Project V4SAFETY
TECHNOLOGICAL SOLUTIONS FROM 3 EU-PROJECTS

Event: Webinar on road safety
Date: 27 February 2023
Trend in the number of road deaths in EU

Source: CARE (EU database on road crashes) | EU DG Mobility and Transport
# Road Traffic Fatalities in the EU in 2021

by road user and (other) ‘main vehicle’ involved in the crash

<table>
<thead>
<tr>
<th>Fatalities</th>
<th>Pedestrians</th>
<th>Bicycle</th>
<th>Moped</th>
<th>Motorbike</th>
<th>Car</th>
<th>Lorry (&lt;3.5t)</th>
<th>Heavy Goods Vehicle (&gt;3.5t)</th>
<th>Bus or Coach</th>
<th>Other/Vehicle/Unknown</th>
<th>No Other Vehicle Involved</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrians</td>
<td>29</td>
<td>16</td>
<td>115</td>
<td>2,328</td>
<td>416</td>
<td>391</td>
<td>97</td>
<td>162</td>
<td>183</td>
<td>77</td>
<td>1,837</td>
</tr>
<tr>
<td>Cyclists</td>
<td>7</td>
<td>45</td>
<td>6</td>
<td>838</td>
<td>183</td>
<td>199</td>
<td>30</td>
<td>77</td>
<td>192</td>
<td>200</td>
<td>515</td>
</tr>
<tr>
<td>Moped Riders</td>
<td>0</td>
<td>1</td>
<td>7</td>
<td>232</td>
<td>42</td>
<td>27</td>
<td>9</td>
<td>20</td>
<td>27</td>
<td>200</td>
<td>1,197</td>
</tr>
<tr>
<td>Motorcyclists</td>
<td>10</td>
<td>8</td>
<td>8</td>
<td>1,386</td>
<td>231</td>
<td>207</td>
<td>13</td>
<td>85</td>
<td>12</td>
<td>85</td>
<td>3,236</td>
</tr>
<tr>
<td>Car Occupants</td>
<td>18</td>
<td>6</td>
<td>4</td>
<td>2,504</td>
<td>625</td>
<td>1,392</td>
<td>115</td>
<td>298</td>
<td>52</td>
<td>135</td>
<td>8,803</td>
</tr>
<tr>
<td>Lorry (&lt;3.5t) Occupants</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>124</td>
<td>62</td>
<td>250</td>
<td>10</td>
<td>32</td>
<td>7</td>
<td>32</td>
<td>742</td>
</tr>
<tr>
<td>Heavy Goods Vehicle (&gt;3.5t) Occupants</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>40</td>
<td>11</td>
<td>192</td>
<td>2</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>413</td>
</tr>
<tr>
<td>Bus or Coach Occupants</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>7</td>
<td>12</td>
<td>4</td>
<td>14</td>
<td>4</td>
<td>14</td>
<td>120</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>169</td>
<td>34</td>
<td>52</td>
<td>4</td>
<td>21</td>
<td>6</td>
<td>27</td>
<td>597</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
<td><strong>93</strong></td>
<td><strong>44</strong></td>
<td><strong>2,627</strong></td>
<td><strong>1,611</strong></td>
<td><strong>2,722</strong></td>
<td><strong>280</strong></td>
<td><strong>728</strong></td>
<td><strong>6,487</strong></td>
<td><strong>19,897</strong></td>
<td></td>
</tr>
</tbody>
</table>

Methodological note: the data cover fatalities in single-vehicle crashes and crashes involving one or more traffic units. For the majority of fatal crashes, only one other vehicle is involved in the crash. For multi-vehicle crashes, the ‘main vehicle’ is the heaviest of the vehicles involved as this tends to be responsible for the most serious consequences. As a result, the figures in each column likely underestimate the number of cases a particular vehicle was involved in a crash. Source: EU CARE database on road crashes

Data refer to the year 2021 except IE (2017), MT and SE (2019), CZ, EE, EL, CY, LV and SK (2020)
Clear need for a safety assessment framework

- Capable of dealing with current challenges and the fast developments in technology, now and in the future;
- Requires a feasible testing effort, e.g., by making use of virtual testing using simulations;
- Conforms with EC and UN regulations, as well as international standards (ISO, SAE);
- Is capable of handling the changing role of the human driver, evolving as a result of new transport modalities at various automation and communication levels;
- Is fair, comparable and clear: unambiguous, easily understood, explainable
V4SAFETY takes the perspective from a vehicle

- **In-vehicle safety solutions, e.g.:**
  - Autonomous Emergency Braking
  - Intelligent Speed Adaptation
  - Automated Lane Keeping System
  - Driver nudging – HMI

- **Infrastructure solutions, e.g.:**
  - Speed bumps
  - Road layout
  - Cycling lane indicating tarmac

- **Regulatory changes, e.g.:**
  - Speed limit regulation
  - Regulation on helmet use
  - Vehicle placement on road
V4SAFETY objectives

1. A widely accepted and harmonized predictive safety assessment framework
2. Ensure that simulation models properly address the behaviour of drivers, vehicle occupants, and VRUs
3. Address different types of safety solutions: in-vehicle, infrastructure and regulatory
4. Demonstration of the framework for relevant use cases, e.g., solutions developed by SOTERIA and/or PHOEBE
5. A methodology for projecting the benefits of the application of safety measures throughout the EU in the coming years, also considering the expected changes in the mobility system
Use case domain

Inspired by the Haddon Matrix which applies basic principles of public health to motor vehicle-related conflicts that potentially lead to injury (1980)
### Potential use case to be addressed

<table>
<thead>
<tr>
<th>Use case</th>
<th>Road User 1</th>
<th>Road User 2</th>
<th>Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>E-scooter</td>
<td>Car</td>
<td><img src="#" alt="Scenario A" /></td>
</tr>
<tr>
<td></td>
<td><strong>Crossing paths</strong>&lt;br&gt; E-scooters drive fast and are highly manoeuvrable; it is difficult for a car driver to anticipate the e-scooter’s intention.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Pedestrian</td>
<td>Car</td>
<td><img src="#" alt="Scenario B" /></td>
</tr>
<tr>
<td></td>
<td><strong>Jay-walking pedestrian</strong>&lt;br&gt; It is difficult for a car driver to distinguish a pedestrian (e.g., a playing child) who appears from in between cars to cross the road.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Bicyclist</td>
<td>Car / Truck</td>
<td><img src="#" alt="Scenario C" /></td>
</tr>
<tr>
<td></td>
<td><strong>Right turn across path</strong>&lt;br&gt; A bicyclist in the vehicle’s blind spot might not be seen by the driver.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Powered Two-Wheeler (PTW)</td>
<td>Car</td>
<td><img src="#" alt="Scenario D" /></td>
</tr>
<tr>
<td></td>
<td><strong>Left turn across path</strong>&lt;br&gt; A car driver may turn in the path of a PTW going straight, since the PTW’s distance and speed may be difficult to judge.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
V4SAFETY network

- Advisory board

- Simulation tool providers

- Other related harmonization initiatives
Outlook on the collaboration and impact

• The three sister projects each have their own perspective;
• Covering the road safety domain well significantly contributing to road safety improvement, now and in the future.

V4SAFETY foresees following impacts:
• Economical: reduction of social costs of mobility
• Societal: accelerated introduction of relevant road safety measures reduction of human suffering due to traffic accidents, with special focus on VRUs
• Scientific: harmonised framework and principles along with standards for reporting and documenting results
• Technological: reliable studies that shorten the development and implementation cycles of safety measures that improve traffic safety & traffic flow and reduce costs of crashes
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www.v4safetyproject.eu | #roadsafety #virtualtesting #ccam #safetyassessment

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