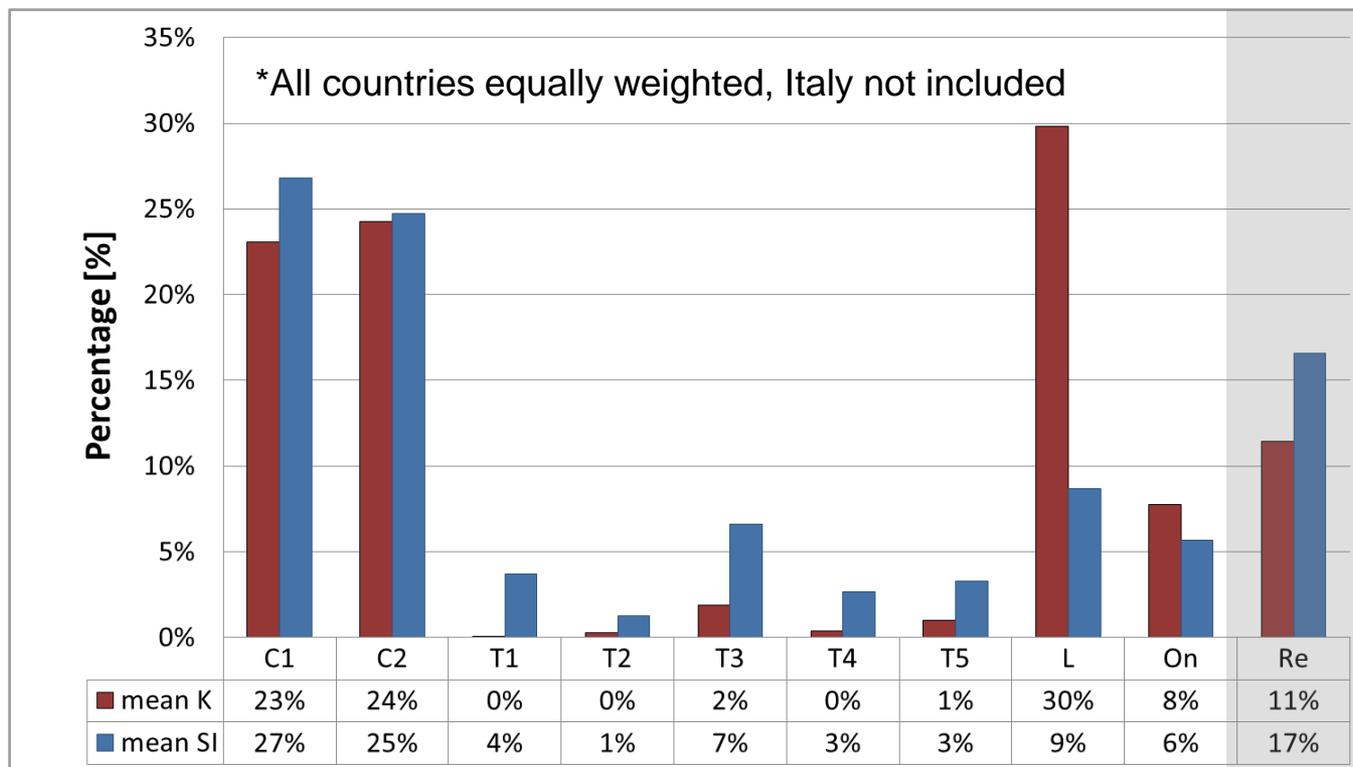
SCENARIO RELEVANCE PER COUNTRY (seriously injured)





PRIORITIZATION OF SCENARIOS

- › What fraction of fatal and severe accidents is covered by the different scenarios?
- › Weight the results for the different countries*:





PRIORITIZATION OF SCENARIOS

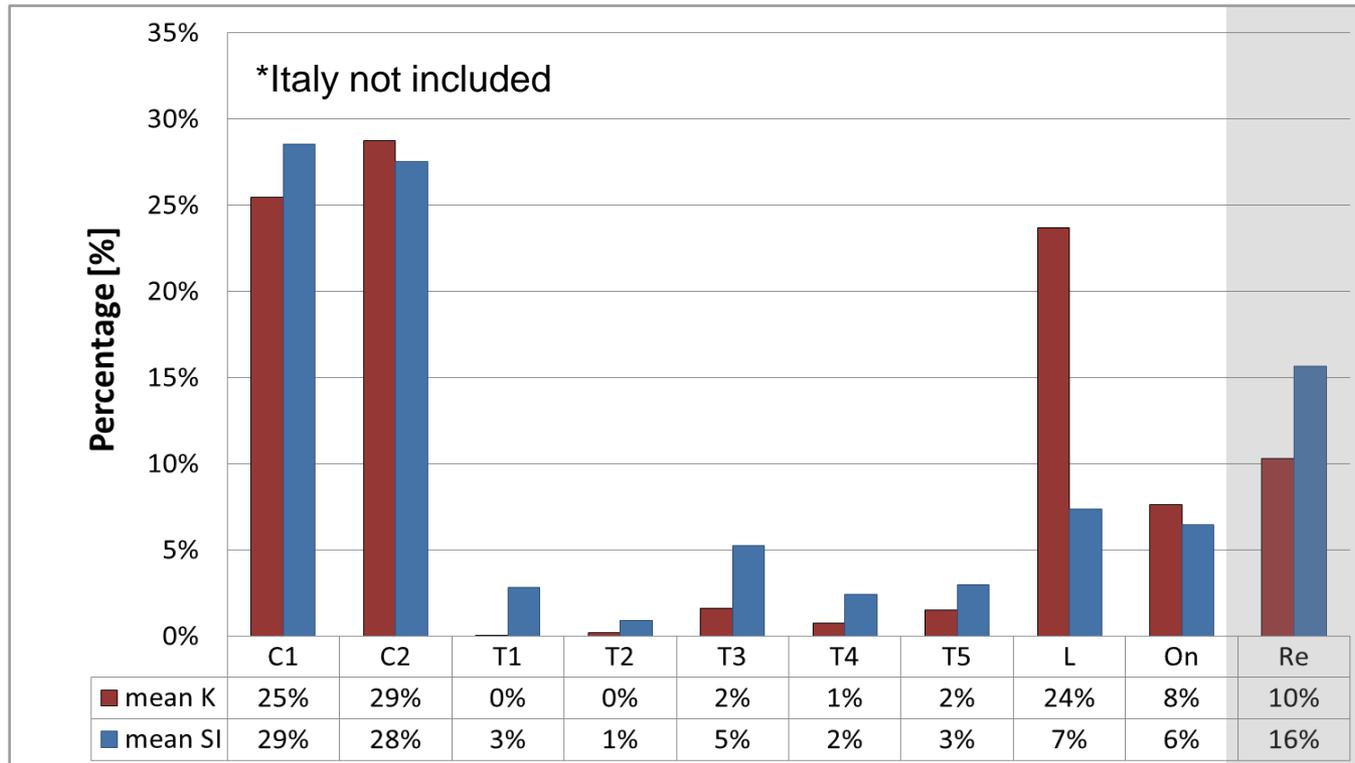
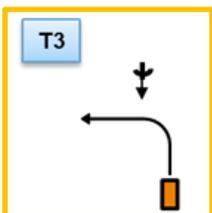
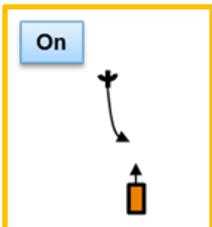
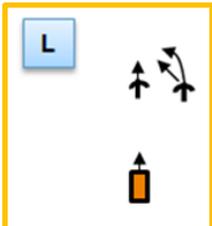
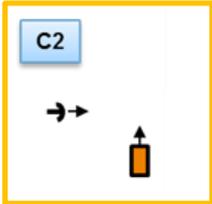
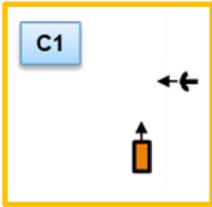
- › Option: weight the results according to # cyclist fatalities per million inhabitants:

| Country | # road fatalities per million inhabitants | # cyclist fatalities per million inhabitants | Weighting [%] |
|-------------|---|--|---------------|
| France | 62 | 2,8 | 11% |
| Germany | 45 | 6,0 | 26% |
| Italy | 68 | 5,4 | - |
| Netherlands | 32 | 9,2 | 38% |
| Sweden | 28 | 3,6 | 15% |
| UK | 30 | 2,3 | 10% |



PRIORITIZATION OF SCENARIOS

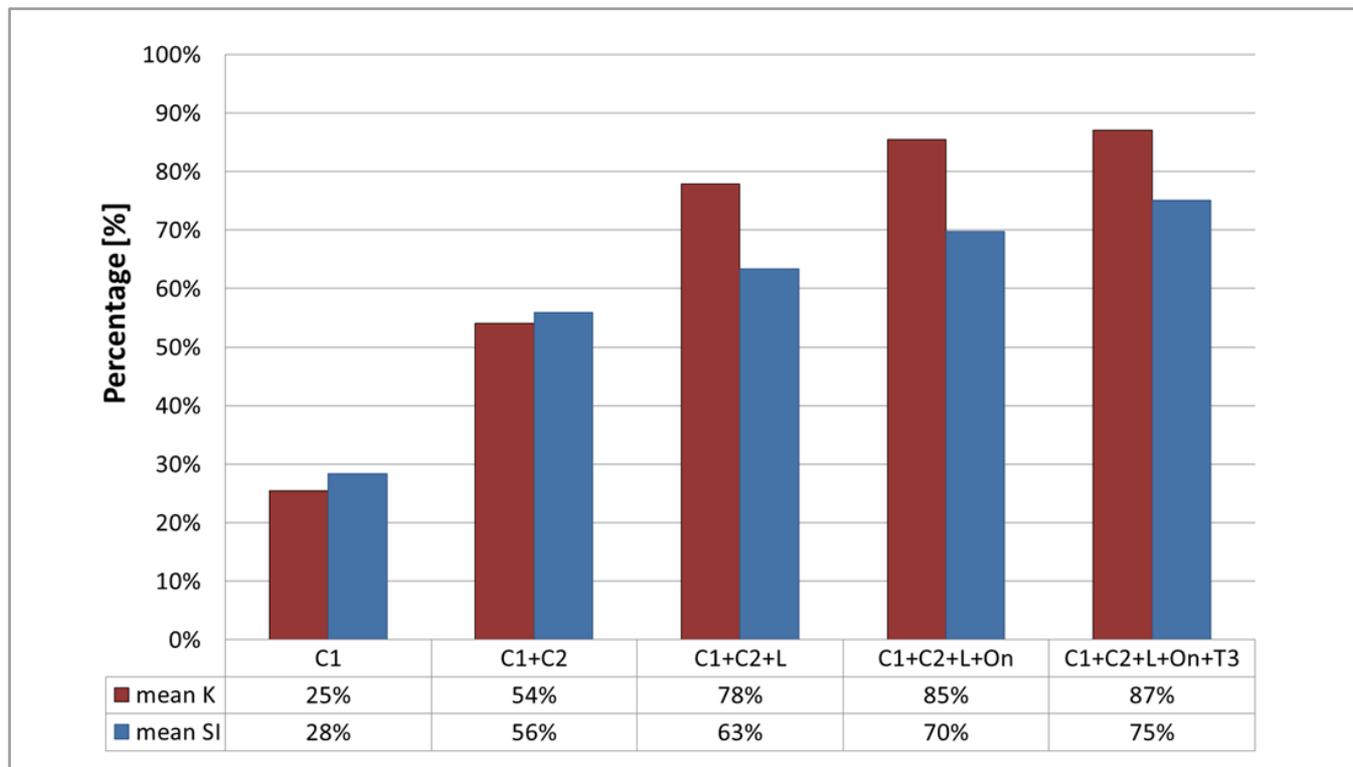
› Weight the results according to # cyclist fatalities per million inhabitants*:





CONCLUSION

- › C1, C2 and L in all countries dominant.
- › The scenarios C1, C2 and L together cover already between 78% and 63%:





NEXT STEPS:

- › Study weighting method.
- › Selection of scenarios for which a test protocol is developed.
- › Determine test ranges for these scenarios such as:
 - Vehicle speeds
 - Bicycles speed
 - Presence of view blocking obstructions
 - Collision point on the vehicle
 - Size and posture of bicyclist
- › Select parameters describing the level of light and precipitation.
- › Use information available in databases (GIDAS – PCM), enriched with results from observation studies.





ACKNOWLEDGEMENT:



Ministry of Infrastructure and the
Environment



DAIMLER

DENSO



Wir leben Autos.

PSA PEUGEOT CITROËN



TOYOTA



VOLKSWAGEN
AKTIENGESELLSCHAFT



**THANK YOU VERY MUCH
FOR YOUR ATTENTION**

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