European Commission

Vehicle Safety 2016

Summary

European Road Safety Observatory
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Transport

Vehicle Safety - Summary

Introduction

Improving vehicle safety is a key Safe System strategy used in addressing international and national road casualty reduction goals and targets. Vehicle safety is a Pillar of Action in the UN Global Plan for the Decade of Action and in the proposal for the next EU Road Safety Action Programme 2011-2020. In best practice activity, countries actively target improvements in vehicle safety in safety programmes. Vehicle safety addresses the safety of all road users.

Vehicle safety policy

The availability and quality of vehicle safety is determined by a combination of international and national regulation, consumer information, car industry policies and product liability considerations. Whilst market forces tend to produce more rapid responses in individual product design, evidence-based legislation can ensure a uniform, acceptable level of safety across the product range.

Within Europe, there are two systems of type approval for high-volume vehicles. One is based around EC Directives (and adopted UN ECE Regulations) and provides for the approval of whole vehicles, vehicle systems, and separate components. The other is based around UN ECE Regulations and provides for approval of vehicle systems and separate components, but not whole vehicles.

Categories of vehicle safety measures

- Measures to help avoid a crash (crash avoidance),
- Measures to mitigate the severity of an accident before it occurs through slowing the vehicle, intelligent speed management or advanced braking (crash mitigation)
- Measures to reduce injury in the event of an accident (crash protection)
- Measures to reduce the consequences of injury (rescue systems and post-crash response).
- Vehicle systems which can integrate vehicle and road network interventions (integrated systems)

What are the solutions?

Cars:

- Crash avoidance and mitigation measures: Intelligent Speed Adaptation (ISA), Event data recorders, Daytime Running Lights (DRL), Anti-lock Braking Systems (ABS), Brake Assist, Autonomous Emergency Braking (AEB), Electronic Stability Control (ESC), Alcohol interlock systems, Collision Avoidance Systems, Night Vision and Warning (NVW), Blind Spot Detection (BSD), Pedestrian Detection System + Emergency Braking Response (PSD+EBR)
- Crash protection: The vehicle's structure, its compatibility with other vehicles or objects on the road and the design and use of the vehicle's restraint system (seat belts, airbags, child restraints, head restraints, smart restraint systems etc.) are all key elements for crash protective design.

- Rescue systems: Emergency Notification Systems or 'Mayday' systems aim to reduce the time between when the accident occurs and when medical services are provided. Automatic Crash Notification (eCall) takes the safety benefits of Mayday systems further by providing emergency responders with data that indicates the severity of the accident and the nature of injuries sustained.

Motorcycles:

- Crash avoidance and mitigation measures: Daytime Running Lights (DRL), Anti-lock Braking Systems (ABS)
- Crash protection: Mandatory crash helmet use, Chest air bags, Leg protection, Protective clothing,

Heavy commercial vehicles:

Heavy goods vehicles are over-involved in fatal accidents, since their high mass leads to severe consequences for other road users in accidents.

- Crash avoidance and mitigation measures include speed limitation systems, blind spot mirrors, retro-reflective markings, Blind Spot Detection (BSD) systems, electronic stability and rollover stability devices, alcohol interlock systems, compliance with drivers' hours and digital tachographs.
- Crash protection measures refer to seat belts and seat design, driver cabin structure, front, rear and side underrun protection.

Light vans and minibuses:

There is relatively limited data in Europe on lights good vehicle accidents and these vehicles are yet to be covered by EU Whole Vehicle Type Approval legislation. Poor accident compatibility between LGVs and passenger cars has been reported; LGVs tend to have greater size and mass and usually have their stiff structures at a greater height than those of passenger cars, often resulting in the large vehicle over- riding the smaller vehicle. Also, lower restraint use has been reported amongst LGV occupants compared with car occupants; therefore, the use of in-vehicle seat belt reminder systems, higher profile awareness and education programmes and stricter enforcement could result in significant safety benefits.

Buses and coaches:

Bus safety design can address a range of identifiable problems.

- Crash avoidance and mitigation are identical to heavy commercial vehicles.
- Specific crash protection measures refer to driver protection in the front of the coach, rollover protection, bus evacuation after the accident and safety of wheelchair users in coaches.

Bicycles:
Bicycles are typically viewed as consumer products rather than road vehicles with much less attention to design and maintenance issues than received by other road vehicles. Yet, there is no EU-wide whole vehicle type approval system for bicycle design which is covered largely by national regulation.

- Crash avoidance and mitigation measures include reflectors, the lighting system and the braking system (strength and reliability).
- Crash protection measures refer to bicycle helmets, safer car structures for cyclists and heavy commercial vehicle side guards.

Notes

1. Country abbreviations

Belgium	BE	Italy	IT	Romania	RO		
Bulgaria	BG	Cyprus	CY	Slovenia	SI		
Czech Republic	CZ	Latvia	LV	Slovakia	SK		
Denmark	DK	Lithuania	LT	Finland	FI		
Germany	DE	Luxembourg	LU	Sweden	SE		
Estonia	EE	Hungary	HU	United Kingdom	UK		
Ireland	IE	Malta	MT				
Greece	EL	Netherlands	NL	Iceland	IS		
Spain	ES	Austria	AT	Liechtenstein	LI		
France	FR	Poland	PL	Norway	NO		
Croatia	HR	Portugal	PT	Switzerland	CH		

2. This 2016 edition of Traffic Safety Synthesis on Vehicle Safety updates the previous versions produced within the EU co-funded research projects SafetyNet (2008) and DaCoTA (2012). This Synthesis on Vehicle Safety was originally written in 2008 and then updated in 2012 by Jeanne Breen, Jeanne Breen Consulting and in 2016 by Andrew Morris and Richard Frampton, Un.Loughborough.

3. All Traffic Safety Syntheses of the European Road Safety Observatory have been peer reviewed by the Scientific Editorial Board composed by: George Yannis, NTUA (chair), Robert Bauer, KFV, Christophe Nicodème, ERF, Klaus Machata, KFV, Eleonora Papadimitriou, NTUA, Pete Thomas, Un.Loughborough.

4. Disclaimer

5. Please refer to this Report as follows:

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