DG MOVE
Roadworthiness Committee

Study on the inclusion of light trailers and two- or three-wheel vehicles in the scope of the periodic roadworthiness testing

June 24th, 2019
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Project partners

CITA – www.citainsp.org
CVH – www.cvh.hr
DEKRA – www.dekra.com

Subcontractors

IERC – www.ierc.de
UC3M – www.uc3m.es
Project Consortium

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Highlights

General data collection for **EU Member States** as well as an **in-depth analysis** for countries of the project partners: **Croatia, Germany and Spain**
• **Data collection** consisting of:
  - In-depth research of **available data** combined with **survey data**
  - Light trailers as well as two- and three wheel vehicles
  - Fleet sizes, mileage, PTI statistics and accident data
  - Collection and analysis of national **road safety measures**

• **Three scenarios** have been defined:
  - Scenario 0: base case (no PTI)
  - Scenario 1: complete inspection
  - Scenario 2: simplified inspection

• The results of a **Cost and Benefit Analysis** finally led to **policy recommendations**
Trailers:
Lack of accident data
Reference country: Croatia

Two- and three-wheelers:
The case of Spain: comparing with and without PTI
No alternative road safety measures identified
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The PTI frequency for O1 trailers is: 0/3/3/3...
The PTI frequency for O2 trailers is: 0/2/1/1

The current (2017) trailer failure rate in Croatia:
- O1 trailers: 12.74%
- O2 trailers: 11.35%

Fleet size in Croatia

The PTI frequency for O1 trailers is: 0/3/3/3...
The PTI frequency for O2 trailers is: 0/2/1/1

The current trailer failure rate in Croatia:
- O1 trailers: 12.74%
- O2 trailers: 11.35%

Types of deficiencies for O1 trailers in Croatia

- 00. IDENTIFICATION: 12%
- 02. BRAKING: 25%
- 05. CABIN, CHASSIS, CHASSIS PARTS: 0%
- 09. ELECTRIC EQUIPMENT AND INSTALLATION: 0%
- 14. OTHER EQUIPMENT: 0%
- 01. STEERING: 52%
- 03. LIGHTS AND SIGNALLING DEVICES: 0%
- 06. WHEELS, AXLES, TYRES: 0%
- 13. COUPLING DEVICES: 4%

Types of deficiencies for O2 trailers in Croatia

- 00. IDENTIFICATION: 0%
- 02. BRAKING: 2%
- 05. CABIN, CHASSIS, CHASSIS PARTS: 9%
- 09. ELECTRIC EQUIPMENT AND INSTALLATION: 10%
- 14. OTHER EQUIPMENT: 26%
- 01. STEERING: 49%
- 03. LIGHTS AND SIGNALLING DEVICES: 0%
- 06. WHEELS, AXLES, TYRES: 0%
- 13. COUPLING DEVICES: 0%
- 15. FIRST AID KIT, FIRE EXTINGUISHER, ETC.: 0%
Scenario 0 - No PTI / Base case

Scenario 1 - Full PTI
This Scenario includes all inspection areas set out by 2014/45/EU

Scenario 2 - Tailored PTI of trailers
(0) Identification of the vehicle;
(1) Braking equipment;
(4) Lighting equipment and parts of the electrical system;
(5) Axles, wheels, tyres, suspension;
(6) Chassis and chassis attachments.
Scenario 0 - No PTI / Base case

Scenario 1 - Full PTI
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Scenario 2 - Tailored PTI of trailers
(0) Identification of the vehicle;
(1) Braking equipment;
(4) Lighting equipment and parts of the electrical system;
(5) Axles, wheels, tyres, suspension;
(6) Chassis and chassis attachments.

Proposed scenarios are feasible with current equipment
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Two- and three-wheelers

Accident evolution after the introduction of PTI for mopeds in Spain

<table>
<thead>
<tr>
<th>Period</th>
<th>Mopeds fleet share</th>
<th>Fatalities</th>
<th>Injured</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Urban</td>
<td>Road</td>
</tr>
<tr>
<td>2003 - 2006</td>
<td>7,5%</td>
<td>30,67%</td>
<td>5,43%</td>
</tr>
<tr>
<td>2013</td>
<td>6,38%</td>
<td>8,85%</td>
<td>3,16%</td>
</tr>
</tbody>
</table>

PTI for Mopeds has been introduced in Spain between 2007 and 2010 depending on the region. Source: Anuario estadístico de Accidentes 2013 DGT. Data presented by Luis Gutiérrez – AECA-ITV. Mixed with other road safety factors.
Scenario 0 - No PTI / Base case

Scenario 1 - Full PTI
This Scenario includes all inspection areas set out by 2014/45/EU

Scenario 2 - Tailored PTI
(0) Identification of the vehicle;
(4) Lighting equipment and parts of the electrical system;
(5) Axles, wheels, tyres, suspension;
(6) Chassis and chassis attachments;
(8) Nuisance (polluting emissions).
Scenario 0 - No PTI / Base case

Scenario 1 - Full PTI
This Scenario includes all inspection areas set out by 2014/45/EU

Scenario 2 - Tailored PTI
(0) Identification of the vehicle;
(1) Braking equipment;
(4) Lighting equipment and parts of the electrical system;
(5) Axles, wheels, tyres, suspension;
(6) Chassis and chassis attachments;
(8) Nuisance (polluting emissions).

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CBA: 2 Paths

Two- and three-wheelers

- Empirical data set
- 18 Spanish regions
- Benefits from environmental improvement not considered
- Dependent variable: moped accidents
- Independent variables:
  - Number of Mopeds
  - PTI
- PTI caused on average a reduction of
  - The 18% of total fatalities
  - Level of significance is 1%

Trailers

- Low data availability
- Assumptions are needed
- Germany with no PTI and Croatia with PTI
- 2,448 kilometers per year and trailer (statistics in Germany)
- 2,188 kilometers per year and trailer (Survey in Croatia)
- Estimation of the likelihood of an accident caused by trailer
- BCR for Croatia: 6.32
The average cost per PTI in Croatia is around 20 Euros for trailers. Given that there have been 28,884 checks, around 577,680 Euros of costs can be estimated. Using the derived benefits from the previous chapter, a maximum benefit-cost ratio of 6.32 can be estimated.
Two- and Three-Wheelers (Spain)

Given the benefit of 99 Euros per moped checked and considering the 21 Euros cost for a PTI after taxes, a benefit-cost ratio of around 4.73 is the outcome.

Fixed Effects Model for three different accident outcomes

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>Fatalities (1)</th>
<th>Severely Injured (2)</th>
<th>Slightly Injured (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total of mopeds</td>
<td>0.0002***</td>
<td>0.0022***</td>
<td>0.0102***</td>
</tr>
<tr>
<td></td>
<td>(0.00001)</td>
<td>(0.0001)</td>
<td>(0.0010)</td>
</tr>
<tr>
<td>PTI</td>
<td>-5.0430***</td>
<td>-53.1784***</td>
<td>-262.1746***</td>
</tr>
<tr>
<td></td>
<td>(0.5498)</td>
<td>(6.0283)</td>
<td>(43.3027)</td>
</tr>
<tr>
<td>Observations</td>
<td>180</td>
<td>180</td>
<td>180</td>
</tr>
<tr>
<td>R2</td>
<td>0.7698</td>
<td>0.7546</td>
<td>0.5726</td>
</tr>
<tr>
<td>Adjusted R2</td>
<td>0.7425</td>
<td>0.7254</td>
<td>0.5218</td>
</tr>
<tr>
<td>F Statistic</td>
<td>267.5901***</td>
<td>245.9536***</td>
<td>107.1722***</td>
</tr>
</tbody>
</table>

Note: * p < 0.1; ** p < 0.05; *** p < 0.01

The consequence of the accident | Unit costs
--- | ---
Fatality | €1,370,993
Severe injury | €170,035
Slight injury | €22,288

Cost-Unit Rates for Accident Effects adjusted to inflation for the year 2017. Source: SAFESPOT Project Deliverable 6.5.1
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✓ Regardless of the lack of data, the benefit of inspecting light trailers is greater than the cost
✓ The case of Spain allow to compare the scenarios with and without PTI for L vehicles, with a positive impact
✓ Both proposals are feasible with the equipment already defined in Directive 2014/45/EU
Thank you for your attention!!!

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