

# REDUCING CASUALTIES INVOLVING YOUNG DRIVERS AND RIDERS IN EUROPE



## About the YEARS project

YEARS (Young Europeans Acting for Road Safety) is a three-year project run by the European Transport Safety Council (ETSC) and the Parliamentary Advisory Council for Transport Safety in the UK (PACTS). The project seeks to gain a better understanding of young people and the risks they face on the road.

This policy report, looks at the current situation in Europe, using the latest data on road deaths involving young people and the main risks they face in their first years of driving and riding. It also explores example of good practice and effective measures that can be promoted.

The project will also mobilise university students to take action by running communication campaigns aimed at preventing young road users' deaths in their local area. In this latter stage the focus will broaden to cover the safety of pedestrians and cyclists as well.

The YEARS project receives financial support from the European Commission, the German Road Safety Council (DVR) and the Belgian Road Safety Institute.



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# REDUCING CASUALTIES INVOLVING YOUNG DRIVERS AND RIDERS IN EUROPE

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# EXECUTIVE SUMMARY

Young drivers and riders aged 15-25 are more likely to be killed on Europe's roads than their older counterparts, despite continued improvements in road safety. Road collisions remain one of the highest external causes of death for young people. The risks are especially high for young males and for young riders.

This high collision risk is caused by a combination of factors. Biological and social changes between the ages of 15-25 affect the risk perception of young people and lead to an increase in social activity and associated pressure from peers.

A lack of experience on the road means that young people are worse at anticipating and reacting to hazards. They are also less aware of how best to drive and ride in particular road conditions and situations.

A range of impairments and distractions affect young people. This is linked to the increased social activity they experience during the ages of 15-25, which includes a greater exposure to alcohol and drugs, the influence of peer-age passengers and the effects of fatigue. In-car distraction from mobile devices is also a problem.

Young people tend to drive smaller and older vehicles as they are cheaper and more practical. These cars often have a lower crashworthiness and lack the safety technologies featured in newer, larger cars. The use of seat belts and protective clothing is also poor amongst young people.

A variety of countermeasures have been adopted across Europe and further afield, with the aim of reducing the collision risk of young people.

Recommendations have been made here based on those countermeasures shown to be most effective. The report groups these into the following four areas:

- **General safety measures:** Countries with higher general road safety standards also have safer young road users. Better enforcement of speed and drink-drive limits and of seat belt wearing particularly helps protect young people.
- **Training and education:** Introduce hazard perception training, expand formal training to cover driving and riding style as well as skills and encourage more accompanied driving to help gain experience.
- **Licensing systems and testing:** Adopt graduated licensing systems that encourage young people to gain more experience while limiting certain high-risk activities such as driving at night and with passengers. Ensure testing allows examiners to ascertain a safe driving style by including aspects such as independent driving. Lower the BAC limit for all young drivers including novice drivers.
- **Safer vehicles and telematics:** Encourage young people to use safer vehicles and utilise assistive technologies. Further explore the link between telematics-based insurance and safe driving.

# PART I

## THE RISKS FACED BY YOUNG ROAD USERS IN EUROPE

### 1.1 INTRODUCTION

In the EU, over 3800 young people (18-24) were killed in road traffic collisions in 2013.<sup>1</sup> This remains the biggest single cause of death for this age group, who are disproportionately likely to be involved in a fatal collision.<sup>2,3</sup> Despite ongoing improvements in road safety, young people continue to face a unique combination of factors that leads to a higher rate of collisions, and consequently deaths.

The purpose of this report is to review existing legislation and practice across Europe and highlight effective practice in improving road safety for young people, while also noting practices that appear ineffective. Some examples from countries outside Europe are also included.

This report focuses on young road users aged 15-25 (inclusive), although in some places data for 15-24 or 15-30 has been used where the 15-25 data was not readily available. This age range best encompasses the period in which young people can start learning to drive cars, ride motorcycles and mopeds, pass their tests and begin independent driving. This is also the period of heightened

social activity and rapid social and emotional development which affects their safety on the roads.

Young people in this age range are more likely to suffer injuries as vehicle occupants and motorcycle and moped riders than as pedestrians and cyclists.<sup>4</sup> However, improved young driver and rider safety should improve safety for all road users.

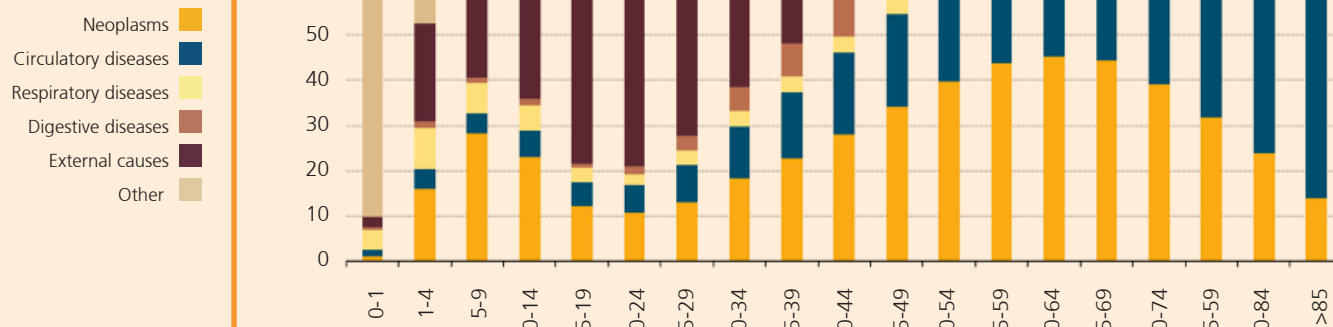
The report provides an overview of the most prominent risk factors that contribute to fatal collisions amongst young road users and assesses the ways in which the EU and EU Member States can best take action to mitigate these. A range of policy recommendations are provided for decision makers at EU and national levels.

### 1.2 GREATER RISKS FACED BY YOUNG ROAD USERS

Road collisions are one of the largest single causes of death for young people in Europe, making up 28% of deaths by external causes for those aged 15-19 and 26% for those aged 20-24 (Fig. 1.1).<sup>5</sup>

*Young people continue to face a unique combination of factors that leads to a higher rate of collisions, and consequently deaths.*

**FIG. 1.1**  
Causes of death by age group, EU 28, 2011<sup>6</sup>



<sup>1</sup> European Commission, June 2015, Traffic Safety Basic Facts on Young People, p3. <https://goo.gl/eLy6il>

<sup>2</sup> Eurostat, 2015, Being young in Europe today, p80. <https://goo.gl/UwUDY9>

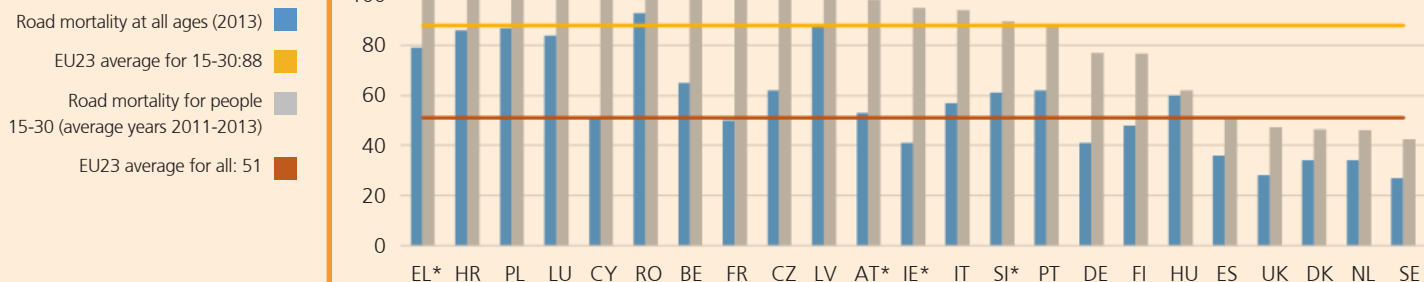
<sup>3</sup> European Commission, 2015, Road Safety in the European Union: Trends, statistics and main challenges, p10. <http://publications.europa.eu/s/bRrK>

<sup>4</sup> European Commission, June 2015, Traffic Safety Basic Facts on Young People, p7. <https://goo.gl/eLy6il>

<sup>5</sup> EUROSTAT, 2010, Being Young in Europe Today – Health. <https://goo.gl/InnbCU>

<sup>6</sup> EUROSTAT, 2010, Being Young in Europe Today – Health. <https://goo.gl/InnbCU>

**FIG. 1.2**  
**Young people road deaths per million inhabitants (with road deaths per million inhabitants at all ages for comparison) \*2010-2012 average years.**



Young people are more likely to be killed or seriously injured on the road in almost every country in Europe than older people (Fig. 1.2) Young people aged 15-24 represent 11% of the population but 17% of road deaths.<sup>8</sup> A UK study found that one in five young drivers reported having a collision in the first six months after passing their practical test.<sup>9</sup>

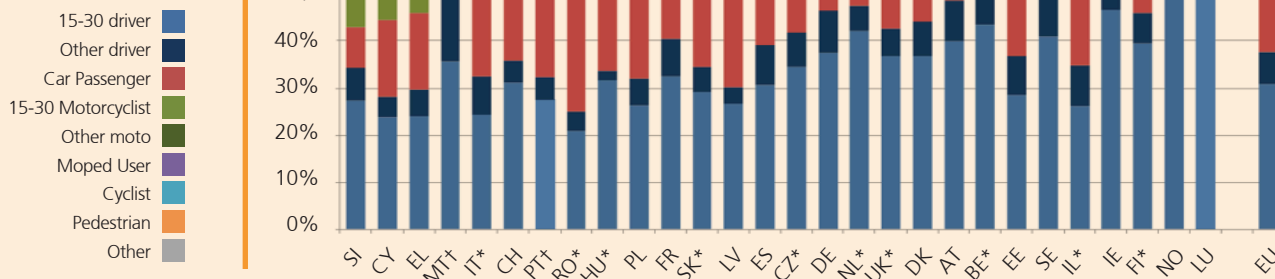
The risks are even higher for young moped and motorcycle riders.<sup>10</sup> Studies have shown that the likelihood of being

injured in a collision is 10-20 times higher amongst moped riders of all ages compared to car drivers.<sup>11</sup>

Death rates for moped riders peak between 15 and 17 and for motorcycle riders between 18 and 24.<sup>12</sup> In some Member States over 40% of moped and motorcycle under 25 had been in a collision in the last twelve months.<sup>13</sup>

Young people also pose a risk to their passengers and other road users (Fig. 1.3). Collisions involving a young driver or rider account for 37% of total road traffic

**FIG. 1.3**  
**Road deaths following collisions involving at least one car or motorcycle driven by a young person ranked by the share of car users (drivers or passengers) killed in those collisions. \*Latest 3 years available 2007, 2008, 2009. † Latest data available 2007, 2008**



<sup>7</sup> EUROSTAT, 2010, Being Young in Europe Today – Health. <https://goo.gl/NnbCU>  
<sup>8</sup> European Commission, March 2015, Road Safety in the European Union: Trends, Statistics and Main Challenges, p10. <http://publications.europa.eu/s/bRrk>  
<sup>9</sup> Wells P et al, 2008, Cohort II: A Study of Learner and New Drivers. Volume 1: Main Report, Road Safety Research Report No. 81. UK Department for Transport, p3. <https://goo.gl/cj2L7Q>  
<sup>10</sup> Steg, L., Van Brussel, 2009, Accidents, aberrant behaviours, and speeding of young moped riders, Transportation Research Part F: Traffic Psychology and Behaviour, Volume 12, Issue 6, pp. 503-511. <https://goo.gl/i4wrpB>  
<sup>11</sup> Møller, M., Hausteijn, S., February 2016, Factors contributing to young moped rider accidents in Denmark, Accident Analysis & Prevention, Volume 87, pp. 1-7. <https://goo.gl/Ti0ef1>  
<sup>12</sup> European Commission, June 2015, Traffic Safety Basic Facts on Motorcycles & mopeds, p12. <https://goo.gl/EjrGyU>  
<sup>13</sup> Riderscan, 2014, p47. <https://goo.gl/KMM2WX>

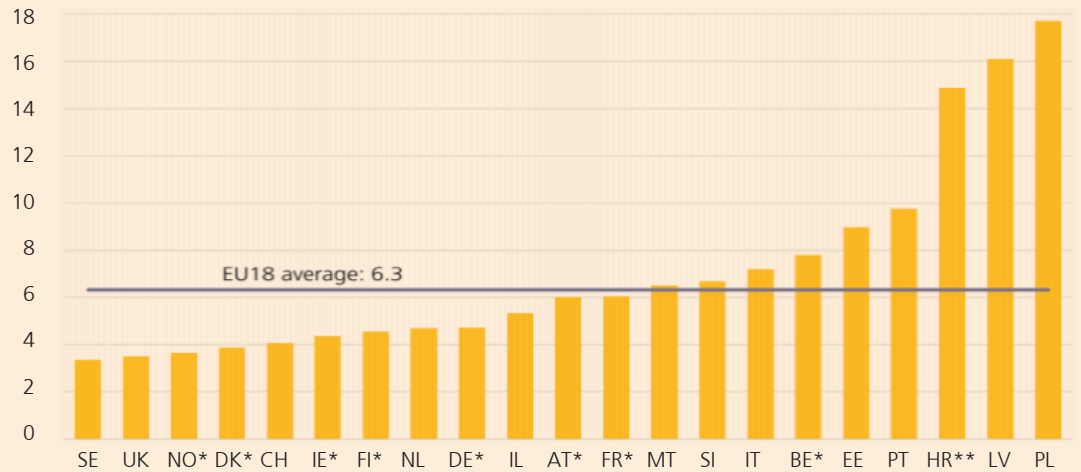
*One in five young drivers in the UK reported having a collision in the first six months after passing their practical test.*

deaths and for each young driver or rider killed in collisions involving a young driver or rider, there are 1.12 passengers or other road users killed in the same set of collisions.<sup>14</sup>

There is significant variation between different Member States and different road user groups when it comes to road safety, as shown in Figs. 1.4, 1.5 and 1.6. For example, across the EU, over half of young road user

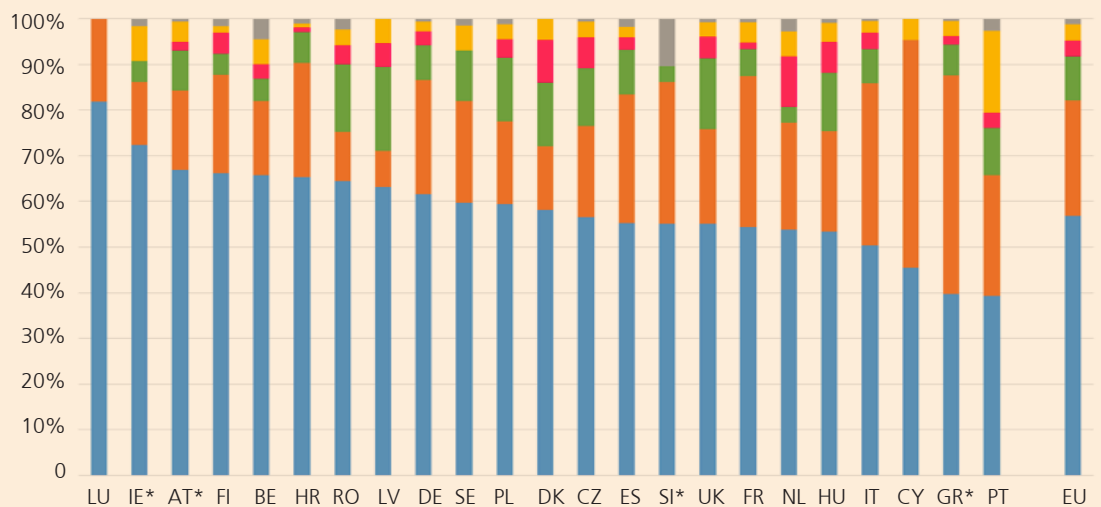
deaths are in cars, whereas only a quarter are on powered two-wheelers (PTW). However, in certain Member States, especially those in Southern Europe such as Cyprus and Greece, PTWs are far more common and account for nearly 50% of deaths (Fig. 1.6). These differences need to be taken into account when deciding which measures are most relevant for a particular country.

**FIG. 1.4**  
Total road deaths (all ages) per billion vehicle km, ETSC 2016<sup>15</sup>



**FIG. 1.5**  
Road deaths by road user type among the 15-30 age group in 2013, with countries ranked by percentage of car users. \*2012 data used<sup>16</sup>

- Car
- PTW
- Pedestrian
- Cyclist
- HGV/Lorry
- Other&Unknown

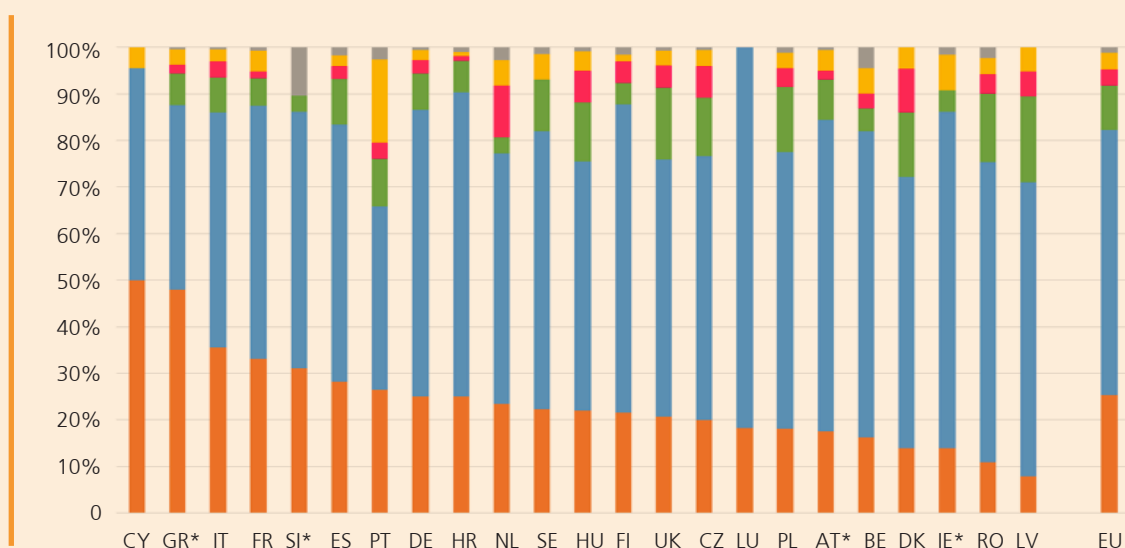


<sup>14</sup> ETSC, 2012, 6th Road Safety PIN Report: A Challenging Start towards the EU 2020 Road Safety Target, p42. <https://goo.gl/2aP0U4>  
<sup>15</sup> ETSC, 2016, 10th PIN Annual Report. Average for the latest three years for which both the road deaths and the estimated data on distance travelled are available. 2013-2015 (HR, LV, SE, CH), 2012-2014 (AT, SE, DK, FI, FR, IE, NL, PT, UK, IL, NO), 2011-2013 (BE, PL), 2014-2015 (MT). \*Provisional figures for road deaths in 2015. \*\*Road deaths per billion vehicle-km travelled by cars only. <https://goo.gl/x5Wtpv>  
<sup>16</sup> European Commission CARE Database. <https://goo.gl/gefT1e>



**FIG. 1.6**  
Road deaths by road user type for the 15-30 age group in 2013, with countries ranked by percentage of PTW users. \*2012 data used<sup>17</sup>

Car  
PTW  
Pedestrian  
Cyclist  
HGV/Lorry  
Other&Unknown



### 1.3 WHY ARE YOUNG ROAD USERS AT GREATER RISK?

The increased risk that young people face on the road is due to a combination of factors. These include risky biological and behavioural traits particular to young people, a lack of experience and a particular array of impairments and distractions.<sup>18</sup> The vehicles they use and the amount that they drive and ride also affect their exposure to risk.

It is important to note that while the majority of young drivers and riders are responsible and act safely on the roads, that these factors can affect all young people.

#### Age, gender and biological immaturity

Young people undergo significant biological and social changes between the ages of 15 and 25. Cognitive development during puberty can lead to greater emotional instability and more assertive behaviour. Consequently, as road users, young people tend to display risky behaviours and have a diminished appreciation of the hazards that they face.<sup>19</sup>

Young male drivers in particular have more assertive, hazardous driving styles and are consistently more likely to be involved in a fatal collision than young female drivers. (Fig. 1.6) They are also more likely to experience pressure from peers to speed and even race.

Learning to drive and ride is often part of the transition towards adulthood and greater independence. Social activity increases during adolescence leading to a greater exposure to peers and their influences.<sup>20</sup>

#### A lack of driving experience

Young road users lack experience. They may quickly acquire the technical skills of driving, but not enough practice means that young people have not yet developed the necessary skills required to anticipate hazards and deal with potentially dangerous situations, such as bad weather and driving at higher speeds.

*Young people have not yet developed the necessary skills required to anticipate hazards and deal with potentially dangerous situations, such as bad weather and driving at higher speeds.*

During the early stages of driving, skills are not yet ingrained and the driving task requires greater concentration. Consequently, distractions and impairments pose a greater risk to young people than they do for more experienced road users.<sup>21</sup> Young drivers, especially males, are more likely to be in speed-related collisions with the inherent risk that more severe injuries will be sustained.<sup>22</sup>

<sup>17</sup> European Commission CARE Database <https://goo.gl/gefT1e>

<sup>18</sup> Twisk, D., Stelling, A., 2014, Young people's risky behaviour requires integral approach, SWOV, p4. <https://goo.gl/Y1GjNF>

<sup>19</sup> Twisk, D., Stelling, A., 2014, Young people's risky behaviour requires integral approach, SWOV, p4. <https://goo.gl/Y1GjNF>

<sup>20</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, pp.75-76. <https://goo.gl/dHJJRj>

<sup>21</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p82. <https://goo.gl/dHJJRj>

<sup>22</sup> Department for Transport, September 2010, The Characteristics of Speed Related Collisions, Road Safety Research Report 117, p48. <https://goo.gl/01pkZ3>

## Impairments and distractions

Young people are affected by common impairments (alcohol, drugs, fatigue). However, they have a high exposure and susceptibility to these impairments due to their age and related behavioural traits. They have a lower tolerance level for alcohol and drugs. Increased socialising with peers increases their exposure to these substances, as well as the likelihood of more night-time road use, as they travel to and from social events.<sup>23</sup>

Distraction is particularly dangerous, as the driving and riding tasks are not as automated for young people as they are for older road users. Significant distractions are caused by mobile devices being used for communication and entertainment, as well as driving with peer-age passengers. Stress and fatigue, which many experience during their adolescent years, also serve to increase the chances of error.

## Vehicle choice and the consideration of safety

Owing to the high costs of learning to drive, buying a car and obtaining insurance, young people tend to use

smaller, older, vehicles which tend to have lower safety standards.<sup>24</sup> This means that they are less likely to benefit from assistive safety features such as Electronic Stability Control and Autonomous Emergency Braking.

Similarly, many young riders forgo suitable Personal Protective Equipment (PPE), either out of choice/comfort (especially in warmer climates) or due to the costs involved.

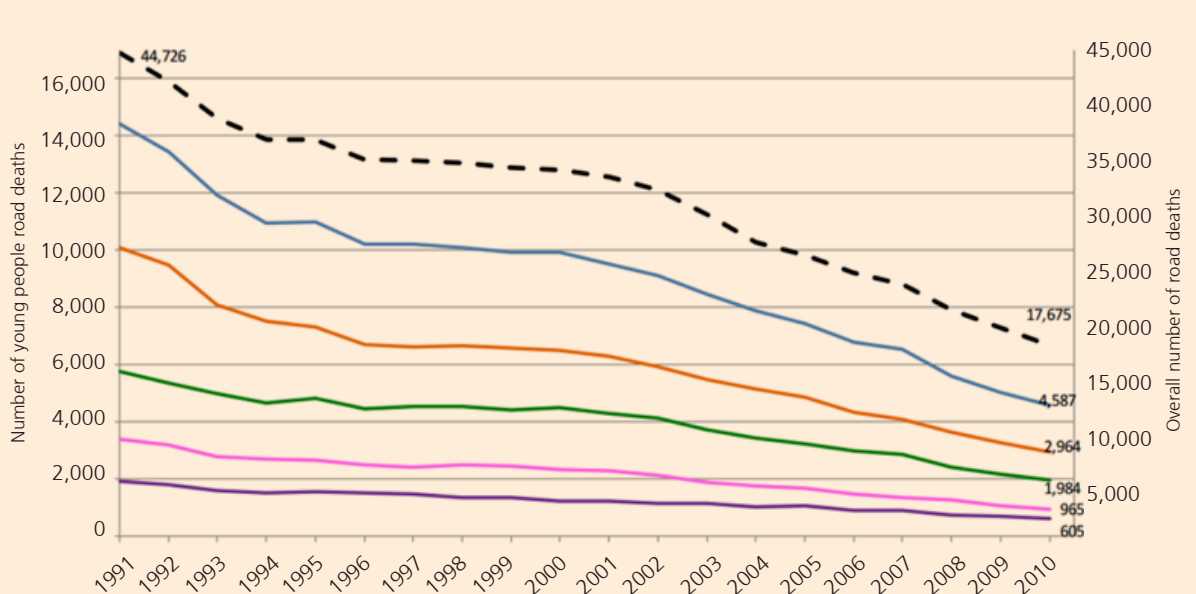
## 1.4 GENERAL IMPROVEMENTS IN ROAD SAFETY

The EU and Member States are aware of the pressing need to address deaths and injuries on the roads. This is reflected by policy statements and initiatives such as the European Commission's Road Safety Policy Orientations 2011-2020<sup>25</sup> and the 2011 European Commission White Paper, Roadmap to a Single European Transport Area.<sup>26</sup> Progress is continually monitored and policy changes are recommended and made where necessary.<sup>27</sup>

**FIG. 1.7**

**Reduction in road deaths since 1991 in the EU15 (except Germany) among people aged 15-17 (purple line), 18-24 (orange line), 25-30 (green line), among males aged 15 to 30 (blue line) and females aged 15-30 (pink line) and reduction in total road deaths (black dotted line)<sup>28</sup>**

Young people 15-17 age\* —  
 Females in 15-30 age\* —  
 Young people 18-24 age\* —  
 Males in 15-30 age\* —  
 Young people 25-30 age\* —  
 Overall numbers of deaths —



<sup>23</sup> EU Barometer, 2014, Young People and Drugs. <https://goo.gl/gWx17a>

<sup>24</sup> Department for Transport, 2010, The Characteristics of Speed Related Collisions, Road Safety Research Report 117, p48. <https://goo.gl/01pkZ3>

<sup>25</sup> European Commission, Road Safety: Policy Orientations 2011-2020. <https://goo.gl/wEm4wr>

<sup>26</sup> European Commission, 2011, White Paper, Roadmap to a Single European Transport Area: Towards a competitive and resource efficient transport system. <https://goo.gl/vABb0r>

<sup>27</sup> European Commission, White Paper Mid Term Review

<sup>28</sup> CARE database (except 2010: PIN data as provided by Panellists). Source: ETSC (2012). 6th PIN Report. <https://goo.gl/g7c7PE>

As a result of this work, numbers of killed and seriously injured have fallen substantially over the past two decades. (Fig 1.6) Reductions over the past five years may also be partly linked to the effects of the 2008 financial crisis. It is known that during a downturn people travel less and drive and ride more economically.<sup>29</sup> The proportion of young people on the roads is also likely to have been smaller as fewer people take their tests.<sup>30</sup>

Many individual measures have been implemented across Europe and now have a high level of compliance.<sup>31</sup> Seat belt wearing in the front seats of cars and vans is now above 90% in many Member States.<sup>32</sup> The majority of people now see it as socially irresponsible to drive while under the influence of alcohol.<sup>33</sup> Car occupant safety has increased steadily, aided by the European New Car Assessment Programme (Euro NCAP).<sup>34</sup> More improvement can be made but these measures are widely considered to be effective, publicly accepted and unlikely to be reversed.

Consequently, there is an increasing focus on identifying and improving road safety for certain road user groups, such as older drivers, people driving at work, motorcyclists, cyclists and pedestrians.

Prominent and critical amongst these groups is young road users, especially young drivers and riders.

## 1.5 WORK ON THE YOUNG ROAD USER PROBLEM

Young road users have long been identified as a high risk group and a number of initiatives, reports and projects have attempted to identify the most effective ways of addressing the issue.<sup>35</sup>

The OECD's comprehensive 2006 report, *Young Drivers – The Road to Safety*, covered in great detail the risks young drivers' face, before exploring the most effective restrictions, countermeasures and changes that could be employed.<sup>36</sup> Over a decade on from its publication it remains an ample summary of the young driver problem and contains much that is relevant today.

A range of European projects has been carried out since the 1990s by organisations such as the International Commission for Driver Testing (CIECA). These projects have included broad analyses of young driver policy (SafetyNet, 2009), as well as evaluations of specific policy areas and measures that could reduce young driver risk such as licensing, training and road user behaviour (GADGET, 1999/Advanced, 2002/NovEV, 2004/MERIT and TEST, 2005).<sup>37</sup>

A number of reports have been issued by the European Transport Safety Council (ETSC). In 2012, the EU's progress in reducing road deaths amongst young people was a key feature of the 6th Road Safety PIN report.<sup>38</sup> Young driver safety in specific situations has also been addressed, as in the report *Managing Young Drivers at Work*.<sup>39</sup>

An extensive academic literature exists on the various risk factors and behaviours linked to young road users, much of which has been utilised in the projects listed above. These cover a range of aspects of young driver safety from technical, quantitative studies of vehicle safety, speeding and telematics to more sociological and psychological work on the impact of gender, adolescent lifestyles and driving styles.<sup>40</sup>

The combined result of this collective work on young road users has been an extensive list of recommendations for policymakers, vehicle designers, parents, instructors, enforcement agencies and young people themselves.

It should be noted that the overwhelming majority of literature on the topic of young road users focuses on young drivers. There is a significant lack of work that focuses on young riders, and riders in general let alone other road users such as young pedestrians and cyclists.

## 1.6 EFFECTIVE COUNTERMEASURES

Despite varying viewpoints and areas of focus much of the existing work on young road users centres on a small number of recommended evidence-based countermeasures. These aim to improve the learning and experience of young road users, and to limit the risks they face as they begin independent driving. It also aims to help young people become more safety conscious drivers and riders.

<sup>29</sup> Lloyd, L., Reeves, C, Broughton J. and Scoons, J., 2013, Investigating the reduction in fatal accidents in Great Britain from 2007-2010, p41. <https://goo.gl/FOFSMT>

<sup>30</sup> IRTAD, 2015, Annual Road Safety Report 2015; Summary, p4. ITF/OECD, 2015, Why Does Road Safety Improve When Economic Times Are Hard? <https://goo.gl/DR8Uui>

<sup>31</sup> European Commission, March 2015, Road Safety in the European Union: Trends, Statistics and Main Challenges, p7. <http://publications.europa.eu/s/bRrK>

<sup>32</sup> ETSC, 2014, Ranking EU Progress on Car Occupant Safety, PIN Flash Report 27, p15. <https://goo.gl/GYsDN9>

<sup>33</sup> Eurobarometer, 2010, EU citizens' attitudes towards alcohol. <https://goo.gl/mXNfC1>

<sup>34</sup> ETSC, 2014, Ranking EU Progress on Car Occupant Safety, PIN Flash Report 27, p23. <https://goo.gl/GYsDN9>

<sup>35</sup> Goldstein, L. G., 1972, Youthful drivers as a special safety problem. *Accident Analysis & Prevention*, 4(3), 153-189.

<sup>36</sup> ITF/OECD, 2006, *Young Drivers – The Road to Safety*. <https://goo.gl/dHJJRj>

<sup>37</sup> SafetyNet, 2009, Novice Drivers GADGET (1999), MERIT (2005) and TEST (2005), NovEV (2004) and Advanced (2002)

<sup>38</sup> ETSC, 2012, 6th Road Safety PIN Report: A Challenging Start towards the EU 2020 Road Safety Target. <https://goo.gl/DBTd5I>

<sup>39</sup> ETSC, 2015, *Managing Young Drivers at Work*, PRAISE Report. <https://goo.gl/uW2IY3>

<sup>40</sup> Helman, S., Grayson, G., and Parkes, A. M., 2010, How can we produce safer new drivers? A review of the effects of experience, training, and limiting exposure on the collision risk of new drivers, TRL Insight Report, <https://trl.co.uk/reports/INS005> & Secton, B., and Grayson, G., 2009, 'Further analyses of accident data from the Cohort II study: when do drivers have their first accident and does it have an impact on their subsequent driving?', TRL Report. <https://goo.gl/IPBQV6>

The countermeasures fall into four broad categories:

- a) **Strengthening enforcement of general road safety measures** will particularly benefit young road users by encouraging better compliance with road safety laws such as seat belt wearing, speeding and drink and drug driving.
- b) **Improving training** to ensure young road users gain experience and exposure to as wide a range of hazards and driving situations as possible prior to licensing and independent road use. Training should encourage a greater awareness of the young person's own limits and the various risks they will encounter during regular driving and riding as well as maximising the potential of accompanied driving with competent family and friends.
- c) **Changes to licensing systems and testing** so that they engender safer road use both before and after taking the test. Graduated licensing systems allow temporary restrictions to be put in place during learning and immediately after licensing to help protect young drivers and riders (and their passengers) until they gain sufficient experience.

Improvement and alterations can be made to testing, to move the focus away from basic vehicle control and towards a more wide-ranging set of knowledge and skills.

- d) **Utilising technology** to encourage continued safe road use amongst young people.

This report will provide a summary of the common countermeasures used to reduce young road user risk (using the above four categories), and identify those countermeasures that have been shown to be most effective.

Successful examples from Europe and further afield will be used to illustrate how best to improve the safety of young riders and drivers and recommendations will be made for the European and Member State level.

# PART II

## FACTORS BEHIND THE YOUNG ROAD USER PROBLEM

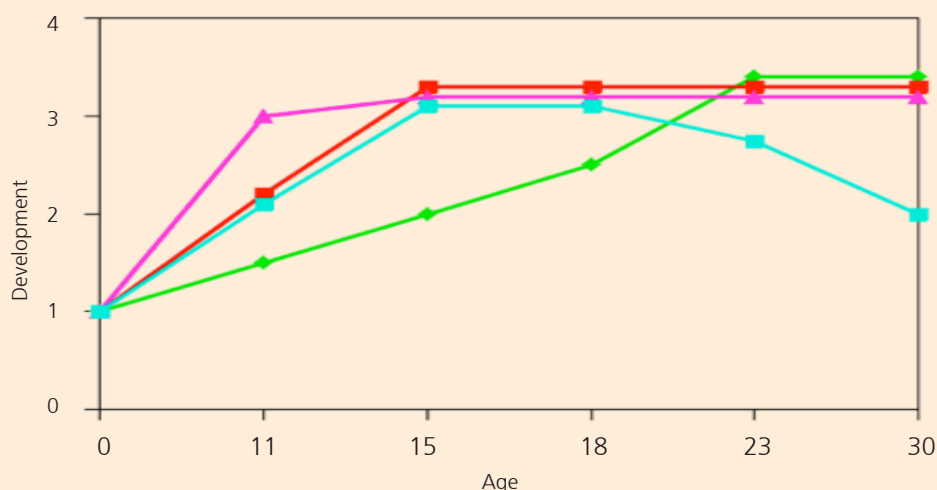
### 2.1 AGE, GENDER, BIOLOGICAL IMMATURITY AND SOCIAL FACTORS

Between the ages of 15 and 25, young people go through a series of biological and social changes as they mature from adolescents to young adults. These changes affect their behaviour on the roads and their attitude to driving as an activity.

Brain development is ongoing throughout this period and is not completed until well into the 20s.<sup>41</sup> Consequently, when young people are learning to drive, their cognitive abilities are still not completely developed. This affects their perception of, and attitudes towards, risk.

**FIG. 2.1**  
Psychological Development and Age<sup>42</sup>

Cognitive control —●—  
Social emotional —■—  
Logical reasoning —▲—  
Risk taking —■—



*When young people are learning to drive, their cognitive abilities are still not completely developed. This affects their perception of, and attitudes towards, risk.*

Both genders experience hormonal changes at this stage in life. Young males in particular experience a marked increase in testosterone which is linked to greater sensation-seeking and risk-taking behaviour.<sup>43</sup> Young males also tend to have a greater confidence in their own driving ability than young females.<sup>44</sup>

Although females cognitively mature earlier than males, young males continue to form the majority of young drivers and riders and use the roads more frequently than females.<sup>45</sup> This imbalance is reflected in the fact that males make up the great majority of young road deaths in every European country (Fig. 2.2).

<sup>41</sup> Divera Twisk, 2015, Presentation, YEARS Project Launch Event. <https://goo.gl/mhxSpi>

<sup>42</sup> Brijs, Kris; Ruiter, Rob; BRIJS, Tom, 2009, Naar een evidence-based en doelgroep-specifieke verkeerseducatie, Published in: Brijs, Kris & Ruiter, Rob & Brijs, Tom (Ed.) Jaarboek Verkeersveiligheid, p. 92-100. <https://goo.gl/GYIgt3>

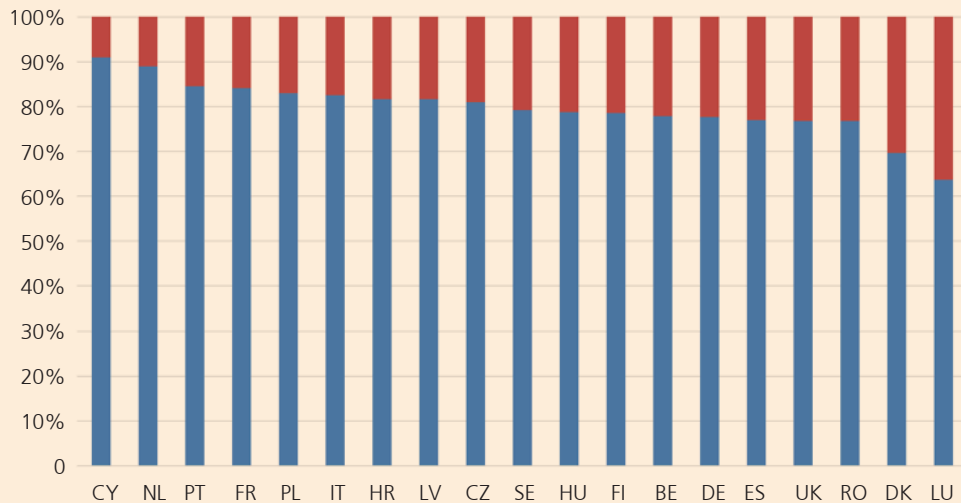
<sup>43</sup> Twisk, Divera, 2014, Protecting pre-license teens from road risk: Identifying risk-contributing factors and quantifying effects of intervention strategies, pp.47-48. <https://goo.gl/rMe31s>

<sup>44</sup> Wells P, et al, 2008, Cohort II: A Study of Learner and New Drivers. Volume 1: Main Report, Road Safety Research Report No. 81. UK Department for Transport, p3. <https://goo.gl/4dA3Si>

<sup>45</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p70. <https://goo.gl/dHJJRj>

**FIG. 2.2**  
Percentage of road user deaths amongst 15-30 year olds for 2013 by gender <sup>46</sup>

Male ■  
Female ■



*Aspects of the adolescent lifestyle include a rise in alcohol and drug use and an increased level of socialisation with peers in the same age group.*

The increased risk faced by young males on the road has a direct effect on young females. Research in Ireland showed that seven in ten female passengers killed between the ages of 17-24 were in cars driven by men in the same age group.<sup>47</sup>

Young male riders are more likely to be killed than young female riders. Furthermore, the gender imbalance amongst young riders does not see the same reduction with age as it does for young drivers (Fig. 2.3)

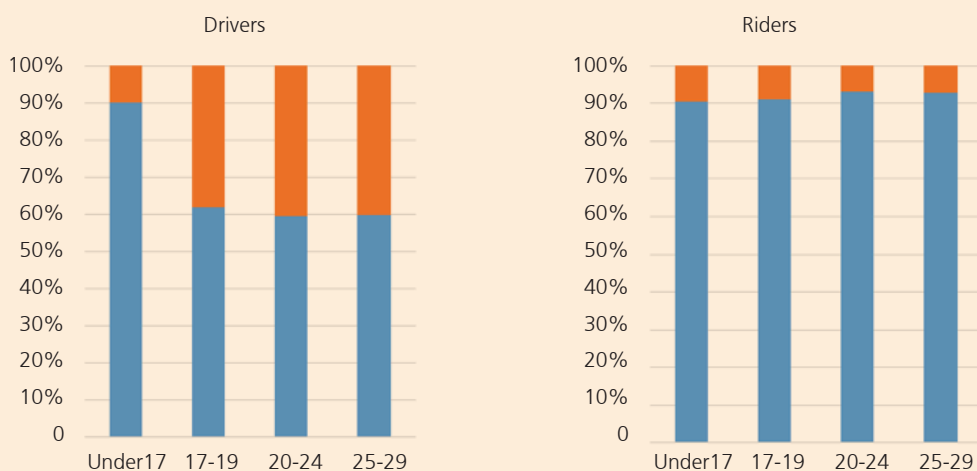
Young males are much less likely than females to use a seat belt and are more likely to place a greater importance on the vehicles themselves and driving ‘for

the sake of driving’.<sup>48</sup> There is also a greater tendency to take risks and violate traffic laws amongst young males, and they are more likely to choose a car with a higher-powered engine.<sup>49</sup>

Young people experience significant social change as they assume greater independence and begin to transition into the adult world.<sup>50</sup> Learning to drive is a significant practical and symbolic part of this transition, enabling access to social gatherings and employment, but also freedom to travel and explore independently.<sup>51</sup>

**FIG. 2.3**  
Driver and rider casualties in reported accidents between ages of under 17 and 29, by gender. Source: Reported Road Casualties Great Britain: 2014 Annual Report

Male ■  
Female ■



<sup>46</sup> European Commission CARE Database. <https://goo.gl/L9pc54>

<sup>47</sup> ETSC, 2012, 6th Annual Road Safety Performance Index (PIN) Report, p54. <https://goo.gl/U2QmIW>

<sup>48</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p53. <https://goo.gl/dHJJRj>

<sup>49</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p94. <https://goo.gl/dHJJRj>

<sup>50</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p75. <https://goo.gl/dHJJRj>

<sup>51</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p14. <https://goo.gl/dHJJRj>

However, this period of life is also one of emotional instability and impulsive, self-gratifying behaviour. Aspects of the adolescent lifestyle include a rise in alcohol and drug use and an increased level of socialisation with peers in the same age group.<sup>52</sup>

Sensitivity to popularity and peer pressure is also prominent amongst adolescents. This creates a desire to 'keep-up' with peers and obtain a driving licence as soon as possible and also encourages risk-taking behaviour.<sup>53</sup>

These aspects are often combined, occurring at social gatherings in the evenings, late at night and on the weekends. This increases the likelihood of a combination of high-risk behaviours: at night, with passenger distractions, after having taken alcohol and/or drugs, and when more mature drivers are less likely to be present as passengers.

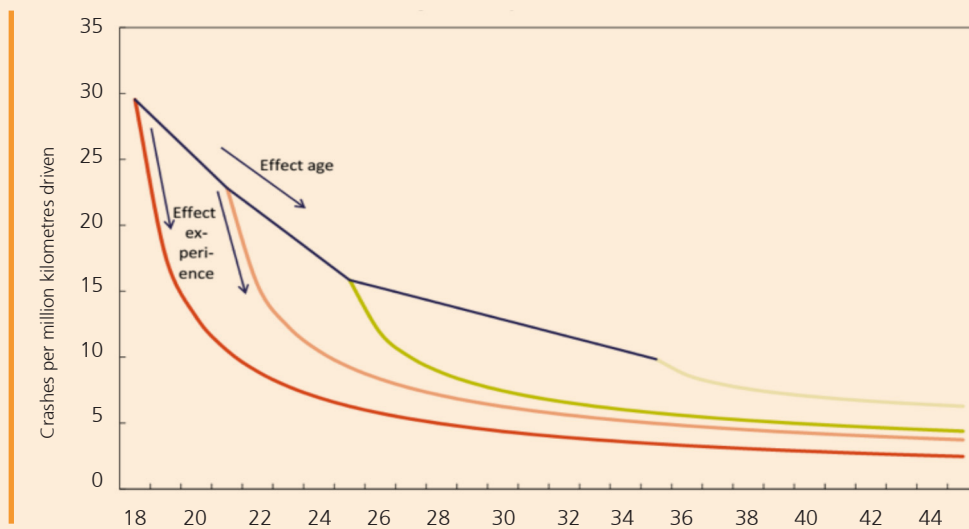
In the course of learning, young road users will acquire the skills needed to manoeuvre the vehicle and successfully pass the practical test. However, as with learning any skill, the initial stages require a lot of attention and thought, which creates a higher mental workload.

It takes years for complex driving skills to become routine, or automated. This higher mental workload means that young drivers and riders find it harder to appropriately respond to unfamiliar environments and unexpected situations. It detracts from performing critical tasks such as hazard perception and can be easily affected by distractions and impairments.

Young people are worse at observing and anticipating the actions of other road users. Severe collisions involving young people often occur when turning across the

**FIG. 2.4**  
Decrease in the crash rates of novice drivers starting their driving career early and novice drivers starting their driving career later or late<sup>55</sup>

- Licence at 18
- Licence at 21
- Licence between 23-27
- Licence between 30-40
- Initial crash rate



## 2.2 A LACK OF EXPERIENCE

Young road users are almost inevitably inexperienced. Although they have a knowledge of basic vehicle control by the time they pass their test, they have not accumulated as much on-road time as older road users have.

Furthermore, they are less likely to have encountered the variety of road environments that more experienced road users have. The early years of road use involve encountering numerous unfamiliar situations and it is the accumulation of this experience, alongside the familiarity with specific skills that makes safer drivers and riders.<sup>54</sup>

path of traffic or overtaking.<sup>56</sup> The ability to search for, recognise and react to hazards is on average noticeably better in drivers with more experience.<sup>57</sup>

With their lack of experience, young people are especially at risk from driving and riding at an inappropriate speed for their current road environment and they feature heavily in collisions caused by loss of control, especially young riders.<sup>58</sup>

*Young people are worse at observing and anticipating the actions of other road users.*

<sup>52</sup> Twisk, Divera, 2014, Protecting pre-license teens from road risk: Identifying risk-contributing factors and quantifying effects of intervention strategies, p96. <https://goo.gl/So3hS7>

<sup>53</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p15. <https://goo.gl/dHJJRj>

<sup>54</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p193. <https://goo.gl/dHJJRj>

<sup>55</sup> Vlakveld, 2005, featured in SWOV, 2016, Fact Sheet, 18-24 year olds: Young Drivers, <https://goo.gl/d60PeM>

<sup>56</sup> Maycock G, 2002, Novice Driver accidents and the driving test, TRL (TRL527), p2.

<sup>57</sup> McKenna, F. P. & Crick, J. L., 1994, Hazard perception in drivers: a methodology for testing and training. TRRL Report CR313. Crowthorne: Transport and Road Research Laboratory, p21. <https://trl.co.uk/reports/CR313>

<sup>58</sup> Helman, S., Grayson, G. B. and Parkes, A. M., 2010, How can we produce safer new drivers? A Review of the effects of experience, training and limiting exposure on the collision risk of new drivers, TRL Insight Report INS005, p3. <https://trl.co.uk/reports/INS005>

### 2.3 IMPAIRMENT AND DISTRACTION

All road users can be affected by common impairments such as alcohol, drugs and fatigue, but they pose more serious problems for young people.

During adolescence, young people experience more contact with alcohol and drugs. This often occurs at social gatherings and events late at night, which can only be accessed by car or bike, increasing the likelihood of driving while under the influence of one or sometimes both.

The majority of young people are generally less tolerant of alcohol and drugs than most older drivers and are therefore more affected when driving than older road users.<sup>59</sup> Given their lack of experience on the roads, they also have a poorer understanding of how even legal levels of alcohol impair their ability to drive.<sup>60</sup>

Young people are often less aware of the legal consequences of drink and drug driving and may have a more permissive attitude to drink-driving than older road users.<sup>61</sup> However, it has been demonstrated that prospective drivers (aged 15-17) have a slightly more responsible attitude to drink and drug driving than active young drivers.<sup>62</sup>

Drugs are most commonly detected in young drivers and riders, especially males, and at the weekend.<sup>63</sup> Young people are also the group most likely to have taken multiple drug combinations or alcohol with drugs.<sup>64</sup>

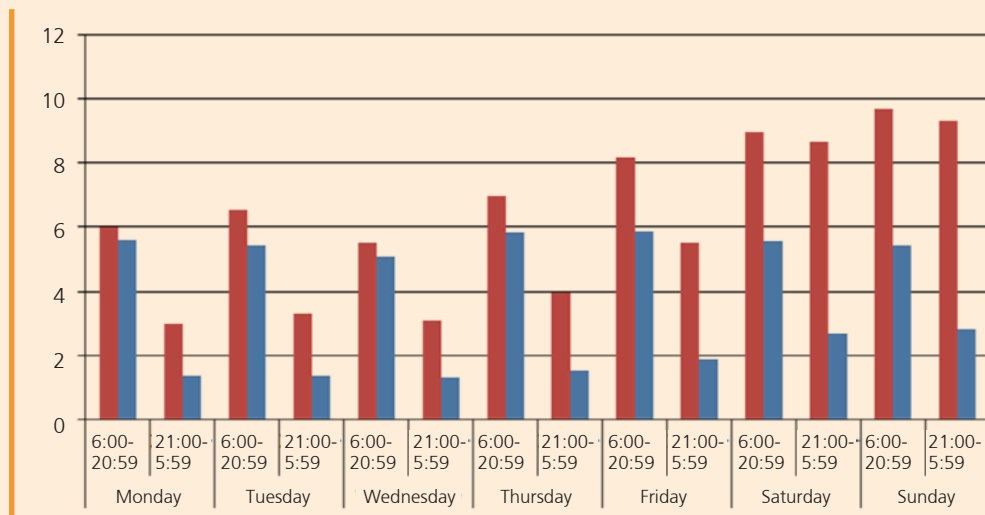
Fatigue is particularly problematic for young road users, especially as adolescents have a biological need for more sleep.<sup>65</sup> Young people will be unfamiliar with the impact that fatigue has on their driving quality and hazard perception skills. Given the higher levels of concentration needed for driving, fatigue can set in faster for young drivers and riders, even though they may not be travelling long distances.

Young people have a tendency to drive late at night and in the early mornings for both voluntary (social engagements) and compulsory (work shifts) activities which further increases the risk of fatigue, especially when the two are combined.<sup>66</sup> This is especially true on the weekends (Fig. 2.5). Fatigue has an even more detrimental effect when the driver has taken alcohol, even if only a relatively small amount of alcohol has been consumed.<sup>67</sup>

*Given the higher levels of concentration needed for driving, fatigue can set in faster for young drivers and riders, even though they may not be travelling long distances.*

**FIG. 2.5**  
Young people and total death rates per million population by day of the week and time of the day, EU, 2013, or latest available year.<sup>68</sup>

Young people ■  
Total ■



<sup>59</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p78. <https://goo.gl/dHJJRj>

<sup>60</sup> ETSC, 2015, Managing Young Drivers at Work, PRAISE Report, p11.

<sup>61</sup> DRUID Project Report, 2012, p70/73. <https://goo.gl/U6s1ii>

<sup>62</sup> DRUID Project Report, 2012, p70. <https://goo.gl/U6s1ii>

<sup>63</sup> DRUID Project Report, 2012, pp.17-23. <https://goo.gl/U6s1ii>

<sup>64</sup> DRUID Project Report, 2012, p22. <https://goo.gl/U6s1ii>

<sup>65</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p81. <https://goo.gl/dHJJRj>

<sup>66</sup> ETSC, 2015, Managing Young Drivers at Work, PRAISE Report, p13. <https://goo.gl/URhoyi>

<sup>67</sup> UK Department for Transport Project, 2000, The Interactions Between Sleepiness and Moderate Alcohol Intake. <http://www.dft.gov.uk/rmd/project.asp?intProjectID=10129>

<sup>68</sup> European Commission, Directorate General for Transport, June 2015, Traffic Safety Basic Facts on Young People, p12. <https://goo.gl/nbOHZh>



Distraction poses a heightened risk to young road users. The driving task is more complicated and demanding for an inexperienced younger driver, than it is for somebody older. As a result, distractions from passengers and in-car devices can affect their driving to a much greater degree than they would a more experienced driver.

Peer-age passengers in particular lead to an increase in collision risk as pressure to drive riskily and show-off becomes more likely.<sup>69</sup> Whereas older drivers see a decrease in collision risk when carrying passengers, drivers aged 18-19 years old see their risk double and 16-17 year old drivers can see it increase four times.<sup>70</sup>

Mobile phone usage is heaviest amongst young people with 74% also using them to access the internet, compared to an EU average of 44%.<sup>71</sup> They are the cohort of drivers most likely to own and use electronic communications and are more likely than older drivers to use mobile devices in cars, to play music and videos and to access social media. Navigational aids, while helpful for new drivers, are also a distraction for those unused to driving with them. Mobile phones are increasingly being used for navigational purposes.<sup>72</sup>

Less is known about impairments and distractions concerning young riders due to a lack of research. However, in many ways, they face the same issues as car drivers. One study of collisions involving young riders (aged 16 and 17) found that attention error was the most frequently assigned accident factor.<sup>73</sup>

## 2.4 VEHICLE CHOICE AND THE CONSIDERATION OF SAFETY

Young people tend to drive smaller, older cars, due to cost and practicality.<sup>74</sup> These cars are not as safe as newer models and are less likely to have the same standards of crashworthiness or come with safety features such as Automated Emergency Braking (AEB) and Electronic Stability Control (ESC). However, even in new cars some safety systems are not fitted as standard.

Some young road users will see the ability to drive as more important than the ability to drive safely. However, even those who want to be safe on the roads are also at an elevated risk of being involved in a collision. Given the likelihood of other road users being involved in a young road user's collision, it is important that the vehicles involved are as safe as possible.

Given their greater frequency of insurance claims, particularly catastrophic claims, young people pay significantly higher insurance premiums, adding further to the cost of the learning and driving process.

Young riders also have to choose whether or not to utilise Personal Protective Equipment (PPE), which can often be expensive.

## 2.5 THE FOUR FACTORS COMBINED

All young drivers and riders are affected by the above four factors to varying degrees and in varying combinations.

Some may be relatively safe drivers when alone, but suffer from peer-pressure and distractions when carrying friends. Others may be impulsive and aggressive drivers. All will be subject to greater risks if driving a less safe vehicle or not using personal protective equipment.

Therefore, a range of effective countermeasures are needed to address all four factors.

<sup>69</sup>ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p143. <https://goo.gl/dHJJRj>

<sup>70</sup>SafetyNet, 2009, Novice Drivers, p7. <https://goo.gl/GsJYMZ>

<sup>71</sup>Eurostat, 2015, Being young in Europe today, p198. <https://goo.gl/hxX3yD>

<sup>72</sup>ETSC, 2010, Minimising In-Vehicle Distraction, PRAISE Thematic Report 5, pp.3-5. <https://goo.gl/ZK6iNz>

<sup>73</sup>Møller, M., Hausteijn, S., February 2016, Factors contributing to young moped rider accidents in Denmark, Accident Analysis & Prevention, Volume 87, pp. 1-7. <https://goo.gl/Ti0ef1>

<sup>74</sup>UK Department for Transport, September 2010, The Characteristics of Speed Related Collisions, Road Safety Research Report 117, p36. <https://goo.gl/lyLY9D>

# PART III

## COUNTERMEASURES

Numerous countermeasures have been recommended to help improve the safety of young road users. This report looks at those that have shown themselves to be effective in reducing casualties involving young road users in Europe and further afield.

They are reviewed in four categories, although it is recognised that some may be placed in more than one.

- General Safety Measures
- Training and Education
- Licensing Systems and Testing
- Safer Vehicles and Telematics

### 3.1 GENERAL SAFETY MEASURES

All road users benefit from robust and effective road safety legislation, but especially young drivers and riders. Good safety legislation and its enforcement targets the most dangerous activities, those that are proven to increase the risk of a collision and the severity of injury, such as speeding, drink, drug and distracted driving and non-use of seat belts or helmets.

As discussed in 2.1-2.4, young people not only engage in these activities but are more likely to be involved in a collision as a result. Therefore, ensuring that existing road safety legislation is being properly enforced will directly benefit young road users. Safety legislation also helps to improve vehicle safety, which will be discussed further in section 3.4.

The enforcement of existing road safety legislation is the most straightforward way of reducing young road user casualties. It benefits young road users without 'singling them out' and is well supported, with 42% of the public stating that better enforcement of traffic laws should be a primary area of focus for governments when it comes to road safety.<sup>75</sup>

One way of improving compliance levels amongst young road users is by strengthening demerit systems in general

and for young road users in particular, by setting a lower points threshold for loss of licence or other penalties.<sup>76</sup>

### *Demerit point systems are known to reduce collisions and fatalities.*

For example, in Spain and France, novice drivers lose their licence after losing 6 points, instead of the standard 12. If this occurs, they must retake their test.<sup>77</sup>

#### Demerit point systems

Demerit point systems work by subtracting points from the licence of a road user who has committed an offence. Once a certain number of points are lost, the offender loses their licence. Young drivers can be subjected to a lower maximum number of points meaning they lose their licenses more quickly for loss of a given number of points.

Similar systems operate by assigning points. In the UK, drivers and riders accrue points for offences until a certain threshold is crossed, after which they are banned from driving. The standard threshold is 12 points, however, new drivers have a lower threshold of 6 points.

Demerit point systems are known to reduce collisions and deaths when coupled with increased enforcement, effective follow-up and communication campaigns. A 2012 meta-analysis study of European and non-European systems showed a decrease of between 15-20% in the number of collisions, deaths and injuries.<sup>78</sup> High levels of enforcement are needed to maximise the effects of penalty point systems.

Committing serious offences resulting in many demerit points are good predictors of future collisions, a relationship that is strongest with young drivers.<sup>79</sup> Fines

<sup>75</sup> Flash Eurobarometer, July 2010, Road Safety Analytical Report, p6. <https://goo.gl/aq9Jzo>

<sup>76</sup> Van Schagen, I., Machata K., 2012, The BestPoint Handbook: Getting the best out of a Demerit System, p16. <https://goo.gl/79AArZ>

<sup>77</sup> Gov.uk, Penalty Points. <https://goo.gl/dGqqI>

<sup>78</sup> SWOV, September 2012, Factsheet on Demerit Points, p2. <https://goo.gl/7KVjoK>

are also known to be more effective at deterring unsafe behaviour amongst younger road users than older road users.<sup>80</sup> Mandatory learner and probationary plates can be used to help authorities identify young road users more easily.<sup>81</sup> They also serve to help other road users identify them and drive more carefully around them.<sup>82</sup>

Countries with safe roads overall tend to have safer young road users.<sup>83</sup> They benefit from road systems that are more forgiving when it comes to driver errors such as those outlined in the Safe Systems approach.<sup>84</sup> As young road users have a greater propensity to drive at illegal and inappropriate speeds, safety cameras will also have beneficial effects.

Safe roads are particularly important for riders as visibility issues, road-side features and poor road surfaces can all pose a risk. Ensuring that infrastructure is designed and maintained with the needs of riders in mind can help reduce the likelihood and severity of collisions, especially for younger riders who are less likely to stay in control given their lack of experience. For example, Transport for London have created a checklist of design issues as part of their Urban Motorcycle Design Handbook.<sup>85</sup>

Having an efficient and safe public transport system helps provide a viable alternative for young people and reduces exposure to the riskier road modes like driving and riding.<sup>86</sup> This is another reason why the EU and Member States should promote the extension, quality and use of public transport and that conversely more dangerous modes should be discouraged.<sup>87</sup> The Transport White Paper Working Document published in 2011 also recognises that the safety of public transport will be essential to the greater uptake of public transport. The provision of travel information and travel planning should include a consideration of safety in promoting alternatives in terms of both mode choice and route choice. For example, the Netherlands introduced a free public transport pass for students, resulting in a lasting reduction in the mileage of young people aged 18-24 and a subsequent decrease in their collision rate.<sup>88</sup>

### 3.1.1 Speed

Speed is one of the main killers on the EU's roads and young people are over-represented when it comes to speed related deaths.<sup>89,90</sup> Young people are also less likely to recognise when they are travelling at excessive or otherwise inappropriate speed for their ability or for the road condition. They are therefore less likely to reduce speed, as an older, more experienced driver might.

#### *Young people are over-represented when it comes to speed related fatalities.*

In free-flowing traffic, between 20 and 50% of drivers exceed speed limits on motorways, between 15 and 17% on rural roads and between 20 and 80% on urban roads.<sup>91</sup> A 2013 survey by Ford of 9,500 people found that a majority of young drivers admit to breaking the speed limit.<sup>92</sup>

Better enforcement of existing speed limits and lower limits effectively enforced would therefore help reduce deaths amongst young people, who are over-represented in speeding behaviour, collisions and deaths. This is especially true for young males who tend to drive faster than females and for moped riders who have been reported as more likely to speed and having a stronger intention to disobey speed limits.<sup>93</sup>

Enforcement is best carried out in conjunction with high-profile public information campaigns, targeted at young people.<sup>94</sup>

Norway has recently used speed campaigns to target young drivers, and young male drivers in particular. This saw deaths for 16-24 year olds killed on the roads decrease from 49 in 2010 to 32 in 2015. These campaigns have simultaneously targeted the general population, fatal accidents in which excessive speed was a contributing factor fell from 41% in 2010 to 23% in 2014.<sup>95</sup>

<sup>79</sup> SWOV, September 2012, Factsheet on Demerit Points, p2. <https://goo.gl/7KVjoK>

<sup>80</sup> DRUID Project, 2012, p72. <https://goo.gl/U6s1ii>

<sup>81</sup> Helman, S., Grayson, G., Parkes, A. M., 2010, How can we produce safer new drivers? A review of the effects of experience, training, and limiting exposure on the collision risk of new drivers, TRL Insight Report (INS005), p60. <https://trl.co.uk/reports/INS005>

<sup>82</sup> ETSC, 2012, 6th Annual Road Safety Performance Index (PIN) Report, p58. <https://goo.gl/U2QmiW>

<sup>83</sup> Twisk, Divera A.M., and Colin, Stacey, 2007, Trends in young driver risk and countermeasures in European countries, Journal of Safety Research, p5. <https://goo.gl/TJXDJ>

<sup>84</sup> ITF/OECD, 2008, Towards Zero: Ambitious Road Safety Targets and the Safe System Approach. <https://goo.gl/1mFWWI>

<sup>85</sup> TfL Urban Motorcycle Design Handbook. <https://goo.gl/NtGw8S>

<sup>86</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, p180. <https://goo.gl/dHJJR>

<sup>87</sup> ETSC, 2013, Position on Urban Transport. <https://goo.gl/VbSVnJ>

<sup>88</sup> SafetyNet, 2009, Novice Drivers, p21. <https://goo.gl/GsJYMZ>

<sup>89</sup> ETSC, 2011, Traffic Law Enforcement across the EU: Tackling the Three Main Killers on Europe's Roads, p19.

<sup>90</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, p198. <https://goo.gl/dHJJR>

<sup>91</sup> ETSC, 2010, 4th Road Safety Performance Index Report (PIN), p42. <https://goo.gl/ufd1pF>

<sup>92</sup> FORD News Centre, Young Drivers Admit to Speeding, Using Phone and Eating at the Wheel as Ford Launches Driving Skills Program in Europe. <https://goo.gl/4sn6Mc>

<sup>93</sup> Steg, L., Van Brussel, A., November 2009, Accidents, aberrant behaviours, and speeding of young moped riders, Transportation Research Part F: Traffic Psychology and Behaviour, Volume 12, Issue 6, pp. 503-511. <https://goo.gl/i4wrpB>

<sup>94</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, p216. <https://goo.gl/dHJJRj>

<sup>95</sup> ETSC, 2016, 10th Road Safety Performance Index Report (PIN), p25. <https://goo.gl/WtKHy7>

Speed limits can be enforced via improved technology. In France, between 2002 and 2006, the introduction of a fully automated speed camera programme to enforce the speed management system saw a drop in deaths among young people by 40%.<sup>96</sup> Intelligent Speed Assistance (ISA) has been shown to be effective in helping drivers stay under the speed limit when it is fitted to their vehicles,<sup>97</sup> and this will be considered later in this report.

### 3.1.2 Drink, drugs and distraction

Young people, especially males, are over-represented when it comes to road deaths linked to drink and drugs.<sup>98</sup> Enforcing and tightening limits can therefore help reduce these deaths.

Young drivers are one of the road user groups most involved in drink-driving collisions.<sup>99</sup> BAC limits across Member States are commonly 0.5 g/l for standard drivers but fourteen Member States have a lower limit for young drivers.<sup>100</sup> Germany, Croatia, Italy, Lithuania and Slovenia and Switzerland have a zero-tolerance limit for young drivers.<sup>101</sup> These lower limits are often in place as part of a graduated licensing system (see below). Awareness campaigns are regularly used to target young people and highlight the consequences of drink-driving.<sup>102</sup>

*Young people, especially males, are over-represented when it comes to road deaths linked to drink and drugs.*

Drug-driving is not as well understood a phenomenon as drink-driving and lacks the benefit of widespread public awareness. Illegal drug use increases with age between the ages of 15-25, before falling again and figures for youths are twice those of adults.<sup>103</sup> It is known that young people, especially males and those with sensation seeking and risky behavioural traits are more likely to drug-drive.<sup>104</sup> However, with a combination of legislation, enforcement and screening devices drug-driving can be addressed.

Roadside chemical testing is a means of identifying drug drivers and is currently used by Belgium, Finland, France, Germany, Norway Denmark and Switzerland.

In 2015 the UK introduced new regulations for roadside testing, establishing drug limits and a zero tolerance approach to the eight drugs most associated with illegal use.<sup>105</sup> Combined with the use of drug-screening devices, within six months drug-driving arrests increased by 600%.<sup>106</sup> This large increase is to be expected, as the regulations are new, and effectiveness will need to be monitored in the long-term. However, it demonstrates that drug-drivers can be stopped with the right tools. Cyprus introduced similar zero-tolerance drug-testing in 2016.<sup>107</sup>

Young drivers are less likely to appreciate the potentially fatal effects of distraction and are more likely to overestimate their risk awareness and ability to compensate for distraction.<sup>108,109</sup>

Most EU countries have banned hand-held mobile phones.<sup>110</sup> Police enforcement, combined with publicity campaigns, has the potential to reduce illegal use of a mobile phone while driving. But even though the phenomenon of using a mobile phone while driving is widespread, especially among young people, enforcement levels remain low.<sup>111</sup>

### 3.1.3 Seat belts

Although overall usage of seat belts is rising, wearing rates for those in rear seats are still low in many countries (Fig. 3.1/3.2).<sup>112</sup>

Wearing rates can be improved through targeted seat belt enforcement strategies accompanied by information campaigns. In Denmark, changes to the Danish Road Traffic Act saw police checking all persons in a vehicle, including child restraints, and giving a higher fine for non-use of a seat belt. Compliance rates for car drivers rose by 7% in five years, from 80% to 87%.<sup>113</sup> Seat belt reminders for all seats help to increase usage (see section 3.4.2).

<sup>96</sup> ETSC, 2012, 6th Road Safety PIN Report: A Challenging Start towards the EU 2020 Road Safety Target, p58.

<sup>97</sup> ETSC, 2015, Position Paper Revision of the General Safety Regulation 2009/661, <http://goo.gl/YJdSYo>

<sup>98</sup> EMCDDA, 2012, Driving Under the Influence of Drugs, Alcohol and Medicines in Europe — findings from the DRUID project, p. 19. <https://goo.gl/PNhUpU>

<sup>99</sup> ETSC, 2012, Drink Driving: Towards Zero Tolerance, p22. <https://goo.gl/MOYng8>

<sup>100</sup> Austria, Belgium, Germany, Greece, Spain, France, Croatia, Ireland, Italy, Lithuania, Luxembourg, Latvia, Netherlands and Slovenia.

<sup>101</sup> <http://etsc.eu/BAClimits>

<sup>102</sup> ETSC, 2012, Drink Driving: Towards Zero Tolerance. <https://goo.gl/MOYng8>

<sup>103</sup> Twisk, Divera A.M., and Colin, Stacey, 2007, Trends in young driver risk and countermeasures in European countries, Journal of Safety Research, p7. <https://goo.gl/8jcUi0>

<sup>104</sup> DRUID, 2012, Final report, p55. <https://goo.gl/U6s1ii>

<sup>105</sup> Drug Driving, UK Department for Transport. <https://goo.gl/d3b6e6>

<sup>106</sup> BBC News, 23rd November 2015 'Drug-driving arrests increase 600% after law change', <http://www.bbc.co.uk/news/uk-34898385>

<sup>107</sup> Cyprus Mail, February 25th 2016, 'MPs open the way for narco test', <https://goo.gl/Y6S9BE>

<sup>108</sup> Kinnear, N., and Stevens, A., 2015, The Battle for Attention: Driver Distraction – a review of recent research and knowledge, p17. <https://goo.gl/p2xHTq>

<sup>109</sup> SWOV Fact Sheet, Mobile Phones, p2.

<sup>110</sup> Definition of illegal use of a mobile phone varies across the EU, for regulation in each country see the EC website Going Abroad: <http://goo.gl/PhwJUO>

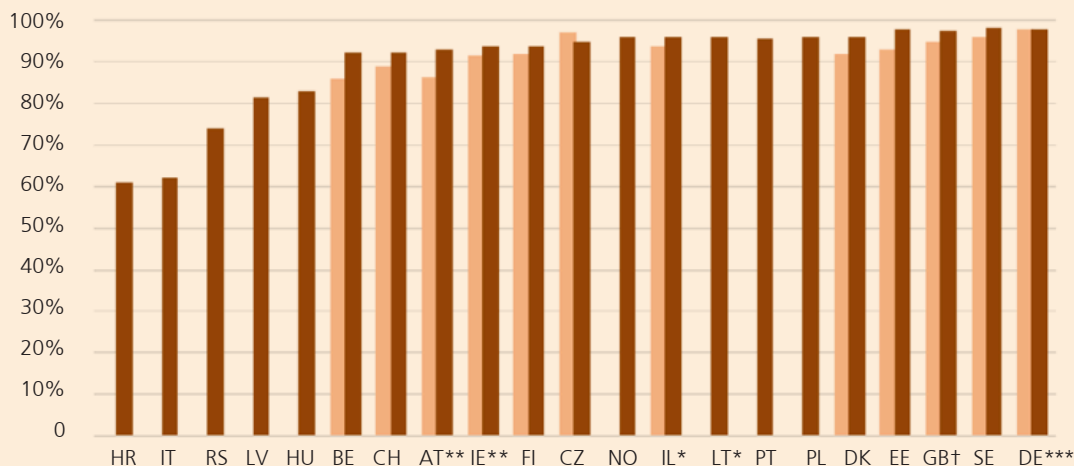
<sup>111</sup> ETSC (2016), PIN Flash 31, How can traffic law enforcement contribute to safer roads, [http://etsc.eu/wp-content/uploads/PIN\\_FLASH31\\_final.pdf](http://etsc.eu/wp-content/uploads/PIN_FLASH31_final.pdf), Fig.8, p.37.

<sup>112</sup> SUPREME Project, p41. <https://goo.gl/xOKAzO> (not working)

<sup>113</sup> SUPREME Project, p41. <https://goo.gl/xOKAzO> (not working)

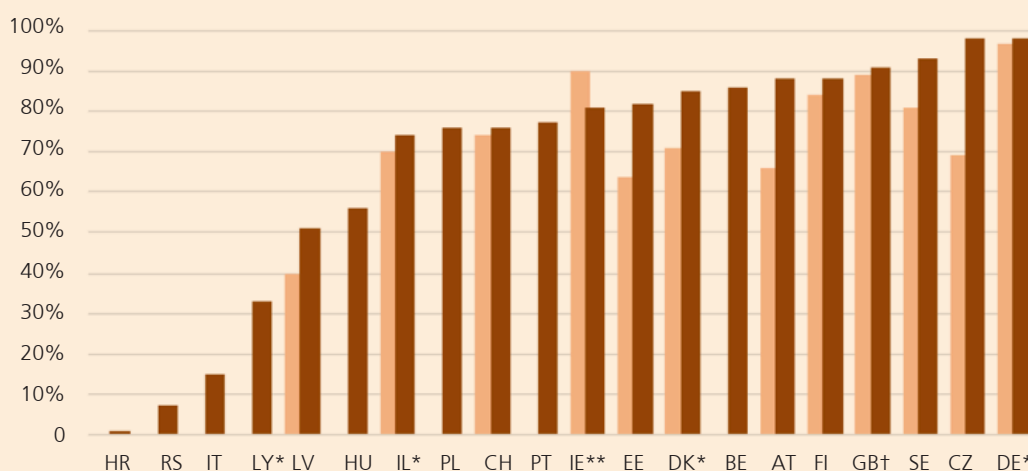
**FIG. 3.1**  
1: Seat belt wearing rates in front passenger seats of cars and vans in 2015 and 2010 for comparison. †England and Scotland only. 2010-2014. \*2010-2014. \*\*2009-2015. \*\*\*2009-2014. <sup>114</sup>

2010  
2015



**FIG. 3.2**  
Seat belt wearing rates in rear seats of cars and vans in 2015 and 2010 for comparison. †England and Scotland only. 2010-2014. \*\*2011-2014. <sup>115</sup>

2010  
2015



### Recommendations EU

- Within the context of the revision of Directive 2015/413 concerning cross-border exchange of information on road safety related traffic offences, improve enforcement in particular against the main killers: speed, drink-, drug- and distracted driving and non-use of protective equipment (seat-belts and helmets). These particularly affect young road user safety.
- The EC should propose for consideration a Directive setting a 0.2g/l limit on BAC for driving by those aged up to 25.<sup>116</sup>

### Recommendations Member States

- Improve enforcement in particular against the main killers: speed, drink-, drug- and distracted driving and non-use of protective equipment (seat-belts and helmets).
- Where these do not exist, introduce stricter demerit systems during a probationary period for newly-

licensed drivers with penalties such as loss of licence or mandatory traffic risk awareness training.

- Introduce drug-driving laws and testing equipment for major drugs.
- Improve awareness campaigns for young people concerning traffic laws, their enforcement and its consequences.
- Continue to upgrade and redesign transport infrastructure according to the Safe System approach.
- Consider establishing a 0.2 g/l BAC limit for driving by all young drivers and novice drivers<sup>117</sup>.
- Consider targeted enforcement of traffic law in areas and at times with high traffic of young road users.
- Develop enforcement/campaign strategies to deal with high mobile device usage amongst young people.
- Continue to invest in and encourage alternative modes of transport where possible, (walking/cycling/public transport), which can be used by young people as alternatives to driving and riding.

<sup>114</sup> ETSC, 2016, PIN Flash 31, How can traffic law enforcement contribute to safer roads, p30. <https://goo.gl/draaPj>

<sup>115</sup> ETSC, 2016, PIN Flash 31, How can traffic law enforcement contribute to safer roads, p31. <https://goo.gl/draaPj>

<sup>116</sup> ETSC, 2012, Drink Driving: Towards Zero Tolerance.

A technical enforcement tolerance level could be set at either 0.1 or 0.2g/l BAC but the message to drivers should be clear: no drink and drive. <https://goo.gl/MOYng8>

<sup>117</sup> ETSC, 2012, Drink Driving: Towards Zero Tolerance

A technical enforcement tolerance level could be set at either 0.1 or 0.2g/l BAC but the message to drivers should be clear: no drink and drive. <https://goo.gl/MOYng8>

## 3.2 TRAINING AND EDUCATION

Training teaches the skills required to both manoeuvre the vehicle and use the roads safely. It includes both formal training (under the supervision of a qualified driving instructor) and informal training (practice with family and friends).

Education focuses on the attitudes of young people to safe behaviour on the road and how best to develop an awareness of the risks they face and how to minimise them. Many states provide general road safety education in schools from an early age, with some offering education more targeted at potential young drivers and riders.

Training and education are also closely linked to the content of the practical and theory tests. Both can continue after licensing in the form of compulsory and voluntary courses.

### 3.2.1 Education

Road safety education commonly starts in schools. Campaigns featuring testimonies from individuals involved in collisions, such as Safe Drive Stay Alive in the UK, are often used to educate children on the impact that a collision can have.<sup>118</sup> However, while these schemes can be used to inform other interventions, there is no evidence that they alone have a significant effect on collision risk.<sup>119</sup>

Jurisdictions may choose to incorporate the issue into the official school curriculum, either as an individual subject, or as part of health education, although pre-driver education aimed at 16-17 year olds has not been proven to have a significant effect on reducing collisions.<sup>120</sup>

Northern Ireland provides a (non-compulsory) course in their curriculum entitled "Motor Vehicle and Road User Studies". The course, available for 15-16 year olds, covers issues such as learning to drive, coping with hazards and accidents, the costs and practicalities of driving or riding and wider issues of traffic management and road use. It even includes a practical component involving moped riding.<sup>121</sup>

Groups such as the UK's Motorcycle Industry Association have called for a general, multi-modal theory test to be

taken in schools so as to prepare young people for all modes of road use.<sup>122</sup>

The Norwegian driver training curriculum can start as early as 15 with some elements being taught in school, covering topics such as risk awareness, social behaviour, night-time driving and first aid.<sup>123</sup>

At vocational schools in Germany, every year a specific road safety topic is discussed in the context of work-related road accident prevention. Teaching materials for download are available from the German Road Safety Council (DVR).<sup>124</sup>

Similarly, Western Australia employs a scheme called Road Aware which examines risk-taking behaviour and attitudes and encourages parents and students to undertake 120 hours of driving practice as a learner.<sup>125</sup>

Attitudes to road safety are established at an early age and can be affected by many influences, especially the driving behaviour of parents.<sup>126</sup> A positive attitude during childhood may help young road users when they finally learn to drive and ride, although there is little direct evidence of this.

### 3.2.2 Pre-licence training (first phase)

Learners undertake formal training with qualified instructors who teach them the skills they need to pass the tests.

While acquiring knowledge and skills they also have to gain experience of regular driving. Most learners take part in regular informal training, in the form of accompanied driving which helps young people to build up experience of a range of situations and environments.<sup>127</sup>

Training should also encourage young learners to think about their own limitations as a road user, their motives for wanting to learn to drive or ride and the specific risks they face.<sup>128</sup>

To provide an overview of this process, the Goals for Driver Education (GDE) matrix (Appendix I) was developed. The matrix covers three categories: knowledge and skill, risk increasing aspects and self-assessment.

<sup>118</sup> <http://www.safedrive.org.uk/>

<sup>119</sup> Dale, H., Scott, C., Ozakinci, G., 2016, Safe Drive Stay Alive: exploring effectiveness of a real-world driving intervention for predrivers and the utility of the health action process approach. <https://goo.gl/8lZRCs>

<sup>120</sup> Kinnear, N. et al, 2013, Novice Drivers: Evidence Review and Evaluation – Pre-driver education and training, Graduated Driver Licensing and the New Drivers Act: TRL Research Findings, p14. <https://goo.gl/Shq3Sv>

<sup>121</sup> Northern Ireland Motor Vehicle and Road User Studies GCSE <http://ccea.org.uk/mvrs/>

<sup>122</sup> MCIA Motorcycle Framework. <https://goo.gl/szsSSu>

<sup>123</sup> CIECA, 2007, Integrating the GDE matrix into category B driver training and the practical driving test", p27. <https://goo.gl/SefKAw>

<sup>124</sup> <https://goo.gl/DEmvQS>

<sup>125</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p145. <https://goo.gl/dHJJRj>

<sup>126</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p145. <https://goo.gl/dHJJRj>

<sup>127</sup> Wells P, et al, 2008, Cohort II: A Study of Learner and New Drivers. Volume 1: Main Report, Road Safety Research Report No. 81. UK Department for Transport, p1. <https://goo.gl/cj2L7Q>

<sup>128</sup> SafetyNet, 2009, Novice Drivers, p23. <https://goo.gl/GsJYMZ>

Each of these categories is divided into four levels:

1. Vehicle manoeuvring and control
2. Mastery of traffic situations
3. Goals and context of driving
4. Goals for life and skills for living

Expansions to the GDE matrix have been put forward, including a 5th category, 'Social Environment', which includes issues of legislation, enforcement, social groups, group values and norms.<sup>129</sup>

The lower levels (1 and 2) are traditionally covered by existing driver education in the majority of Member States. The higher levels (3 and 4) are yet to be fully included. The 'self-assessment' category is lacking in most driver education systems, apart from references in theory testing.<sup>130</sup> The levels are hierarchical, as progress in the higher levels depends on experience of and success in the lower ones.

Research has concluded that ensuring that the higher levels of the GDE matrix are incorporated during driver education would help produce more inherently safe drivers.<sup>131</sup>

On-road experience is considered by some experts to be more important in reducing collision risk than training and education.<sup>132</sup> However, there is agreement that current training can be improved by focusing on elements that are known to reduce risk, and enhancing the quality of the training in these areas.<sup>133</sup>

### Formal training

Most young people learn to drive with the help of a qualified driving instructor and in many Member States it is compulsory to do so. Traditionally, this formal training focuses on teaching young riders and drivers the skills they need to control the vehicle and drive in traffic (the lower levels of the GDE matrix).

Improving cognitive skills through hazard perception training is thought to be effective in reducing collision risk.<sup>134</sup> While hazard perception can be improved with

on-road experience, it can also be practised and honed in a risk-free environment, using computer simulations.

Other skills that are linked to collision risk include driving at greater speeds, overtaking and driving at night. It is important that these are included in driving syllabuses and covered in training.<sup>135</sup>

Many people lack the confidence to use motorways, despite their relative safety. A 2015 survey of UK motorists found that 66% of 18-24 year olds avoid driving on a motorway because they are nervous about using it. In a similar 2013 survey, 51% of respondents said they were unprepared post-test to drive on motorways. Consequently, the UK AA Charitable Trust began offering free two-hour courses on motorway driving.<sup>136</sup>

Since 2012, Italy requires people preparing for a category B licence to have two hours of highway driving, two hours of night driving and two hours of driving on major urban roads, such as ring roads. A certificate from the driving school proving this must be shown in order to take the practical test.

While skills are crucial, training should also help young people develop a good driving style and make them aware of the issues that can affect their driving or riding ability.<sup>137</sup> This also helps young people think about the way they choose to drive or ride. This is known as defensive and/or social driving, which takes account of road and weather conditions, other traffic and the interests and behaviour of other road users.<sup>138</sup>

In Norway, formal training includes a series of compulsory practical and classroom lessons at a driving school, which focus on these issues of style which feature in the higher GDE orders.<sup>139</sup> Examples of these include:

- Identifying risk and typical mistakes
- Peer pressure, choices and how your mind influences driving behaviour
- Reflection on general and driving behaviour
- Cooperation with other road-users
- Road conditions and their consequences

<sup>129</sup> GDE-5 SOC, Keskinen, Peräaho & Laapotti, 2010.

<sup>130</sup> CIECA, 2007, "Integrating the GDE matrix into category B driver training and the practical driving test", p5. <https://goo.gl/SefKAw>

<sup>131</sup> SafetyNet, 2009, Novice Drivers, p25. <https://goo.gl/GsJYMZ>

<sup>132</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p131. <https://goo.gl/dHJJRj>

<sup>133</sup> CIECA, 2007, "Integrating the GDE matrix into category B driver training and the practical driving test", p3. <https://goo.gl/SefKAw>

<sup>134</sup> Kinnear, N. et al., 2013, Novice Drivers: Evidence Review and Evaluation – Pre-driver education and training, Graduated Driver Licensing and the New Drivers Act: Full Report, TRLDfT, p32. <https://goo.gl/Shq3Sv>

<sup>135</sup> MERIT, p172.

<sup>136</sup> Motorway Paranoia, AA - <https://www.theaa.com/newsroom/news-2015/aa-charity-offers-free-motorway-courses.html>

<sup>137</sup> Helman, S., Grayson, G., and Parkes, A. M., 2010, How can we produce safer new drivers? A review of the effects of experience, training, and limiting exposure on the collision risk of new drivers, TRL Insight Report, p7. <https://trl.co.uk/reports/INS005>

<sup>138</sup> European Commission/CIECA, 2005, TEST: Towards European Standards for Testing, Final Report, p125. <https://goo.gl/T9GavF>

<sup>139</sup> CIECA, 2007, "Integrating the GDE matrix into category B driver training and the practical driving test", pp.27-30. <https://goo.gl/SefKAw>

Current evaluation of the result of this practice is unclear, although there was a substantial decrease in deaths in following years according to figures. A report into the drop in figures stated that changes to driver training could have been a contributory factor.<sup>140</sup>

Motoring organisations, such as the ACI in Italy, also provide courses and tutorials that can be taken alongside training, focusing on topics such as defensive driving and eco-driving.<sup>141</sup>

Ideally, these competencies should be included in the test as well. Rider education also needs to incorporate these elements to encourage better attitudes to safety and risk awareness.<sup>142</sup>

In some Member States, formal training for powered two wheelers is much more basic than it is for cars. In the UK for example, the compulsory basic training course can be completed in one day. Given that young riders can ride alone as a learner, it is important that training is thorough and covers the competencies included in the tests.

### Informal training and accompanied driving

Informal training, usually in the form of driving accompanied by an experienced driver, allows learners to practice and reinforce skills learnt during formal training and gain valuable on-road experience outside of structured lessons. It is associated with higher test pass rates and safer driving and can take place before and after the practical test.<sup>143</sup>

Some Member States allow young people to begin learning at an earlier age than normal, provided they undertake a certain amount of accompanied driving during their training or only drive accompanied until they reach a certain age.

In 2005 Germany allowed young people to begin training from 16.5 years old and get their licence at 17, but they must drive accompanied by an experienced driver until they are 18. Estimates of the effect of this change on collisions indicate decreases ranging from 20-22% amongst those young people involved.<sup>144</sup>

In 1993 Sweden lowered the minimum age for accompanied driving from 17.5 to 16. This led to an increase in the average number of accompanied driving hours per person from 47.9 to 117.6. Even after

factoring in self-selection bias, the collision rate for those young drivers who had opted for increased accompanied driving dropped by 35% over a period of two years.<sup>145</sup>

Further evidence of the effects of accompanied driving is demonstrated by the reductions in collisions following the implementation of GDL systems which feature accompanied driving components.

In New South Wales the collision rate of young drivers declined considerably after the introduction of a 120 hour minimum for accompanied driving, alongside other measures.<sup>146</sup>

### *Higher quality informal training can be achieved by making accompanying drivers first refresh their own driving skills.*

Effectiveness does depend on the number of accompanied driving hours and the variety of routes and environments encountered.<sup>147</sup> Research suggests that the minimum number of hours required is around 100-120.<sup>148</sup>

Parents should liaise with the learner's instructor to discuss how accompanied driving can best help support formal lessons, as well as to avoid teaching negative skills.

Higher quality informal training can be achieved by making accompanying drivers first refresh their own driving skills.

Finland requires anybody accompanying a young driver to acquire a teaching permit. In order to gain this, they must pass a theory test themselves and must be deemed to have personal qualities suitable for teaching.<sup>149</sup> They are then responsible for instructing the learner in accordance with the official syllabus.<sup>150</sup>

A system such as this ensures that those involved in informal training are more aware of the skills and behaviours required of the learner. Young riders can participate in pairing schemes in which they practice under supervision and gain advice from older and more experienced riders.<sup>151</sup>

<sup>140</sup> TOI Report, 2014, What can explain the decline in the number of traffic fatalities and serious injuries in Norway from 2000 to 2012?, p6. <https://goo.gl/Rf1jNQ>

<sup>141</sup> ACI Ready2Go. <https://goo.gl/suUztT>

<sup>142</sup> Riderscan, 2014, p59. <https://goo.gl/KMM2WX>

<sup>143</sup> Wells P, et al, 2008, Cohort II: A Study of Learner and New Drivers. Volume 1: Main Report, Road Safety Research Report No. 81. UK Department for Transport, p1. <https://goo.gl/cj2L7Q>

<sup>144</sup> SWOV, 2015, Fact Sheet – Accompanied Driving, p3. <https://goo.gl/eK3BSV>

<sup>145</sup> Gregersen, N.P., Berg, H.-Y., Engström, I., Nolén, S., et al., 2000, Sixteen years age limit for learner drivers in Sweden - an evaluation of safety effects. In: Accident Analysis & Prevention, Vol. 32, No. 1, pp. 25-35. <https://goo.gl/YOjOQt>

<sup>146</sup> SWOV, 2015, Fact Sheet – Accompanied Driving, p3. <https://goo.gl/eK3BSV>

<sup>147</sup> SWOV, 2015, Fact Sheet – Accompanied Driving, p2. <https://goo.gl/eK3BSV>

<sup>148</sup> SWOV, 2015, Fact Sheet – Accompanied Driving, pp.2-4 <https://goo.gl/eK3BSV>

<sup>149</sup> Finnish Transport Safety Agency, Driving instruction permit. <https://goo.gl/og0tOz>

<sup>150</sup> Finnish Category B permit-based instruction: Syllabus and lesson plans. <https://goo.gl/wx4N5R>

<sup>151</sup> Scooter Safe. <https://goo.gl/npvKDZ>



### 3.2.3 Post-licence training (second phase)

Post-licence training refers to the variety of courses and further lessons that young people take after obtaining a full licence. In some Member States this constitutes a compulsory continuation of pre-licence training. In others it is optional and used by those young people that want further training and practice, although not necessarily those who need it most.

No licensing system produces fully competent young drivers and riders. Therefore, it is important that after licensing, they have access to further training and support, should they require or want it.

Many young people find the transition to independent post-licence driving challenging and feel that they lack experience of certain situations and environments.<sup>152</sup> A UK study found that over the course of three years after passing the test, young drivers continued to report a need to improve aspects of their driving.<sup>153</sup> These aspects ranged from dealing with hazardous driving conditions (ice/snow), to situational judgements such as anticipating other drivers' actions.

Furthermore, after licensing young people may revert to their 'normal' style of driving and riding and not be as safety conscious as they were before their test. Post-licence training can be used to consolidate pre-licence training and to help teach young people more about the risks they face and how to address them. Indeed, a recent poll of riders found that post-licence training was the highest ranked source of safety information.<sup>154</sup>

Post-licence training can take place on public roads, in the classroom or on private tracks. Different jurisdictions vary in which of these they focus on. In the UK, organisations tend to focus on on-road training, whereas Germany and Nordic countries tend to utilise track-based training.<sup>155</sup> Austria applies a combination of both.

Some training environments will be more effective than others for a certain aspect of driving. On-road training is good for developing driving confidence and experience whereas track training is better for teaching manoeuvres in hazardous situations.

There are doubts about the utility of post-licence training and the best way to deliver it.<sup>156</sup> The lack of testing involved means that there is little standardisation and regulation. Post-licence training also tends to put a greater emphasis on manoeuvring skills rather than driving style.<sup>157</sup>

Focusing on specific skills and tasks can inadvertently make young road users overconfident and lead them to behave more riskily than if they had not taken the course.

*A number of jurisdictions offer optional post-licence training schemes and encourage take-up via incentives.*

In Norway in the 1980s novice drivers took compulsory skid control training as part of a compulsory two-phase system and accidents on slippery roads after having taken the course actually increased amongst the target group.<sup>158</sup> The two-phase system was eventually abolished in 1994.

Some courses may simply be taken due to related incentives such as lower insurance premiums.

However, benefits do exist. The content and duration of first-phase training will always be, to some extent, determined and restricted by the practical test. Young people simply want to gain enough knowledge and experience to successfully pass, making safety a secondary consideration.

A number of jurisdictions offer optional post-licence training schemes and encourage take-up via incentives, such as allowing people to take their test at an earlier age or by making them undertake extended accompanied driving.

In Germany, selected driving schools offer post-test safety training for novice drivers. The effect of this training has been evaluated and the result is positive, nevertheless for the time being it is offered only on a voluntary basis.<sup>159</sup>

In other jurisdictions, post-test training is mandatory and may be incorporated into a formal two-phase training system.

Austria incorporates comprehensive post-licence training as part of a multi-phase training system. Once learners have passed their theory and practical tests, they enter a probationary period of two years. During the first year they must return on three occasions for further driving education, comprised of two 'feedback' driving sessions (real traffic, with a professional trainer), road safety (track) training and psychological education. Analysis of this system showed an average reduction in collisions involving young drivers of 28%.<sup>160</sup>

<sup>152</sup> Wells P, et al, 2008, Cohort II: A Study of Learner and New Drivers. Volume 1: Main Report, Road Safety Research Report No. 81. UK Department for Transport, p3. <https://goo.gl/cj2L7Q>

<sup>153</sup> Wells P, et al, 2008, Cohort II: A Study of Learner and New Drivers. Volume 1: Main Report, Road Safety Research Report No. 81. UK Department for Transport, p3. <https://goo.gl/cj2L7Q>

<sup>154</sup> Riderscan, 2014, p67. <https://goo.gl/KMM2WX>

<sup>155</sup> Advanced, 2002, Project Summary, p3. <https://goo.gl/SCjv48>

<sup>156</sup> Advanced, 2002, Project Summary, p5. <https://goo.gl/SCjv48>

<sup>157</sup> NovEv, 2004, p15. <https://goo.gl/iE0KqV>

<sup>158</sup> Advanced, 2002, Final Report, p13. <https://goo.gl/SWCHtr>

<sup>159</sup> <https://goo.gl/FW4ZrR>

<sup>160</sup> SWOV, 2009, Fact Sheet: Post-licensing training, p2. <https://goo.gl/bgtjei>

Finland has operated a post-test training phase since 1990, which includes both individual and group lessons and driving sessions focused on:

- Self-assessment of driving and interaction skills.
- On-road assessment.
- Group discussions and tasks (e.g. accident analysis).
- Track demonstrations (e.g. importance of safety margins, speed on bends).
- Ecological driving.<sup>161</sup>

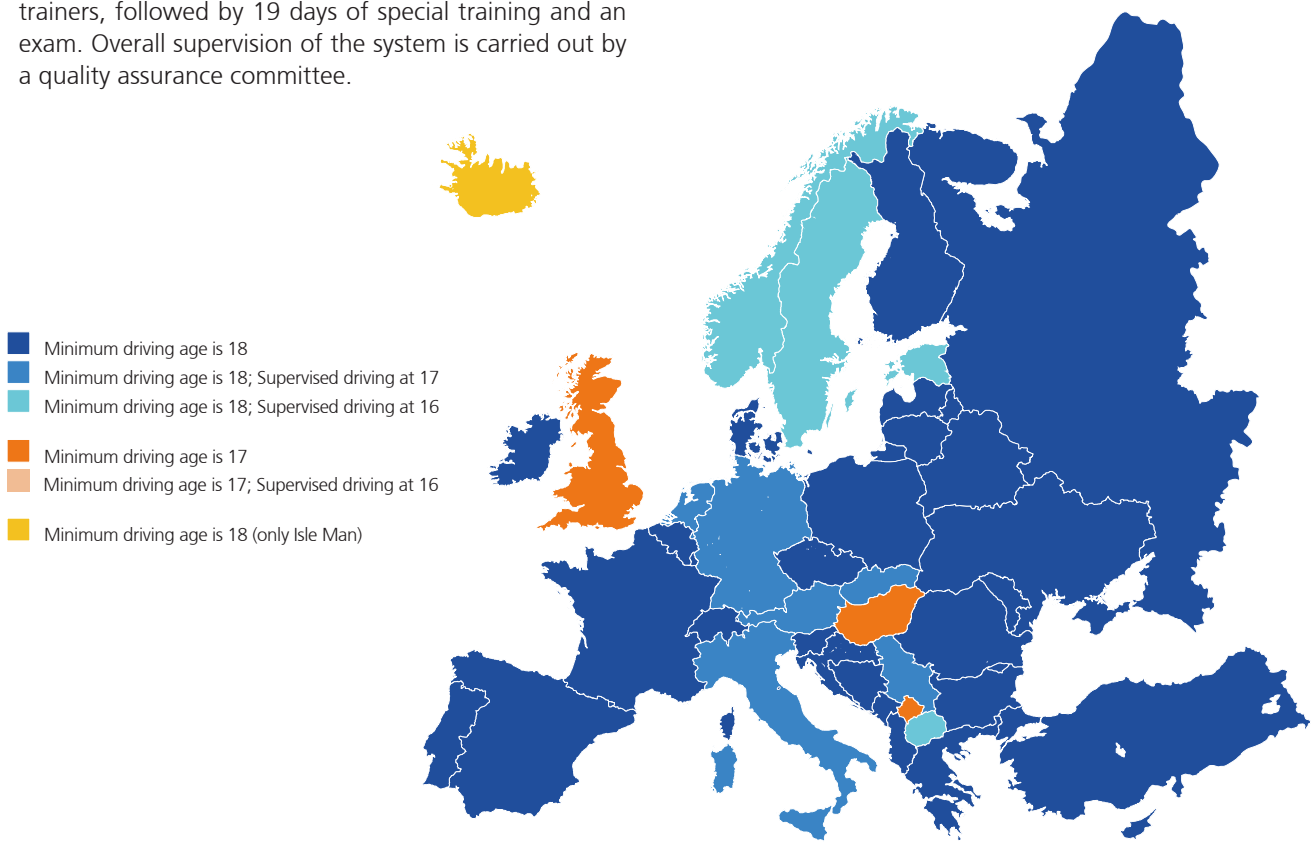
Since 2006, Switzerland has also operated a compulsory post-test training programme, comprising two days of training within the three-year probationary period for novice drivers. It is suggested that novices take the first day within the first six months after their test. The training includes:

- Accident analysis.
- Discussion of the effects of drink and drugs.
- Practical Driving Experiences: Braking distances, safe distances, speed on curves.
- Driver profiling, driving feedback, ecological and energy-saving driving.<sup>162</sup>

This programme is operated alongside a strict quality assurance system, including training centres for course providers and socio-pedagogical suitability tests for trainers, followed by 19 days of special training and an exam. Overall supervision of the system is carried out by a quality assurance committee.

### Recommendations Member States

- Encourage higher levels of accompanied driving while novice drivers are learning and gaining experience.
- Expand training to incorporate additional skills and new technologies, e.g. motorway driving, driving with navigational devices
- Introduce higher level GDE components into driver and rider training.
- Encourage communication between instructors and accompanying drivers to maximise the benefit of informal practice (e.g. a joint lesson/logbook)
- Ensure that suitable, post-licence training programmes are available for those who wish to continue learning
- Support the further incorporation of road safety into mainstream education.



Source: [https://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_minimum\\_driving\\_age#/media/File:Driving\\_age\\_Europe.svg](https://en.wikipedia.org/wiki/List_of_countries_by_minimum_driving_age#/media/File:Driving_age_Europe.svg)

<sup>161</sup> WCIECA, 2007, "Integrating the GDE matrix into category B driver training and the practical driving test", p49. <https://goo.gl/SefKAw>  
<sup>162</sup> CIECA, 2007, "Integrating the GDE matrix into category B driver training and the practical driving test", p47. <https://goo.gl/SefKAw>

### 3.3 LICENSING SYSTEMS AND TESTING

Collision risk is highest in the immediate post-test period, when young people are driving and riding independently for the first time.

An effective licensing and testing system is one that helps minimise this collision risk while ensuring young people have the necessary competencies required for independent driving and riding.

Licensing must also take into account the fact that collision risk is higher the younger a person gains their licence and falls as they age and gain experience.

The majority of European countries have a licensing age for independent driving of 18, although others choose 17. In a few Member States young people can drive under supervision as young as 16.

However, the amount of time between beginning to learn to drive, and being able to obtain a driving licence varies significantly across Europe (see Appendix I).

Rider licensing tends to start at a younger age than driving, although there are greater restrictions on the categories and power of the vehicles available to learner riders.

#### 3.3.1 Graduated Driver Licensing (GDL)

The introduction of a graduated driver licensing (GDL) system is the most effective way of reducing collision risk on the roads for novice drivers of all ages, but the benefits are largest for young drivers.<sup>163</sup> They temporarily restrict novice drivers from certain high-risk activities while increasing the amount of driving experience that they accumulate.

GDL systems may also specify that certain amounts of learning and practice must be undertaken before a learner can take the practical test, such as a certain number of hours with a qualified driving instructor. A GDL system helps them adjust to independent driving in a safe and controlled way.

Governments may be reluctant to implement GDL systems due to concerns that they are restrictive. For example, despite calls from road safety organisations to implement a nation-wide GDL system in the UK, the government declined on the grounds that it would excessively limit the freedom of young people, for example, in travelling to work at night.<sup>164</sup> There is also the possibility that the implementation of a GDL system would see more young people opting for PTWs.

#### Who sets licensing competencies?

##### European Union

- Issues European Driving Licensing Directives
  - Sets the minimum standards for driving licences and outlines vehicle categories
  - Sets minimum requirements for testing and training

##### Member States

- Issue driving licences according to national regulations while respecting the minimum requirements set out by the European Driving Licence Directive.
- Ensure applicants possess the knowledge and skills and exhibit required behaviours.
- Impose sanctions (e.g. penalty points, provisional licences and disqualification).
- May raise or lower minimum age, within limits, for certain licence categories.
- Applicants must pass practical and theory examinations.

*The introduction of a graduated driver licensing (GDL) system is the most effective way of reducing collision risk on the roads for novice drivers of all ages.*

There is no standard GDL system. However, they typically feature three phases, each comprising a number of components:

##### a) Pre-licensing Phase:

During this phase, drivers begin the process of learning how to drive, which can feature both professional tuition and private practice with family and friends. Once ready, they can take the necessary tests.

Certain conditions may apply during this period:

- A minimum or specific period before a learner can take the practical test (e.g. 1 year).
- A minimum number of lessons/hours with a qualified driving instructor.
- A minimum number of hours of practice (with an instructor/family/friends).
- Practice in specific conditions (e.g. night-time, wet roads, urban areas, motorways).

Learners can be encouraged or required to keep track of training hours by using a log-book system.

<sup>163</sup> Kinnear, N. et al, 2013, Novice Drivers: Evidence Review and Evaluation – Pre-driver education and training, Graduated Driver Licensing and the New Drivers Act: Full Report, p. 77. <https://goo.gl/Shq3Sv> / Russell, K.F., et al, 2011, Graduated driver licensing for reducing motor vehicle crashes among young drivers. Cochrane Database of Systematic Reviews. <https://goo.gl/t4Oi3X>

<sup>164</sup> Written Answers to Questions, December 2013, Transport Minister Robert Goodwill MP. <https://goo.gl/NTC70F>

## b) Probationary Phase

Upon passing the required tests, independent driving is permitted. For a fixed period, certain restrictions can apply:

- A night-time driving curfew between set hours (e.g. between 9pm and 6am).
- A ban on driving with more than one peer-age passenger (e.g. between 15-24 years of age).<sup>165</sup>
- A reduced or zero BAC limit (0.2g/L mg is common).<sup>166</sup>
- A stricter demerit system.

The more restrictions that are implemented, the greater the effect as multiple areas of collision risk are targeted.<sup>167</sup> Exemptions are permissible to ensure that young people are not denied access to employment and educational opportunities.

## c) Full Licence Phase

Once the probationary period has been completed the road user is allowed to drive unrestricted. Some temporary restrictions may be continued during this stage, such as a lower BAC limit for the first one or two years and a stricter demerit point system (as discussed in 3.1)

*The effectiveness of GDL systems is reflected by a number of studies, which show a near universal reduction in collisions.*

GDL systems can be adapted to fit existing licensing systems. Many jurisdictions choose to introduce individual components incrementally. Overall effectiveness depends on the number of components included and the extent to which these are properly enforced.

Stronger systems are those that have a combination of minimum learning periods and probationary phase restrictions. The longer the minimum learning periods

and the more restrictions in the probationary period, the more effective the system has been shown to be.<sup>168</sup>

Enforcement is no more difficult than policing for other road safety legislation, although stronger enforcement and support from parents and relevant authorities helps to improve compliance.<sup>169</sup> Learners can be demoted to the previous stage if they violate restrictions.

Studies of GDL systems in the United States have shown that engagement with a learner's family and explaining the benefits of GDL systems is also important in order to gain their cooperation in enforcement. Areas with higher parental support tend to see better compliance.<sup>170</sup> Learners without parents, or with less parental support, may be less likely to abide by the rules.

GDL systems have been assessed by a number of studies, which nearly all show a reduction in collisions.<sup>171</sup> However, given the variation between individual GDL systems, it is difficult to accurately judge the average effectiveness of a GDL system.

For example, the extent of the collision reduction is dependent on both the age at which driving is first allowed, and the age at which the test can first be taken. Furthermore, parental cooperation and supervision is much easier for children aged 16 or younger, than it is for those who are 18, or over.

A review of 34 studies of US and Canadian GDL systems saw a 36% median collision reduction for 16 year olds in their first year of driving following a GDL system, and a 15.5% reduction for all teenage drivers.<sup>172</sup>

Effectiveness has been demonstrated for 17 and 18 years olds as well.<sup>173</sup> A study in Victoria in Australia saw a reduction of 31% in fatal and serious collisions amongst 18-20 year olds in their first year of driving. Reductions are especially large for collisions during night time hours and with passengers. The same study saw a 58% reduction in fatal and serious collisions with two

<sup>165</sup> One peer-age passenger could be allowed to allow designated driving.

<sup>166</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, p200. <https://goo.gl/dHJRj>

<sup>167</sup> Kinnear, N. et al., 2013, Novice Drivers: Evidence Review and Evaluation – Pre-driver education and training, Graduated Driver Licensing and the New Drivers Act, p58. <https://goo.gl/Shq3Sv>

<sup>168</sup> Kinnear, N. et al., 2013, Novice Drivers: Evidence Review and Evaluation – Pre-driver education and training, Graduated Driver Licensing and the New Drivers Act, p15. <https://goo.gl/Shq3Sv>

<sup>169</sup> Kinnear, N. et al., Novice Drivers: Evidence Review and Evaluation – Pre-driver education and training, Graduated Driver Licensing and the New Drivers Act (2013), p61. <https://goo.gl/Shq3Sv>

<sup>170</sup> Kinnear, N. et al., 2013, Novice Drivers: Evidence Review and Evaluation – Pre-driver education and training, Graduated Driver Licensing and the New Drivers Act, pp.59-61. <https://goo.gl/Shq3Sv>

<sup>171</sup> Kinnear, N. et al., 2013, Novice Drivers: Evidence Review and Evaluation – Pre-driver education and training, Graduated Driver Licensing and the New Drivers Act: Full Report, TRL/DfT, p46. <https://goo.gl/Shq3Sv>

<sup>172</sup> Kinnear, N. et al., 2013, Novice Drivers: Evidence Review and Evaluation – Pre-driver education and training, Graduated Driver Licensing and the New Drivers Act: Full Report, TRL/DfT, p43. <https://goo.gl/Shq3Sv>

<sup>173</sup> Kinnear, N. et al., 2013, Novice Drivers: Evidence Review and Evaluation – Pre-driver education and training, Graduated Driver Licensing and the New Drivers Act: Full Report, TRL/DfT, p63. <https://goo.gl/Shq3Sv>

or more passengers amongst the same group of 18-20 year olds. In New Jersey, USA a study found a 44% reduction in fatal collisions during restricted night time hours amongst 17 year olds.<sup>174</sup>

Even when results are adjusted to take into account differences in the amount of driving, studies showed a reduction in fatal collisions for all teenage drivers of 12.5% in the first year post-GDL and 18% beyond the first year post-GDL.<sup>175</sup>

GDL systems were first introduced in the United States, New Zealand and Australia in the 1980s and 1990s. Although there are currently no three-stage GDL systems in the European Union, some Member States such as the Netherlands have introduced Learning Phases. Northern Ireland has recently moved towards introducing a GDL system that will feature a minimum learning period, a lower BAC limit and a restriction on passengers for young and learner drivers.<sup>176</sup>

Graduated systems do exist for riders, although these are less common and feature less in studies of graduated licensing.

In Australia, New South Wales uses a five step programme for rider licensing:

1. Complete a pre-learner course.
2. Pass the rider knowledge test to receive a learner rider licence.
3. Hold learner rider licence for a minimum three months and complete the pre-provisional course to receive a first provisional rider licence (P1).
4. Hold the P1 licence for at least 12 months and apply for a second provisional rider licence (P2).
5. Hold the P2 licence for at least two years before applying for a full rider licence.<sup>177</sup>

In Canada, Alberta also uses a form of graduated licensing for riders, which is similar to that for drivers but features additional probationary conditions such as a restriction on night-time riding and mandatory accompaniment by a fully-licensed rider, either as a passenger or in close proximity in or on another vehicle.<sup>178</sup>

The 3<sup>rd</sup> European Driving Licence Directive provided a system similar to GDL by creating a series of stages to acquire a full licence for the largest and most powerful

### Third European Driving Licence Directive (2006/126/EC)

#### Aims

- Harmonise the conditions that must be met by candidates applying for a driving licence.
- Facilitate recognition of these licences throughout the member countries of the European Union and aid the movement of persons.
- Enhance the road safety of all users.

#### Means

- Establishes minimum requirements for driving tests, both theory and practical.
- Establish minimum requirements for driver training.
- Establishes minimum standards of physical and mental fitness for driving.
- Establish minimum standards for persons who conduct practical driving tests.
- Standardises vehicle categories.
- Establish a pan-European driving licence format.

powered two wheelers. Learners begin learning on smaller, less-powerful vehicles, before graduating to the more powerful categories. Minimum ages are applied to each stage, but those over 24 can directly access the more powerful machines.

However, this system lacks the probationary conditions commonly found in GDL systems for drivers. There are also concerns that it discourages test-taking as young people will simply wait until they are older and then directly access the most powerful categories. This would also lead to a decrease in the amount of experience accumulated.

### 3.3.2 Testing

Testing plays an important role in setting the competency levels required for licensing and judging a candidate's performance in a number of areas. Tests also set the competencies that determine what candidates will learn during their training.

It is important that they address the skills and attitudes associated with safe road use, such as hazard perception. They also need to have access to a range of driving environments and be long enough to give examiners the best chance of properly assessing a candidate's abilities.

<sup>174</sup> Kinnear, N. et al., 2013, Novice Drivers: Evidence Review and Evaluation – Pre-driver education and training, Graduated Driver Licensing and the New Drivers Act: Full Report, TR/LDfT, p46. <https://goo.gl/Shq3Sv>

<sup>175</sup> Kinnear, N. et al., 2013, Novice Drivers: Evidence Review and Evaluation – Pre-driver education and training, Graduated Driver Licensing and the New Drivers Act: Full Report, TR/LDfT, p43. <https://goo.gl/Shq3Sv>

<sup>176</sup> Northern Ireland Road Traffic (Amendment) Bill Explanatory and Financial Memorandum.

<sup>177</sup> Roads and Maritime, Rider licence, New South Wales: Roads and Maritime. <https://goo.gl/8waOyk>

<sup>178</sup> Alberta Transportation, Graduated Driver Licensing, <https://goo.gl/4HrGAF>

### What does the European Driving Licence Directive say about testing?

- Member States must ensure that applicants for licences possess the knowledge and skills and exhibit the behaviour required for driving a motor vehicle.
- Drivers of all vehicles must:
  - Recognise traffic dangers and assess their seriousness.
  - Have sufficient command of their vehicle.
  - Comply with road traffic regulations.
  - Detect any major technical fault in their vehicle.
  - Take account of all the factors affecting driving behaviour (e.g. alcohol, fatigue etc).
  - Help ensure the safety of all road users by showing due respect for others.

### Requirements vary depending on the category of vehicle but generally testing must include:

- A theory test that covers:
  - Road traffic regulations.
  - Using the road.
  - Awareness of oneself as a driver and other road users.
  - Vehicle mechanics and vehicle safety equipment.
- A skills and behaviour test that covers:
  - The driving of the vehicle.
  - Preparation and technical check of the vehicle.
  - Behaviour in traffic.
  - Special manoeuvres (often with a bearing on road safety, such as emergency braking).

### Hazard perception

Hazard perception is a cognitive-based skill. Higher levels of hazard perception are associated with reduced collision risk. Studies show that young road users have poorer hazard perception skills than more experienced road users and collision-free road users have better hazard perception skills than those involved in collisions.<sup>179</sup>

Ideally, hazard perception would be tested either during the practical examination or through the use of a simulator. Testing in the practical examination has only been tried in New Zealand but was deemed too unreliable due to variations between tests in terms of traffic and location and the possibility that a candidate may train a specific route or area. Attempts to standardise the tests and increase reliability were found to be too costly. Simulators, although very reliable, are too costly and complex to use on a day-to-day basis for testing.<sup>180</sup>

Only the UK and the Netherlands currently employ specific hazard perception testing. Since 2002 the UK has used films, comprising real-life, on-road footage. Candidates watch the film and press a button when they detect a potential hazard.

In the UK, hazard perception testing has been shown to reduce anticipation and awareness faults in the practical test.<sup>181</sup> This may be a result of screening out poorer candidates. However, it also appears that the introduction of hazard perception tests is associated with a reduction in subsequent collision liability.<sup>182</sup> It resulted in an estimated 17% reduction in the hazard perception-related collision risk of drivers in their first year of driving.<sup>183</sup>

Hazard perception training and testing can be updated and made more advanced by taking advantage of new technologies and using 3D animations to better simulate a wider variety of hazards as has been done in the UK.<sup>184</sup>

### Test content

During a test, examiners need to be able to check that learners have the necessary skills-based competencies, but also that they are capable of driving safely in regular traffic. Tests must accurately reflect the realities of driving and riding and as these change, testing must be able to adapt as well.

For example, in 2015 the UK began trialling a series of alterations to the driving test. These included different manoeuvres, a period of independent driving and driving

<sup>179</sup> SWOV, 2014, Fact Sheet – Hazard Perception and how to test it, pp.2-3. <https://goo.gl/aj6uAd>

<sup>180</sup> SWOV, 2014, Fact Sheet – Hazard Perception and how to test it, p3. <https://goo.gl/aj6uAd>

<sup>181</sup> Wells P, et al, 2008, Cohort II: A Study of Learner and New Drivers. Volume 1: Main Report, Road Safety Research Report No. 81. UK Department for Transport, p3. <https://goo.gl/cj2L7Q>

<sup>182</sup> Wells P, et al, 2008, Cohort II: A Study of Learner and New Drivers. Volume 1: Main Report, Road Safety Research Report No. 81. UK Department for Transport, p1. <https://goo.gl/cj2L7Q>

<sup>183</sup> Helman, S., Grayson, G., and Parkes, A. M., How can we produce safer new drivers? A review of the effects of experience, training, and limiting exposure on the collision risk of new drivers, TRL Insight Report (INS005) (2010), p12. <https://trl.co.uk/reports/INS005>

<sup>184</sup> Hazard Perception Clips Get a Modern Makeover, Gov, <https://www.gov.uk/government/news/hazard-perception-clips-get-a-modern-makeover>

with a navigational device. The trial also included the use of 'show me' questions, which are used by an examiner to ask the candidate to demonstrate a certain action while driving.<sup>185</sup>

A candidate's awareness and understanding of what constitutes safe driving should also be assessed.<sup>186</sup> The 3rd European Driving Licence Directive stipulates that examiners should pay special attention to whether a candidate is demonstrating defensive and social driving.<sup>187</sup>

This can be achieved via self-assessment questionnaires, or by using situational awareness questioning during the practical test.

Finland, the Netherlands and Sweden all use a system of self-assessment questionnaires that are filled out by candidates prior to the test. Examiners then compare the candidate's self-assessment to their own at the end of the test.<sup>188</sup> In Sweden and the Netherlands, examiners can also ask candidates to explain the reasoning behind certain manoeuvres they make during the test.<sup>189</sup>

Studies have shown that examiners are supportive of these types of changes in test content.<sup>190</sup>

Riders typically receive much less formal training than drivers and as a result, it is important that testing is as rigorous as possible.

### Test location and length

There are significant variations in testing across Europe, both between Member States and within them. Some follow standardised test routes while others let candidates drive in regular traffic. Differences also exist between test locations due to variations in climate and urban and rural geography.<sup>191</sup>

Reducing divergence between test centres helps to ensure reliable and valid testing.<sup>192</sup> Locations that give access to a wide range of driving environments should be used, for example those that allow for both rural and urban driving, although this may be difficult in heavily urban areas.

Variations in test duration have been observed, both between Member States and test centres.<sup>193</sup> However, the 3<sup>rd</sup> European Driving Licence Directive states that time spent on the road during tests must not be less than 25 minutes for the main categories of vehicle.

Expanding and changing test content could require longer tests that incorporate a wider range of road environments. Longer tests tend to be more rigorous as they allow examiners to better assess a candidate's normal driving style.<sup>194</sup> They also allow candidates to perform longer, independent tasks such as driving to or back from a specific location.<sup>195</sup> Test time could also be maximised by separating special manoeuvres from the on-road test and examining them beforehand.

### Recommendations EU

- Encourage Member States to introduce elements of graduated driver licensing systems for young drivers and riders.
- Ensure that the Driving Licence Directive remains valid for new technologies, and autonomous and semi-autonomous driving.

### Recommendations Member States

- Implement those aspects of graduated driver licensing that would most benefit young driver safety in the particular country.
- Introduce GDL style probationary elements for young riders.
- Establish a hazard perception test.
- Ensure that the driving and motorcycle test remains valid for new technologies.
- Incorporate higher level GDE components into testing.

<sup>185</sup> Improving the Driving Test, <https://www.gov.uk/government/publications/improving-the-driving-test/improving-the-driving-test>

<sup>186</sup> CIECA, 2007, "Integrating the GDE matrix into category B driver training and the practical driving test", p11-12. <https://goo.gl/SefKAw>

<sup>187</sup> Annex II, 9.2 <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1430377687650&uri=CELEX:32006L0126>

<sup>188</sup> CIECA, 2007, "Integrating the GDE matrix into category B driver training and the practical driving test", CIECA, p12. <https://goo.gl/SefKAw>

<sup>189</sup> CIECA, 2007, "Integrating the GDE matrix into category B driver training and the practical driving test", CIECA, p14. <https://goo.gl/SefKAw>

<sup>190</sup> CIECA, 2005, TEST-Towards European Standards for Testing; Final report, p172. <https://goo.gl/YjK9Mk>

<sup>191</sup> CIECA, 2005, TEST-Towards European Standards for Testing; Final report, p6. <https://goo.gl/YjK9Mk>

<sup>192</sup> SafetyNet, 2009, Novice Drivers, p27. <https://goo.gl/GsJYMZ>

<sup>193</sup> CIECA, 2005, TEST-Towards European Standards for Testing; Final report, p102. <https://goo.gl/YjK9Mk>

<sup>194</sup> CIECA, 2005, TEST-Towards European Standards for Testing; Final report, p161. <https://goo.gl/YjK9Mk>

<sup>195</sup> CIECA, 2007, "Integrating the GDE matrix into category B driver training and the practical driving test", p15. <https://goo.gl/SefKAw>

### 3.4 SAFER VEHICLES AND TELEMATICS

Technology and vehicle design have, for a long time, been employed to reduce the severity of a collision. Improved vehicle design and crashworthiness helps protect vehicle occupants in the event of a collision.

More recently, there has been a focus on active safety systems that can prevent collisions occurring in the first place by detecting and addressing their likely causes. This benefits young people, who are more likely to be involved in a collision.

*In the coming decades the nature of road use will change significantly as vehicles become increasingly automated.*

Increasingly, telematics technologies are being used to monitor and assess driving style. Feedback is then given to the driver to help them improve their driving style. Improvements in technology can also help to reduce the number of distractions encountered by young people and be used to enhance training through more sophisticated simulations.

Obstacles such as cost and lifestyle often stop young people benefiting from this technology and steps need to be taken to improve their access to safety-enhancing technology.

Technological progress is accelerating rapidly. In the coming decades the nature of road use will change significantly as vehicles become increasingly automated. The ramifications of this for young and novice road users will need to be considered.

Technology is not a panacea and should not be relied upon at the expense of effective training and licensing. However, it can provide a safety net for young people by preventing many potentially fatal collisions while helping them to safely gain crucial experience.

#### 3.4.1 Vehicle choice and crashworthiness

Collisions do happen and having a safe vehicle is the most immediate way of preventing death and injury when they occur. Schemes such as the European New Car Assessment Programme (Euro NCAP), have increased awareness amongst consumers about safety when

purchasing a vehicle and the safety of specific models. They have also helped to drive up standards of vehicle safety, far in advance of regulations.<sup>196</sup>

Many young people drive smaller and older cars due to issues of choice, cost and practicality.<sup>197</sup> Smaller cars are often favoured by young people as they are seen as easier to drive and cheaper. Similarly, many young people are unable to afford a new car and therefore rely on older, second-hand cars which lack more modern safety technologies.

Some smaller cars, especially older ones, tend to lack the protection afforded by newer and larger cars. Those with parental assistance may be able to buy a newer, safer vehicle, but not all young people will have that option, particularly as higher insurance premiums for young people further add to the cost of driving.

A minority of young road users will see the ability to drive or ride as more important than the ability to do so safely. However, even the safety conscious can be involved in a collision so it is important that young road users choose cars that are as safe as practicable for themselves, their passengers and other road users who might be involved.

The substantial safety benefits offered by newer cars to all young people would outweigh the higher prices if young people could afford them. Attempts to prevent young drivers accessing more powerful vehicles may well have little point as those who wish to drive riskily tend to do so regardless of the vehicle they have.<sup>198</sup>

#### 3.4.2 Safety features and assistive technologies

There is an increasing array of safety features and assistive technologies available in vehicles that address and rectify potentially dangerous aspects of driving. Their mandatory fitment is under consideration in the upcoming review of the General Safety Regulation 2009/661<sup>199</sup>.

Seat belts are well known to be one of the most effective ways of reducing the severity of injury during a collision.<sup>200</sup> However, usage varies widely across the EU and is especially low amongst young people, particularly for passengers in the rear seats (see Fig. 3.1)

<sup>196</sup> Euro NCAP. <https://goo.gl/TgQuCh>

<sup>197</sup> Department for Transport, Sept 2010, The Characteristics of Speed Related Collisions, Road Safety Research Report 117, p36. <https://goo.gl/lyLY9D>

<sup>198</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p143. <https://goo.gl/dHJJRj>

<sup>199</sup> ETSC, 2015, Position Paper Revision of the General Safety Regulation 2009/661, <http://goo.gl/YJdSYo>

<sup>200</sup> ETSC, 2010, 4th Road Safety PIN Report: Road Safety Target in Sight: Making up for lost time, p63. <https://goo.gl/ufd1pF>



Seat belt reminders can be used to repeatedly prompt drivers and occupants to wear their seat belt.

Currently, seat belt reminders are only mandatory on driver seats. Their use should be extended to front passenger seats and rear seats. Although there are concerns that this may cause problems if sensors perceive luggage to be a person, increasingly sophisticated sensors are able to differentiate between people and luggage on the seats.

In-vehicle assistive technologies can help with the driving task and react automatically to situations which may lead to a collision. One example is Electronic Stability Control (ESC), which is now mandatory in all new cars in Europe. ESC uses sensors to detect deviations from the intended path of the vehicle. It then uses braking or power reduction to individual wheels to bring the vehicle back under control. Collisions caused by loss of control are high amongst young people and could be reduced by widespread use of ESC.<sup>201</sup>

#### Other examples include:

**Intelligent Speed Assistance (ISA)** helps drivers to keep their speed within the permitted limit by allowing the vehicle to recognise the speed limit and respond accordingly if it is exceeded.<sup>202</sup>

Although the most likely forms of ISA can be overridden by a driver, it would encourage young people to abide by speed limits as well as educating them about the limits used in different road environments. Evidence shows that the widespread use of ISA systems could lead to a 20% reduction in road deaths and 30% in injury collisions.<sup>203</sup>

**Autonomous Emergency Braking (AEB)** helps a vehicle to avoid collisions by identifying dangerous situations and warning the driver. It can also prevent collisions or reduce the severity of unavoidable collisions by braking to lower the speed and prepare the vehicle and restraint systems for impact.<sup>204</sup>

**Lane Departure Warning** monitors road markings and edges to alert drivers when the vehicle is getting close to a lane marking.<sup>205</sup>

**Alcohol Interlocks** are connected to the vehicle ignition system and require the driver to take a breath test in order to drive the vehicle. If the driver is found with alcohol above the legal BAC limit the engine will not

start<sup>206</sup>. A number of European countries have used alcohol interlocks to tackle drink driving, especially amongst persistent offenders.<sup>207</sup>

Some technologies, such as AEB, can also be used on motorcycles. However, the effects of such systems on powered-two wheelers are not as well-known as they are for cars and this requires more research.

Ensuring that such technologies, alongside general levels of crashworthiness, are included in the relevant safety regulations will help all drivers and riders, but especially young ones, to benefit from safer vehicles.

### 3.4.3 Telematics

A recent area of technological progress relevant to young drivers is the use of telematics to monitor driving behaviour. These 'black boxes' are used to record information about high-risk behaviours, such as speeding, harsh-braking, lane changes and night-time driving.<sup>208</sup>

*Telematics can be used to record information about high-risk behaviours, such as speeding, harsh-braking, lane changes and night-time driving.*

This information can then be assessed and used to develop a picture of an individual driver's behaviour on the road and their crash risk. Assessment can be provided by a range of individuals and groups, such as insurance companies, instructors, parents and employers. Feedback, penalties and rewards can be issued on the basis of the information collected.

Telematics also allow young people to be monitored unobtrusively while driving independently. This increases the likelihood of capturing their 'normal' driving behaviour, when not being personally monitored by an instructor or accompanying driver.

The knowledge that a telematics device is in operation can be enough on its own to improve a young person's driving, or at least to suppress high-risk behaviours. Through proper assessment and constructive feedback over time, driving behaviour can be changed.

<sup>201</sup> ITF/OECD, 2006, Young Drivers – The Road to Safety, OECD, p185. <https://goo.gl/dHJJRj>

<sup>202</sup> ETSC, 2015, Position Paper Revision of the General Safety Regulation 2009/661, <http://goo.gl/YJdSYo>

<sup>203</sup> Lai, F, Carsten, O., Tate, F., 2012, How much benefit does Intelligent Speed Adaptation deliver: An analysis of its potential contribution to safety and the environment. <https://goo.gl/PX9N2c>

<sup>204</sup> Euro NCAP, Autonomous Emergency Braking, <https://goo.gl/cCPEVN>

<sup>205</sup> Euro NCAP, Lane support, <https://goo.gl/C7vm7s>

<sup>206</sup> ETSC, 2015, Position on the Revision of the General Safety Regulation 2009/661. <https://goo.gl/EHjrHv>

<sup>207</sup> ETSC, 2012, Drink Driving: Towards Zero Tolerance, p15. <https://goo.gl/MOYng8>

<sup>208</sup> Tong, S. et al, 2015, Provision of Telematics Research, TRL (TRL755), p18. <https://goo.gl/5pX7wf>

Many insurance companies are now adopting telematics as a tool to help support and influence positively young people's driving. They also allow the companies themselves to select safer drivers. This in turn can then reduce claims expenditure. In the UK, a number of insurance providers have been marketing telematics based policies to young people since 2010.

The insurance provider monitors the telematics information and offers rewards in return for safer, more responsible driving. Offering incentives, rather than penalties, encourages a positive view of safer driving and helps to make such schemes more appealing to young drivers.

By providing an on-line portal, some insurance providers allow young drivers and their parents to access and review the telematics information themselves.<sup>209</sup> Instant alerts from telematics devices can also be used to locate and respond to collisions, in a similar way to the e-Call system.

Italy introduced legislation in 2012 to make telematics compulsory in all new cars. It has the potential to ensure that over time all cars are fully equipped for telematics.

The link between telematics usage and safer driving needs to be researched further. Insurers may of course simply select less risky customers and safer young drivers may be more likely to participate in telematics schemes.

### 3.4.4 Dealing with distraction

Technology can cause distraction. Navigational aids, mobile phones and in-car entertainment systems all have the capacity to distract young drivers from the driving task. Even safety based technologies can cause problems for those unfamiliar with them. However, distractions can be reduced by effective research and technological development.

International guidelines, such as the European Statement of Principles, offer recommendations for how to develop in-car systems that minimise distraction. These guidelines should be regularly updated as technology evolves and manufacturers should be encouraged to follow them.<sup>210</sup>

Technology already exists that can restrict the functioning of certain devices when the vehicle is in motion. It can be made impossible to operate devices such as navigational aids while driving.

Mobile phones can also be made to block texts, calls and notifications, although these blocks can often be easily overridden. Alternatively various functions/devices can be integrated into one system to reduce overall distractions.<sup>211</sup>

One way of discouraging mobile use is to link them to existing telematics devices or use the phone itself to do the same task. Although not as sophisticated as 'black box' based telematics, mobile phones are capable of carrying out many of the same functions and are used by some insurers to encourage and reward safer driving. Disabling all other phone functions when it is operating as a telematics device may be one way of reducing distractions while also encouraging safer driving.

### 3.4.5 Vehicle automation and connectivity

The driving task will change extensively in the coming decades. Increased vehicle automation and interconnectivity between vehicles will have a profound effect on the role of the driver and possibly other road users. Technological improvements, while improving safety, are gradually altering the driving task. Young drivers who have access to automated driving may build up less driving experience. This is an area that needs more research.<sup>212</sup>

Assistive technologies are already relieving drivers from certain aspects of the driving task. As automation increases, consideration will need to be given as to how much drivers and riders are expected to do in terms of controlling the vehicle. This also poses questions for driver training: how will training teach people to drive safely and make the most of automated driving techniques, and how will drivers be taught to safely make the switch between fully autonomous and automated driving.<sup>213</sup>

<sup>209</sup> InsuretheBox: <https://goo.gl/443yQ6>

<sup>210</sup> Kinnear, N., and Stevens, A., 2015, The Battle for Attention: Driver Distraction – a review of recent research and knowledge, TRL, p16. <https://goo.gl/p2xHTq>

<sup>211</sup> SWOV, 2013, Fact Sheet: Distraction in Traffic, p4. <https://goo.gl/G1PCuo>

<sup>212</sup> ETSC, 2016, Prioritising the Safety Potential of Automated Driving in Europe, p15. <https://goo.gl/RLR6t7>

<sup>213</sup> ETSC, 2016, Prioritising the Safety Potential of Automated Driving in Europe, p15. <https://goo.gl/RLR6t7>

*The proliferation of assistive technologies may inadvertently lead to risk compensation, and encourage some road users to act more dangerously than they otherwise would.*

The proliferation of assistive technologies may inadvertently lead to behavioural adaptation, and encourage some road users to act more dangerously than they otherwise would. Even road users who consider themselves safe may come to rely on assistive technologies to correct flaws in their driving.

As the driving and riding task changes, so too will the way in which drivers and riders are trained and prepared. Managing and utilising the various in-car technologies will become a greater part of the driving task.

A transition period can be expected during which more vehicles become increasingly autonomous but traditional vehicles will continue to be driven. This will be challenging for all, especially if individuals must learn to drive and change between the different types of technology.

It is important that young people are still taught the skills and driving styles needed to use the roads safely. New technologies must not become a substitute for a competent driving or riding style.

#### **Recommendations EU**

- Revise the General Safety Regulation 2009/661 and the Pedestrian Protection Regulation 2009/78 to help ensure that all new vehicles used by young drivers have improved levels of crashworthiness and standard crash avoidance features.

#### **Recommendations Member States**

- Support the revision of the General Safety Regulation 2009/661 and the Pedestrian Protection Regulation 2009/78 to help ensure that all new vehicles used by young drivers have improved levels of crashworthiness and standard crash avoidance features.
- Promote the understanding and choice of safer vehicles by young people via consumer information.
- Put incentives in place to make safer cars and safety technologies more accessible to young people.
- Promote the provision and take-up of telematics-based insurance for young people and conduct further research on the potential safety benefits of such telematics.

# PART IV

## CONCLUSIONS AND RECOMMENDATIONS

Road casualties involving young drivers and riders remain at unacceptably high levels across Europe. Targeted interventions are required to bring down the level of death and injury. This requires action by the EU and Member States. This report explains why young road user casualties are high, and sets out the main types of intervention that appear to be effective.

The nature and scale of the young road user safety problem varies across Europe. In some countries casualties involving young motorcyclists exceed those involving young drivers. Despite this, research and interventions for young drivers are better developed and more widely used than those for young riders.

Young drivers and riders are likely to benefit from measures that improve safety for all road users, such as better infrastructure, education and enforcement, and vehicle safety standards. Some measures will benefit young users disproportionately, others less so. This report has focused on measures specific to young road users.

The laws, licensing, training, insurance and other factors affecting the safety of young road users also vary across Europe, as do the age of the vehicle fleet, infrastructure and enforcement. Each country is starting from a different point and each will need to identify the issues and interventions most relevant to its circumstances.

The following recommendations will need to be carefully considered in light of national or regional circumstances.

### GENERAL RECOMMENDATIONS

#### EU and Member States

- Review the nature of young road user safety issues and interventions available in each country
  - Undertake further research into young road user risk and its causes, including:
    - Competencies linked to safe road use (e.g. hazard perception)
    - The content and effectiveness of training and education
    - Use of powered two wheelers by young people.
- Work towards better standardised reporting of statistics (especially concerning riders) by Member States and monitor them.
  - Encourage greater sharing of legislation and good practice related to young drivers and riders.

#### Safety Legislation and Enforcement

##### EU

- Within the context of the revision of Directive 2015/413 concerning cross-border exchange of information on road safety related traffic offences, improve enforcement in particular against the main killers: speed, drink-, drug- and distracted driving and non-use of protective equipment (seat-belts and helmets). These particularly affect young road user safety.
- The EC should propose for consideration a Directive setting a 0.2g/l limit on BAC for driving by those aged up to 25.

##### Member States

- Improve enforcement in particular against the main killers: speed, drink-, drug- and distracted driving and non-use of protective equipment (seat-belts and helmets).
- Where these do not exist, introduce stricter demerit systems during a probationary period for newly-licensed drivers with penalties such as loss of licence or mandatory traffic risk awareness training.
- Introduce drug-driving laws and testing equipment for major drugs.
- Improve awareness campaigns for young people concerning traffic laws, their enforcement and its consequences
- Continue to upgrade and redesign transport infrastructure according to the Safe System approach.
- Consider establishing a 0.2 g/l BAC limit for driving by all young drivers and novice drivers .
- Consider targeted enforcement of traffic law in areas and at times with high traffic of young road users.

- Develop enforcement/campaign strategies to deal with high mobile device usage amongst young people.
- Continue to invest in and encourage alternative modes of transport where possible, (walking/cycling/public transport), which can be used by young people as alternatives to driving and riding.

## Training and Education

### Member States

- Encourage higher levels of accompanied driving while novice drivers are learning and gaining experience.
- Expand training to incorporate additional skills and new technologies, e.g. motorway driving, driving with navigational devices
- Introduce higher level GDE components into driver and rider training.
- Encourage communication between instructors and accompanying drivers to maximise the benefit of informal practice (e.g. a joint lesson/logbook)
- Ensure that suitable, post-licence training programmes are available for those who wish to continue learning
- Support the further incorporation of road safety into mainstream education.

## Licensing Systems and Testing

### EU

- Encourage Member States to introduce elements of graduated driver licensing systems for young drivers and riders.
- Ensure that the Driving Licence Directive remains valid for new technologies, and autonomous and semi-autonomous driving.

### Member States

- Implement those aspects of graduated driver licensing that would most benefit young driver safety in the particular country.
- Introduce GDL style probationary elements for young riders.
- Establish a hazard perception test.
- Ensure that the driving and motorcycle test remains valid for new technologies.
- Incorporate higher level GDE components into testing.

## Safer Vehicles and Telematics

### EU

- Revise the General Safety Regulation 2009/661 and the Pedestrian Protection Regulation 2009/78 to help ensure that all new vehicles used by young drivers have improved levels of crashworthiness and standard crash avoidance features.

### Member States

- Support the revision of General Safety Regulation 2009/661 and the Pedestrian Protection Regulation 2009/78 to help ensure that all new vehicles used by young drivers have improved levels of crashworthiness and standard crash avoidance features.
- Promote the understanding and choice of safer vehicles by young people via consumer information.
- Put incentives in place to make safer cars and safety technologies more accessible to young people.
- Promote the provision and take-up of telematics-based insurance for young people and conduct further research on the potential safety benefits of such telematics.

# APPENDIX I

## GOALS FOR DRIVER EDUCATION (GDE) MATRIX

Essential elements of driver training				
Hierarchical levels of driver behaviour		Knowledge and skills	Risk-increasing factors	Self-evaluation
	IV. Personal characteristics, ambitions and competencies (General level)	Knowledge and control of general ambitions in life, values and norms and personal tendencies which effect driving behaviour: <ul style="list-style-type: none"> <li>• lifestyle</li> <li>• peer group norms</li> <li>• motives in life</li> <li>• self-control and other characteristics</li> <li>• personal values and norms</li> <li>• etc.</li> </ul>	Risky tendencies: <ul style="list-style-type: none"> <li>• acceptance of risk</li> <li>• self-value through driving</li> <li>• sensation-seeking</li> <li>• adapting to social pressure</li> <li>• use of alcohol and drugs</li> <li>• attitude towards society</li> <li>• etc.</li> </ul>	Self-awareness regarding: <ul style="list-style-type: none"> <li>• impulse control</li> <li>• risky tendencies</li> <li>• personal unsafe motives</li> <li>• personal risky characteristics</li> <li>• etc.</li> </ul>
	III. Trip-related context and considerations (Strategic level)	Knowledge and skills regarding: <ul style="list-style-type: none"> <li>• choice of route</li> <li>• estimated driving time</li> <li>• effects of social pressure from passengers</li> <li>• estimating urgency of the trip</li> <li>• etc.</li> </ul>	Risks relating to: <ul style="list-style-type: none"> <li>• physiological condition of driver</li> <li>• road environment (urban/rural)</li> <li>• social context and company in vehicle</li> <li>• other motives (e.g. competition in traffic)</li> <li>• etc.</li> </ul>	Self-awareness regarding: <ul style="list-style-type: none"> <li>• personal skills with regard to planning</li> <li>• typically risky motives when driving</li> <li>• etc.</li> </ul>
	II. Mastery of traffic situations (Tactical level)	Knowledge and skills regarding: <ul style="list-style-type: none"> <li>• traffic rules</li> <li>• observation and use of signals</li> <li>• anticipation</li> <li>• speed adaptation</li> <li>• communication</li> <li>• safety margins</li> <li>• etc.</li> </ul>	Risks caused by: <ul style="list-style-type: none"> <li>• poor decision-making</li> <li>• risky driving style (e.g. aggressive)</li> <li>• excessive speed</li> <li>• vulnerable road users</li> <li>• breaking traffic rules / unpredictable behaviour</li> <li>• information overload</li> <li>• difficult (road) conditions (e.g. darkness, bad weather)</li> <li>• insufficient automatisisation of basic skills</li> <li>• etc.</li> </ul>	Self-awareness regarding: <ul style="list-style-type: none"> <li>• strengths and weaknesses regarding driving skills in traffic</li> <li>• personal driving style</li> <li>• personal safety margins</li> <li>• strengths and weaknesses in dangerous situations</li> <li>• realistic assessment of own skill</li> <li>• etc.</li> </ul>
	I. Basic vehicle control (Operational level)	Knowledge and skills regarding: <ul style="list-style-type: none"> <li>• control of direction and position of car</li> <li>• surface grip, tyre pressure</li> <li>• dimensions of the vehicle</li> <li>• technical aspects of vehicle</li> </ul>	Risks related to: <ul style="list-style-type: none"> <li>• insufficient automatisisation of basic skills</li> <li>• difficult (road) conditions (e.g. darkness, bad weather)</li> <li>• improper use of seatbelt, headrest, sitting position</li> <li>• etc.</li> </ul>	Self-awareness concerning: <ul style="list-style-type: none"> <li>• strengths and weaknesses of basic vehicle control</li> <li>• strengths and weaknesses manoeuvring in dangerous situations</li> <li>• realistic assessment of own skill</li> <li>• etc.</li> </ul>

# APPENDIX II

## RESULTS OF THE YEARS SURVEY

	AT	BE	CY	DE	FI	FR	EL	HU	IE	IT	LT	LV	UK	NO	EE	CH	SRB
Earliest age at which someone can begin learning to drive a car on a public road	15.5	17	17.5	16.5	17	15	18	17	17	18	17	16	17	16	15.5	18	16
Earliest age at which someone can begin driving unaccompanied in a car on a public road	17	18	18	18	18	18	18	17	17.5	18	18	18	17	18	18	18	18
Period between beginning to learn to drive on a public road and being able to drive unaccompanied on a public road (years)	1.5	1	0.5	1.5	1	3	0	0	0.5	0	1	2	0	2	2.5	0	2

# BIBLIOGRAPHY

## EU/Governmental

UK Government, Improving the Driving Test <https://www.gov.uk/government/publications/improving-the-driving-test/improving-the-driving-test>

Norther Ireland Motor Vehicle and Road User Studies GCSE, <http://ccea.org.uk/mvrus/>

Northern Ireland Road Traffic (Amendment) Bill Explanatory and Financial Memorandum, <http://www.niassembly.gov.uk/globalassets/documents/legislation/bills/executive-bills/session-2013-2014/road-traffic-amendment-bill/efm---as-amended-at-fcs.pdf>

New South Wales: Roads and Maritime, Rider licence <http://www.rms.nsw.gov.au/roads/licence/rider/>

Alberta Transportation, Graduated Driver Licensing, <http://www.transportation.alberta.ca/Content/docType47/Production/graduateddriverlic.pdf>

Directive 2006/126/EC of the European Parliament and of the Council of 20 December 2006 on driving licences, Annex II, 9.2 <http://eur-lex.europa.eu/legalcontent/EN/TXT/?qid=1430377687650&uri=CELEX:32006L0126>

UK Transport Minister Robert Goodwill MP, 18th December 2013, [http://www.publications.parliament.uk/pa/cm201314/cmhansrd/cm131218/text/131218w0001.htm#131218w0001.htm\\_wqn15](http://www.publications.parliament.uk/pa/cm201314/cmhansrd/cm131218/text/131218w0001.htm#131218w0001.htm_wqn15)

UK Department for Transport, Drug Driving, <https://www.gov.uk/government/collections/drug-driving>

Finnish Transport Safety Agency, [http://www.trafi.fi/en/road/i\\_want\\_a\\_driving\\_licence/driving\\_instruction\\_permit](http://www.trafi.fi/en/road/i_want_a_driving_licence/driving_instruction_permit)

Finnish Category B permit-based instruction: Syllabus and lesson plans - [http://www.trafi.fi/filebank/a/1466678356/251cebf3cccac1082164d38a73c2cac7/21944-B-\\_luokan\\_opetuslupaopetuksen\\_opetussuunnitelma\\_ja\\_ohje\\_2016\\_\(1\)\\_en.docx](http://www.trafi.fi/filebank/a/1466678356/251cebf3cccac1082164d38a73c2cac7/21944-B-_luokan_opetuslupaopetuksen_opetussuunnitelma_ja_ohje_2016_(1)_en.docx)

UK Government, DVSA, Hazard Perception Clips Get a Modern Makeover, <https://www.gov.uk/government/news/hazard-perception-clips-get-a-modern-makeover>

EMCDDA (2012), Driving Under the Influence of Drugs, Alcohol and Medicines in Europe: Findings from the DRUID Project

European Commission (2011), White Paper Mid-Term Review

European Commission (2011), White Paper, Roadmap to a Single European Transport Area: Towards a competitive and resource efficient transport system

Eurostat (2015), Being Young in Europe Today, [http://ec.europa.eu/eurostat/statistics-explained/index.php/Being\\_young\\_in\\_Europe\\_today\\_-\\_health](http://ec.europa.eu/eurostat/statistics-explained/index.php/Being_young_in_Europe_today_-_health)

UK Department for Transport (2002), The Interactions Between Sleepiness and Moderate Alcohol Intake, <http://www.dft.gov.uk/rmd/project.asp?intProjectID=10129>

UK Department for Transport (2010), Road Safety Research Report 117: The Characteristics of Speed Related Collisions

UK Penalty Points (endorsements), <https://www.gov.uk/penalty-points-endorsements/new-drivers>

Transport for London Urban Motorcycle Design Handbook (<http://content.tfl.gov.uk/tfl-urban-motorcycle-design-handbook.pdf>)

EU Barometer (2014), Young People and Drugs

EU Barometer (2010), EU Citizens' Attitudes Towards Alcohol

European Commission (2011), Road Safety: Policy Orientations 2011-2020



European Commission, Traffic Safety Basic Facts on Young People, European Commission, Directorate General for Transport, June 2015

EU Flash Barometer (July 2010), Road Safety, Analytical Report

European Commission (2015), Road Safety in the European Union: Trends, Statistics and Main Challenges

## Reports

CIECA (2007), "Integrating the GDE matrix into category B driver training and the practical driving test: Final Report"

European Commission/CIECA (2005), MERIT: Minimum Requirements for Driving Instructor Training

European Commission/CIECA (2004), NovEV: Evaluation of Novice Driver Training Schemes in 6 EU-Member States

European Commission/CIECA (2014), RIDERSCAN Project: Ecodriving – European Scanning Tour for Motorcycle Safety

European Commission/European Road Safety Observatory (2009), SafetyNet: Novice Drivers

European Commission/CIECA (2007) SUPREME Project, Best Practices in Road Safety. [http://ec.europa.eu/transport/road\\_safety/pdf/projects/supreme-c\\_en.pdf](http://ec.europa.eu/transport/road_safety/pdf/projects/supreme-c_en.pdf)

European Commission/CIECA (2002), Advanced: Study of post-licence driver and rider training, Final Report

European Commission/CIECA (2002), Advanced: Study of post-licence driver and rider training, Project Summary

European Commission/CIECA (2005), TEST: Towards European Standards for Testing

European Commission (1999), GADGET: Guarding Automobile Drivers through Guidance, Education and Technology

European Commission (2012), DRUID: Driving Under Influence of Drugs, Alcohol and Medicines

ETSC (2010), 4th Road Safety PIN Report, Road Safety Target in Sight: Making up for lost time

ETSC (2010), Minimising In-Vehicle Distraction, PRAISE Thematic Report 5,

ETSC (2011), Preventing Road Accidents and Injuries for the Safety of Employees, PRAISE Thematic Report 8

ETSC (2011), Traffic Law Enforcement across the EU: Tackling the Three Main Killers on Europe's Roads

ETSC (2012) 6th Road Safety PIN Report, A Challenging Start towards the EU 2020 Road Safety Target

ETSC (2012), Drink Driving: Towards Zero Tolerance

ETSC (2012), The BestPoint Handbook: Getting the best out of a Demerit System

ETSC (2012), Drink Driving: Towards Zero Tolerance

ETSC (2014) Ranking EU Progress On Car Occupant Safety, PIN Flash Report 27

ETSC (2015), Managing Young Drivers at Work, PRAISE Report

ETSC (2016), 10th Road Safety Performance Index Report (PIN)

ETSC (2016), PIN Flash Report 31, How Traffic Law Enforcement Can Contribute to Safer Roads

ETSC (2016), Prioritising the Safety Potential of Automated Driving in Europe

ITF/OECD (2006) Young Drivers – The Road to Safety

ITF/OECD (2008) Towards Zero: Ambitious Road Safety Targets and the Safe System Approach

IRTAD: International Traffic Safety Data and Analysis Group (2015), Annual Road Safety Report 2015: Summary

SWOV (2015), Fact Sheet, Accompanied Driving

SWOV (2013), Fact Sheet, Graduated Driver Licensing

SWOV (2014). Fact Sheet, Hazard Perception and How to Test It

SWOV (2012), Fact Sheet, Mobile Phones.

SWOV (2013), Fact Sheet, Distraction in Traffic

SWOV (2009), Fact Sheet, Post-licensing Training

SWOV (2012), Fact Sheet, Demerit Points

## Articles

BRIJS, Kris; Ruiter, Rob; BRIJS, Tom (2009), Naar een evidence-based en doelgroep-specifieke verkeerseducatie , Published in: Brijs, Kris & Ruiter, Rob & Brijs, Tom (Ed.) Jaarboek Verkeersveiligheid, p. 92-100.

Dale, H., Scott, C., & Ozakinci, G. (2016). Safe Drive Stay Alive: exploring effectiveness of a real-world driving intervention for pre-drivers and the utility of the health action process approach. *Injury prevention*, injuryprev-2015.

Goldstein, L. G. (1972). Youthful drivers as a special safety problem. *Accident Analysis & Prevention*, 4(3), pp. 153-189.

Gregersen, N.P., Berg, H.-Y., Engström, I., Nolén, S., et al. (2000). Sixteen years age limit for learner drivers in Sweden - an evaluation of safety effects. In: *Accident Analysis & Prevention*, Vol. 32, No. 1, pp. 25-35.

Helman, S., Grayson, G., and Parkes, A. M., How can we produce safer new drivers? A review of the effects of experience, training, and limiting exposure on the collision risk of new drivers, TRL Insight Report (INS005) (2010)

Høye, A., Bjørnskau, T., Elvil, R. (2014). Summary: What can explain the decline in the number of traffic fatalities and serious injuries in Norway from 2000 to 2012? Norwegian Centre for Transport Research, TØI Report 1299/2014

Kinnear, N., and Stevens, A., The Battle for Attention: Driver Distraction – a review of recent research and knowledge, TRL (2015)

Kinnear, N., Lloyd, L., Helman, S., Husband, P., Scoons, J., Jones, S., Stradling, S., McKenna, F., Broughton, J., Novice Drivers: Evidence Review and Evaluation – Pre-driver education and training, Graduated Driver Licensing and the New Drivers Act: Full Report, TRL/DfT (2013)

Kinnear, N., Lloyd, L., Helman, S., Husband, P., Scoons, J., Jones, S., Stradling, S., McKenna, F., Broughton, J., Novice Drivers: Evidence Review and Evaluation – Pre-driver education and training, Graduated Driver Licensing and the New Drivers Act: TRL Research Findings, TRL/DfT (2013).

Lloyd, L., Reeves, C, Broughton J. and Scoons, J. (2013), Investigating the reduction in fatal accidents in Great Britain from 2007-2010 (PPR663J) Crowthorne, Transport Research Laboratory

Maycock G, Novice Driver accidents and the driving test, TRL (TRL527) (2002), p2.

McKenna, F. P. & Crick, J. L. (1994). Hazard perception in drivers: a methodology for testing and training. TRRL Report CR313. Crowthorne: Transport and Road Research Laboratory

Russell, K.F., Vandermeer, B. & Hartling, L. (2011). Graduated driver licensing for reducing motor vehicle crashes among young drivers. *Cochrane Database of Systematic Reviews* 2011, 10, CD003300.

Secton, B., and Grayson, G., 'Further analyses of accident data from the Cohort II study: when do drivers have their first accident and does it have an impact on their subsequent driving?', TRL Report (2009).

Steg, Linda, van Brussel, Annemarie, Accidents, aberrant behaviours, and speeding of young moped riders, Transportation Research Part F: Traffic Psychology and Behaviour, Volume 12, Issue 6, November 2009, pp. 503-511

Tong, S., Lloyd, L., Durrell, L., McRae-McKee, K., Husband, P., Delmonte, E., Parry, I., Buttress, S., Provision of Telematics Research, TRL (TRL755) (2015)

Twisk, Divera A.M., and Colin, Stacey, Trends in young driver risk and countermeasures in European countries, Journal of Safety Research (2007)

Twisk, Divera, Protecting pre-license teens from road risk: Identifying risk-contributing factors and quantifying effects of intervention strategies (2014)

Vlakveld, 2005, featured in SWOV, Fact Sheet, 18-24 year olds: Young Drivers, May 2016

Wells P, Tong S, Serton B, Grayson G and Jones E, Cohort II: A Study of Learner and New Drivers. Volume 1: Main Report, Road Safety Research Report No. 81. DfT (2008)

Mette Møller, Sonja Haustein, Factors contributing to young moped rider accidents in Denmark, Accident Analysis & Prevention, Volume 87, February 2016, pp. 1-7

GDE-5 SOC" Keskinen, Peräaho & Laapotti (2010)

### **News Articles**

BBC News, 'Drug-driving arrests increase 600% after law change', 23rd November 2015 <http://www.bbc.co.uk/news/uk-34898385>

Cyprus Mail, 'MPs open the way for narco test', 25th February 2016

<http://cyprus-mail.com/2016/02/25/mps-open-the-way-for-narco-test/>

### **Other**

EuroNCAP, <http://www.euroncap.com/en/about-euro-ncap/>

<http://www.euroncap.com/en/vehicle-safety/the-rewards-explained/autonomous-emergency-braking/>

<http://www.euroncap.com/en/vehicle-safety/the-rewards-explained/lane-support/>

Safe Drive Stay Alive, <http://www.safedrive.org.uk/>

Insurance telematics in Europe: The tipping point is near: <http://analysis.tu-auto.com/insurance-telematics/insurance-telematics-europe-tipping-point-near-part-i>

Motorway Paranoia, AA - <https://www.theaa.com/newsroom/news-2015/aa-charity-offers-free-motorway-courses.html>

'Young Drivers Admit to Speeding, Using Phone and Eating at the Wheel as Ford Launches Driving Skills Program in Europe' <http://ophelia.sdsu.edu:8080/ford/09-29-2013/news-center/press-releases-detail/pr-young-drivers-admit-to-speeding-38181.html>

MCIA Motorcycle Framework, <http://www.motorcycleframework.co.uk/executive-summary/>

Divera Twisk presentation, YEARS Launch Event

InsuretheBox: <https://www.insurethebox.com>

ACI Ready2Go: <http://www.ready2go.aci.it/la-patente-con-noi/teoria-e-pratica/>



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