



# **Road safety study for the interim evaluation of Policy Orientations on Road Safety 2011-2020**

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## **Disclaimer**

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## Executive Summary

**EU ROAD SAFETY ROLE AND STRATEGY:** Road safety is at the heart of the aims of the European Union and its functioning. The Preamble to the Treaty on European Union resolves 'to facilitate the free movement of persons, while ensuring the safety and security of their peoples'. The EU shares responsibility for road safety with its Member States and, in common with other shared activities, is guided by principles of subsidiarity and proportionality. The EU has clear competence to act within the broad multi-sectoral context needed to prevent death and mitigate serious injury in road collisions, a problem acknowledged as having an unacceptably high cost in humanitarian and economic terms, but one known to be largely preventable.

Over the last fifteen years, successive EU road safety action plans have been implemented by the European Commission and Member States, with support from the EU institutions. The first EU target of a 50% reduction in road deaths between 2001 and 2010 led to a large 43% reduction in deaths. The ambitious target helped to mobilise effective action at local, national and EU levels. A substantial 54% reduction in road deaths has been achieved since 2001 with the latest provisional figures indicating a 19% reduction between 2010 and 2014. EU road safety progress during the last two decades is an internationally acknowledged success story.

In 2011, the European Commission introduced the current road safety strategy - *Policy Orientations on Road Safety 2011-2020* with an ambitious quantitative target to reduce the number of road deaths by 50% between 2010 and 2020. In addition to the 2020 target, the Transport White Paper in 2012 set out, in line with good practice, a highly challenging, long-term goal for EU road safety activity of virtually eliminating road deaths by 2050. It also envisaged the setting of a quantitative target to reduce road injuries.

**STUDY AIMS:** A systematic, high-level scan has been carried out of EU road safety activity within the framework of *Policy Orientations*. This independent study is a largely qualitative assessment, supported by quantitative data, where possible. It has assessed what has been achieved so far by the EU, whether this is sufficient to meet the 2020 target and in what areas improvements can be made across the good practice road safety management dimensions of *results* (Section 3), *interventions* (Section 4) and *institutional management* (Section 5). Progress towards road safety targets is influenced by many factors. These include external factors such as economic, traffic and demographic trends; the level of ambition and close management of objectives; the scope, quality and amount of systematic intervention and how far it addresses goals and targets, the evidence base and the needs of all road users; and the quality of implementation and institutional delivery. It is outside the scope of this short study and currently available information to assess the specific and relative quantitative contribution of each of these, or to look beyond EU activity. A best judgement assessment has been made.

### **RESULTS: What has been achieved to date?**

In 2013, the latest year for which full figures are available, 25,966 people were killed in road collisions in the EU 28, representing an 18% decrease in deaths since 2010. The socio-economic value of preventing all these deaths is estimated at almost €50 billion for 2013. In most EU countries, road traffic injury is the 1<sup>st</sup> or 2<sup>nd</sup> cause of death for school-age children and young people (between 5 and 24 years), and amongst the first three lead causes for those aged between 5 and 49 years (2010). While there is wide variation in death rates across the EU and inequalities in risk, the EU achieved the lowest road death rate (5.1 deaths per 100,000 inhabitants) in 2013 of any world region and a world's lowest country death rate at 2.8 (Sweden). The average rate of deaths per billion vehicle kilometres travelled for countries where information exists was 8.4, with Sweden, Ireland and the UK having the world's lowest death rate of 4. An average annual reduction of around 6% between 2010 and 2013 indicated an encouraging course for the EU towards the 2020 target. However, provisional figures indicate that 25,500 EU citizens died in road crashes in 2014 representing a substantially reduced average annual reduction of 2%, compared with the 2013 outcome. This means that for the remaining years of the strategy an average annual reduction of 8% is needed to reach the target. While the low decrease between 2013 and 2014 might be an annual random fluctuation, key indicators suggest otherwise with external factors exerting a strong influence on results. In particular, a causal relationship between changes in GDP and changes in the number of road deaths in Europe, North America and Japan has been identified recently by the ITF/OECD. The research identified particularly sharp reductions in young driver and rider deaths and decreased involvement of heavy goods vehicle traffic in fatal crash outcomes which coincided with the

onset of economic recession and which are strongly associated with GDP changes. Whilst research indicates that economic recession worked positively for road safety in EU between 2007 and 2012, the latest results indicate that stronger economic development, compared with the lowest levels of GDP experienced in recent years, may now be starting to demonstrate negative effects for road safety. Other important results, including serious injuries and factors causally related to the risk and number of fatal and serious injuries (e.g. speed, sober driving, protective equipment use, the safety quality of vehicles and roads and efficient emergency medical response), were also reviewed.

*Substantial progress in reducing road deaths has been achieved across the EU since 2001 aided by the establishment of EU road safety targets and strategy. The EU has a world-leading road safety record which the Commission and all road safety partners want to maintain and further improve. The current target and strategy period, however, coincides with particularly uncertain and uneven economic developments across EU 28 which are influencing levels of road deaths. A significant slowing of annual progress below that needed to reach the 2020 target can be expected in the event of stronger economic development, sustained lower fuel prices and a less than urgent approach to implementing new, appropriately targeted intervention at EU and national levels.*

**INTERVENTIONS: Are the strategic objectives of Policy Orientations still relevant?**

A wide variety of intervention is foreseen in the strategy between 2011 and 2020 within seven policy objectives to address many key road safety problems and with new focus on vulnerable road user safety. In many cases interventions are insufficiently defined in the evolving strategy to allow estimation of their road safety value. Others comprise valuable activity which may lead to the identification of future intervention. Many actions are ongoing and implementation since 2011, some four years into the strategy, has been variable, given the complexities of road safety at EU level. Implementation is often dependent on subsequent and, as yet, unknown decisions at EU and national levels. Furthermore, interventions sometimes insufficiently address the largest road fatality groups in efforts to meet the target, ensure the safe free movement of people in harmonisation measures or address needs identified by the evidence base. While valuable preparation has been carried out and important steps taken, the most promising aspects of *Policy Orientations* intervention, whether in implementing proven safety technologies for a range of vehicle types; further infrastructure safety steps or ensuring safety-sensitive powered two wheeler rider and car driver licensing schemes, have yet to be adopted and implemented.

The EU interventions which are likely to be influencing current road safety outcomes the most are legislative initiatives adopted before 2011 in motor vehicle design and safety equipment: electronic stability control systems in cars and trucks; advanced and anti-lock braking systems in motorcycles; daytime running lights in powered two-wheelers, cars and trucks and pedestrian protection. In many cases fitment started before legislative deadlines, aided by Euro NCAP, industry initiatives and national fast-tracking measures. An impact assessment for road infrastructure safety management legislation is expected shortly and this area also holds much future promise, as does the implementation of e-Call.

*Together with the reported road safety results in Section 3, this scan of EU intervention provides a strong indication that while the strategy remains relevant, new effective action and implementation is needed by the EU and Member States between now and 2020 towards achieving existing targets. In terms of meeting the 2020 target and encouraged by EU initiatives, national priorities should focus on making further progress in securing compliance with key road safety rules. More or less immediate results can be achieved in the short-term through affordable combined publicity and police enforcement, particularly to address speeding – the single most important contributory factor to serious and fatal injury outcomes in road traffic crashes and one which influences the effectiveness of a range of measures. Suggestions are made for a range of priority EU intervention to 2020 and beyond (Section 4.1).*

**INSTITUTIONAL DELIVERY: Is the 2020 target still relevant and realistic and what additional targets would be relevant?**

**Results focus:** Road safety is amongst the stated top priorities of the European Commission. As with the previous target, most Member States have adopted or aligned their targets to EU 2020 targets. *Vision Zero/Safe System* goals and strategies are being adopted increasingly. A sharp focus is needed to ensure that road safety interventions specifically relate to EU goals and targets to reduce deaths. All major road casualty groups need to be addressed. The focus needs

to be expanded to address the 2050 goal and to include a long-term goal and interim target for serious injury. The proposal for a 35% reduction in serious injuries by 2020 (2014 baseline) represents an appropriate and challenging strategic target and is recommended. Consistent with good practice, future strategy needs to establish a clear road safety performance framework with specific objectives to allow targeting, closer management and monitoring. Priorities also include targets to 2020 and beyond to increase seat belt and crash helmet use; reduce average speeds and speeding over the limit; reduce levels of drinking and driving and improve the safety quality of the new vehicle fleet through use of Euro NCAP rating and road infrastructure (at least for TEN-T) using road assessment programme ratings (Euro RAP). The strategy should also include reducing work-related road deaths and serious injuries, given their prevalence and cost to employers. A road safety management capacity review would assist the development of a post-2020 *Towards Zero* strategy, involving key Commission Directorates and road safety partners who can deliver results. To help meet the challenges to 2020 and beyond, road safety lead unit capacity needs strengthening in DG MOVE, particularly in any further development of 2020 and post-2020 targets and strategy, coordination, monitoring and evaluation and technical support.

**Coordination:** Some further expansion of inter-Directorate coordination is recommended to ensure multi-sectoral, day-to-day ownership of road safety goals, targets and strategy. DG MOVE should consider setting up and chairing a *Policy Orientations* Steering Group (and subsequently a *Towards Zero* group) bringing together Directorates with day-to-day responsibilities relating to road safety and reporting to Directors. It is recommended that DG MOVE builds on the good cooperation with the High Level Group on Road Safety and suggestions are made for priority activity.

**Legislation:** Large scope exists for further legislation to address the road safety task to 2020, particularly within the framework of the General Safety Regulation, driver licensing and TEN-T related activities. Suggestions for future priority initiatives have been outlined in previous sections on intervention. Further guidance on impact assessment is needed (see below).

**Funding and Resource Allocation:** Despite the increasingly ambitious objectives sought and demonstrated benefit-to-cost ratios (BCR) of publicly acceptable measures, investment in preventing serious health loss in road crashes is not commensurate with the high socio-economic value of its prevention either at EU level or nationally. A standard methodology for assessing the costs and benefits of road safety measures and the updating of values needs to be adopted by DG MOVE and road safety partners for use in developing policy and in impact assessment. Benefit-to-cost assessment, however, may not always be the best tool to determine investment and harmonisation. Measures which prevent a large number of road deaths and serious injuries may have a lower BCR than measures with higher BCRs addressing a smaller number.

**Promotion:** It is recommended that the Commission, at a high level, promotes the *Safe System* goal and approach as the new EU road safety culture and the shared responsibility for addressing targets and goals.

**Monitoring and Evaluation:** While the amount of travel by road user type, an essential exposure indicator, is collected in some countries, such data is not available for EU 28 and this deficit needs to be addressed urgently. Extension of the current road safety performance framework is strongly recommended including monitoring of a new range of measurable objectives, further annual national reporting, updating of European Road Safety Observatory information, implementing an in-depth crash injury investigation system and road safety management capacity review at EU and national levels.

**Research and Development and Knowledge Transfer:** EU research and development has underpinned much of the successful life-saving intervention and tools implemented at EU level and in Member States over decades. New research focus is needed on *Safe System* intervention and 2050 goals and there is scope for further EU best practice guidance. The funding of *Safe System* demonstration projects could usefully accelerate knowledge transfer and encourage roll out and inclusion of *Safe System* into the mainstream of road safety activity in EU 28.

*The long-term goal to 2050 and the 2020 target provides a clear focus and strong encouragement for improved EU road safety activity. Meeting the existing 2020 target is certainly challenging, but further progress is, without doubt, achievable given new efforts by the EU institutions, Member States and the wider road safety partnership. New, effective action needed between now and 2020 towards achieving existing targets (Section 4), setting a new serious injury target and preparing next actions towards the 2050 goal requires some strengthening of institutional delivery in key areas (Section 5).*

# 1 Introduction

## 1.1 Background

In 2011, the European Commission introduced the current road safety strategy - *Policy Orientations on Road Safety 2011-2020*.<sup>1</sup> This document sets out an ambitious quantitative target to reduce the number of annual road deaths by 50% between 2010 and 2020. The following year, and in addition to the 2020 target, a Transport White Paper set out a highly ambitious long-term goal of virtually eliminating road deaths by 2050 – a *Vision Zero* for EU road safety activity.<sup>2</sup> It also envisaged the setting of a quantitative target to reduce road injuries.

In support of the 2050 and 2020 goal and target, the Commission has recently taken up the internationally recommended *Safe System* approach<sup>3</sup> to intervention aimed at better addressing common human error and human vulnerabilities in various working documents (See Annex 1). *Safe System* aligns well with other EU societal objectives such as sustainable development and environmental protection, energy security, public health as well as occupational health and safety and social equity. It presents opportunities, given sufficient stimulus, encouragement and the right frameworks, for integrating, building better business cases and achieving co-benefits with these and other areas of activity.<sup>4</sup>

In a series of seven broad strategic objectives, *Policy Orientations* sets out a range of policy priorities, intervention fields and policy instruments to provide a framework for activity towards the 2020 target.

As for the previous action programme 2001-2010<sup>5</sup> the European Commission is carrying out an interim review of the *Policy Orientations* strategy and, in line with recommended good practice for monitoring and evaluation, has commissioned an independent evaluation in support of this work.

## 1.2 Study objectives

The Terms of Reference of this study state that its objective is “to provide an assessment as to whether the current EU road safety policy framework set out in *Policy Orientations* is likely to be sufficient to reach the EU road safety target to 2020, given current and foreseeable road safety trends in the region as well as actions taken to date. The aim is to assist understanding as to whether any area needs more, or less, action at EU level.” The overall aim for the study “is to maximise the chances of reaching the strategic road safety target, within the Commission's competence and room to manoeuvre.”

<sup>1</sup> European Commission (2010). *Towards a European road safety area: Policy Orientations on Road Safety 2011-2020*, Brussels, 20.7.2010 COM(2010) 389 final.

<sup>2</sup> European Commission (2011). *White Paper: Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system* COM(2011) 144 final, Brussels, 28.3.2011.

<sup>3</sup> Commission Staff Working Document (2013) 94 final. On the implementation of objective 6 of the European Commission's *Policy Orientations on Road Safety 2011-2020 – First milestone towards an injury strategy*, Brussels, 19.3.2013.

<sup>4</sup> Global Road Safety Facility (GRSF) (2009), Bliss T and Breen J. *Implementing the Recommendations of the World Report on Road Traffic Injury Prevention. Country guidelines for the Conduct of Road Safety Management Capacity Reviews and the Specification of Lead Agency Reforms, Investment Strategies and Safe System Projects*, World Bank, Washington DC.

<sup>5</sup> European Commission (2003). *European road safety action programme – Halving the number of road accident victims in the European Union by 2010: a shared responsibility* COM (2003) 311 final.

The study focuses on the target period (2010-2020) and strategy period (2011-2020) and addresses the following questions, as far as available information allows:

- What has been achieved so far by the EU: what road safety outcomes and trends can be linked to EU initiatives and in what areas can improvements be made?
- Is the strategic target of a 50% reduction of road deaths still relevant and realistic with regard to the size and characteristics of road safety problems in the EU today?
- What additional targets, e.g. on serious injuries, would be relevant?
- Are the seven strategic objectives of the *Policy Orientations on road safety* still relevant in relation to the current main road safety problems and challenges?

The study also considers some of the implications for future EU road safety policy of addressing the longer term goal to virtually eliminate deaths by 2050 set out subsequently by the *White Paper* in 2012.

Together with the outcomes of consultation with the Commission's High Level Group on Road Safety and a road safety stakeholder meeting carried out in Brussels in November 2014, this assessment provides input to the Commission's Interim Evaluation which is expected to be published in April 2015. The study took place within a three month period commencing in November 2014.

## 1.3 Methodology

### 1.3.1 Key methodological considerations

The study is a qualitative assessment supported by quantitative data, where available. A purely quantitative or empirical assessment for a review of this nature is not possible for a variety of reasons.

Road safety is produced within a complex multi-sectoral context and across several levels of governance - EU, national, regional and local. Many factors contribute, some of which are external to the direct task of road safety management. Quantitative assessment of the value of EU road safety strategy is a complicated task, requiring in-depth review and a range of inputs. The basis of the conclusions and recommendations drawn in this short study remains, at best, expert judgement.

The EU 2020 road safety target is of an aspirational, strategic nature. It has not been empirically derived, based on the modelling of a combination of time-series trends in deaths, volume of travel and quantitative modelling of intervention options and their effects. For this reason, it is not possible to provide a robust assessment of any past activity and performance based on the impact of different interventions or take account of the 'dose-response' of intervention.

*Policy Orientations* is a high level strategic document, as opposed to an action plan setting out specific lines of activity which can be evaluated, although some specific actions are outlined.

Many of the safety problems addressed by *Policy Orientations* are not measured and the EU performance indicators set for the strategy are very limited. In addition, reliable and comprehensive information on specific indicators for intermediate outcomes which are causally related to deaths and serious injuries are not available for all EU countries, or available/collated on an annual basis, although some information has been included.

Reliable exposure data information such as the amount of travel is not available for all Member States, for all road types and road use types. Very little information is available in many countries for vulnerable road user groups such as cyclists and

pedestrians, which inhibits analysis. At the same time, some countries report significant increases in non-motorised, vulnerable road user modes such as cycling.

Although currently being addressed, reliable, comparable information on serious injury is unlikely to be available for the EU as a whole until mid-2015. Past reviews of practice in different countries indicate that only 70% of serious injuries are reported and that under-reporting and mis-reporting of serious injury is widespread.<sup>6 7</sup>

The timescale of this study neither allows detailed assessment of implementation activity in all Member States nor allows detailed consideration of activity in all sectors and agencies of the European Commission and other road safety partners and stakeholders.

While *Policy Orientations* anticipates the shared responsibility for road safety of a broad range of sectors, for one reason or another, the implementation activity associated with the strategy is largely confined to DG MOVE, the lead Directorate for road safety in the European Commission. However, key activity, past and present with road safety benefits for the strategy period and carried out in other sectors is noted.

The study methodology, therefore, comprises a variety of approaches. The overarching systematic approach adopted was a strategic scan considering the *results*, *interventions*, and *institutional delivery* aspects relating to *Policy Orientations* with reference to an established and widely used road safety management capacity review framework.<sup>8</sup>

### 1.3.2 Results

A quantitative analysis of road safety performance in the EU was carried out examining historical and current trends to assess whether or not the EU is on course to meet the 2020 road fatality reduction target. Since the European Commission's main performance indicator for *Policy Orientations* is progress in reaching the desired final outcome of a achieving a 50% reduction in the number of road deaths by 2020 compared with a 2010 baseline, this provides the main focus for the assessment. Other performance indicators have been set by the European Commission in their Intervention Logic for specific legislative activities (See Annex 2). A broader range of final outcomes<sup>9</sup> and intermediate outcomes<sup>10</sup> is considered to provide information on the key road safety problems and the current challenges for road safety work across the EU. The principal data source used for serious and fatal injuries was the Commission's CARE database. Other databases and survey data used includes the statistical and country profile data collected within the EU DaCoTA project, data collected by international organisations e.g. ETSC, ITF/OECD, Euro RAP, Euro NCAP, ACEA as well as other statistical data from Member States.

<sup>6</sup> Elvik R, Mysen A B.(1999). *Incomplete accident reporting: Meta-analysis of studies made in 13 countries*.Transportation Research Record No 1665, 133-140.

<sup>7</sup> IRTAD (2011). *Reporting on Serious Road Traffic Casualties: Combining and using different data sources to improve understanding of non-fatal road traffic crashes*, International Traffic Safety Data and Analysis Group, OECD/ITF, Paris.

<sup>8</sup> Global Road Safety Facility (GRSF) (2009), Bliss T and Breen J. *Implementing the Recommendations of the World Report on Road Traffic Injury Prevention. Country guidelines for the Conduct of Road Safety Management Capacity Reviews and the Specification of Lead Agency Reforms, Investment Strategies and Safe System Projects*, World Bank, Washington DC.

<sup>9</sup> Final outcomes include social costs, fatalities and serious injuries, also fatal and serious injury rates per capita, vehicle and traffic volume.

<sup>10</sup> Intermediate outcomes are linked to improvements in final outcomes and typical measures include average traffic speeds, the proportion of drunk drivers in fatal crashes, seat belt wearing rates, helmet wearing rates, safety ratings of the vehicle fleet, safety ratings of the road network and the efficiency of emergency medical assistance. Intermediate outcome data can help to enhance understanding of road safety problems and allows closer management of their mitigation.

### 1.3.3 Interventions

In parallel with the quantitative analysis mentioned above, a largely qualitative assessment of *Policy Orientations* has been carried out and focussing on actions carried out by the European Commission. This part of the study considered the main activities of *Policy Orientations* and how far they correspond to the EU 2020 target and 2050 EU road safety goal. It considered the range of activity carried out for each of the seven strategic objectives for interventions set out in *Policy Orientations*, taking account of the Commission's intervention logic (See Annex 2). Given the focus on reducing road deaths, the safety quality of activities undertaken is important. On the basis of expert judgement and using quantitative data where published and available, the review considered the fatality reduction potential of the actions in each field. It considered forecast as well as actual outcomes, where information was available, as well as options for change and improvement with reference to the evidence base and effective practice. A general assessment was made as to the relative high, medium or low fatality reduction potential of intervention based on the size of the casualty problem to be addressed and the potential effectiveness of the measure. It is emphasised that these indications are best estimates and are provided with the aim of giving some general indication of the relative importance of measures. They reflect the availability and quality of relevant quantitative information, the fact that intervention is generally rather than specifically defined and uncertainties regarding implementation levels and quality. A summary of intervention activity implemented or foreseen within the strategy period is provided in Annex 3.

### 1.3.4 Institutional delivery

Finally, a qualitative, scanning analysis was performed on key aspects of institutional delivery of *Policy Orientations*. This considered whether or not the focus to date on results is sufficient, whether new targets are needed, whether governmental leadership is present and whether the current capacity of the lead road safety unit is sufficient to encourage and play the important role of orchestrating a wide range of activity on behalf of the Commission. How is the road safety strategy being coordinated, funded, promoted? Is the range of legislation sufficient to meet the strategic target and road safety task? Is monitoring and evaluation adequate? What arrangements are made for research and development and knowledge transfer? It considered, as far as possible, actual delivery to date, as well as options for change and improvement. On the basis of these assessments, conclusions are drawn, as far as possible, concerning the Study Questions outlined in Section 1.2 and these are summarised in Section 6.

## 1.4 Report structure

Following an Executive Summary and introduction, the assessment starts with an outline of the policy context for EU road safety work including key EU Treaty obligations and the principles underlying *Policy Orientations* (Section 2). Section 3 comprises a quantitative analysis of EU road safety results and past trends; outlines key road safety problems and progress achieved to date against the 2020 target. Section 4 reviews interventions identified in *Policy Orientations* and its strategic fields; progress against expected outcomes and potential for future activity. Section 5 considers the institutional delivery of *Policy Orientations* to date as well as suggestions for future arrangements, based on international good practice. Summaries of findings are presented at the beginning of each Section. Section 6 provides a synthesis of findings and conclusions addressing the Study Questions, as far as available data and information allow. The report is supplemented by Annexes 1-12 comprising additional statistical tables and other information and this document is appended separately.

## 2 Broad policy context for EU road safety action

### 2.1 Treaty obligations, the EU role, *Policy Orientations* principles.

The safety of EU citizens is at the heart of the Treaties on European Union and its functioning. The Preamble to the Treaty on European Union states that the EU is resolved 'to facilitate the free movement of persons, while ensuring the safety and security of their peoples'.<sup>11</sup>

The Treaty on the functioning of the European Union sets out the shared responsibility of the EU with its Member States for measures to improve transport safety (Article 91c).<sup>12</sup> In common with other areas of shared activity, road safety competence is governed by the principles of subsidiarity and proportionality. The EU can act only if the objectives of the proposed action cannot be sufficiently achieved by the Member States but can rather, by reason of the scale or effects of the proposed action, be better achieved at EU level.

The Treaty stipulates that all Single Market harmonisation concerning health, safety, environmental protection and consumer protection shall take as a base a high level of protection (Article 114(3)) which is especially important in vehicle standardisation. Furthermore, a high level of human health protection is to be ensured in the definition and implementation of all Union policies and activities (Article 168). In public health, the EU may also adopt incentive measures designed to protect and improve human health and in particular to combat the major cross-border health scourges (Article 168(5)) of which road death and serious injury is a prime example. In social policy, the Treaty states that the Commission shall encourage cooperation between the Member States and facilitate the coordination of their action in a range of fields, including the prevention of occupational accidents and diseases (Article 156). Other shared competences exist in relation to neighbourhood policy and TEN-T networks.

While the provisions for the Common Transport Policy and the Single Market create the framework for key legislative activity relating to road safety, the Treaty on the functioning of the European Union sets out competences in many sectors, most notably in public health and occupational health and safety.<sup>12</sup> These provide a basis for a wide range of related road safety activities and opportunities for a broad EU road safety role and alignment of road safety with other societal objectives as outlined in Box 1.

Against this background *Policy Orientations* sets out three main principles:

1. *an integrated approach to road safety* where future road safety policy is taken into account in other policy fields of the EU and take the objectives of these other policies into account
2. *striving for the highest road safety standards* throughout Europe raising the level of road safety, ensuring safe and clean mobility for citizens everywhere in Europe and fostering equity among road users through focused efforts to improve the safety of more vulnerable road users; and
3. *subsidiarity, proportionality and shared responsibility*.

<sup>11</sup> Council of the European Union, 12 November 2012. 6655/7/08 Rev 7, *Consolidated version of the Treaty on European Union*, Brussels.

<sup>12</sup> Council of the European Union, 12 November 2012. 6655/7/08 Rev 7, *Consolidated version of the Treaty on the functioning of the European Union*, Brussels.

**Box 1: The road safety role of the European Union**

The EU shares responsibility for road safety with Member States and has competence to add value to their road safety efforts by:

- Establishing through the 2050 *Vision Zero/Safe System* goal and interim target-setting to 2020 a focus on achieving ambitious road safety results across the EU, supported by governmental leadership, EU road safety strategy and action programmes, aligning at the same time with a broad range of related societal objectives.
- Coordinating actions across Commission Directorates at EU level, with other EU institutions and Member States and with the business sector and civil society to achieve desired results.
- Legislating to meet the road safety task in areas of shared competence with due consideration to subsidiarity, proportionality, the evidence-base and providing a high level of protection.
- Funding initiatives supporting EU goals, targets and action programmes, twinning and capacity building initiatives and projects, research and development, benchmarking review and best practice guidelines, effective NGO activity.
- Promoting the societal shared responsibility for road safety at a high level and creating new demand for road safety.
- Monitoring and evaluation of road traffic crashes, injuries and exposure to risk in transport and health sectors, EU action programmes, objectives and interventions through CARE, other databases, surveys and projects, in-depth study and independent review.
- Research and development of road safety interventions and tools and disseminating knowledge e.g. through developing best practice guidance and the European Road Safety Observatory.

## 3 EU road safety results

### 3.1 Summary

#### **Progress towards the 2020 target:**

In 2013, 25,966 people were killed in road collisions in the EU 28, representing an 18% decrease in deaths since 2010. The socio-economic value of preventing these deaths is estimated to be almost €50 billion. Provisional figures for 2014 indicate that 25,500 EU citizens died in road crashes representing a 19% decrease since 2010.

Progress towards the achievement of road safety targets is influenced by many factors including external factors such as economic, traffic and demographic trends; the scope, quality and amount of systematic intervention (and how far it addresses goals and targets, relates to the evidence base and meets the needs of all road users); and the quality of implementation and institutional delivery.

An average annual reduction in road deaths of around 6% was achieved to 2013, indicating an encouraging course for the EU towards the 2020 target. However, provisional figures for 2014 indicate a substantially reduced average annual reduction of 2% compared with the 2013 outcome. This may be an annual random fluctuation but key indicators suggest otherwise. Research indicates that economic recession worked positively for road safety in the EU between 2007 and 2012. Particularly sharp decreases in deaths occurred of 27% between 2007 and 2010 and these reductions are strongly associated with changes in GDP over this period. As indicated by the 2014 results and below average progress in reducing road deaths in recent years for populous Member States, stronger economic development compared with the lowest levels of GDP experienced in recent years may now be starting to demonstrate negative road safety effects.

The reported results provide a strong indication that new, effective action is needed by the EU and Member States between now and 2020 towards achieving existing targets. An average annual reduction of 8% is needed between 2015 and 2020 to reach the target.

#### **Priority outcomes to be addressed:**

- The casualty groups which determine future priorities to reduce targeted numbers of road deaths in EU countries are *car occupants* and *powered two-wheeler users (non built-up areas)* and *pedestrians (built-up areas)*.
- The casualty groups which determine future priorities for reductions in the risk of road death (number of deaths per 100,000 of population) groups in EU countries are *young novice drivers*, *powered two-wheeler users (non-built up areas)* and *pedestrians and cyclists (built-up areas)*.
- In most EU countries, road traffic injury is the 1<sup>st</sup> or 2<sup>nd</sup> cause of death for school age children and young people (5-24 age groups), and amongst first three leading causes for 5-49 age groups (2010). An increasingly ageing society and the physical vulnerability of older road users also need more attention.
- The identified crash types which need to be addressed are *head-on crashes*, *run-off-road crashes*, *intersection crashes* and *pedestrian and other vulnerable road user crashes* (See Annex 9).
- The key factors causally related to the risk and number of fatal (and serious) injuries are *levels of speeding*, *drinking and driving*, *non-use of protective equipment*, *the safety quality of vehicles and roads*, and *emergency medical response*.
- New focus on serious injury is warranted given its prevalence, the slower improvement achieved for serious injury as opposed to fatal injury and the new reporting for MAIS  $\geq 3$  serious injury expected in 2015. The main life-threatening injuries to be addressed are *head and spinal injuries*.
- New additional focus is warranted on work-related road deaths and serious injuries given their prevalence and cost to employers.

### 3.2 Introduction

This section presents a summary quantitative analysis of EU road safety results and past trends; outlines key road safety problems and progress towards the 2020 fatality reduction target against the 2010 baseline. While new and appropriate consideration is being given to serious injuries in the developing *Policy Orientations* strategy, the main focus in this section is on targeted road deaths. For discussion of how the target was set, see Section 5.

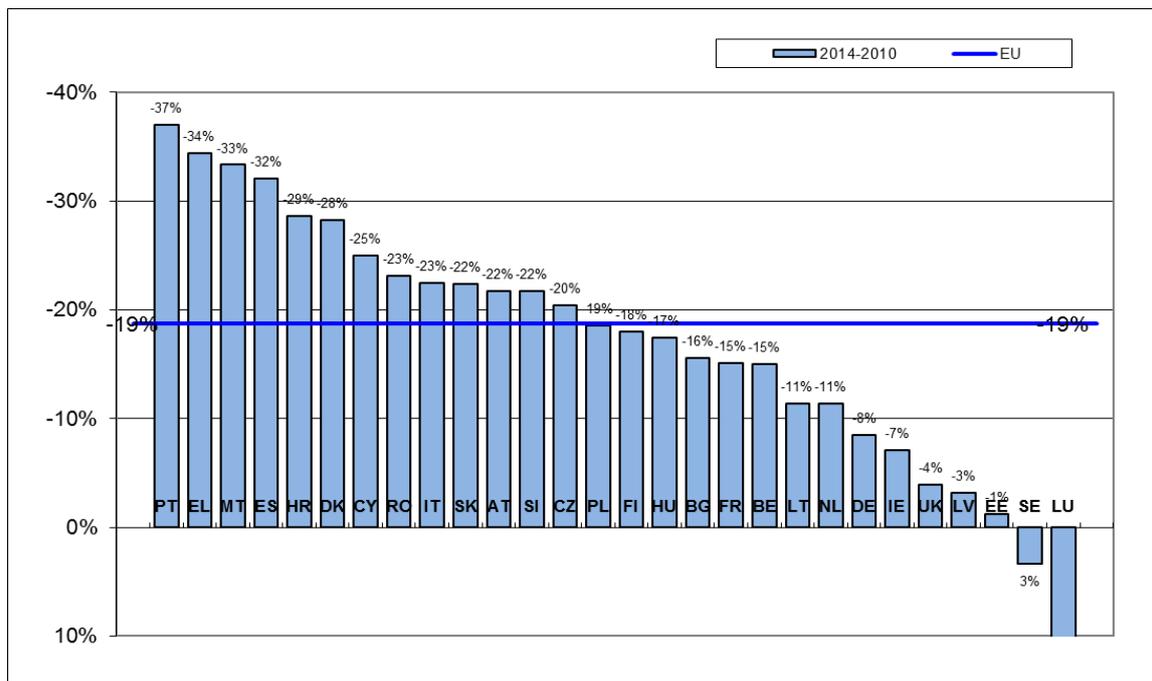
### 3.3 Final outcomes

#### 3.3.1 Road deaths: number and rates

In 2013, 26,000 people were killed in road collisions the EU 28. This represents an 18% decrease compared with the 2010 baseline and represents a 6% average annual reduction. Provisional figures for 2014 indicate that there were around 25,500 road deaths, representing a 19% decrease against the 2010 baseline and a 2% annual reduction against 2013 outcomes.

The road fatality outcomes in 2013 and in the provisional 2014 figures are mixed. Some countries report large reductions, others indicate slowing progress and others reported increased numbers of road deaths.

Figure 1: EU Road deaths 2010-2014



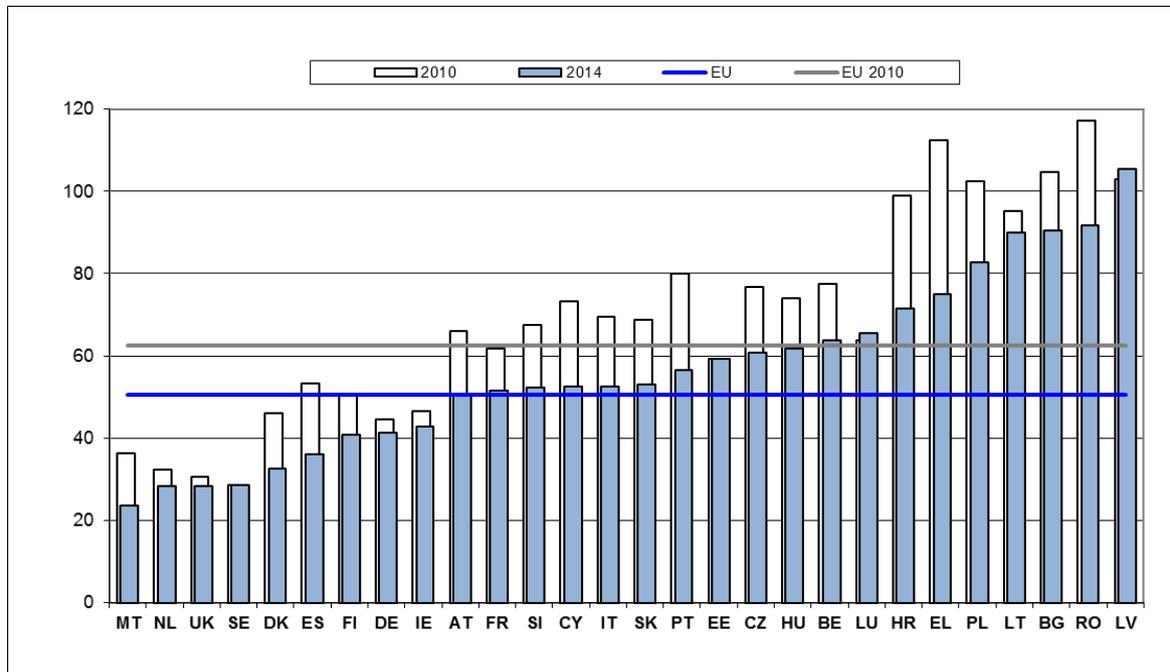
Source: CARE (EU road accident database) National Data 2015

The number of road deaths per 100,000 inhabitants in 2013 was 5.1 (the provisional estimate for 2014 shown in Figure 2 is 5.0) compared with 6.3 in 2010. This is the lowest road death rate achieved by any world region. However, there is more than a threefold variation between the lowest and highest road death rates across the EU.

The average rate of deaths per kilometre travelled for countries with available information ranging between 2009 and 2013 (EU 21) indicates an average rate of 8.4 deaths per billion vehicle kilometres driven. The highest road death rate is found in

Poland at 21 deaths per billion vehicles kilometres This is more than 5 times as high as the lowest: Sweden, Britain and Ireland with 4 deaths per billion vehicle kilometres driven).<sup>13</sup>

Figure 2: EU Road death rates per population 2010-2014



Source: CARE (EU road accident database) National Data 2015

### 3.3.2 Road deaths by gender, user type, age

As shown in this section most deaths in road collisions are to males, car occupants and young adults. Inequalities in the risk of death in road crashes are evident by gender, road user type and age.

The vast majority of deaths in 2013 involved males (76%) and 24% were females. Males have three times the death rate of females and demonstrate riskier behaviours such as speeding.<sup>14</sup> Before the European Court of Justice (ECJ)'s gender ruling came into effect on 21 December, 2012, insurers were able to take gender into account when calculating premiums to reflect the greater risks incurred by males.<sup>15</sup> This is no longer possible and the road safety impact of lower insurance premiums for males should be evaluated to inform action on reducing this inequality in risk.

For the EU as a whole in 2013, nearly half of road fatalities (47%) were car occupants. Pedestrians contributed the largest share of vulnerable road user deaths (23%) followed by powered two wheelers (18%) and 8% of all road deaths were cyclists. The specific contribution of different road user groups to overall fatality totals differs in many Member States due to modal split and other factors. Compared with 2010, the

<sup>13</sup> European Transport Safety Council (2014) *Ranking EU Progress On Road Safety*, 8th Road Safety Performance Index Report, Brussels.

<sup>14</sup> European Transport Safety Council (2013). *Back on track to reach the EU 2020 Road Safety Target*, 7th Road Safety PIN Report, Brussels.

<sup>15</sup> Council Directive 2004/113/EC of 13 December 2004 implementing the principle of equal treatment between men and women in the access to and supply of goods and services.

largest percentage decreases in EU road deaths in 2013 were for car occupants, powered two wheeler riders and van occupants. Deaths in buses during this period (though very small numbers in total) increased by almost a third. As shown in Table 1 the rate of decline in deaths between 2010 and 2013 was markedly slower amongst pedestrians, cyclists and heavy goods vehicle occupants than for other groups.

*Table 1: Road deaths by road user type*

<i>Road user type</i>	<i>% of all deaths 2013</i>	<i>% change in numbers of deaths 2010-2013</i>	<i>% change in numbers of deaths 2001-2013</i>
Car occupants	47%	-20%	-59%
Pedestrians	23%	-6%	-44%
Motorcycle riders	15%	-17%	-31%
Bicycle riders	8%	-5%	-43%
Moped riders	3%	-29%	-67%
Van occupants	3%	-19%	-51%
HGV occupants	2%	-5%	-32%
Bus occupants	1%	32%	-48%
Agricultural vehicle users	1%	-13%	-49%
Other road users	1%	2%	-50%

Source: CARE (EU road accident database) National Data 2015

Most reported deaths in road crashes involve motor vehicles, the majority involving passenger cars, as shown in Table 2.

*Table 2: Road deaths involving different motor vehicle types*

<i>Vehicle type</i>	<i>% of all deaths 2013</i>
Cars	75%
Powered two wheelers	19%
Heavy goods vehicles	15%
Goods vehicles <3.5 tonnes	8%
Buses	5%

Source: CARE (EU road accident database) National Data 2015

The large variation in fatality risk on EU roads amongst different types of road user and between protected and unprotected groups is well-known.<sup>16</sup> Recent data adjusted for distance travelled is not available at EU level. However, analysis in one Member State where recent travel data is available indicates that motorcyclists are at by far the highest risk of death (accounting for less than 1% of traffic but 19% of fatalities in 2013), with pedal cyclists and pedestrians forming the next highest risk groups. While comprising the largest share of deaths, car occupants sustained the lowest risk of these modes.<sup>17</sup>

EU road deaths in all age-groups have been reduced since 2010 particularly for the under 30 years age group, although the rate of decline between 2010 and 2013 is markedly slower for those aged over 65 years than for other groups.

<sup>16</sup> European Transport Safety Council (2003) *Transport safety performance in the EU: a statistical overview*, Brussels.

<sup>17</sup> Department of Transport (2014) *Reported Road Casualties Great Britain: Annual Report 2013*, HMSO.

Table 3: Road deaths by road user age: 2013

Road user age	% share of all known ages	% change in numbers of death 2010-2013	% change in numbers of deaths 2001-2013
<15	2%	-27%	-69%
15-17	2%	-35%	-70%
18-24	15%	-26%	-62%
25-30	10%	-22%	-61%
31-49	25%	-23%	-55%
50-64	19%	-13%	-40%
>=65	25%	-6%	-35%

Source: CARE (EU road accident database) National Data 2015

Global Burden of Disease data for 2010 in 26 EU countries indicate that road traffic injury was the leading or second leading cause of death for school aged children and young people (5-24 age group). In 21 EU countries (75%), road traffic injury was amongst the three leading causes of death for those aged 5-49 years.<sup>18</sup>

### 3.3.3 Road deaths by road type

In 2013, some 55% of deaths in road collisions (14,200) occurred in non built-up areas, 38% (9,800) in built-up areas and 7% (2,000) on motorways. Since 2010 reductions in deaths occurred in all road types, although the rate of decline was markedly less for motorways than for other road types, as shown in Table 4.

Table 4: Road deaths by road type: 2013

Road type	% total deaths 2013	% change 2010-2013	% change 2001-2013
Non built-up areas	55%	-19%	-55%
Built-up areas	38%	-18%	-52%
Motorways	7%	-4%	-47%

Source: CARE (EU road accident database) National Data 2015

With the exception of pedestrian deaths, the majority of road user deaths occurred on non built-up roads.

### 3.3.4 Road deaths at work or travelling to work

While statistical information is limited, work-related motor vehicle crashes are a leading cause of death and long-term injury in the workplace and in driving associated with work. In several EU countries, between 40% and 60% of all work accidents resulting in death are road crashes while using the road for work and while commuting.<sup>19</sup>

### 3.3.5 Serious injuries

In 2013, 220,000 police-reported serious injuries were recorded, although country estimates indicate that this may comprise only 70% of the total serious injuries sustained.<sup>20</sup> This represents around a 9% decrease compared with 2010 figures - half of what was achieved for road deaths. Since 2001 a 44% decrease in serious injuries has been achieved compared to a 53% decrease in deaths with the majority of EU countries experiencing more rapid reductions in road deaths than in serious injuries.<sup>21</sup>

<sup>18</sup> Institute of Health Metrics and Evaluation IHME (2013). *Global Burden of Disease: Generating Evidence, Guiding Policy*, Institute of Health Metrics and Evaluation, University of Washington, Seattle.

<sup>19</sup> DaCoTA (2012). *Work-related road safety*, Deliverable 4.8v of the EC FP7 project DaCoTA, Brussels.

<sup>20</sup> Elvik R, Mysen A B (1999). *Incomplete accident reporting: Meta-analysis of studies made in 13 countries*. Transportation Research Record No 1665, 133-140.

<sup>21</sup> European Transport Safety Council (2014). *Ranking EU Progress On Road Safety*, 8th Road Safety Performance Index Report, Brussels

Serious injuries can be a life-long burden to crash victims and their families, have major impact on their personal and working lives and result in large costs to society and employers. It is estimated that for every death in EU countries, there are at least 4 permanently disabling injuries such as to the brain or spinal cord and 10 serious injuries.<sup>22</sup> While more work is needed at EU level on serious injury costs, research indicates that these injuries are very costly whatever their duration particularly motorcycle leg and head injuries and injuries to vulnerable road users.<sup>23</sup> Member States have agreed to provide serious injury data sets using the new common EU definition (MAIS  $\geq 3$ ) to the Commission starting with 2014 data in mid-2015 (See Annex 4).

### 3.3.6 Serious and fatal crash types

In 2013, around 25,900 reported collisions in the EU 28 resulted in fatal injuries (with, an average of just over 1 person killed per fatal collision) and representing a reduction of 6% compared with 2010 levels. In 2013, there were around 205,000 reported serious injury producing crashes representing reductions of 1% respectively compared with 2010 levels. The main road traffic crash types which need to be addressed to reduce fatal and serious injury on EU roads are:<sup>24 25</sup>

- Head-on crashes typically kill and seriously injure car occupants even in the best designed vehicles at speeds greater than 70 km/h. In depth research shows that Frontal crashes account for about 55% of passenger car fatalities and serious injuries.<sup>25</sup> Different factors influence crash severity, the most important being speed of travel, seat belt use, vehicle mass and the level of crash protection and mitigation provided in the vehicle.
- Side impacts at intersections typically kill and seriously injure car occupants even in the best designed vehicles at speeds greater than 50 km/h. Of passenger car fatalities and seriously injured, side impacts account for about 35 to 40%.<sup>25</sup>
- Run-off-road crashes into rigid fixed objects produce a high number of fatal and serious outcomes at speeds greater than 70 km/h for frontal impacts and 50 km/h for side impacts even in the best designed vehicles.
- Other motor vehicle impacts The remainder include rear impacts (5%) and other impact types.
- Walking and cycling across or along the road The risk of being killed in traffic per kilometres travelled is 9 times higher for pedestrians than car occupants and 7 times higher for cyclists.<sup>26</sup> Pedestrian and cyclist risk increases steeply in mixed speed traffic when traffic speeds are greater than 30 km/h. Research suggests that the majority of all fatally and seriously injured pedestrians in Europe are hit by the fronts of cars.<sup>27</sup> The survival of these vulnerable road users depends upon their separation from the high speeds of motor vehicles or, where shared use is common, sufficiently low vehicle impact speed to prevent severe crash injury and provision of crash protective car fronts and, for cyclists, underrun protection on trucks. Single vehicle crashes are most common for cyclists.<sup>28</sup>

<sup>22</sup> Mackay G M (2005). *Quirks of Mass Accident Data Bases*, Journal of Traffic Injury Prevention 6:4 (308-311), December 2005.

<sup>23</sup> Eds. Peden M, Scurfield R, Sleet D, Mohan D, Hyder A, Jarawan E, Mathers C (2004). *World Report on Road Traffic Injury Prevention*, World Health Organisation and World Bank (Washington), Geneva.

<sup>24</sup> United Nations Road Safety Collaboration (UNRSC) (2011). *Safe Roads for Development: A policy framework for safe infrastructure on major road transport networks*, WHO, Geneva.

<sup>25</sup> Euro NCAP (2014). *2020 Roadmap, European New Car Assessment Programme*, Brussels.

<sup>26</sup> European Transport Safety Council (2003). *Transport safety performance in the EU: a statistical overview*, Brussels.

<sup>27</sup> European Enhanced Vehicle-Safety Committee (EEVC)(1998 updates 2002). Working Group 17 Report *Improved test methods to evaluate pedestrian protection afforded by passenger cars*.

<sup>28</sup> Peden M., Scurfield R, Sleet, D, Mohan D, Hyder A, Jarawan, E and Mathers, C. eds.(2004). *World Report on Road Traffic Injury Prevention*, World Health Organisation, World Bank, Geneva.

Motor vehicle crashes are the leading cause of traumatic brain injury. The priorities for preventing severe injuries in road collisions are head and spinal injuries. Pedestrians and motorcyclists suffer the most severe injuries as a result of motor vehicle collisions, report more continuing medical problems and require more assistance, compared with other types of road user.<sup>28</sup> Fatally injured motorcyclists sustain multiple injuries to the head, chest and legs with the majority to the head, despite helmet use. Lower-leg injuries result either from direct contact with the impacting vehicle or result from impact between the motorcycle and the ground. Head injuries are the major cause of death in around 75% of cyclist deaths and head or brain injury is present in about 50% of all younger hospitalised crash victims.<sup>29</sup>

### 3.3.7 Social costs and the value of prevention

A recent update of the external costs of road transport<sup>30</sup> estimates that the average value for the prevention of a road fatality across EU 28 is €1.87 million (based on 2010 prices and using willingness to pay.<sup>31</sup> The European Transport Safety Council, employing a similar good practice methodology<sup>32</sup> estimates that the value of preventing a road fatality for the EU 28 in 2013 was €1.91 million. The potential socio-economic value of preventing 26,000 deaths in 2013 is very large, estimated at almost €50 billion. The total value of the reductions in road deaths in the EU28 for 2013 compared to 2010 is estimated at approximately 10.7 billion euro, and the value of the reductions in the years 2011-2013 taken together compared with three years at the 2010 rate is around 18.7 billion euro.<sup>33</sup>

### 3.3.8 Past road fatality trends and progress towards the 2020 target

A substantial 53% reduction in road deaths has been achieved between 2001 and 2013 (54% to 2014 based on provisional figures), as shown in Figure 3.

Deaths decreased particularly sharply by almost 26% between 2007 and 2010. In 2013 there were 18% fewer road deaths compared with the baseline year 2010, equivalent to a 6% average annual reduction (See Annex 5 for EU Member State trends). During 2013, the EU trend continued to be largely positive.

<sup>29</sup> DaCoTA (2012). *Vehicle Safety*, Deliverable 4.8u of the EC FP7 project DaCoTA, Brussels.

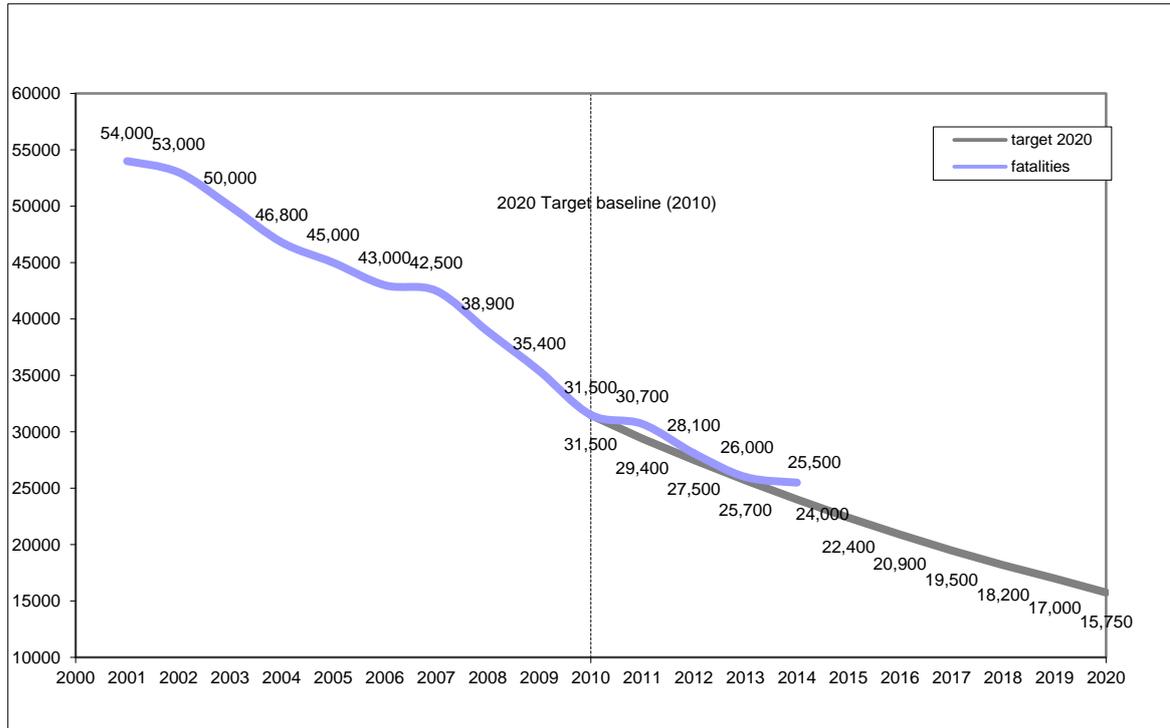
<sup>30</sup> The most important costs of road crashes in the EU cover direct and indirect costs and comprise medical costs, production losses, material damage, administrative costs and an estimated monetary value of the prevention of pain, grief and suffering.

<sup>31</sup> Ricardo-AEA (2014). *Update of the Handbook on External Costs of Transport, Final Report for the European Commission*: DG MOVE, ED57769 Issue Number 1.

<sup>32</sup> While both valuations use the willingness to pay method to assess the value of preventing a fatality the Handbook values are at market prices, whereas the ETSC value is at factor cost and around 20% higher. See European Transport Safety Council (2011) *Methodological Note PIN Report 2011*, and ETSC(2014) *Monetary Valuation of EU-wide road safety developments in 2013*, RE Allsop, 2014.

<sup>33</sup> European Transport Safety Council (2014) 8<sup>th</sup> PIN Report, Brussels.

Figure 3: Trends in EU road deaths and progress towards the 2020 target



Source: CARE (EU road accident database) National Data (2015)

Provisional figures for 2014 indicate that an average 2% reduction was achieved for EU countries compared with 2013 (See Annex 5 for EU and national trends). Compared with 2010 levels this represents a 4% annual reduction. This means that an average annual reduction of at least 8% between 2015 and 2020 is needed to achieve the target of no more than 15,500 road deaths across the EU.

While this dip may be an annual random fluctuation, various factors indicate that the sharp decline in deaths observed since 2007 may not continue. Indeed, recent annual changes since 2012 in the six most populous Member States which contribute over 70% of all road deaths as well as 75% of the EU passenger vehicle fleet indicate a challenging course towards the 2020 target (See Table 5).

Table 5: Trends in Member States with most population and most road deaths

Member State	% population	% total deaths	% change 2010-2013	% change 2012-2013	% change 2013-2014
France	13%	13%	-18%	-11%	4%
Germany	16%	13%	-8%	-7%	0%
Italy	12%	13%	-18%	-7%	-6%
Poland	8%	13%	-14%	-6%	-5%
Spain	9%	7%	-32%	-12%	0%
United Kingdom	13%	6%	-7%	-2%	3%
	<b>71% EU total</b>	<b>65% EU total</b>	<b>-13% change</b>	<b>-7.5% change</b>	<b>-1.1% change</b>

Source: CARE (EU road accident database) National Data (2015)

Recent forecasting in Great Britain, for example, indicates that the percentage reduction in deaths between 2010 and 2020 may not be more than 22%, based on 'business as usual'.<sup>34</sup>

However, even in the better performing countries further large reductions in deaths by 2020 are possible. In Sweden, a 50% reduction in deaths by 2020 compared with 2010 has been targeted towards their eventual elimination. A comprehensive analysis has shown that the 50% target is achievable. Here, a sharp focus on traffic system factors which are causally related to fatal outcomes has been adopted.<sup>35</sup> In Britain and the UK, a range of new intervention has been identified which could produce substantial further savings in deaths and serious injuries.<sup>36 37</sup>

### 3.3.9 External factors influencing trends

Progress towards the achievement of road safety targets is influenced by a range of factors. These include external factors relating to exposure – economic, traffic and demographic trends – the scope, quality and amount of systematic intervention and how far it relates to the evidence base for road casualty reduction and the quality of implementation and institutional delivery. This section presents a range of external factors which are influencing the road safety results achieved in EU countries.

#### Economic factors

Various studies have indicated a relationship between economic development levels of countries and road safety levels. A recent review on road safety and economic development noted that the global financial crisis in 2007-2008 was accompanied by marked falls in annual numbers of road deaths in most OECD countries.<sup>38</sup> These reductions were larger than might be expected a result of road safety policies and other influences. The review found strong statistical associations between national annual numbers of road deaths and both GDP per inhabitant and unemployment rate in high-income countries in Europe, Japan and the USA. It concluded that the substantial majority of studies indicate that, other things being equal, economic recession is associated with a reduction in road deaths and economic growth is associated with an increase in road deaths. The numbers of road deaths tend to be lower when unemployment is higher, particularly among those aged 18-24 compared with deaths at all ages. This is possibly explained by the fact that young drivers, who in general have a substantially higher crash risk and a relatively high share in the number of road casualties, are more responsive to economic fluctuations. They may be the first who lose their job in times of economic recession, and the first to find a new job in economic recovery.<sup>39</sup> Some consequential changes for road safety of a fall in GDP per inhabitant and a rise in unemployment are fewer vehicle kilometres travelled; some being driven more safely (e.g. from drivers wishing to save fuel by speeding less or from a reduction in drinking and driving) and the proportion driven by young adults may be smaller.<sup>38</sup>

For the EU 28, the sharp declines in road deaths between 2007 and 2010 (particularly for the <24 years age group) coincided with a marked decline in GDP growth. Unemployment levels for EU 28, particularly for young people rose sharply (See Annex

<sup>34</sup> Mitchell CGB and RE Allsop (2013). *Projections of road casualties in Great Britain to 2030*, PACTS, London.

<sup>35</sup> Swedish Transport Administration (2014), *Analysis of Road Safety Trends 2013, Management by objectives for road safety work towards the 2020 interim targets*, Borlänge.

<sup>36</sup> Parliamentary Advisory Council for Transport Safety (PACTS) 2014 *PACTS Campaign Priorities for Road Safety*, Westminster..

<sup>37</sup> Department for Transport (2009), *A Safer Way: Consultation on making Britain's roads the safest in the world*, London, HMSO..

<sup>38</sup> ITF/OECD (2015 in print). *Road safety and economic development*, Paris.

<sup>39</sup> ITF/OECD (2015 in print). *Road Safety And Economic Development*, Paris, Paper by Wijnen W and Rietveld P *The Impact Of Economic Development On Road Safety: A Literature Review*.

7). A steeper downward trend in HGV traffic and HGV-involved road deaths compared with total traffic and all deaths also took place during 2007 and 2009 (See Annexes 6 and 8). As noted in Box 2, an in-depth analysis in one Member State identified likely influences of the recession on the number of road deaths through reduction in vehicle kilometres driven, especially by young men and by heavy goods vehicles (accounting between them for about half the fall in road deaths between 2007 and 2009), reduction in speeding and in drink driving, and reduction in learning to drive by young men.<sup>40</sup>

As countries show stronger economic development compared with the lowest levels of GDP experienced in recent years and if the current, substantially lower costs of fuel are sustained to 2020 and beyond, further negative impacts on the number and rate of deaths in road collisions can be expected without new road safety intervention.

**Box 2: Road safety and economic development in Britain**

In Britain a detailed investigation was carried out of how a wide range of factors may have contributed to the falls in annual numbers of road deaths in Great Britain between 2007 and 2010. The findings provide strong support for the hypothesis that changes influenced by the recession have had a major role in leading to these falls. The study identified likely influences of the recession on the number of road deaths through reduction in vehicle-km driven, especially by young men and by heavy goods vehicles (accounting between them for about half the fall in road deaths between 2007 and 2009), reduction in speeding and in drink driving, and reduction in learning to drive by young men. Other identified likely contributors to the fall in road deaths were two severe winters and stricter enforcement of some traffic laws. Accelerated improvement in car occupant protection is ruled out as a likely substantial contributor to the unusual size of the fall in deaths. Road safety policy and its implementation remained broadly unchanged from 2007 until halfway through 2010.

Source: ITF/OECD (2015 in print)<sup>40</sup>

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Traffic trends

The amount of travel is a key factor affecting the number of deaths on the road. Traffic volume trends and vehicle registration data also reflect changes in the growth of GDP as shown in Annex 6. Sharp decreases in passenger kilometres travelled from a peak in 2008 and particularly sharp reductions in the volume of goods traffic between a peak in 2007 and 2009, gradually increasing after 2009 but neither recovering to peak levels. Data collected by the AESCAP indicates that motorway toll traffic amongst their member organisations increased by over 8% between 2010 and 2013.<sup>41</sup> The absence of EU 28 information traffic volume for all road types and user types is notable and there is little national information on pedestrian and cyclist volumes which impedes analysis. Some countries report increases in cycling in recent years. In Britain, for example, road traffic estimates have shown a gradual increase in the distance cycled in Great Britain, with a 1% rise between 2012 and 2013. This figure is 13% higher than the 2005-09 average. While the number of pedal cyclist fatalities decreased each year between 2005 and 2009, the number of annual deaths has fluctuated since then with some evidence of a slight upward trend.<sup>42</sup> The Swedish

<sup>40</sup> ITF/OECD (2015 in print). *Road safety and economic development*, Paris. Noble B, Lloyd D, Fletcher J, Lloyd L, Reeves C, Broughton J and J Scoons, *Fatal Road Casualties In Great Britain: Two Studies Relating Patterns To Wide Ranging Exposure Factors*.

<sup>41</sup> AESCAP (2011-2014). *AESCAP in Figures*, Association Européenne des Concessionnaires des Autoroutes, Paris.

<sup>42</sup> Department for Transport (2014) *Reported Road Casualties Great Britain: 2013 Annual Report*, HMSO, London.

Transport Administration reported an increase in the number of seriously injured cyclists in 2013 and concluded that the outcomes coincided with increased exposure.<sup>43</sup> Further business traffic and private travel increases associated with economic growth, and modal shift increases to potentially healthier but riskier (for the time being at least) travel modes such as cycling and walking will necessitate a redoubling of efforts to reduce fatal outcomes in line with targets.

#### Demographic factors

Important demographic factors in relation to fatal injuries concern the percentage share of the total population of young people (who are at disproportionately high risk of serious and fatal crash involvement), of older users (who are at disproportionately high risk of serious and fatal crash injury due to physical vulnerabilities) and the age group with the largest share of total population. Eurostat population statistics (2014) indicate a declining share for those aged <49 years (11.5% in 2013 compared with 13% in 2002 for the 15-24 age group) but a rising share for people over 50 (38.3% in 2013 compared with 33.8% in 2002) which will continue to rise for the remainder of the strategy period. The largest contributing group is the 25-49 age group which 35% of the total EU 28 population in 2013 (compared with 36.6% in 2002).

#### Weather factors

Weather factors also have an impact on levels of deaths and serious injuries and affect crash rates and exposure to hazards. Weather conditions partly determine decisions about whether to travel, road conditions as well as driver behaviour.<sup>44</sup> For example a fall in road deaths was associated, along with other key factors, with two severe winters in the UK. Possible reasons given were that drivers may drive less and also more cautiously when roads are visibly more risky.<sup>45</sup>

### **3.4 Intermediate outcomes**

#### **3.4.1 Factors causally related to fatal and serious injuries**

This section looks at selected road safety factors which are causally related to the number and risk of death and serious injury (intermediate outcomes) in countries which collect such information. Periodic survey data is not collected or available for EU 28 and it is not possible to make a systematic review of 2013 against 2010 outcomes, although some comparable information is available for 2009 and 2012. Further EU and national progress in addressing all these areas will underpin the achievement or otherwise of targets and goals to 2020 and beyond.

In introducing this section it is worth mentioning that a common perception in road safety is that human error is by far the most important contributory factor to road crashes and their outcomes. Over the last decade, research concerning crash causation indicates that, while a key factor, the role of human behaviour may have been overstated or oversimplified in past research methodologies.<sup>46</sup> Factors contributing to serious and fatal road crashes and their outcomes are differently distributed compared with those associated with crashes of all severities which is a central consideration in addressing EU road fatality reduction targets.<sup>47,48</sup> The extent

<sup>43</sup> Swedish Transport Administration (2014), *Analysis of Road Safety Trends 2013, Management by objectives for road safety work towards the 2020 interim targets*, Borlänge

<sup>44</sup> SWOV (2012). *Fact sheet: The influence of weather on road safety*, Leidschendam.

<sup>45</sup> Noble B, Lloyd D, Fletcher J, Lloyd L, Reeves C, Broughton J and J Scoons, *Fatal Road Casualties In Great Britain: Two Studies Relating Patterns To Wide Ranging Exposure Factors* in OECD/ITF (2015 in print), *Road safety and economic development*, Paris.

<sup>46</sup> Kimber R (2003). *Traffic and Accidents: Are the Risks Too High?* TRL, Imperial College London.

<sup>47</sup> Stigson H, Krafft M, Tingvall C (2008). *Use of fatal real-life crashes to analyze a safe road transport system model, including the road user, the vehicle, and the road*. *Traffic Injury Prevention* 9(5): 463-71.

to which road traffic system elements address known human tolerance thresholds and other human characteristics is also important. A focus on road network safety factors, vehicle safety factors, emergency medical system factors that address common human error as well as offering crash protection and injury mitigation to address known human characteristics is key to identifying actions to address goals and targets for serious and fatal injury. The speed of motorised vehicles is central since it affects both crash causation and crash severity and influences the effectiveness of a range of measures. This understanding forms the basis of the *Safe System* approach which is being promoted widely by international organisations and adopted increasingly all over the world (See Annex 1).

### 3.4.2 Levels of mean speed, excess speed

Managing speeds to safe levels is at the core of the road safety challenge. Studies show that for both urban and rural environments, small differences in speed can have a substantial effect on the occurrence and severity of road crashes and injuries.<sup>49 50 51</sup> The chances of survival for an unprotected pedestrian hit by a vehicle diminish rapidly at speeds greater than 30 km/h, whereas for a properly restrained motor vehicle occupant the critical impact speed is 50 km/h (for side impact crashes) and 70 km/h (for head-on crashes).<sup>52</sup>

Research indicates that 1% decrease in average speed corresponds with a 2% decrease in injury crashes, a 3% decrease in serious injury crashes and a 4% decrease in fatal crashes and vice versa.<sup>49 50</sup> On this basis it is estimated that more than 1000 fatal road crashes could have been prevented in 2013 if average speeds had dropped by just 1 km/h on all roads across the EU. Measuring and targeting reductions in average speeds is internationally recommended good practice, although this is by no means common practice in EU countries.

Non-compliance with speed limits is widespread and excess speed is identified as a primary factor in about one third of EU fatal road collisions.<sup>53</sup> In countries where data are available, and collected in free-flowing traffic, the latest available information indicates that between 10 and 50% of drivers exceed speed limits on motorways, between 10% and 60% on rural roads and between 30% and 60% on urban roads.<sup>54</sup> Even in Sweden, the EU's road safety leader in 2013, despite the reduction in average speeds, the share of traffic volume within speed limits was estimated at just under 47% (target 80%) on national roads and just over 63% (target 80%) on municipal roads. Better compliance with speed limits is one of the major challenges identified by Sweden to meet the EU 2020 target.<sup>55</sup>

<sup>48</sup> Stigson H, Kullgren A and Krafft M (2011). *Use of Car Crashes Resulting in Injuries To Identify System Weaknesses*, Paper presented at the 22nd International Technical Conference on the Enhanced Safety of Vehicles (ESV). Washington DC. DOT/NHTSA.

<sup>49</sup> Nilsson G. (2004) Traffic safety dimensions and the power model to describe the effect of speed on safety. Bulletin 221, Lund Institute of Technology, Lund

<sup>50</sup> Elvik R, Christensen P, Amundsen A, (2004) *Speed and Road Accidents, an evaluation of the Power Model*, TOI, Oslo.

<sup>51</sup> Taylor MC, D A Lynam DA and A Baruya (2000) *The effects of drivers' speed on the frequency of road accidents*, TRL Report 421, Crowthorne.

<sup>52</sup> Tingvall C and N Haworth (1999). *Vision Zero - An ethical approach to safety and mobility*, Paper presented to the 6th ITE International Conference Road Safety & Traffic Enforcement: Beyond 2000, Melbourne, 6-7 September 1999.

<sup>53</sup> OECD/ECMT (2006). *Speed management*, OECD, Paris.

<sup>54</sup> ETSC (2014). *Ranking Progress on EU Car Occupant Safety* PIN Flash Report 27, Brussels.

<sup>55</sup> Swedish Transport Administration (2014), *Analysis of Road Safety Trends 2013, Management by objectives for road safety work towards the 2020 interim targets*, Borlänge.

### 3.4.3 Levels of seat belt and child restraint use

Seat belt use is compulsory in cars across EU 28 countries and is covered by EU legislation.<sup>56</sup> Average seat belt use in cars in the EU in 2012 was estimated to be 88% for front seats and 74% for rear seats in the 26 countries monitoring wearing levels periodically.<sup>57</sup> Across the EU, an estimated 8,600 occupants of cars survived life-threatening collisions in 2012 because they wore a seat belt. Another 900 deaths could have been prevented if 99% of all occupants had been wearing a seat belt.<sup>57</sup>

In 2012, France, Germany and Sweden had the highest seat belt wearing rates of 98% for front seat occupants (compared with 95% in 2009). Seat belt use in front seats increased most between 2005 and 2012 in the Czech Republic, Estonia, Belgium, Spain, Hungary and Portugal. Over 98% of rear seat occupants were restrained in Germany, the best performer with 4 times the wearing level of Greece (21%). Seat belt use in rear seats increased most between 2005 and 2012 in Estonia, Ireland, Slovenia, Czech Republic, Spain and Hungary.<sup>57</sup> An EU-wide seat belt survey conducted by TISPOL, the European Traffic Police Network, in September 2013 found that 104,533 tickets for failure to wear a seat belt were issued in the course of one week.<sup>57</sup>

### 3.4.4 Levels of drinking and driving

Data from roadside checks conducted by the police in 19 EU countries in 2010 indicated a wide range of compliance with excess alcohol laws ranging from 0.6% over the legal limit to 5.3%.<sup>58</sup> About 25% of all road fatalities in Europe are alcohol-related whereas only 1.6% of all kilometres driven in Europe are driven by drivers with 0.5 g/l alcohol or more in their blood.<sup>59</sup> It is estimated that 3.45% of all passenger car kilometres in Europe are being driven by drivers under the influence of alcohol (0.1 g/L or higher), while 0.4% of all kilometres are being driven with a blood alcohol content level of 1.2 g/L or higher.<sup>60</sup> In one Member State registering the lowest percentage of drivers over the limit, an in-depth study of fatal crashes found that some 19% of fatally injured passenger car drivers were killed were under the influence of alcohol (blood alcohol concentration  $\geq 0.2$ ) in 2013.<sup>61</sup>

### 3.4.5 Levels of crash helmet use by powered two wheelers

Research shows that the use of crash helmets by powered two wheeler riders can reduce fatal injury by around 44% and that compulsory use legislation increases use and prevents brain injury.<sup>62</sup> <sup>63</sup> Although use is not covered by EU Directive, all Member States have crash helmet wearing laws. Data on current levels of helmet use by riders is incomplete for EU 28. Many countries report high levels of use, but there are indications of potential for improvement in some countries e.g. Italy, Greece and Romania.

<sup>56</sup> EU Directive 91/671/EEC and EU Directive 2003/20/EC on the approximation of the laws of the Member States relating to the compulsory use of safety belts in vehicles of less than 3.5 tonnes.

<sup>57</sup> ETSC (2014). *Ranking Progress on EU Car Occupant Safety* PIN Flash Report 27, Brussels.

<sup>58</sup> DRUID (2012). *Driving Under the Influence of Drugs, Alcohol and Medicine*, Integrated Project 1.6.

Sustainable Development, Global Change and Ecosystem 1.6.2: Sustainable Surface Transport, 6th Framework Programme, Brussels.

<sup>59</sup> DaCoTA (2012). *Alcohol*, Deliverable 4.8a of the EC FP7 project DaCoTA, Brussels.

<sup>60</sup> ECORYS, COWI (2014). *Study on the prevention of drink-driving by the use of alcohol interlock devices* Final Report, Rotterdam.

<sup>61</sup> Swedish Transport Administration (2014). *Analysis of Road Safety Trends 2013, Management by objectives for road safety work towards the 2020 interim targets*, Borlänge.

<sup>62</sup> Elvik R, Vaa T, Høy A, Erke A and M Sørensen Eds. (2009). *The Handbook of Road Safety Measures*, 2nd revised edition Emerald Group Publishing Limited, ISBN: 9781848552500.

<sup>63</sup> Servadei F, Begliomini C, Gardini E, Giustini M, Taggi F, Kraus J. (2003). *Effects of Italy's motorcycle helmet law on traumatic brain injuries*. *Injury Prevention* 9:257 -260.

### 3.4.6 Levels of crash helmet use by cyclists

Bicycle helmets can reduce the risk of head and brain injuries by between 63% and 88%.<sup>64</sup> Few EU countries mandate the use of cycle helmets. Several require the use of helmets by children. Little information is generally available on levels of use. Usage levels reported in 2008/9 indicate a range of between 11% and 40%, and large potential for further reductions in head injuries.<sup>65</sup>

### 3.4.7 Safety ratings of the road network in non built-up areas

Systematic risk rate mapping, performance tracking and safety rating is carried out by the European Road Assessment Programme (Euro RAP) and International Road Assessment Programmes (iRAP). Road protection scores assess the level of protection afforded by the road environment against death and serious injury in the event of a crash. Each road is given a star rating from 1 to 4 stars. Minimum Euro RAP star ratings for the infrastructure safety of major roads are increasingly being used in targeted programmes.<sup>66</sup>

While comprising some of the EU's busiest corridors a relatively small proportion of total EU deaths (5%) occur on the TEN-T network. However, Euro RAP monitoring (2011) of 50% of the TEN-T network against a *Safe System* assessment model indicated that less than one third (31%) of assessed TEN-T network length has the best possible safety standard.<sup>67</sup> Monitoring shows that even among the EU road safety leaders, there is significant potential for improved infrastructure safety performance. For example, in Britain where most road deaths are concentrated on just 10% of the road network (motorways and 'A' roads outside major urban areas) 14% of the network surveyed has unacceptably high risk.<sup>68</sup> The risk of death and serious injury to road users is 7 times greater on an average single carriageway than a motorway with some single roads representing more than 20 times the motorway risk. Targeting a minimum 3 star safety standard for motorways and A roads in Britain via a capital investment of £8.2 billion over 20 years, could save 600 lives annually, equivalent to £34 billion over a 20 year life of measures implemented.<sup>69</sup>

### 3.4.8 Safety ratings of new vehicles

Systematic rating of the safety quality of vehicles key crash tests is carried out by the European New Car Assessment Programme (Euro NCAP). Research shows that 5-star rated Euro NCAP cars have a 68% lower risk of fatal injury and a 23% lower risk of serious injury compared to 2-star rated cars.<sup>70</sup> A periodic assessment of the safety quality of the EU vehicle fleet using Euro NCAP ratings is not available. The average age of the EU vehicle fleet in 2010 was 8.3 years with the oldest national fleet almost twice as old as the age of the youngest.<sup>71</sup> The younger the fleet, the greater the opportunity for countries to benefit from life-saving technologies being introduced into new vehicles with the highest Euro NCAP ratings. National promotion and fast-tracking of new technologies is needed to ensure faster take-up. Sweden, for example, through

<sup>64</sup> DaCoTA (2012). *Vehicle Safety*, Deliverable 4.8u of the EC FP7 project DaCoTA, Brussels.

<sup>65</sup> ETSC(2011). 5<sup>th</sup> PIN Report, 2001 *Road safety target outcome: 100,000 fewer deaths since 2001*, Brussels

<sup>66</sup> Hill J and Starrs C (2011), *Saving lives, saving money. The costs and benefits of achieving safe roads*, Road Safety Foundation and RAC Foundation, <http://www.roadsafetyfoundation.org/media/1107>

<sup>67</sup> European Road Assessment Programme (Euro RAP (2011). *How safe are you on Europe's Trade Routes? Measuring and mapping the safety of the TEN-T road network*, Basingstoke.

<sup>68</sup> Euro RAP (2014). *How safe are you on Britain's roads?* Road Safety Foundation. Basingstoke.

<sup>69</sup> Hill J and Starrs C (2011). *Saving lives, saving money. The costs and benefits of achieving safe roads*, Road Safety Foundation and RAC Foundation, <http://www.roadsafetyfoundation.org/media/1107>.

<sup>70</sup> Kullgren A, Lie A, Tingvall C (2010). *Comparison between Euro NCAP test results and real-world crash data*. Traffic Injury Prevention. 2010 Dec 11(6):587-93.

<sup>71</sup> ACEA (2013). *Pocket Guide*, Brussels.

the actions by its road safety lead agency, increased the percentage of new cars sold in Sweden with the highest Euro NCAP rating from 66% in 2007 to 87% in 2013.<sup>72</sup>

#### **3.4.9 Efficiency of emergency medical system response**

Reducing the time between crash occurrence and arrival of emergency services from 25 to 15 minutes reduces deaths by one third.<sup>73</sup> Annual systematic monitoring data for emergency medical response is not available for EU 28.

#### **3.4.10 Other factors**

Other identified factors which have an impact on serious and fatal outcomes in road traffic crashes and which deserve more attention in research and intervention include driver distraction<sup>74</sup>, in-car telephone use<sup>75</sup>, fatigue<sup>76</sup> and the use of drugs while driving.<sup>77</sup>

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<sup>72</sup> Swedish Transport Administration (2014). *Analysis of Road Safety Trends 2013, Management by objectives for road safety work towards the 2020 interim targets*, Borlänge.

<sup>73</sup> Sánchez-Mangas R, García-Ferrer A, De Juan A, Arroyo A M (2010). *The probability of death in road traffic accidents. How important is a quick medical response?* Accident Analysis and Prevention 42(2010) 1048).

<sup>74</sup> DaCoTA (2012). *Driver distraction*, Deliverable 4.8f of the EC FP7 project DaCoTA, Brussels.

<sup>75</sup> DaCoTA (2012). *Car telephone use while driving*, Deliverable 4.8b of EC FP7 project DaCoTA, Brussels.

<sup>76</sup> DaCoTA (2012). *Fatigue*, Deliverable 4.8h of the EC FP7 Project DaCoTA, Brussels.

<sup>77</sup> DRUID (2012). *Driving Under the Influence of Drugs, Alcohol and Medicine*, Integrated Project 1.6. Sustainable Development, Global Change and Ecosystem 1.6.2: Sustainable Surface Transport, 6th Framework Programme, Brussels.

## 4 EU road safety interventions

### 4.1 Summary

#### ***Contribution of EU measures towards the 2020 target:***

A systematic scan was carried out of the main road safety interventions implemented or foreseen within *Policy Orientations* 2011-2020 as well as those measures which were implemented before 2011 and which may now be influencing road safety outcomes.

#### ***- EU measures since 2011:***

A wide variety of intervention is foreseen between 2011 and 2020 to address many key road safety problems and with new focus on vulnerable road user safety. In many cases interventions are insufficiently defined in this evolving strategy to allow the estimation of their road safety value or comprise activity which may lead to the identification of future intervention which may or may not be implemented. Many actions are ongoing and implementation since 2011 has been understandably variable, given the complexities of road safety at EU level. Implementation is often dependent on subsequent and, as yet, unknown decisions by Member States. Cross-border enforcement is one example. Furthermore, interventions sometimes insufficiently address the largest fatality groups, consider the safe free movement of people in harmonisation measures or pay enough attention to the evidence base. While a range of valuable preparation has been carried out and important steps taken, the most promising aspects of *Policy Orientations* intervention whether in implementing proven vehicle safety technologies; further developing infrastructure safety or ensuring safety-sensitive powered two wheeler rider and car driver licensing schemes have yet to be adopted and implemented.

#### ***- EU measures before 2011:***

The most promising areas of EU intervention which are likely to be influencing current road safety outcomes are previous EU legislative initiatives in vehicle design and safety equipment: electronic stability control system in cars and trucks; advanced and anti-lock braking systems in motorcycles; daytime running lights in all powered two-wheelers, cars and trucks and pedestrian protection. In many cases fitment has started before legislative deadlines, aided by Euro NCAP, industry initiatives and national fast-tracking measures. (See Section 4.6). An impact assessment for the road infrastructure management legislation is expected shortly and this area also holds much promise, as does the implementation of e-Call.

#### ***Priority measures addressing the 2020 target and beyond:***

Together with the reported road safety results in Section 3, this intervention scan provides a strong indication that new, effective action is needed by the EU and Member States between now and 2020 towards achieving existing targets. In terms of meeting the 2020 target and encouraged by the EU institutions, national priorities should focus on making further progress in securing compliance with the key road safety rules. More or less immediate results can be achieved in the short-term through combined publicity and policy enforcement, particularly to address speeding. For discussion of the further development of the *Policy Orientations*, see Section 5. Suggestions are made here for priority EU action.

#### ***Policy Objective 1: Improve education and training of road users***

- Review Directive 2006/126/EC towards the introduction of a package of effective Graduated Driver Licensing measures for car drivers and powered two-wheeler riders.
- Review Directive 2003/59/EC with a view to introducing new provisions/guidance on demonstrably effective training schemes for professional drivers
- Promote ISO 39001 in work-related road safety activities.

#### ***Policy Objective 2: Increase enforcement of road rules***

- Set up/support annual surveys of levels of compliance with speed limits, excess alcohol legislation and levels of front and rear seat belt use and report on findings.
- Set targets to 2020 at EU and national levels for improved compliance with speed limits, excess alcohol limits and seat belt use legislation and request annual reporting by the High Level Group on Road Safety and CARE.

- Provide new guidance on best practice enforcement of key road safety rules.
- Promote and fund enforcement activity and other intervention in *Safe Corridor* and *Safe City/Safe Town* projects on the TEN-T and secondary network.
- Mandate EU fitment of speed assistance systems and seat belt reminders in all seating positions in all motor vehicles at the earliest opportunity and take a variety of actions in the short-term to encourage the fitment and use of alcolocks e.g. in cross-border enforcement and in best practice guidance on their use in alcohol user rehabilitation.

Policy Objective 3: Safer road infrastructure

- Encourage knowledge transfer and the adoption of the *Safe System* approach to road safety engineering on the TEN-T and the secondary network.
- Establish a safety performance framework for the TEN-T network, require measurement of safety indicators e.g. Euro RAP ratings and mean speed levels.
- Targets a percentage increase in Euro RAP star rating of TEN-T roads to 2020 and beyond.
- Update TEN-T guidelines to ensure that all EU-funded infrastructure conforms to EC Directives 2004/54/EC and 2008/96.
- Set a maximum speed limit or lower of 120 km/h on TEN-T roads.
- Promote and fund *Safe Corridor* and *Safe City/Safe Town* projects on the TEN-T and secondary network comprising road safety engineering and multi-sectoral intervention to achieve results and develop road safety management capacity.

Policy Objectives 4, 5: Safer vehicles and new in-vehicle and integrated safety technologies and equipment

- Ensure that EU vehicle safety standards provide a high level of protection.
- Propose a range of new EU vehicle safety legislation to reduce the number and risk of serious and fatal injury including the following priorities: Autonomous Emergency Braking Systems (AEBS); Speed Assist (advisory and voluntary systems); seat belt reminders for front and rear seat passengers; fitment of adaptive restraints in cars; protection of far-side car occupants in side impacts; improved heavy goods vehicle front end design, rear and side underrun protection; and Lane Keeping Assist.
- Revise EC Directive 2014/24/EU on public procurement to include road safety, alongside existing provisions covering environmental and social aspects.
- Invite the High Level Group on Road Safety to consider national incentives to fast-track proven technologies by a range of means including procurement, safe travel policies, and tax and insurance incentives.
- Through the EU Health and Safety at Work agency, devise safe travel policies for the European Commission as well as promoting take up of ISO 39001 on road safety management systems for organisations.

Policy Objective 6: Improve emergency and post-injuries services

- Commission a study to review the scope of post impact care in reducing deaths and serious injuries in road collisions.
- Include first responder training in EU provisions for commercial and public transport driver training and emergency services personnel.
- Monitor and rank annually through EU databases the role of road traffic injury as cause of death and disability compared with other mortality and morbidity.

▪ Protect vulnerable road users

Policy Objective 7: Protect vulnerable road users

In addition to the actions noted in previous sections:

- Promote and fund a Euro SHARP consumer information programme on powered two-wheeler use crash helmets in cooperation with the UK SHARP programme.
- Monitor the usage levels of helmets by powered two wheeler riders and cyclists across the EU and promote/propose mandatory cycle helmet use legislation for school-aged children across the EU and target increased levels of use; establish a European cycle helmet consumer information programme.
- Promote zero-rated Value Added Tax for cyclist and motorcyclist helmets.

## 4.2 Introduction

The principal aim in this part of the review is to identify what actions have been taken at EU level and how far they might have contributed towards the 2020 target. Note is also taken of past activities falling outside the strategy period 2011-2020 which may be contributing to road safety benefits within this period. For the reasons set out in Section 1.3.1, this part of the review is mainly qualitative and based on expert judgement and knowledge of evidence-based road safety activity.

*Policy Orientations* promotes a systematic approach which takes account of human error and inappropriate behaviour and the role that improvements to vehicles, infrastructure and the emergency medical system can play in preventing human error and limiting injury consequences. Seven strategic objectives are set out which comprise various intervention fields as well as a targeted user group:

1. Improve education and training of road users
2. Increase enforcement of road rules
3. Safer road infrastructure
4. Safer vehicles
5. Promote the use of modern technology to increase road safety
6. Improve emergency and post-injuries services
7. Protect vulnerable road users

Each element is considered in accordance with the methodology set out in 1.3.3. There is considerable overlap between objectives and no attempt has been made to treat each as a comprehensive strategic field. There is particular overlap between Objectives 4 and 5 and assessment is combined to avoid duplication (Section 4.6).

## 4.3 Improve education and training of road users

### 4.3.1 Introduction

This section considers a range of EU education, training and driver and rider licensing initiatives foreseen in Objective 1 of *Policy Orientations* (4.3.2) as well as those adopted in the previous decade which may influence road safety outcomes (See Section 4.3.3) and ends with suggestions for further initiatives to 2020 and beyond (4.3.4).

### 4.3.2 Aim, proposed actions and status of *Policy Orientations* activities

*Policy Orientations* aims for a wider approach than adopted previously by the Commission where education and training is now viewed as a 'lifelong educational continuum'. Specific consideration is anticipated of pre-test learning (particularly on accompanied driving), the driving licence test (broadening to include risk awareness, defensive driving and eco-driving) and post-licence training (for non-professional drivers). The specific proposed action is set out below.

### Strategic Objective 1: Improve education and training of road users

<i>Proposed action</i>	<i>Activity status reported by the Commission</i>
<i>Action</i> The Commission will work, in cooperation with Member States as appropriate, on the development of a common educational and training road safety strategy including the integration of apprenticeship in the 'pre-licensing' process and common minimum requirements for driving instructors.	Action is <u>ongoing/under preparation</u> . No action yet on car driver licensing, although Directive 2006/126/EC on driving licences may be reviewed. Directive amended re driving licences for powered two-wheelers applicable from 19.1.13. Ongoing review of Directive 2003/59/EC on the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods or passengers.

#### 4.3.3 Contribution of *Policy Orientations*/other EU measures to 2020 target

The education and training of road users is a much cited need and a popular countermeasure. It is often argued that human behaviour can be easily altered by such approaches and, consequently, that education and training should be the first 'port of call' for intervention. However, it should be noted that while educational measures provide general support, there is little or no evidence to indicate casualty reduction effects for this approach for the general driving population.<sup>78</sup> Reviews continue to indicate the lack of evidence of a relationship between rider and driver training (whether compulsory or voluntary) and road casualty reduction for non professional users.<sup>79</sup> This is an important consideration when prioritising intervention to meet targets to reduce deaths and serious injuries. At the same time, research indicates that some types of professional driver training can yield results.<sup>80</sup>

Good practice driver licensing plays a key role in managing exposure to risk of new drivers and riders, creating the conditions for safe access to the road network as well as assisting enforcement agencies in securing compliance with key road safety rules. The EU has been active in the field of driving licence harmonisation since 1980 when the first Driving Licence Directive (80/1263/EEC) was adopted – the issue being at the core of the Treaty obligation for the free and safe movement of people.

While there have been no implemented EU interventions arising from this *Policy Orientations* strategy since 2011, current and future review of key previously introduced Directives present important opportunities for a contribution to the 2020 target and beyond.

#### Driving licences

Directive 2006/126/EC provides for a single EU model licence in plastic card; the possibility to introduce a storage medium (microchip) as part of the driving licence; mutual recognition for driver licences; introduces a new category of driving licences for mopeds and for motorcycles including minimum age requirements for a variety of vehicle types and for graduated access to the use of more powerful machines (although graduated driver licensing principles are not fully applied). The minimum age for access to a moped licence is 16 but Member States may lower this to 14 or increase to 18 years. The minimum age for driving a car is 18 years, but Member States may lower to 17 years. The legislation also introduces minimum requirements for

<sup>78</sup> Peden M, Scurfield R, Sleet D, Mohan D, Hyder A, Jarawan E and Mathers C eds. (2004). *World Report on Road Traffic Injury Prevention*, World Health Organization and World Bank (Washington), Geneva.

<sup>79</sup> Kinnear, N., Lloyd, L., Helman, S., Husband, P., Scoons, J., Jones, S., Stradling, S., McKenna, F. and Broughton, J. (2013). *Novice drivers: evidence review and evaluation – pre-driver education and training, graduated driver licensing, and the New Drivers Act*. Published Project Report (PPR673). Transport Research Laboratory.

<sup>80</sup> DaCoTA (2012) *Work-related road safety*, Deliverable 4.8v of the EC FP7 project DaCoTA, Brussels.

the initial qualification and the training of driving examiners and harmonises the frequency of medical checks for professional drivers.

Driver licensing measures can have a significant impact on road safety outcomes. EU measures need to address Treaty obligations to provide safe movement and a high level of protection. How far existing measures will contribute positively to EU goals and targets is unclear. Mixed results are found in the literature concerning the relationship between cubic capacity or power to weight ratio, although the latter is acknowledged to be the better safety indicator.. A recent review concluded that the effect of engine performance on safety is not fully understood and the relationship between engine power and crash rate is complex. Research, however, is clear that higher minimum age limits than required by the existing Directive are needed for mopeds and motorcyclist casualty reduction.<sup>81</sup>

### Professional drivers

Directive 2003/59/EC sets out the initial qualification and periodic training of bus and lorry drivers who are nationals of Member States or who work for an undertaking based in the EU. The initial qualification obtained either through an option based on training and a theoretical test or a theoretical and practical test are attested by a certificate issued to drivers, called the Certificate of Professional Competence (CPC). The periodic training consists of 35 hours of training every 5 years. The Directive establishes the minimum age for driving vehicles (which differ from those set out in the Driving Licence Directive), intended for the carriage of goods or passengers, in accordance with different criteria such as the driving licence category, the duration of the training to obtain the initial qualification, and the distance travelled.

Regulation 561/2006/EC and Directive 2006/22/EC concerning social legislation relating to professional road transport activities may also contribute to safety goals. Article 2 prescribes that "each Member State shall organise checks in such a way that, as from 1 May 2006, 1% of days worked by drivers of vehicles falling within the scope of Regulations (EEC) No 3820/85 are checked. This percentage will increase to at least 2% from January 2008 and to at least 3% from 1 January 2010".

Directive 2003/88/EC (the Working Time Directive) aims to provide minimum standards common to all EU countries to protect workers from health and safety risks associated with excessive or inappropriate working hours, and with inadequate time for rest and recovery from work. Research indicates that driving fatigue is present in 20% of commercial vehicle crashes in the EU and a special problem given the long distances travelled and the irregular shift patterns imposed which affect sleep. Regulating duty time as opposed to driving time is an important means of reducing cumulative driving fatigue.<sup>82</sup> This Directive is currently under review.<sup>83</sup>

<sup>81</sup> DaCoTA (2012). *Powered Two Wheelers*, Deliverable 4.8n of the EC FP7 project DaCoTA, Brussels.

<sup>82</sup> ETSC (2001). *The role of driving fatigue in commercial road transport crashes*, Brussels.

<sup>83</sup> European Commission (2014). *Public consultation on the review on the Working Time Directive (Directive 2003/88/EC)*.

<i>Inputs</i>	<i>Outputs</i>	<i>Desired results</i>	<i>Before and after safety assessment</i>	<i>Fatal crash/ fatal injury reduction potential</i>
Driving licences Directive 2006/126/EC applicable from 19.1.13	- Minimum requirements of driver training and testing - Minimum standards for driving examiners - Progressive access of young people to PTW categories.	- Fewer fatal or serious injury accidents involving young or novice drivers.  - Fewer fatal or serious injury accidents involving young motorcyclists	No evaluation of effectiveness and results has been carried out.  Formal review expected in 2018.	Unclear.  High potential from any new action on car and PTW licences which implement best practice on minimum age limits and graduated licensing schemes.
Professional drivers Directive 2003/59/EC applicable from 10.9.08 and 10.9 09 for different articles.	- Minimum initial qualifications - Minimum periodic training requirements	- Fewer fatal or serious injury accidents involving vehicles used for transport of goods or passengers.	No impact assessments are available	Unclear.  Dependent on type of training implemented.

#### 4.3.4 Suggested areas for priority consideration

##### Combined education and enforcement

Combining public information and social marketing with visible police enforcement can make a substantial contribution to reducing road deaths by deterring unsafe behaviours (See Section 4.4).

##### Graduated driver licensing

The introduction of graduated driver licensing (GDL) schemes for car drivers helps to manage exposure to high risk in the initial years of driving. It comprises a number of components at learner and intermediate stages which create a framework for initial driving experience before gaining a provisional and full licence under lower-risk conditions. Countries have implemented different packages of GDL measures. A recent review found that key components in the learner stage are the minimum learning period (the duration of a provisional licence), minimum required amounts of accompanied driving, minimum age for graduation to intermediate stage (the higher the licensing age the lower the crash risk). The most effective components of the intermediate stage (and for GDL in general) are restrictions on solo night driving and restrictions on carriage of passengers under 30 years old for novices under 30 years old. In addition, a lower alcohol limit and a ban on hands free mobile phone use (where these do not exist for all drivers) are likely to reduce collisions. Research indicates that it has been effective in reducing collisions wherever implemented and that reductions are seen for novice drivers of all ages.<sup>84</sup>

<sup>84</sup> Kinnear N, Lloyd S, Helman S, Husband P, Scoons J, Jones S, Stradling S, McKenna F, Broughton J, (2013). *Novice Drivers: Evidence Review and Evaluation*, TRL PPR673, Crowthorne.

**Box 3: Graduated driver licensing in Victoria, Australia.**

*Main provisions:*

- a minimum 12 month learner period and 120 hours of on-road supervised driving experience for the under 21s
- a new and more challenging on-road driving test to get a probationary licence
- an increase of the probationary period from three to four years for those aged under 21 years
- a ban on mobile phone use by learner and P1 drivers, P1 drivers limited to 1 peer passenger (16 to 21 years)
- an extension of the zero blood alcohol limit from three to four years.
- new probationary prohibited vehicle restrictions
- re-licensed drink drivers aged up to 26 years or on P plates must drive a vehicle fitted with an alcohol ignition interlock to prevent re-offending, and
- a range of educational support measures.

*Main results:*

- 23% fewer first-year drivers (18-20 years) involved in casualty crashes
- 31% fewer first-year drivers (18-20 years) involved in fatal and serious injury crashes
- 57% reduction in first year drivers in casualty crashes while carrying 2 or more peer passengers, with a corresponding 58% reduction for involvement in fatal and serious injury crashes,
- The overall estimated savings derived from the interim evaluation are \$39 million per annum.

Source: VicRoads (2012)<sup>85</sup>

*Professional driver training and work-related road safety*

Some types of professional driver training have been identified as useful intervention strategies in work-related road safety.<sup>86</sup> Formal defensive driver training for professional drivers taught at the workplace, combined in larger companies with incentive systems for crash-free driving has been found to reduce the crash rate by around 20%.<sup>86</sup> Other types of instruction for professional drivers, including skid training, both amongst ambulance drivers and drivers of lorries and articulated lorries have been found to increase the crash rate.<sup>87</sup> There are several differences among Member States in the application of Directive 2003/59/EC and further provisions may be necessary to improve the content and quality assurance of training and testing.

A new International Standards Organisation standard (ISO 39001)<sup>88</sup> has been produced to assist employers of organisations of all types and sizes in establishing and implementing a road safety management system. It is expected that adoption of the new standard will greatly assist the contribution that can be made in improving work-related safety and it deserves EU-wide promotion. European projects, such as the European Transport Safety Council's PRAISE, together with national network activities, are also helping to identify and promote good and best practice in current work-related safety management and enhanced corporate social responsibility.

**Summary of recommendations for EU action**

- Review Directive 2006/126/EC towards the introduction of a package of effective Graduated Driver Licensing measures for car drivers and powered two-wheeler riders.
- Review Directive 2003/59/EC with a view to introducing new provisions/guidance on demonstrably effective training schemes for professional drivers.
- Promote ISO 39001 in work-related road safety activities.

<sup>85</sup> Healy D, Catchpole C, Harrison W (2012). *Victoria's Graduated Licensing System Evaluation Interim Report*, VICROADS, Melbourne.

<sup>86</sup> Haworth N., Tingvall C and Kowadlo N. (2000) *Review of Best Practice Road Safety Initiatives in the Corporate and/or Business Environment*, Report N. 166, Monash University, March 2000

<sup>87</sup> Elvik R, Vaa, T, Høy A and Erke A and M Sørensen Eds. (2009). *The Handbook of Road Safety Measures*, second revised edition Emerald Group Publishing Limited, ISBN: 9781848552500.

<sup>88</sup> ISO (2012) 39001: Road Traffic Safety (RTS) Management Systems Standards, Requirements with Guidance for Use, Geneva.

## 4.4 Increase enforcement of road rules

### 4.4.1 Introduction

This section considers a range of EU initiatives in the field of enforcement as foreseen in *Policy Orientations* (4.4.2) as well as those adopted in the previous decade which may be starting to influence road safety outcomes (See Section 4.4.3) and ends with suggestions for further initiatives to 2020 and beyond (4.4.4).

### 4.4.2 Aim, proposed actions and status of *Policy Orientations* activities

The Commission Recommendation on enforcement in the field of road safety (2004/345/EC)<sup>89</sup> encourages Member States to apply good practice in road safety enforcement. *Policy Orientations* continues this work and acknowledges the important role that enforcement plays in reducing road deaths and serious injuries. The strategy anticipates cross-border exchange of information in the field of road safety; enforcement campaigns; vehicle technology to assist enforcement; and national enforcement objectives are highlighted as key fields of action for a common enforcement strategy. Three specific actions are identified:

<b>Strategic Objective 2: Increase enforcement of road rules</b>	
<i>Proposed action</i>	<i>Activity status reported by the Commission</i>
<p><u>Action 1</u> The Commission will work together with the European Parliament and the Council on the establishment of a cross-border exchange of information in the field of road safety.</p>	<p>Action is <u>ongoing</u>. Directive 2011/82/EC on cross-border exchange of information for enforcement was adopted in 2011. Following a Court of Justice decision on 6.5.14, the Directive was annulled and had to be re-tabled. It has been processed in Parliament and Council and the EP plenary vote is expected in March/April 2015. An evaluation of 2011/82/EC including development of enforcement guidelines that could potentially form a basis for a common approach to enforcement of road traffic rules for safety is expected in 2016.</p>
<p><u>Action 2:</u> The Commission will work on a common road safety enforcement strategy including the possibility of introducing speed limiters in light commercial vehicles and of making use of alcohol interlock devices obligatory in certain specific cases.</p>	<p>Action is <u>partly completed</u> on the part of DG MOVE. Evaluation studies on speed limiters<sup>90</sup> alcohol interlocks<sup>91</sup> were completed in 2013 and passed on to DG GROW for input into current review of the General Safety Regulation 661/2009.</p>
<p><u>Action 3:</u> The Commission will work on the establishment of national implementation plans for road safety enforcement.</p>	<p>Action is <u>completed</u>. In 2012, this initiative was merged into a wider analysis of national road safety action plans within the framework of the High-Level Group on Road Safety. A working paper was finalised in 2014.<sup>92</sup></p>

### 4.4.3 Contribution of *Policy Orientations*/other EU measures to 2020 target

This strategic field has high importance for road fatality reduction, the 2020 target and the 2050 goal and is highly dependent on the actions and decisions of Member States. Research indicates that if all road users complied with all road rules, deaths would fall by around 60% and injuries by 40%.<sup>93</sup> Good practice police enforcement of key safety

<sup>89</sup> European Commission (2004) *Commission Recommendation 2004/345/EC on enforcement in the field of road safety*(OJ L 111 17.4.2004, p.75.

<sup>90</sup> [http://ec.europa.eu/transport/road\\_safety/pdf/vehicles/speed\\_limitation\\_evaluation\\_en.pdf](http://ec.europa.eu/transport/road_safety/pdf/vehicles/speed_limitation_evaluation_en.pdf)

<sup>91</sup> [http://ec.europa.eu/transport/road\\_safety/pdf/behavior/study\\_alcohol\\_interlock.pdf](http://ec.europa.eu/transport/road_safety/pdf/behavior/study_alcohol_interlock.pdf)

<sup>92</sup> [http://ec.europa.eu/transport/road\\_safety/pdf/national-road-safety-strategies\\_en.pdf](http://ec.europa.eu/transport/road_safety/pdf/national-road-safety-strategies_en.pdf)

<sup>93</sup> Elvik R, Vaa, T, Høy A, Erke A and M Sørensen Eds. (2009). *The Handbook of Road Safety Measures*, second revised edition Emerald Group Publishing Limited, ISBN: 9781848552500.

rules such as speed limits (aided by speed cameras), excess alcohol, seat belt and crash helmet use can provide more or less immediate and very substantial road safety benefits. For example, in Great Britain in 2004, speed camera operations at more than 4,000 sites prevented some 3,600 personal injury collisions, saving around 1,000 people from being killed or seriously injured with a benefit to cost ratio of >2.<sup>94</sup> In-vehicle safety technologies provide an additional and sustainable means of assisting drivers in keeping to the rules.

Better enforcement activity directly addresses key road safety problems across the EU, outlined in Sections 3.3 and 3.4 and would contribute to the target of reducing deaths on European roads by 50% by 2020. In 2008, the Commission estimated, based on an impact assessment study, that cross-border enforcement initiatives accompanied by improved methods of enforcement in Member States could lead to a reduction of 5,000 road deaths per year and large reductions in emissions and fuel consumption in the EU.<sup>95</sup>

#### *EU measures since 2011:*

##### *Cross-border exchange of information on road safety related traffic offences*<sup>96</sup>

Directive 2011/82/EC enables EU drivers to be identified for specific road safety related offences committed in a Member State other than the country of vehicle registration. The Directive provides Member States mutual access to vehicle registration data via an electronic data exchange network. The specific offences covered by the Directive cover key behaviours which are causally related to road traffic deaths and are thus highly relevant to the EU road safety goal and target:

- (a) speeding
- (b) non-use of a seat-belt
- (c) failing to stop at a red traffic light
- (d) drink-driving
- (e) driving under the influence of drugs
- (f) failing to wear a safety helmet
- (g) use of a prohibited lane
- (h) illegally using a mobile telephone or any other communication device while driving

According to the Commission, non-resident drivers account for approximately 5% of road traffic in the EU; 15% of the number of detected speed offences are committed by non-resident driver; drivers of foreign-registered car are three times more likely to commit traffic offences than drivers of a domestically-registered one.<sup>97</sup> Speeding offences in France by foreign-registered cars contribute approximately 25% of the total, rising to 40% to 50% of the total during periods of high transit and tourism. The Commission thus expects the highest positive benefits to be observed in countries with high levels of transit and tourism traffic, such as Austria, Belgium, France, Germany, Hungary, Italy, Luxembourg, Poland or Spain.<sup>98</sup> An ex-ante impact assessment carried out in 2006 indicated a potential reduction of around 400 road deaths annually and a ex-post assessment is expected in 2016.<sup>99</sup>

<sup>94</sup> Allsop RE (2010). *The effectiveness of speed cameras: A review of the evidence*, RAC Foundation.

<sup>95</sup> Staff Working Document accompanying the Proposal for a Directive of The European Parliament and of the Council *Facilitating Cross-Border Enforcement In The Field Of Road Safety Full Impact Assessment* {Com(2008) 151} {Sec(2008) 350}

<sup>96</sup> Following a Court of Justice decision on 6.5.14, the Directive had to be re-tabled. It has been processed in Parliament and Council and the EP plenary vote is expected in March/April 2015.

<sup>97</sup> European Commission (2010). *Cross border enforcement*, Memo 10/642.

<sup>98</sup> [http://europa.eu/rapid/press-release\\_MEMO-11-483\\_en.htm](http://europa.eu/rapid/press-release_MEMO-11-483_en.htm)

<sup>99</sup> Staff Working Document *accompanying the Proposal for a Directive of The European Parliament and of the Council Facilitating Cross-Border Enforcement In The Field Of Road Safety Full Impact Assessment*{Com(2008) 151}Sec(2008) 350).

Speed limiters in light commercial vehicles and alcohol interlock devices

*Policy Orientations* also indicated that the Commission would consider the possibility of mandatory fitment of speed limitation devices to light commercial vehicles and mandatory fitment of alcohol interlock devices for some types of vehicle or for use in rehabilitation schemes. Studies were carried out for both.

The study on light commercial vehicles (LCVs) indicated that the fatal crash reduction potential was -2% (LCV speed limiters at 110 km/h) -5% (LCV speed limiters at 110 km/h), -9% (LCV advisory ISA (systems which provide audible warning signals) or -25% (LCV voluntary ISA (systems which provide active feedback). Reductions were also found for serious injury crashes, although these were smaller, and for emissions.<sup>100</sup>

The study on alcohol interlock devices indicated the following fatality reduction potential: (1) if fitted on heavy goods vehicles (HGVs) a reduction of 125 alcohol-related deaths involving HGVs; (2) if fitted to buses and coaches a reduction in 5 alcohol-related deaths involving buses and coaches; (3) a reduction of between 7 to 137 deaths per annum if an EU scheme for high-risk offenders (BAC 130+) were to be initiated and (4) between 3500 to 5600 deaths per annum if fitted to passenger cars. Between 1.2 and 2.3 fewer alcohol-related road deaths might be expected for information exchange on alcolocks and 2 to 4 fewer alcohol-related deaths in the first year and 4 to 8 fewer deaths in the second year of harmonised alcohol interlocks at EU level.<sup>101</sup> Large scale quantitative research on alcohol interlock devices in use has shown that they are 40% to 95% more effective in preventing drink and driving recidivism than traditional measures such as licence withdrawal or fines.<sup>102</sup>

The establishment of national implementation plans

While providing highly useful input on national road safety plans, where capacity exists to implement them, this document currently has little detail as yet on the implementation of enforcement aspects, as foreseen in *Policy Orientations*. The ITF/OECD and recommends that a road safety management capacity review is carried out by all countries and jurisdictions embarking upon new road safety investments.<sup>103</sup>

<i>Inputs</i>	<i>Outputs</i>	<i>Desired results</i>	<i>Before/ after safety assessments</i>	<i>Fatal crash /fatal injury reduction potential</i>
<p><b>Action 1</b> Cross-border exchange of information on road safety related traffic offences Directive 2011/82/EC  Applicable as of 7.11.13 to 25 countries. To be revised with new legal basis by May 2015 (EU 28).</p>	<p>Enforcement of sanctions when offences are committed with a vehicle registered in another Member State</p>	<p>Fewer non-resident drivers breaking road traffic rules.  Contribution to 2020 target.</p>	<p>External ex-ante assessment estimated a potential reduction of 400 road deaths annually (2006).  No information on compliance. Evaluation study(due 2016)</p>	<p>Medium</p>

<sup>100</sup> Transport & Mobility Leuven(2013) *Ex-post evaluation on the installation & use of speed limitation devices*.

<sup>101</sup> ECORYS, COWI (2014). *Study on the prevention of drink-driving by the use of alcohol interlock devices evaluation*.

<sup>102</sup> SUPREME (2007). *Summary and publication of best practices in road safety in the Member States, Brussels, Thematic report: Vehicles, CEC, Brussels*.

<sup>103</sup> OECD (2008) *Towards Zero: Achieving Ambitious Road Safety Targets through a Safe System Approach*, Paris.

<p><b>Action 2</b> Common road safety enforcement strategy possibly including mandatory speed limiters in Light Commercial Vehicles (LCVs) and alcohol interlock devices in certain specific cases.</p>	<p>Not specified</p>	<p>Contribution to 2020 target</p>	<p>External ex-ante assessments of potential road safety value (2013, 2014) Speed limiters on LCVs = 2% to 5% reduction in fatal crashes; ISA advisory on LCVs = 9% ISA voluntary on LCVs = 25% reduction in fatal crashes. Alcohol interlock devices in HGVs, buses = 130 fewer deaths Alcohol interlock devices in high risk offender schemes = 7 to 137 fewer deaths.</p>	<p><i>Medium</i> Speed limiters on LCVs  <i>Low</i> Alcohol interlocks in specific cases, although fitment to heavy goods vehicles and use in offender schemes offer high BCRs.  <i>High</i> If common enforcement strategy includes these and other key safety technologies for all vehicles.</p>
<p><b>Action 3</b> Establishment of national implementation plans (Staff Working Document 2014)<sup>104</sup></p>	<p>Not specified</p>	<p>Contribution to 2020 target</p>	<p>Too recent to assess response.</p>	<p>A useful tool deserving further detailed development on managing for results and <i>Safe System</i>.</p>

#### EU Measures before 2011:

Previous activity by the Commission has included the Recommendation on Enforcement in the Field of Road Safety (2004/345/EC) and a range of social legislation affecting professional drivers relating to digital tachographs (mandatory since 2006), speed limiters, and tighter legislation hours of work and rest times (Regulation EC561/2006).

At present, it is difficult to estimate the past or possible future contribution of the Commission in this strategic field since much of it depends upon future decisions regarding vehicle safety technologies, the activities of Member States in the targeting and resourcing of enforcement activity, the execution of sanctions and the extent of take-up of best practice advice on national road safety planning. It is not clear on current information when Member States started to implement Directive 2011/82/EC on cross-border exchange of information for enforcement with specific intervention and what impact this has had on enforcement practice and thus, on road safety. The possible guidance on effective road safety enforcement envisaged for 2016 is late in the strategy period and, again, relies upon Member States for implementation, including resourcing.

#### 4.4.4 Suggested areas for priority consideration

Clearly the EU has an important and established role in improving road safety enforcement. Of all *Policy Orientations* fields, it is the one most likely to produce road safety results in the short-term until further measures requiring longer implementation lead times start to have an effect. While Member States will determine how much can be achieved through combined publicity and enforcement activity, the EU can play a key role in encouraging and funding surveys of levels of compliance,

<sup>104</sup> Commission Staff Working Document (2014). *Road safety planning Good practice examples from national road safety strategies in the EU*. SWD web paper regularly updated.

setting additional targets to 2020 in key areas and funding *Safe Corridor* and *Safe Town/City* demonstration projects with combined publicity and enforcement components.

The implementation of in-vehicle devices is considered to be the most efficient and effective EU tool. The progressive mandatory fitment of different types of advanced driver assistance systems such as intelligent speed assistance, alcohol interlocks and seat belt reminders to different types of vehicles is widely advocated and holds much promise (See Section 4.6). Fast-tracking fitment of new safety technologies in advance of legislative deadlines in public procurement policies, notably in Sweden, has also led to swift take-up of important safety equipment. Appropriate EU action to encourage such activity should be explored.<sup>105</sup>

Other measures could include promoting the application of best practice in enforcement devices (automated speed cameras, random breath testing), in enforcement intensity (number of devices, frequency of actions, selection of road sections and areas) as well as actions to increase public awareness and mechanisms to achieve coordinated publicity and enforcement. Through better convergence of enforcement practices and methods, the aim would be to ensure that the chances of being caught for offences are more or less similar across the EU. This could be addressed by amendment to the Cross Border Directive, by an updated recommendation or other initiatives via the High Level Group on Road Safety.

### Summary of recommendations for EU action

- Set up/support annual surveys of levels of compliance with speed limits, excess alcohol legislation and levels of seat belt use and report on findings.
- Set targets to 2020 at EU and national levels for improved compliance with speed limits, excess alcohol limits and seat belt use legislation and request annual reporting by the High Level Group on Road Safety and CARE.
- Promote and fund enforcement activity and other intervention in *Safe Corridor* and *Safe City/Safe Town* projects on the TEN-T and secondary network.
- Provide new guidance on best practice enforcement of key road safety rules.
- Mandate EU fitment of speed assistance systems and seat belt reminders in all seating positions in all motor vehicles at the earliest opportunity and take a variety of actions initially to encourage the fitment and use of alcohollocks e.g. in cross-border enforcement activity, in best practice guidance on their use in alcohol user rehabilitation programmes and in work-related road safety guidance.
- Mandate provision of proven safety technologies in EU and national public procurement.

## 4.5 Safer road infrastructure

### 4.5.1 Introduction

This section considers a range of EU infrastructure safety initiatives foreseen in *Policy Orientations* (4.4.2) as well as those adopted in the previous decade which are starting to influence road safety outcomes (See Section 4.4.3) and ends with suggestions for further initiatives to 2020 and beyond (4.4.4).

<sup>105</sup> Swedish Transport Administration (2014). *Analysis of Road Safety Trends 2013, Management by objectives for road safety work towards the 2020 interim targets*, Borlänge.

#### 4.5.2 Aim, proposed actions and status of *Policy Orientation* activities

The Commission's priority for safety engineering in Objective 3 of *Policy Orientations* is to address the rural and urban roads where the highest numbers of deaths occur. The aim is to find ways of gradually extending the principles of safe management of infrastructure applied to the TEN-T road network (through Directives 2008/96/EC and Directive 2004/54/EC) to the secondary road network of the Member States, taking into account the principle of subsidiarity.

<b>Strategic Objective 3: Safer road infrastructure</b>	
<i>Proposed action</i>	<i>Activity status reported by the Commission</i>
<b>Action 1</b> The Commission will ensure that European funds will only be granted to infrastructure compliant with the road safety and tunnel safety Directives.	The action is <u>ongoing</u> . Systematic and ongoing cooperation has been established with DG REGIO and ELARG for road safety principles to be taken into account in operational programmes and partnership agreements with Member States. Discussions have been held with the development banks (notably EIB and EBRD) for common approach and application of the infrastructure safety management principles also by international actors.
<b>Action 2</b> The Commission will promote the application of the relevant principles on infrastructure safety management to secondary roads of Member States, in particular through the exchange of best practice.	The action is <u>ongoing</u> . The principles are promoted in annual operational programming exercises and in best practice exchanges between Member States in the High Level Group on Road Safety and in the working paper <sup>106</sup> on national road safety strategies and action plans finalised in 2014. Best practice exchanges are also regularly organised in the expert groups linked to infrastructure safety and promoted in EU-funded grant projects such as: Pilot4 Safety <sup>107</sup> and Whiteroads <sup>108</sup> . Additional initiatives may be launched in the future as a result of the ongoing review of Directive 2008/96/EC on road infrastructure safety management.

#### 4.5.3 Contribution of *Policy Orientations*/other EU measures to 2020 target

This strategic field has highly importance for road safety, the 2020 fatality reduction target, the 2050 goal and for implementing a *Safe System* approach. All road deaths and serious injuries occur within the road network which should provide the framework for safe use. A study of fatal car occupant crashes involving road user, vehicle and road factors identifies the road as the component most often linked to a fatal outcome.<sup>109</sup> While most motor vehicle occupant deaths take place on rural roads, most pedestrian deaths occur within the urban road network.

##### *EU measures before 2011:*

Over the last decade, the EU focus has been on the road safety aspects of the TEN-T network. While comprising some of the EU's busiest corridors a relatively small proportion of total EU deaths (5%) occur on the TEN-T network. European Road Assessment Programme (Euro RAP) Members, often with EC support in cohesion countries, have undertaken road inspections across a large sample of core and comprehensive TEN-T road networks both inside and outside the EU. They have also inspected substantial lengths of other national and provincial road networks. Euro RAP monitoring (2011) of 50% of the TEN-T network against a *Safe System* assessment model recorded some 30,000 fatal and serious road crashes. Some 55% of these were on motorways, 20% on dual carriageways and 25% on single carriageways. Large differences in risk on TEN-T roads in different Member States are found. Sweden's network is assessed as low-risk for 85% of its TEN-T sections whereas in Poland, only 4% of its TEN-T network is assessed as being low-risk.

<sup>106</sup> [http://ec.europa.eu/transport/road\\_safety/pdf/national-road-safety-strategies\\_en.pdf](http://ec.europa.eu/transport/road_safety/pdf/national-road-safety-strategies_en.pdf)

<sup>107</sup> [http://ec.europa.eu/transport/road\\_safety/pdf/projects/pilot4safety.pdf](http://ec.europa.eu/transport/road_safety/pdf/projects/pilot4safety.pdf)

<sup>108</sup> [http://ec.europa.eu/transport/road\\_safety/pdf/projects/whiteroads.pdf](http://ec.europa.eu/transport/road_safety/pdf/projects/whiteroads.pdf)

<sup>109</sup> Stigson H, Krafft M, Tingvall C (2008). *Use of fatal real-life crashes to analyze a safe road transport system model, including the road user, the vehicle, and the road*. Traffic Inj Prev.2008 Oct 9(5):463-71.

EuroRAP currently estimates that approximately 25% of the TEN-T within the EU is below 3-star at either the 1-star or 2-star level. This network is largely in newer EU countries but flaws are common across many national networks. French auto routes have been cited by EuroRAP as achieving the most consistent and high star ratings.<sup>110</sup> This means that there is still good potential to achieve reductions in deaths and serious injuries in TEN-T policies, programmes and projects.

Two Directives on tunnels and road infrastructure safety management set out key road safety requirements.

#### Directive 2004/54/EC on minimum safety requirements for tunnels in the TEN-T

This specifies that all Trans-European Road Network road tunnels longer than 500 metres must comply with minimum safety requirements.

#### Directive 2008/96/EC on road infrastructure safety management

This requires the establishment and implementation of procedures relating to road safety impact assessments, road safety audits, the management of road network safety and safety inspections and assessments by the Member States.<sup>111</sup> The EU ROSEBUD project estimated that application of these safety engineering tools to the TEN-T could reduce 600 deaths and 7000 injuries annually. If applied to main roads, some 700 additional lives might be saved.<sup>112</sup>

TEN-T roads are also required to be free of level crossings with railway lines and other transport infrastructure connections and the safety at level crossings of the railway network is to be enhanced. TEN-T guidelines require the core network to be equipped with parking areas which enable heavy goods vehicle drivers to meet the rest times required by EU legislation and to benefit from safe and secure parking conditions.

Preliminary findings of the study on the road infrastructure safety management Directive relating to implementation revealed that there are no particular barriers or hindrances; when encountered, these consisted mainly of lack/poor capacity and not/or poorly consistent pre-existing legislative framework.<sup>113</sup>

#### *EU measures since 2011:*

The actions since 2011 have mainly comprised the commissioning of evaluations of the Road Infrastructure Safety Management Directive 2008/96/EC and the Tunnels Directive 2004/54/EC which are expected shortly; the promotion of the safety principles underpinning these Directives; knowledge transfer in specific experts groups and broader strategic papers and engagement with DG REGIO, DG ELARG and the European development banks (EIB, EBRD) to promote the take up of Directives 2004/54/EC and 2008/96 in all EU-funded road infrastructure.

<sup>110</sup> Euro RAP, personal communication.

<sup>111</sup> 'Road safety impact assessment' means a strategic comparative analysis of the impact of a new road or a substantial modification to the existing network on the safety performance of the road network; 'road safety audit' means an independent detailed systematic and technical safety check relating to the design characteristics of a road infrastructure project and covering all stages from planning to early operation; 'road safety inspection' means an assessment of the existing network; 'network safety ranking' which is a key part of network safety means a method for identifying, analyzing and classifying parts of the existing road network according to their potential for safety development and crash cost savings.

<sup>112</sup> EU ROSEBUD Project, [http://ec.europa.eu/transport/road\\_safety/pdf/projects/rosebud.pdf](http://ec.europa.eu/transport/road_safety/pdf/projects/rosebud.pdf)

<sup>113</sup> Prospex (2014), Minutes report of Stakeholder Conference as part of the Evaluation Study on the Road Infrastructure Safety Management (Directive 2008/96/EC, July 2014, Brussels).

<i>Action</i>	<i>Outputs</i>	<i>Commission desired results</i>	<i>Before/ after safety assessments</i>	<i>Fatal crash /fatal injury reduction potential</i>
<p><b>Action 1</b> The Commission will ensure that European funds will only be granted to infrastructure compliant with the road safety and tunnel safety Directives.</p>	Cooperation amongst EC Directors and with EBRD and EIB.	<p>Larger proportion of EU roads and tunnels designed, constructed and maintained in line with road infrastructure safety management principles</p> <p>Contribution to 2020 target.</p>	<p>ROSEBUD assessment (2008)</p> <p>Ex-post evaluation for possible review in 2015.</p>	<p>600 deaths</p> <p>Medium-high depending on level and quality of implementation</p>
<p><b>Action 2</b> The Commission will promote the application of the relevant principles on infrastructure safety management to secondary roads of Member States, in particular through the exchange of best practices.</p>		<p>Larger proportion of EU roads and tunnels designed, constructed and maintained in line with road infrastructure safety management principles</p> <p>Contribution to 2020 target</p>	<p>ROSEBUD assessment (2008)</p> <p>Ex-post evaluation for possible review in 2015.</p>	<p>700 deaths</p> <p>Medium-high depending on level and quality of implementation</p>

#### 4.5.4 Suggested areas for priority consideration

##### Encouraging the adoption of the Safe System approach

Integrating *Safe System* principles through proactive safety planning and design addresses intrinsic dangers in the road transport system and improves protection for non-motorised as well as motorised road users. The *Safe System* intervention strategy is based on scientific safety principles and aims to ensure that in the event of a crash, the impact energies remain below the threshold likely to produce either death or long-term injury. It is recommended to all countries irrespective of levels of infrastructure development or socio-economic status.<sup>114</sup> The rationale is to integrate or separate for safety to achieve safe mobility. The central design parameter is the biomechanical tolerance of the human (See Annex 1).

Modern approaches to safety engineering involve establishing clear urban and rural road hierarchies which better match function to speed limit and layout and design; separating oncoming traffic on high-volume, high-speed roads to prevent head-on collisions and providing crash protective roadsides to address run-off road collisions; ensuring safe speeds at intersections to reduce fatal and serious side collisions and ensuring safe speeds on roads and streets with dangerous mixed used where separation of motor vehicles and vulnerable road users may be difficult.<sup>115</sup>

Road classifications and road speed limits are decided nationally. With the growth of EU membership over the last 15 years there is less convergence in speed limits than previously and few countries have revised road classifications in line with *Safe System*

<sup>114</sup> OECD (2008). *Towards Zero: Achieving ambitious road safety targets and the Safe System approach*, Paris.

<sup>115</sup> UNRSC (2012). *Safe roads for development: a policy framework for safe infrastructure on major road transport networks*, Geneva.

principles and identified thresholds. Eurostat data (2014) indicates that the maximum speed limit for motorways is mostly 130 (16 countries) or 120 km/h or below (lower vehicle speed limits for trucks and buses exist); rural roads limits vary widely between 70-120 km/h (where most deaths occur) and urban roads 50 km/h with increasingly widespread use of 30 km/h in residential areas.

As indicated in Section 3.2.10, studies show that for both urban and rural environments, small differences in speed can have a substantial effect on the occurrence and severity of road crashes and injuries. It is estimated that if mean speeds reduced by only 1 km/h on all roads in the EU, then 1300 deaths could be prevented each year.<sup>116</sup> Other steps forward would be to adopt a maximum speed limit of 120 km/h or less for the EU TEN-T motorway network and encourage Member States through best practice guidance to adopt self-enforcing 30 km/h zones in their residential areas and areas with high volumes of pedestrians and cyclists. Speed management is a major area for road safety improvement deserving urgent attention by the Commission and Member States.

The Commission has acknowledged the importance of a *Safe System* approach in reaching EU road safety goals and targets. Best practice guidance is now needed on how to get started in implementing *Safe System* and how to integrate it into the mainstream of road and safety engineering on TEN-T roads as well as the secondary road network. Some implementation examples are provided in Annex 9.

*Establishing a safety performance framework for the TEN-T network and targeting better performance to 2020 and beyond.*

The need to establish a safety performance framework for the TEN-T network is widely acknowledged.<sup>117</sup> Priorities for consideration include measurement and targeting of mean and excess speeds and assessment and targeting of the safety quality of the TEN-T network using European New Car Assessment Programme. Worldwide, leading countries and development banks are focusing on setting a minimum 3-star standard for national networks following cost-benefit analysis. This was a policy goal introduced by the Dutch government in 2010. Some countries are now seeking to target 4-star minimums for roads of national significance and this level is viable for busy sections of the TEN-T. The implications of a minimum 3-star goal for the TEN-T and European E-routes generally to be achieved in the period 2025-2030 is currently being considered by EuroRAP.

*Take up of EC Directives 2004/54/EC, 2008/96 in all EU-funded road infrastructure*

The TEN-T guidelines should be revised to ensure that all EU-funded infrastructure has to conform to these Directives.

*Promoting and funding Safe Corridor and Safe Town/City projects*

In many countries, the majority of death and serious injuries usually take place on a small proportion of sections of the main road network that are high-volume and high-risk due to the high operating speed permitted on them, often with mixed-use of motorised and non-motorised traffic. Using high quality crash data, where it exists, and/or by taking account of traffic volumes, mean speeds and traffic mixes, and by using safety rating tools such as those developed by the European Road Assessment Programme, these sections can be identified and targeted for multi-sectoral intervention in funded *Safe Corridor* projects.<sup>118</sup>

<sup>116</sup> ETSC (2014). *Ranking EU progress on car occupant safety*, PIN Flash report 27, Brussels.

<sup>117</sup> Minutes report of Stakeholder Conference as part of the Evaluation Study on the Road Infrastructure Safety Management (Directive 2008/96/EC, July 2014, Prospex, Brussels.

<sup>118</sup> World Bank Global Road Safety Facility (2009). *Training Course Modules, Road Safety Training Workshop*, Washington DC, June 17-19, 2009.

*Safe Town* or *Safe City* projects of the type promoted in the EU DUMAS project on urban safety management can also provide opportunities for effective multi-sectoral working and help develop safety management across urban planning, public transport, safety engineering, health, police and education sectors and reach ambitious targeted road safety results. They tend to attract great public support, especially with mayoral and cross party engagement.<sup>119</sup> Carrying out a series of specially funded, multi-sectoral demonstration projects targeting results both for the long-term and interim will help to develop *Safe System* guidelines and performance management frameworks to address 2020 and 2050 goals.

#### Summary of recommendations for EU action:

- Encourage knowledge transfer and the adoption of the *Safe System* approach to road safety engineering on TEN-T and the secondary network.
- Establish a safety performance framework for the TEN-T network, require measurement of safety indicators e.g. Euro RAP ratings and mean speed levels.
- Targets a percentage increase in Euro RAP star rating of TEN-T roads to 2020 and beyond.
- Update TEN-T guidelines to ensure that all EU-funded infrastructure conforms to EC Directives 2004/54/EC and 2008/96.
- Set a maximum speed limit or lower of 120 km/h on TEN-T roads.
- Promote and fund *Safe Corridor* and *Safe City/Safe Town* projects on the TEN-T and secondary network comprising road safety engineering and a range of multi-sectoral road safety intervention to achieve results and develop road safety management capacity.

## 4.6 Safer vehicles and new in-vehicle and integrated safety technologies and equipment

### 4.6.1 Introduction

This section combines the *Policy Orientations* strategic Objectives 4 and 5 in view of the considerable overlap between these in terms of scope and subsequent action. It considers a range of EU vehicle safety initiatives foreseen in *Policy Orientations* (4.6.2) as well as those adopted in the previous decade which are starting to influence road safety outcomes (See Section 4.6.3) and ends with recommendations for further initiatives (4.6.4).

### 4.6.2 Aim, proposed actions and status of *Policy Orientations* activities

*Policy Orientations* foresees continuing activity to improve active and passive safety including a focus on addressing vulnerable road user risks as well as new in-vehicle safety technologies; further action on roadworthiness tests and technical roadside inspections; and review of the impact and benefits of co-operative systems and combined technologies.

<sup>119</sup> DUMAS Project (Developing Urban Management And Safety) (2001). *Final Project Report*.

<b>Strategic Objective 4: Safer vehicles</b>	
<i>Proposed action</i>	<i>Activity status reported by the Commission</i>
<u>Action 1</u> The Commission will make proposals to encourage progress on the active and passive safety of vehicles, such as motorcycles and electric vehicles.	The action is <u>completed</u> . Progress has been made by DG GROW on safety type approval for two- and three- wheeled vehicles. The General Safety Regulation is currently under review.
<u>Action 2</u> The Commission will make proposals in view of the progressive harmonisation and strengthening of roadworthiness tests and technical roadside inspections	The action is <u>completed</u> . The Roadworthiness Package was adopted in April 2014. It consists of Directive 2014/45/EU on periodic roadworthiness tests, Directive 2014/47/EU on technical roadside inspections for commercial vehicles and Directive 2014/46/EU on vehicle registration documents.
<u>Action 3</u> The Commission will further assess the impact and benefits of co-operative systems to identify most beneficial applications and recommend the relevant measures for their synchronised deployment.	The action is <u>completed</u> . A Staff Working Document with analysis of most beneficial applications was adopted in 2014.

<b>Strategic Objective 5: Promote the use of modern technology to increase road safety</b>	
<i>Proposed action</i>	<i>Activity status reported by the Commission</i>
<u>Action 1</u> Evaluate the feasibility of retrofitting commercial vehicles and private cars with Advanced Driver Assistance Systems.	The action is <u>completed</u> . A Staff Working Document <sup>120</sup> on the implementation of objectives 4 and 5 of the European Commission's policy orientations on road safety 2011-2020 – deployment of vehicle technologies to improve road safety was adopted in 2014.  A study on the benefits for road safety of Event Data Recorders (EDRs) was completed in 2014. <sup>121</sup> The objective of this study was to assist the Commission in deciding whether the fitting of EDRs in all vehicles or certain categories of vehicles could result in an improvement of road safety or other benefits. The study aimed to quantify the costs and benefits for heavy goods vehicles, light goods vehicles, buses and coaches, and passenger cars (for private and commercial use).
<u>Action 2</u> Accelerate the deployment of e-Call and examine its extension to other vehicles.	The action is <u>ongoing</u> . Decision No 585/2014/EU on the deployment of the interoperable EU-wide e-Call service was adopted in May 2014. Additional work on the specifications for e-Call for goods vehicles is on-going.

#### 4.6.3 Contribution of Policy Orientations/other EU measures to 2020 target

Vehicle safety measures address all road users. They need to accommodate human capacities and be designed to prevent and mitigate serious and fatal crash outcome, reduce injury severity in the event of a crash and facilitate faster access to the emergency medical system through enhanced post-crash response. *Safe System* approaches aim to integrate vehicle safety measures with other system measures e.g. separated facilities in the road network, in-vehicle lane departure systems linked to

<sup>120</sup> Commission Staff Working Document *on the implementation of objectives 4 and 5 of the European Commission's policy orientations on road safety 2011-2020 – deployment of vehicle technologies to improve road safety*, Brussels, 3.10.14 SWD(2014) 297 final.

<sup>121</sup> Hynd D and M McCarthy (2014). *Study on the benefits resulting from the installation of Event Data Recorders* Final Report, Prepared for DG MOVE, PPR707, Crowthorne.  
[http://ec.europa.eu/transport/road\\_safety/pdf/vehicles/study\\_edr\\_2014.pdf](http://ec.europa.eu/transport/road_safety/pdf/vehicles/study_edr_2014.pdf)

road markings, crash-protective medians and roadsides and speed management to ensure tolerable kinetic energy in the event of a serious and fatal crash.<sup>122</sup>

Major progress has been made in the implementation of improved vehicle occupant protection since the mid-1990s. Vehicle safety measures have played a large part in addressing targeted reductions in deaths and serious injuries at EU and national levels. Improvements in vehicle safety design over this period have reduced the risk of death and serious injury for car occupants by 50% or more. While much of the progress in vehicle safety has been for car occupant safety, initiatives in pedestrian protection and powered two wheeler safety are starting to contribute to improved road safety outcomes.

Where they address identified road safety problems, new safety technologies hold much promise to prevent serious and fatal crash injuries through crash avoidance, crash mitigation, crash protection, post-crash protection or the integration of all of these approaches.<sup>123</sup> The potential value of developing an integrated approach to vehicle safety, linking preventive, crash protection and mitigation and post-crash approaches into cooperative systems for drivers, passengers and vulnerable road users as well as vehicle and road network safety systems is being increasingly understood.<sup>122</sup> Furthermore, new in-vehicle technologies have the potential to increase as well as decrease crash injury risk through introducing new driver distraction and inadvertent behavioural change which may solve one problem but create another.<sup>124,125</sup> In order to understand the scope of the problem and potential for countermeasures, the Commission has recently launched a call for a new study on road user distraction.<sup>126</sup> In the last decade crash avoidance technologies have started to contribute significantly to casualty reduction, although the safety effects of some of the technologies that are being promoted widely have yet to be demonstrated or evaluated. At the same time, more promising safety technologies, where benefits have been demonstrated, are being promoted in too few countries or taken up at a lesser rate across EU countries.<sup>122</sup> Looking ahead, as Euro NCAP states "There is no doubt that greater automation will drive a safety revolution, and this will mean putting safety above all other requirements and characteristics of a car."<sup>127</sup>

Improvements in the safety of the EU vehicle fleet are brought about by a complex interaction of initiatives of car and safety equipment manufacturers, EU type approval (apart from bicycles) and other legislation, consumer information such as the European New Car Safety Programme, public procurement initiatives in Member States, the initiatives of insurers and increased acknowledgement amongst vehicle fleet managers of the benefits of purchasing safer vehicles and equipment.

EU type approval plays a key role. The EU's coordinated position in global harmonisation forums such as UN ECE WP 29 is a dominant influence and should ensure that removals of barriers to trade also leads to a high level of protection being afforded, in line with Treaty obligations.

Advanced technologies for road safety are being increasingly considered and incorporated as requirements under the EU type-approval framework. This activity is

<sup>122</sup> DaCoTA (2012). *Vehicle Safety*, Deliverable 4.8u of the EC FP7 project DaCoTA, Brussels.

<sup>123</sup> DaCoTA (2012). *eSafety*, Deliverable 4.8g of the EC FP7 project DaCoTA, Brussels.

<sup>124</sup> DaCoTA (2012). *Driver distraction*, Deliverable 4.8f of the EC FP7 project DaCoTA, Brussels.

<sup>125</sup> European Commission Staff Working Document on the implementation of objectives 4 and 5 of the European Commission's policy orientations on road safety 2011-2020 – deployment of vehicle technologies to improve road safety, Brussels, 3.10.2014 SWD (2014) 297 final.

<sup>126</sup> European Commission Call for Tender *Study on good practices for reducing road safety risks caused by road user distractions*, 07/05/2014.

<sup>127</sup> Euro NCAP (2014). *Road Map 2020*, European New Car Assessment Programme, Brussels.

led by DG GROW with support from the CARS 21 High Level Group<sup>128</sup> and DG MOVE, which plays a key role in this process in commissioning studies and identifying and promoting priorities for vehicle safety. Within the framework of the implementation of its ITS strategy initiatives, DG MOVE also proposes technical specifications necessary to exchange data and information between vehicles; between vehicles and infrastructure; and between infrastructures.<sup>125</sup>

A range of Directives were introduced over the last 10-15 years which will contribute to the 2020 target, although most EU activities since 2011 will mainly contribute into the future.

#### General Safety Regulation (GSR) EC 661/2009

The General Safety Regulation (GSR) EC 661/2009 came into force on 1 November 2014 which specified that vehicles 'be designed, constructed and assembled so as to minimise the risk of injury to their occupants and other road users.' It required a variety of new safety features to be mandatorily fitted in new motor vehicles. The most important of these new requirements, in terms of addressing the 2020 target, are electronic stability control, seat belt reminders and anti-lock braking for motorcycles. Various initiatives by the motor manufacturing industry, Euro NCAP and other international organisations as well some national fast-tracking

*Seat Belt Reminders for passenger car drivers:* Seat belt reminders are intelligent, visual and audible devices that detect whether seat belts are in use in various seating positions and give out increasingly urgent warning signals until the belts are deployed. Research shows they increase levels of seat belt use beyond what has been achieved through traditional enforcement methods<sup>129</sup>, prevent serious and fatal injury and are generally cost-beneficial.<sup>130</sup> However, the GSR mandates fitment in the driver's seat only.

*Electronic Stability Control (ESC):* The Regulation requires the mandatory fitment of ESC in new cars, vans, trucks and buses. Research indicates that ESC reduces fatal car crashes by around 25% with higher reductions for different crash types results in serious or fatal injury such as loss of control (33%), rollover (59%) and wet or icy conditions (30%). ESC has been mandatorily phased in for trucks and heavy vehicles since 2010 (with an estimated saving of 500 lives annually), for new types of cars and vans from 2011 and for all new vehicles from 2014.

*Advanced Emergency Braking (AEBS) for trucks and buses* employs sensors to alert the driver when a vehicle is too close to the vehicle in front and, in certain situations, apply emergency braking to prevent or reduce the consequences of a collision was phased in from 1 November 2013 and is mandatory for all new vehicles registered as of 1 November 2015. According to the European Commission, preliminary estimates suggest that the new measures for fitting advanced systems could save around 1000 lives each year.

#### Pedestrian Safety Regulation (OSR) EC 78/2009

Directive 2003/102/EC introduced provisions for improving crash protective car fronts for pedestrians for new type approvals from September 2015 and for new registrations

<sup>128</sup> CARS 21 High Level Group on the *Competitiveness and Sustainable Growth of the Automotive Industry(2012) in the European Union* Final Report 6 June 2012, Brussels.

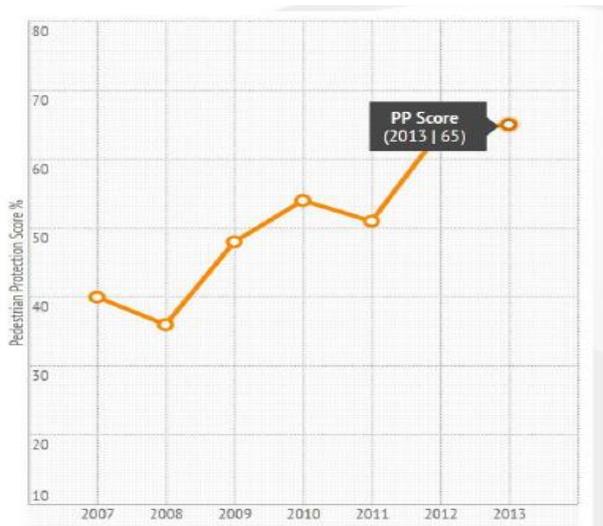
<sup>129</sup> Lie A, Krafft M, Kullgren A, Tingvall C. 2008, . *Intelligent seat belt reminders-do they change driver seat belt use in Europe?*

<sup>130</sup> Hynd D, McCarthy M, Carroll JA, Seidl S, Edwards M, Visvikis C, Reed R and A Stevens (2014), *Benefit and Feasibility of a Range of New Technologies and Unregulated Measures in the fields of Vehicle Occupant Safety and Protection of Vulnerable Road Users: Final Report*, TRL, Crowthorne.

in 2019. The European Commission stated in 2003 that take up of proposed state of the art crash tests could avoid 20% of deaths and serious injuries to vulnerable road users in EU countries annually. The Pedestrian Safety Regulation (OSR) EC 78/2009 updated the 2003 Directive with a revised package of more limited requirements. The EU legislation is aligned with the new Global Technical Regulation 9's passive safety sub-system tests for Phase 2. It requires a mixture of measures to protect pedestrians involved in a collision with a vehicle, by requiring vehicle manufacturers to make energy absorbing bonnets and front bumpers (to lesser requirements than proposed in the 2003/102/EC) and to fit Brake Assist Systems to reduce the stopping distance and lower the speed of impact.<sup>131</sup>

Despite promotion by the European New Car Assessment Programme (Euro NCAP), since the late 1990s, the response of the car industry was initially slow compared with efforts on improved car occupant protection. However, during the last few years as industry prepared to meet the legislative deadline and new Euro NCAP requirements, large improvements have been seen in the pedestrian protection scores of cars tested to best practice crash tests. In 2007, new cars met 40% of the test requirements rising to nearly 65% in 2013.<sup>132</sup> A strong correlation has been demonstrated between Euro NCAP pedestrian protection scores and reductions in deaths and serious injuries to pedestrians in crashes, although the same study found only a small, non-significant reduction in injuries from Brake Assist.<sup>133</sup>

Figure 5: Trend in pedestrian protection score ratings 2007-2013<sup>132</sup>



### Daytime running lights

EU Directive 2008/89/EC required the mandatory fitment of daytime running lights (DRL) in all new cars from February 2011 and for trucks and buses from August 2012. It has been estimated that the fitment of DRL to cars in EU countries could lead to an annual reduction of multi-party daytime crashes by around 12% and deaths and injured victims by 25% and 20% respectively.<sup>134</sup> Regulation (EU) No 168/2013 also

<sup>131</sup> DaCoTA (2012). *Vehicle Safety*, Deliverable 4.8u of the EC FP7 project DaCoTA, Brussels.

<sup>132</sup> DaCoTA (2012). *eSafety*, Deliverable 4.8g of the EC FP7 project DaCoTA, Brussels.

<sup>133</sup> Euro NCAP, van Ratingen M (2014) *An Update on the Euro NCAP Safety Ratings Program*, 12<sup>th</sup> International Symposium and Exhibition on Sophisticated Car Occupant Safety Systems, 2014

<sup>134</sup> Strandroth J, Rizzi M, Sternlund S., Lie A and Tingvall C (2011). *The Correlation Between Pedestrian Injury Severity In Real-Life Crashes And Euro NCAP Pedestrian Test Results*, ESV 2011, Washington.

<sup>134</sup> Koornstra M, Bijleveld F, Hagenzieker M (1997). *The safety effects of daytime running lights*, Leidschendam, Institute for Road Safety Research, SWOV Report R-97-36.

makes mandatory from 2016 the fitment of daytime running lights on powered two and three wheelers. In Europe, the use of daytime running lights by powered two-wheelers has reduced visibility-related crashes in several countries by between 10%-16%.<sup>135</sup>

#### Blind spot mirrors on HGVs

Directive 2003/97/EC introduced the mandatory provision of blind spot mirrors to substantially increase the field of view in new trucks and buses sold in the EU from January 2007. In-depth crash investigation has shown that restricted driver vision to see pedestrians and bicycle riders is a factor in crashes with particularly high risks whilst manoeuvring or reversing. This Directive aims to improve road user safety by upgrading the performance of rear view mirrors and accelerating the introduction of new technologies that increase the field of indirect vision for drivers of passenger cars, buses and trucks. The Directive was further amended by Directive 2005/27/EC to extend the installation of wide angle mirrors to more vehicle types and through Directive 2007/38/EC to require retrofit of blind spot mirrors to heavy goods vehicles.

#### Anti-lock braking systems (ABS) for powered two and three wheelers

These in-vehicle devices aim to prevent the locking of wheels during braking when under emergency conditions so preventing motorcyclists from falling off their vehicles. Research indicates that such systems can reduce 48% of serious and fatal motorcycle crashes.<sup>136</sup> Regulation (EU) No 168/2013 on the approval and market surveillance of two- or three-wheel vehicles and quadricycles makes the fitting of anti-lock braking systems on larger motorcycles as well as the fitting of advanced braking systems (e.g. combined braking systems) on other motorcycles mandatory from 2016. In 2009, Swedish importers increased the number of motorcycle models fitted with ABS as standard and the share of new motorcycles with ABS has increased from 15% in 2009 to 60% in 2010.

#### e-Call

Directive 2010/40/EC provides for the mandatory fitment of e-Call which is a system for sending automated emergency calls to the emergency service from vehicles in the event of a crash. The in-vehicle e-Call is an emergency call (an E112 wireless call) generated either manually by the vehicle occupants pushing a button or automatically via activation of in-vehicle sensors after a crash. When activated, the in-vehicle e-Call device will establish an emergency call carrying both voice and data directly to the nearest emergency services (normally the nearest<sup>112</sup> Public Safety Answering Point (PSAP)). The voice call enables vehicle occupants to communicate with a trained e-Call operator. At the same time, a minimum set of data will be sent to the e-Call operator receiving the voice call. The minimum set of data contains information about the incident including time, precise location, vehicle identification, e-Call status (as a minimum, indication if e-Call has been manually or automatically triggered) and information about a possible service provider.<sup>137</sup>

There are three elements to the deployment: equipping vehicles with the system; ensuring that the mobile phone network is capable of transmitting the message format; and ensuring that the emergency centres are able to handle the messages. Following agreement by the European institutions requiring that Member States should put in place the infrastructure to handle e-Calls these three elements are now in place and there has been recent agreement that the Directive will apply to new models of cars from 2018. Consideration could now be given to extending e-Call to motorcycles

<sup>135</sup> DaCoTA (2012). *Vehicle Safety*, Deliverable 4.8u of the EC FP7 project DaCoTA, Brussels.

<sup>136</sup> Rizzi M, Standroth J, Tingvall C (2009). *The Effectiveness of Antilock Brake Systems on Motorcycles in Reducing Real-Life Crashes and Injuries*, Traffic Injury Prevention, 10(5), pp. 479- 487.

<sup>137</sup> DaCoTA (2012). *eSafety*, Deliverable 4.8g of the EC FP7 project DaCoTA, Brussels.

and commercial vehicles. It is estimated that with e-Call, emergency services' response time could be reduced by 50% in rural areas and 40% in urban areas, leading to a reduction of fatalities estimated to be between 2% and 10%, and reduction of severity of injuries between 2% and 15% depending on the country considered. The benefit-to cost ratio was estimated at 1.74.<sup>138</sup>

#### Event data recorders

Event Data Recorders (EDRs) record a range of vehicle data over a short timeframe before, during and after a triggering threshold and are typically used to record information about road traffic collision. They can help crash investigators to establish objectively crash circumstances and determine the responsibilities of the users involved. In addition, when used in research they can assist understanding about the relationship between factors affecting crash outcomes and severity. The evaluation study (2014) indicates that, where there is driver awareness of their presence, they can have a positive behavioural effect, although estimating potential casualty reduction potential is difficult.<sup>139</sup> While EDRs are fitted to almost all new passenger cars in the EU and have been equipped for some years, most drivers are unaware of their presence to allow a behavioural response. Mechanisms to improve driver awareness and engagement with EDRs would be needed to realise greater safety benefit. Many commercial fleets install in-vehicle data recorders, primarily to measure and influence driving efficiency and behaviour, with the aim of reducing costs and improving safety. The DG MOVE study<sup>139</sup> recommends harmonised specifications for EDR and standardising technical protocols for access to the information generated. Estimated benefit-to cost ratios appear greatest for large vehicles, although the greatest absolute benefit accrues to passenger cars because of the greater fleet size of this vehicle type.

#### Retro-fitting commercial and private cars with Advanced Driver Assistance Systems

The Commission's Staff Working Document on new technologies states that it is often not possible or cost-effective to retrofit existing vehicles with safety systems required for the new vehicle types but this possibility should be encouraged when practical, for instance, by promoting insurance premium reductions for vehicles incorporating these technologies. In particular retrofitting measures may be appropriate when the use of safety system is linked to the vehicle use rather than to the vehicle type.<sup>140</sup>

#### Roadworthiness Package (2014)

The package comprises three Directives. Directives 2014/45/EU and 2014/46/EU are applicable from 2018 and 2014/47/EU is applicable in 2018/19. These relate to periodic technical inspection and build on a range of previous harmonisation initiatives in this field which started nearly 40 years ago. The aim is to increase the scope and the level of requirements for roadworthiness testing and roadside controls across the EU and to create the appropriate framework for information flow between actors and Member States involved in the enforcement of the results of periodic technical inspection. Key safety provisions relating to road safety include improving the quality of vehicle tests by setting common minimum standards for equipment, training of inspectors and assessment of deficiencies; increasing the frequency of periodic roadworthiness tests for old, high mileage vehicles; extending the scope to powered

<sup>138</sup> European Commission Staff Working Document *Impact Assessment Accompanying the document Commission Recommendation on support for an EU-wide e-Call service in electronic communication networks for the transmission of in-vehicle emergency calls based on 112 (e-Calls)*, C 2011,6269 final}

<sup>139</sup> Hynd D and M McCarthy (2014). *Study on the benefits resulting from the installation of Event Data Recorders* Final Report, Prepared for DG MOVE, PPR707, Crowthorne:  
[http://ec.europa.eu/transport/road\\_safety/pdf/vehicles/study\\_edr\\_2014.pdf](http://ec.europa.eu/transport/road_safety/pdf/vehicles/study_edr_2014.pdf)

<sup>140</sup> Commission Staff Working Document *on the implementation of objectives 4 and 5 of the European Commission's policy orientations on road safety 2011-2020 – deployment of vehicle technologies to improve road safety*, Brussels, 3.10.14 SWD(2014) 297 final.

two wheelers over 125 cc unless a Member State reaches equivalent road safety enhancement by other measures (from 2022), and making electronic safety components (e.g. ESC, ABS) subject to mandatory testing.

This package seeks to address the reduction of technical vehicle defects and improve road safety. The key research finding used in the impact assessment<sup>141</sup> is that defects contribute around 6% of collisions involving cars and around 8% of motorcycle collisions.<sup>142</sup> The assessment (2012) assumes that this translates into the same percentage reduction for fatal injury and this assumption underpins the estimate that this package might save over 1200 lives annually.<sup>143</sup> However, measures aimed at preventing crashes in general may not be those that are necessary to target the prevention of serious and fatal outcomes.<sup>144</sup> An assumption has also been made that the type of intervention included will successfully address reducing deaths and serious injuries through reducing defects whereas monitoring has shown this is not necessarily the case.<sup>145</sup> While the fatality reduction effect of detecting faults in new proven safety technologies is also included (with possible increased value over time with the introduction of further measures), it is difficult to make a reliable quantified estimation of the effects of the package.

<i>Action</i>	<i>Commission specified outputs</i>	<i>Commission desired results</i>	<i>Before/ after safety assessment</i>	<i>Fatal crash /fatal injury reduction potential on full implementation</i>
<b>Strategic Objective 4: Safer vehicles</b>				
<u>Action 1</u> Proposals to encourage progress on the active and passive safety of vehicles, such as motorcycles and electric vehicles	Review of General Safety Regulation	Contribution to 2020 target	GSR Review study (2014) See Table 5	High for fatality reduction for road users in general. (See Table 6)
<u>Action 2</u> Roadworthiness Package <sup>146</sup> , 29.4.14 comprising: - Directive 2014/45 periodic roadworthiness tests - Directive 2014/46 technical roadside inspections for commercial vehicles - Directive 2014/47 vehicle registration documents		Fewer vehicles with technical failures on the roads  Contribution to 2020 target		Initially low but potential to increase with greater fitment of key electronic safety measures.
<u>Action 3</u> Assessment of the impact and benefits of co-operative systems relevant measures for their synchronised deployment.	Staff Working Document adopted in 2014.	Contribution to 2020 target		High post 2020 contribution likely.

<sup>141</sup> Commission Staff Working Document *Impact Assessment Final Report of Contributions to Impact Assessment of Policy Options to Improve the EU Systems of PTI and of Roadside Vehicle Testing*, Brussels, 13.7.2012, SWD(2012) 206 final.

<sup>142</sup> Rechnitzer G, Haworth N and Kowadio N (2000). *The effect of vehicle roadworthiness on crash incidence and severity*, Monash University Accident Research Centre, Report No. 164.

<sup>143</sup> [http://europa.eu/rapid/press-release\\_IP-12-780\\_en.htm?locale=en](http://europa.eu/rapid/press-release_IP-12-780_en.htm?locale=en)

<sup>144</sup> Stigson H, Krafft M, Tingvall C (2008). *Use of fatal real-life crashes to analyze a safe road transport system model, including the road user, the vehicle, and the road*. Traffic Inj. Prev. 9(5): 463-71.

<sup>145</sup> Christensen P and R Elvik (2007). *Effects on accidents of periodic motor vehicle inspection in Norway*, Accident Analysis and Prevention 39 (2007) 47-52.

<sup>146</sup> [http://ec.europa.eu/transport/road\\_safety/events-archive/2012\\_07\\_13\\_press\\_release\\_en.htm](http://ec.europa.eu/transport/road_safety/events-archive/2012_07_13_press_release_en.htm)

<i>Action</i>	<i>Commission specified outputs</i>	<i>Commission desired results</i>	<i>Before/ after safety assessment</i>	<i>Fatal crash /fatal injury reduction potential on full implementation</i>
<b>Strategic Objective 5: Promote the use of modern technology to increase road safety</b>				
<i>Action 1</i> Evaluate the feasibility of retrofitting commercial vehicles and private cars with Advanced Driver Assistance Systems.		Contribution to 2020 target		
<i>Action 2</i> Accelerate the deployment of e-Call and examine its extension to other vehicles.		Contribution to 2020 target		<i>Medium to high depending on efficient coordination of e-call partners.</i>

#### 4.6.4 Suggested areas for priority consideration to 2020

Vehicle safety is a key *Safe System* strategy and research has identified large scope for further enhancement. For car occupants, frontal and side impact crashes remain the priorities for further developments in crash protection in car to car, car to truck and car to rigid object crashes. These will require a combination of measures which directly address these crash scenarios and vehicle crash protection compatibility needs. There is potential for further reductions in pedestrian deaths and serious injuries as manufacturers make further progress in addressing state of the art crash tests. Key activity will include adapting existing type approval standards to technical progress in line with EEVC and Euro NCAP recommendations and protocols. There is large future promise of casualty reduction for all road users from crash avoidance and active safety technologies as long as development is prioritised to maximise casualty reduction. Priority needs here are in-vehicle measures to assist driver compliance with key safety rules – speed, alcohol and occupant restraint use and advances in braking and conspicuity systems.<sup>147, 90</sup>

The current review of the General Safety Regulation and the Pedestrian Safety Regulation are expected to result in the preparation of a Communication to the European Parliament and to the Council at the beginning of 2015. The independent study highlights a range of single measures which might be considered for legislation.<sup>148</sup> Where vehicle standards are regulated at global level in UN ECE WP 29, the EU coordinated position provides a majority contribution and an influential means of ensuring a high level of protection in standardisation process which is in line with Treaty obligations for consumer protection.

Using this review as a principal source, Table 6 sets out examples of priority measures with large fatality reduction potential as well as positive benefits to cost.

<sup>147</sup> DaCoTA (2012). *Vehicle Safety*, Deliverable 4.8u of the EC FP7 project DaCoTA, Brussels.

<sup>148</sup> Hynd D, McCarthy M, Carroll JA, Seidl S, Edwards M, Visvikis C, Reed R and A Stevens (2014), *Benefit and Feasibility of a Range of New Technologies and Unregulated Measures in the fields of Vehicle Occupant Safety and Protection of Vulnerable Road Users*: Final Report, TRL, Crowthorne.

Table 6: Priority measures for EU action on vehicle safety

Measure	Description	Fatal crash/fatal injury reduction potential	BCR
Autonomous Emergency Braking Systems (AEBS)	AEBS combines sensing of the environment ahead of the vehicle with the automatic activation of the brakes (without) driver input) in order to mitigate or avoid a collision.	Reductions in fatal front to rear crashes between 145 to 532; reductions in serious front to rear crashes between 1402 and 8808 and a 11% overall casualty reduction (EU 27)	≥1
Speed assist	Advisory – alert the driver to when their speed is too great	5% reduction in fatal crashes and 4% reduction in serious crashes. <sup>149</sup>	>1
	Voluntary – the driver chooses whether the system restricts their vehicle speed and/or the speed it is restricted to.	21% reduction in fatal crashes and 14% reduction in serious crashes.	
	Mandatory - the driver's speed selection is physically limited by the ISA system	46% reduction in fatal crashes and 34% reduction in serious crashes. <sup>149</sup> Annual reduction of 37% of fatal crashes cited in TRL report for speed assist in general.	
Lane keeping assist (LKA)	LKA monitors the position of the vehicle with respect to lane boundary, applying a torque to the steering wheel or pressure to brakes when lane departure is about to occur.	Annual reduction of between 171 -3630 of fatal crashes and serious injury crashes between 871 and 17985.	≥1
Safer HGV front end design	Improvements in HGV frontal protection offered to other road users.	Annual reduction of between 273 and 922 road user deaths.	>1
Improved HGV rear underrun protection	Increased strength and reduced ground clearance of HGV rear underrun guards.	Annual reduction of between 43 and 93 deaths and 694 to 2063 serious injuries (EU 25)	>1
Improved HGV side underrun protection	Provision of lateral protection for trucks and trailers – removal of exemptions in current legislation.	Annual reduction of 5-13 pedestrians and cycle deaths	<1 to 1
Fitment of adaptive restraints	Fitment of improved (adaptive) restraint systems to reduce chest injuries and injuries to older road users.	Annual reduction of 5% of fatally and seriously injured car occupant casualties.	1
Protection of far-side car occupants	Measures to protect against injuries caused to far-side occupants in side impacts and some types of rollover.	Annual reductions of 30% in fatal far-side casualties and between 18 and 57% in serious far-side casualties.	>1
Seat belt reminders	Devices which detect the presence of an occupant and give an audible and/or visual warning if occupants are not wearing a seat belt (only driver seats in passenger cars are currently covered by EU legislation.	Reductions of 191 vehicle occupant deaths and 1902 seriously injured casualties between 2015-2025	>1 (Car front seat passenger cars; drivers, passengers of other vehicles).

<sup>149</sup> Carsten O (2012). Personal communication of additional results to study Lai F, Carsten O and Tate F, *How much benefit does Intelligent Speed Adaptation deliver: An analysis of its potential contribution to safety and environment*, Accident Analysis and Prevention 48 (2012) 63– 72.

Driver distraction and drowsiness recognition	Devices which measure driver inattention or drowsiness	Potential to reduce collisions caused by driver distraction or drowsiness.	>1 (Commercial/public service fleets).
Alcolocks	Alcohol interlock devices prevent the vehicle ignition from operating if alcohol above a pre-defined threshold is detected.	Reductions of 3500-5600 passenger car deaths, 7-137 deaths if used in offender schemes, 125 deaths if fitted to HGVs, 5 deaths if fitted to buses and coaches.	0.3-3.3 <sup>150</sup> 1.4 HGVs 1 -2.8 Offenders 0.8-1.3 All passenger cars
Event Data Recorders	Event Data Recorders (EDRs) record a range of vehicle data over a short timeframe before, during and after a triggering threshold and are typically used to record information about road traffic accidents.	Difficult to quantify.	>1

Source: Unless indicated otherwise, Hynd D, McCarthy M, Carroll JA, Seidl S, Edwards M, Visvikis C, Reed R and A Stevens (2014),<sup>148</sup>

Where large benefits might be expected, a combination of EU legislation, consumer information and national fast-tracking through public procurement, tax and insurance incentives looks to be a useful approach. The Commission has identified a number of additional, useful delivery mechanisms at EU and national levels for the implementation of vehicle safety technologies.<sup>151</sup>

#### Public procurement

"Public procurement can be used as leverage by requiring that vehicles used within contracts with a public administration be equipped with minimum safety features." The Europe 2020 strategy for smart, sustainable and inclusive growth' (2010) includes public procurement as one of the market-based instruments to be used to achieve smart, sustainable and inclusive growth while ensuring the most efficient use of public funds. New EU Directives on public procurement (Directive 2014/24/EU) came into force on 17 April 2014. However, while environmental protection and social issues are included in the scope, the opportunity to include road and vehicle safety is omitted.

#### Tax incentives

"Member States' authorities could provide tax incentives to promote the fitting of additional safety systems, in the same way they are provided for e.g. environmentally friendly technologies." As ACEA has noted, measures to drive fleet renewal might be encouraged since the average age of cars in some countries can be up to 14 years.<sup>152</sup> It will also be necessary to ensure that such measures also relate to the highest Euro NCAP ratings to ensure maximum safety value.

#### Insurance premiums

"Insurance companies may take into account the safety systems fitted to a vehicle when determining the amount of premiums. Some insurance companies are already offering discounts to drivers who accept the fitting of an Event Data Recorder. Similar incentives could be especially relevant for crash avoidance technologies."

<sup>150</sup> ECORYS, COWI (2014). *Study on the prevention of drink-driving by the use of alcohol interlock devices Final Report* to European Commission, DG for Mobility and Transport, Rotterdam.

<sup>151</sup> Commission Staff Working Document *on the implementation of objectives 4 and 5 of the European Commission's policy orientations on road safety 2011-2020 – deployment of vehicle technologies to improve road safety*, Brussels, 3.10.2014 SWD(2014) 297 final.

<sup>152</sup> ACEA (2014). *Response on the mid-term evaluation of the Commission's road safety policy orientations 2011-2020*, European Automobile Manufacturers Association, Brussels.

### Promotional campaigns

"The Commission and Member States authorities can financially support awareness campaigns to inform the public about the existence of these systems and their benefits for road safety."

#### **Box 4: What can a jurisdiction/organisation/company do to promote safer vehicles?** <sup>153</sup>

- Use travel policies
- Look at road safety management systems (ISO 39001)
- Include vehicle safety in traffic safety work
- Support Euro NCAP and actively use the results
- Support every organisation that wants to focus on safety
- Be the market
- Get occupational health and safety on-board
- Follow up new technologies

### Safety rating systems

"The European New Car Assessment Programme (Euro NCAP) is gradually incorporating in-vehicle technologies in its assessment programme. Through 'Euro NCAP Advanced', the programme rewards the fitting of advanced safety technologies and a roadmap has been drawn up for the inclusion of emerging crash-avoidance technologies in the assessment scheme by 2015." "The European Road Assessment Programme (Euro RAP) can also contribute by identifying risks related to the infrastructure and promoting the deployment of infrastructure based safety systems."

### The Transatlantic Trade and Investment Partnership (TTIP)

While the above-mentioned measures can play a vital role, the legislative framework for EU vehicle safety provides the underlying framework for successful intervention. Road safety experts have expressed concern about the potential undermining of the safety quality of EU-registered vehicles to date by a new trade agreement which is currently being negotiated between the EU and the United States. The Transatlantic Trade and Investment Partnership (TTIP) aims to remove trade barriers in various areas, including passenger cars. The concern is that EU and US crash testing regimes and performance thresholds differ in a number of key areas such as frontal and side impact protection. Accepting US vehicles with lower levels of protection (for EU country conditions) into the EU fleet would be a retrograde step in this important EU strategic field for road safety.

### **Summary of recommendations for EU action**

- Ensure that EU vehicle safety standards provide a high level of protection.
- Propose a range of new EU vehicle safety legislation to reduce the number and risk of serious and fatal injury including the following priorities: Autonomous Emergency Braking Systems (AEBS); Speed Assist (advisory and voluntary systems); seat belt reminders for front and rear seat passengers; fitment of adaptive restraints in cars; protection of far-side car occupants in side impacts; improved heavy goods vehicle front end design, rear and side underrun protection; and Lane Keeping Assist.
- Promote and fund a Euro SHARP consumer information programme on powered two-wheeler use crash helmets in cooperation with the UK SHARP programme.
- Monitor the usage levels of helmets by powered two-wheeler riders and cyclists across the EU and promote/propose mandatory cycle helmet use legislation for school-aged children across the EU and target increased levels of use; establish a European cycle helmet consumer information programme.

<sup>153</sup> Lie A (2010), *Vehicle safety policy – Swedish Transport Administration*, PRAISE Seminar, 12.5.2010, ETSC, Brussels.

- Promote zero-rated Value Added Tax for cyclist and motorcyclist helmets.
- Revise EC Directive 2014/24/EU on public procurement to include road safety, alongside existing provisions covering environmental and social aspects.
- Invite the High Level Group on Road Safety to consider national incentives to fast-track proven technologies by a range of means including procurement, safe travel policies, and tax and insurance incentives.
- Through the EU Health and Safety at Work agency, devise safe travel policies for the European Commission as well as promoting take up of ISO 39001 on road safety management systems for organisations.

## 4.7 Improve emergency and post-injuries services

### 4.7.1 Introduction

This section considers a range of EU initiatives foreseen in Objective 6 of *Policy Orientations* (4.8.2) and ends with suggestions for further initiatives to 2020 (4.8.3). Note that activity on e-Call - a significant post-impact care contribution - is covered in the strategy's Objectives 4 and 5 on safer vehicles and new technologies. No other specific action on post-impact care is included here.

### 4.7.2 Aim, proposed actions and status of PO activities carried out

The main topic for road safety covered in this section is the development of a Road Injuries Strategy. As highlighted in Section 5, this provides a potential overarching framework for the further development of *Policy Orientations* to 2020 and beyond, targeting both death and serious injury reduction and a range of intermediate outcomes, through system-wide intervention and strengthened institutional delivery.

<b>Strategic Objective 6: Improve emergency and post-injuries services</b>	
<i>Proposed action</i>	<i>Activity status reported by the Commission</i>
<p><u>Action 1</u> In collaboration with Member States and other actors involved in road safety, the Commission will propose the setting-up of a global strategy of action on road injuries and first aid.</p>	<p>The action is <u>ongoing/under preparation</u>. The first step in setting-up a strategy on road injuries was to identify a common EU definition of "serious road traffic injury" for data reporting to the CARE database. This definition and other key milestones were described in the staff working document (SWD2013/94) on serious injuries. The methodology for reporting this data was developed together with Member States during 2013. Member States collect the first data under the new common definition during 2014 and the first comparable and reliable data will be available in 2015. Based on that baseline, a strategic target could be adopted on reduction of serious road traffic injuries. In parallel, preparations are made for possibly launching study/studies in 2015 on options for an injury strategy.</p>

### 4.7.3 Contribution of *Policy Orientations*/other EU measures to 2020 target

The need for focussed attention on the reduction of serious injury is widely acknowledged and supported. The ground work carried out by the Commission, supported by the EU institutions, within this strategic objective since 2011 sets the scene for determining important new safety directions. This has included work towards a new common definition of serious injury and first steps towards a *Road Injuries Strategy* (See Section 5.3.2). There is an urgent need to extend existing EU goals and targets to include serious injury, as newly defined. Measures which address the reduction of serious injury also have the potential to contribute in some way to the 2020 and 2050 fatality reduction targets.

#### 4.7.4 Suggested areas for priority consideration

##### Post impact care

Post impact care is a vital *Safe System* strategy. The appropriate management of road casualties following a crash is a crucial determinant of the chance and quality of survival. European research indicates that about 50% of deaths from road traffic collisions occur within minutes at the scene or in transit and before arrival at hospital. For those patients who are taken to hospital, some deaths occur within the first 4 hours after the crash (15%) but the majority occur after 4 hours (35%). There is, therefore, a chain of opportunities for intervention. Effective post-crash care reduces the consequences of injury by efficient emergency notification, fast transport of qualified medical personnel, correct diagnosis at the scene, stabilization of the patient, prompt transport to point of treatment, quality emergency room and trauma care, and rehabilitation services.<sup>154,155</sup> The quicker the patient has access to the emergency medical system, the greater the chances of surviving and making a full recovery. Research indicates that reducing the time between crash occurrence and the arrival of emergency medical services from 25 to 15 minutes could reduce deaths by one third.<sup>156</sup>

In terms of intervention, this area falls mainly within the competence of Member States. However, the Commission can play a key role in funding studies, encouraging the establishment of trauma registries and other monitoring and evaluation as well as promoting best practice. In the first instance, a study on the scope of post impact care in reducing the consequences of road injuries across the EU is needed. As regards possible first aid measures which are foreseen in *Policy Orientations*, according to the World Health Organization, there is no strong evidence that basic first aid training by drivers and members of the public would decrease pre-hospital mortality. There is, however, some evidence internationally, about the value of first responder training of commercial drivers and emergency services staff.<sup>157</sup>

#### Summary of recommendations for EU action

- Set a quantitative target to reduce serious injuries by 2020 and beyond and the further development of the Injuries Strategy (See Section 5.3.2)
- Commission a study to review the scope of post impact care in reducing deaths and serious injuries in road collisions.
- Include first responder training in commercial and public transport driver training and emergency services personnel.
- Monitor and rank annually through DG SANTE Injury Database the role of road traffic injury as a cause of morbidity compared with other injury causes.

## 4.8 Protect vulnerable road users

### 4.8.1 Introduction

This section considers a range of EU initiatives foreseen in Objective 7 of *Policy Orientations* (4.9.2) as well as those adopted in the previous decade which may be starting to influence road safety outcomes (See Section 4.9.3) and ends with suggestions for further initiatives (4.9.4).

<sup>154</sup> Sasser S, Varghese M, Kellermann A. Lormand JD (2005). *Pre-hospital trauma care systems*, WHO, Geneva.

<sup>155</sup> Mock C, Lormand JD, Goosen J, Hoshipura M., Peden M, (2004). *Essential trauma care guidelines*, WHO, Geneva.

<sup>156</sup> Sánchez-Mangas R, García-Ferrer A, de Juan A, Arroyo A M (2010). *The probability of death in road traffic accidents. How important is a quick medical response?* Accident Analysis and Prevention 42 (2010) 1048

<sup>157</sup> Eds. Peden M, Scurfield R, Sleet D, Mohan D, Hyder A, Jarawan E and C Mathers (2004). *World Report on Road Traffic Injury Prevention*, World Health Organisation, World Bank, Geneva.

#### 4.8.2 Aim, proposed actions and status of *Policy Orientations* activities

Fostering equity among road users through focused efforts to improve the safety of more vulnerable road users is a key principle underpinning *Policy Orientations*. Note, therefore, the considerable overlap with other initiatives pursued under several other *Policy Orientations* objectives.

Specific actions carried out which have not been covered by review in previous sections include studies, reviews, communication activities and the integration of road safety into the Urban Mobility Package.

<b>Strategic Objective 8: Protect vulnerable road users</b>	
<i>Proposed action</i>	<i>Activity status reported by the Commission</i>
<u><i>Action 1</i></u> Monitoring and further developing technical standards for the protection of vulnerable road users.	The action is <u>ongoing</u> . Co-funding research projects e.g. VRUITS under FP7 (on providing recommendations regarding ITS applications for the improvement of the safety and mobility for vulnerable road users).  Contributing to the DG GROW review of Regulation 661/2009 concerning type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefore e.g. by analysis of emergency brake systems/pedestrian detection in draft staff working paper and in bilateral consultations between MOVE and GROW (formerly ENTR).
<u><i>Action 2</i></u> Including powered-two wheelers in vehicle inspections.	The action is <u>partly completed</u> . The roadworthiness package adopted in 2014 (Directive 2014/45, Directive 2014/46 and Directive 2014/47) covers motorcycles above 125 cc. A study on motorcycle accident causation has commenced. <sup>158</sup>
<u><i>Action 3:</i></u> Increasing the safety of cycling and other vulnerable road users, e.g. by encouraging the establishment of adequate infrastructure.	The action is <u>ongoing</u> . The Commission launched in December 2013 the Urban Mobility Package with a specific focus on road safety as an integral aspect of urban planning, the area where safety for vulnerable road users is most relevant. An Advisory Group has been established to investigate how the urban road safety issues can be taken forward. The informal paper with good examples on national road safety planning also presents and promotes a strong focus on vulnerable road users. A call for proposals to support European road safety actions aimed at tackling problems related to vulnerable road users, children, elderly and young drivers <sup>159</sup> .
<u><i>Action 4:</i></u> Member States should develop information, communication and dialogue between road users and with the competent authorities. The Commission will contribute to this effort.	The action is <u>ongoing</u> . The Commission has contributed with a website and smart phone application <sup>160</sup> for helping citizens to get access to road safety information. The Commission makes road safety data and analysis available via the European Road Safety Observatory and provides the platform for the Road Safety Charter providing a link to citizens and civil society. The Commission road safety unit is active in regularly replying to questions from citizens, directly or via the Europe Direct service.

#### 4.8.3 Contribution of *Policy Orientations*/other EU measures to 2020 target

##### Urban Mobility Package

In 2013, an urban mobility package was introduced to strengthen EU action on sustainable urban mobility and encourage Member States to take more decisive and better coordinated action.<sup>161</sup> Accompanied by a staff working document on road

<sup>158</sup> DG MOVE Call for tender; *Study on accident causation for traffic accidents involving powered 2-wheelers and bicycles in the European Union*, 4/7/2014.

<sup>159</sup> DG MOVE/C4-2014/298 *Call for proposals to support European road safety actions aimed at tackling problems related to vulnerable road users, children, elderly and young drivers*.

<sup>160</sup> [http://ec.europa.eu/transport/road\\_safety/going\\_abroad/index\\_en.htm](http://ec.europa.eu/transport/road_safety/going_abroad/index_en.htm)

<sup>161</sup> COM (2013) 913 final Communication: *Together towards competitive and resource-efficient urban mobility*, Brussels, 17.12.2013.

safety<sup>162</sup> the Recommendation notes that sustainable urban mobility will only be achieved if road safety is fully taken into account as an integral part of sustainable urban mobility planning. Cities wanting to encourage a modal shift to more sustainable modes such as walking and cycling should ensure that these are safe options, so that modal shift does not compromise safety. Local targets for reducing road deaths and serious injuries in support of sustainable urban mobility plans are recommended. Plans should address issues such as safe urban infrastructure, especially for vulnerable road users, the use of modern technology for enhanced urban road safety, enforcement and road safety education. In addition Member States should ensure data collection on safety indicators at the most detailed level possible and encourage local authorities to use such data in analysis and safety planning. The Commission plans to collect and disseminate good practice guidance on urban road safety management.

<i>Action</i>	<i>Outputs</i>	<i>Commission desired results</i>	<i>Before/ after safety assessment</i>	<i>Fatal crash /fatal injury reduction potential</i>
<i>Action 1</i> Monitoring and further developing technical standards for the protection of vulnerable road users.	Research studies and promotion, cooperation with other Directorates	Contribution to 2020 target	See Section 4.5/6	High potential from a range of standards in the event of legislative proposals. (See 4.6 Table 6),
<i>Action 2</i> Including powered-two wheelers in vehicle inspections.		Contribution to 2020 target	See Section 4.5/6	Low if any, but difficult to assess.
<i>Action 3:</i> Increasing the safety of cycling and other vulnerable road users, e.g. by encouraging the establishment of adequate infrastructure.		Contribution to 2020 target	See Section 4.4	High potential but dependent on intervention/ implementation in Member States.
<i>Action 4:</i> Member States should develop information, communication and dialogue between road users and the competent authorities. Commission to contribute to effort.		Contribution to 2020 target		Low if any.

#### 4.8.4 Recommended areas for priority consideration

The main factors determining the severity of a road traffic injury are the use of protective devices, the speed of the vehicle(s) involved (Section 3.2.10) (objectives 2,3,4,5), the design and characteristics of vehicles (objectives 4 and 5) and roadsides (objective 3) and swift access to emergency medical systems (objective 6).<sup>163</sup> Key priorities have largely been identified for vulnerable road users in these sections. Additional suggestions are made below.

##### Use of protective devices

Targeting reductions in severe injuries means addressing head injuries and spinal injuries, which comprise the majority of injuries of this type. As the Commission notes, the likelihood of severe head injury decreases considerably with an airbag in place. Failure to wear crash helmets results in serious and fatal head injuries for pedal cyclists, moped riders and motorcyclists.

<sup>162</sup> Commission Staff Working Document, *Targeted action on urban road safety* Brussels, 17.12.2013. SWD(2013) 525 final.

<sup>163</sup> Commission Staff Working Document on *the implementation of objectives 4 and 5 of the European Commission's policy orientations on road safety 2011-2020—deployment of vehicle technologies to improve road safety*, Brussels, 3.10.2014.

- *Powered two wheeler rider crash helmets*

Riders and passengers on mopeds and motorcycles have a higher risk of injury than any other group of road users. Head injuries cause 75% all motorcyclist deaths and around 25% of serious injuries. One quarter of all injured riders suffer a head injury. Research indicates that motorcycle helmet use reduces the number of fatal injuries by around 44% and serious head injuries by 49%.<sup>164</sup> Incorrect fastening of helmets is common and negates potential crash helmet protection. There is also considerable variation in the safety quality of different helmets. Around 20% of fatal and serious head injuries could be reduced by a recommended and achievable improvement in crash helmet performance.<sup>165</sup> The UK Safety Helmet Assessment and Rating Programme (SHARP) was launched in 2007 to provide riders with objective safety rating information about the performance of different crash helmets. Differences in performance of as much as 70% have been found between high and low scoring helmets. In the UK, up to 50 lives could be saved each year if motorcyclists wore the safest helmets (beyond minimum standards) available.<sup>166</sup> Given the success of European safety ratings such as Euro NCAP and EuroRAP, promotion and funded extension of this scheme at EU level (Euro SHARP) could be considered by the Commission, the UK and other interested Member States and partners (Annex 10).

- *Cyclist crash helmets*

Bicycle helmets reduce by the risk of serious head and brain injury by up to 88%. While few Member States mandate the use of cycle helmets, several require the use of helmets by children. Usage levels reported in 2008/9 indicate a range of between 11% and 40%, and large potential for further reducing head injury.<sup>167</sup> The Commission might consider proposing harmonised cycle helmet use legislation to reduce the high risk of death through head injury to children when riding bicycles, as well as a consumer information programme for buyers of cyclist helmets. In some countries, both cyclists and motorcyclists helmets are zero-rated for Value Added Tax and consideration could be given to how this might practice be encouraged.

### Summary of recommendations for EU action

- Monitor usage levels of helmets by powered two wheeler riders and cyclists across the EU.
- Promote/propose mandatory cycle helmet use for school-aged children across EU.
- Consider promoting and funding a Euro SHARP consumer information programme on powered two wheeler use crash helmets in cooperation with the UK SHARP programme.
- Consider the development of a European cycle helmet consumer information programme.
- Promote zero-rated Value Added Tax for cyclist and motorcyclist helmets.

## 4.9 Other actions

A range of other key actions have been carried out since 2011 including further capacity building through twinning and TAIEX projects and further development and support for monitoring and evaluation activities which are discussed in Sections 5.5. and 5.6.

<sup>164</sup> Elvik R, Vaa T, Høy A, Erke A and M Sørensen Eds.(2009). *The Handbook of Road Safety Measures*, 2<sup>nd</sup> revised edition Emerald Group Publishing Limited, ISBN: 9781848552500.

<sup>165</sup> COST 327 (2001). *Motorcycle Helmets*, Final Report, Brussels.

<sup>166</sup> <http://sharp.direct.gov.uk/home>

<sup>167</sup> ETSC(2011). 5<sup>th</sup> PIN Report, 2001 *Road safety target outcome: 100,000 fewer deaths since 2001*, Brussels.

## 5 EU institutional framework for *Policy Orientations*

### 5.1 Summary

Road safety is amongst the stated top priorities of the European Commission. The EU is a world leader in regional road safety management. The new, effective action needed between now and 2020 towards achieving existing targets (Section 4) and preparing for post 2020 actions towards the 2050 goal requires some strengthening of institutional delivery.

#### **Results Focus**

- A long-term Vision Zero/Safe System goal has been set to 2050 to virtually eliminate road deaths, supported by an interim target to reduce deaths by 50% between 2010 and 2020. This represents international best practice and is providing strong encouragement to Member States.
- A sharp focus is needed to address road fatality reduction goals to ensure that interventions to improve road safety appropriately address these goals and targets.
- The current focus on preventing and reducing the number of deaths of the results framework (2020 and 2050 goals) now needs to be expanded to include serious injury. The proposal for a 35% reduction in serious injuries by 2020 compared with 2014 seems an appropriate and challenging strategic target.
- It is suggested that the framework for the future development of *Policy Orientations* is provided by the evolving *Road Injuries Strategy* addressing fatal and serious injuries. Consistent with good practice road safety management, future road safety strategy needs to establish a clear road safety performance framework with specific objectives to allow targeting and monitoring and evaluation.
- The scope of *Policy Orientations* might be extended to include activity towards reducing work-related road deaths and serious injuries.
- Consideration should be given to setting targets to 2020 and beyond to increase seat belt use and crash helmet use; reduce average speeds and speeding over the limit; reduce levels and drinking and driving and fatal injury outcomes; improving the safety quality of the new vehicle fleet through use of Euro NCAP star ratings or for the road infrastructure (at least for TEN-T) using road assessment programme ratings Euro RAP.
- A road safety management capacity review is recommended to assist the development of a post-2020 *Towards Zero* strategy, involving key Commission Directorates and road safety partners who can deliver road safety results.
- In view of the challenges to 2020 and beyond, lead road safety unit capacity needs strengthening in DG MOVE, particularly in the further development of its strategy development and coordination, monitoring and evaluation functions, as well as in technical support for *Safe System* intervention.

#### **Coordination**

- DG MOVE engages with Member States and other Directorates in its road safety task.
- Some further expansion of inter-Directorate coordination is recommended to ensure multi-sectoral, day-to-day ownership of road safety goals, targets and strategy. It is recommended that DG MOVE creates at least one full-time staff position dedicated to coordinating the future development and implementation of *Policy Orientations* and post-2020 strategy.
- DG MOVE should consider setting up and chairing a *Policy Orientations* Steering Group (and subsequently a *Towards Zero* group) bringing together all Directorates with *day-to-day* responsibilities relating to road safety, including reporting to Directors.
- It is recommended that the Commission builds on this cooperation with the High Level Group towards further annual reporting of important road safety outcomes to allow closer monitoring and management of road safety strategy.

#### **Legislation**

- Large scope exists for further legislation to address the road safety task to 2020, particularly within the framework of the General Safety Regulation, driver licensing and TEN-T initiatives. Suggestions for future priority actions have been outlined in previous sections.
- Guidance of impact assessments of road safety legislation needs to include common protocols for assessing costs and benefits and the use of updated annual values for the prevention of a fatality (See next section).

### **Funding and Resource Allocation**

Despite the increasingly ambitious goals and targets sought, identified risks and demonstrated benefit to cost ratios of publicly acceptable measures, investment in preventing serious health loss in road crashes is not commensurate with the high socio- economic value of its prevention either at EU or national levels.

- It is recommended that Commission Directorates adopt the standard methodology for assessing the costs and benefits of road safety measures as presented in the updated handbook for the evaluation of external costs (2014), updated to reflect annual values for the prevention of a fatality.
- Determining priorities for resource allocation and harmonisation should not always rely upon cost-benefit analysis, since measures which provide the largest number of road deaths and serious injuries many have a lower benefit-to cost ratio than measures with higher benefit-to cost ratios which address a smaller number of casualties.

### **Promotion**

- Road safety is promoted at a high level by the European Commission.
- Promote the *Safe System* goal and approach as the new safety culture, interim targets and the shared responsibility for reaching them in all communication activities including the European Road Safety Charter.

### **Monitoring and evaluation**

- DG MOVE is engaged in a wide range of monitoring and evaluation activity and reports annually on EU road safety results.
- While information on traffic volume by road user type in several Member States is collected, traffic volume data is not available for EU 28. Traffic volume is an essential exposure indicator and this important data deficit needs to be addressed urgently by the Commission and Member States.
- Extension of the current EU road safety performance framework is recommended and suggestions are made for a range of indicators for adoption to 2020 and beyond.
- Annual reporting on EU road safety performance could be undertaken within the High Level Group on Road Safety and CARE expert groups.
- The European Road Safety Observatory is a valuable source of road safety information. Country profiles and other statistical information need to be updated annually. .
- The development of an EU-wide in-depth crash injury investigation system is recommended
- The European Road Safety Charter should be reviewed regularly to encourage high quality road safety contributions.

### **Research and development and knowledge transfer**

- The EU plays a crucial role in research and development which has underpinned much of the successful life-saving intervention and tools implemented at EU level and in Member States. New focus is needed on *Safe System* intervention and 2050 goals
- The knowledge transfer role is also vital and there is large scope for EU best practice guidance.
- As recommended previously, the funding of *Safe System* demonstration projects in corridors, cities and areas is needed to accelerate knowledge transfer and to encourage roll out and inclusion of *Safe System* into the mainstream of road safety activity in EU 28.
- The European Road Safety Observatory is a valuable tool for policymakers and professional and web texts and other information should be regularly updated.

## **5.2 Introduction**

This section looks at the institutional framework and arrangements which underpin the Commission's *Policy Orientations*. The emphasis is on the more important issue of whether and how key institutional management functions are delivered rather than the organisational structures – whether existing or new - within which these may be carried out.

## 5.3 Results focus

### 5.3.1 Leadership

Reducing death and injury in road crashes is an issue which knows no borders and takes place in a complex, multi-sectoral context involving several levels of government and many actors. Political will and careful leadership is paramount for effective action and is expressed through high-level governmental leadership of road safety, strong Parliamentary support, the setting of and transparent accountability for long-term goals and quantitative targets supported by effective action with appropriate resource and management capacity.<sup>168</sup>

The EU is a global leader in road safety and the Commission has given itself the task of ensuring that this continues into the future. The new Commission has pledged to make road safety a top transport priority. The European Commission aims to *"Make sure that the EU is a world leader in safety and security of transport in all modes of transport."*<sup>169</sup> In November 2014, Violeta Bulc, the EU Transport Commissioner took the opportunity *"to personally pledge to make road safety one of my top priorities as the European Transport Commissioner"*.<sup>170</sup>

As the European Commission's lead in road safety, DG MOVE and its road safety unit (C4) has responsibility for proposing goals and targets, developing overarching road safety strategies and action programmes and reporting on them. In common with national road safety lead bodies (although comprising significantly less than the human resource capacity typically seen in good practice), DG MOVE has some but not all key road safety responsibilities and a key role in encouraging and guiding the efforts of all key players who can contribute to EU targets. The Unit covers a lot of ground impressively but needs to be strengthened, particularly in any development of road safety strategy and targets, coordination, monitoring and evaluation functions and technical support.

Responsibilities for a range of road safety intervention and activity are spread over several other Directorates including DG MOVE (common transport policy), DG GROW (Single Market vehicle safety standards), DG SANTE (health sector surveillance of road traffic injury and public health), TEN-T agency INEA: (road network safety management), EU-OSHA (the European Agency for Safety and Health at Work; DG ELARG, DG REGIO (TAIEX and other initiatives); DG RESEARCH (road safety research).

While road safety and road injury prevention could not be said to be receiving equal consideration to other areas in transport, health and occupational policies, the Commission has received strong encouragement and support in its road safety task from the Council of Ministers, the European Parliament, other EU institutions and a wide range of stakeholders.

<sup>168</sup> First Global Inter-Ministerial Conference on Road Safety, *Panel 2: Policy Frameworks: Summary*, Moscow, 19-20 November 2009.

<sup>169</sup> European Commission (2011). *White Paper: Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system* COM(2011) 144 final, Brussels, 28.3.2011.

<sup>170</sup> Statement on the occasion of the World Day of Remembrance for Road Traffic Victims, 16.11.14.

### 5.3.2 Adopting goals, targets and strategies

#### Long-term goal to 2050

In line with international good practice, the Transport White Paper<sup>171</sup> set out a highly ambitious long-term goal of virtually eliminating road deaths by 2050 – a *Vision Zero* (or *Safe System* as it is known generically) for EU road safety activity.<sup>172</sup> Subsequent Commission working documents take up the *Safe System* approach to intervention aimed at better addressing common human error and human vulnerabilities.<sup>173</sup>

Working towards the *Safe System* goal and approach are important developments and will require a substantial reorientation of road safety policy and practice over the next decades. Not least, the sheer scale of the ambitious goals and targets will necessitate alignment with other EU societal objectives such as sustainable development and environmental protection, energy security, economic development and public health as well as occupational health and safety. Given sufficient stimulus, encouragement and the right frameworks for integration, these initiatives should lead to building even better business cases for road safety initiatives and achieving co-benefits.

#### 2020 EU road fatality reduction target

Setting challenging but achievable step-wise quantitative final and intermediate outcome and output targets towards the ultimate goal to eliminate death and long-term injury is recommended as effective practice.<sup>172</sup> Targets drive decisions about countermeasures, their coordination needs, legislative needs, funding and resource allocation requirements, promotion needs, as well as requirements for monitoring and evaluation, research, development and knowledge transfer. Quantitative targets lead to better programmes, more effective use of public resources and an improvement in road safety performance.<sup>174</sup> Ambitious targets are associated with better performance than less ambitious targets.<sup>175 176</sup>

In support of the long-term goal, the White Paper and the current road safety strategy *Policy Orientations on Road Safety 2011-2020*<sup>177</sup> set out an ambitious quantitative target to reduce the number of annual road deaths by 50 per cent between 2010 (baseline year) and 2020. According to the Commission it represents a significant increase in the level of ambition compared to the unmet 2010 target considering the progress already made by Member States over the past decade. The aim was 'to give a clear signal of Europe's commitment towards road safety'. As indicated in Sections 3 and 4, while progress is being made achieving the target will require effective new action over and above 'business as usual.'

#### 2020 serious injury reduction target

The White Paper also anticipated the setting of quantitative targets to reduce road injuries. Reducing the number and the severity of serious injuries is an emerging

<sup>171</sup> European Commission (2011). *White Paper: Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system* COM(2011) 144 final, Brussels, 28.3.2011.

<sup>172</sup> OECD (2008). *Towards Zero: Achieving Ambitious Road Safety Targets through a Safe System Approach*, Paris.

<sup>173</sup> European Commission (2014). *Staff Working Document on the implementation of Objective 6 of the European Commission's policy orientations on road safety 2011-2020 – First milestone towards an injury strategy*, Brussels, 19.3.2013 SWD(2013) 94 final.

<sup>174</sup> OECD (1994). *Targeted Road Safety Programmes*, Paris.

<sup>175</sup> Allsop RE, Sze NN Wong SC (2011). *An update on the association between setting quantified road safety targets and road fatality reduction*, Accident Analysis and Prevention 43 (2011) 1279–1283.

<sup>176</sup> Elvik R. (2001). *Quantified road safety targets: An assessment of evaluation methodology*. Report 539. Institute of Transport Economics, Oslo.

<sup>177</sup> European Commission (2010). *Towards a European road safety area: Policy Orientations on Road Safety 2011-2020*, Brussels, 20.7.2010 COM(2010) 389 final.

strategy in *Policy Orientations* and a new priority for EU action.<sup>178</sup> The Commission is currently considering whether to set a target to reduce serious injuries in the knowledge that road deaths are the tip of the iceberg and that less progress is being made in reducing serious as opposed to fatal injury. Setting a challenging but achievable quantitative target to reduce serious injuries by 2020 is very widely supported not least by the High Level Group on Road Safety who recently discussed a range of options. The broad consensus is that a target should be based on the common definition of serious injury agreed in 2014 (serious injury =  $\geq$  MAIS 3) with a 2014 baseline. Injuries classified as  $\geq 3$  on the MAIS scale are the most serious and ones that cause significant or long-term damage and consequences.<sup>179</sup> The European Transport Safety Council recommends a targeted reduction in the numbers of serious injury by 35% by 2020 (2014 baseline) as challenging but achievable and for appropriate parity in ambition with the fatality reduction target, supported by a fully-fledged strategy for its accountable delivery.<sup>180</sup>

#### Other EU targets to 2020

Beyond headline serious and fatality reduction targets, consideration should be given to disaggregated final outcome targets for school-aged children and young people, given that road traffic injury is the leading or second leading cause of death for most EU countries. Targets based on deaths and serious injuries and distance travelled would be useful but exposure data for pedestrians and cyclists is only available for a limited number of Member States and this may be more appropriate for national or post-2020 EU activity.

*Intermediate outcome targets:* As indicated previously, the Commission could also consider targeting outcomes to 2020 which are causally related to reducing road deaths and serious injuries. Where linkages are made between targeting intermediate outcomes and final outcomes, then the targeting process becomes increasingly manageable and meaningful.<sup>181</sup> Intermediate outcome targets include increasing seat belt use and crash helmet use; reducing average speeds or speeding over the limit; reducing levels and drinking and driving; improving the safety quality of the new vehicle fleet through use of Euro NCAP star ratings or for the road infrastructure using road assessment programme ratings Euro RAP. This approach is highly recommended as international best practice by the OECD, World Bank, ISO and other organisations and EU countries are increasingly working with these factors. See Section 5.6 for further discussion and suggestions on safety performance indicators.

#### Encouraging national targets and actions

*Policy Orientations* encourages national action towards EU road safety objectives and encourages Member States to set targets and to target activity towards the weakest areas of country performance.<sup>182</sup> As for the previous action programme, the existence of EU road safety goal, target and strategy is playing a key role in encouraging ambitious targets, many of which replicate or align with the EU 2020 target.

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<sup>178</sup> European Commission (2012). *Public Consultation on an EU strategy to reduce injuries resulting from road traffic accidents*, Brussels.

<sup>179</sup> The MAIS (Maximum Abbreviated Injury Scale) is a globally accepted trauma scale used by medical professionals. It provides an objective and reliable basis for data collection. The injury score is determined at the hospital with the help of a detailed classification key. The score ranges from 1 to 6, with levels 3 to 6 considered as serious injuries.

<sup>180</sup> ETSC (2014). European Transport Safety Council (2014) *Ranking EU Progress On Road Safety*, 8th Road Safety Performance Index Report, Brussels.

<sup>181</sup> OECD (2008). *Towards Zero: Achieving Ambitious Road Safety Targets through a Safe System Approach*, Paris.

<sup>182</sup> Commission Staff Working Document (2014), *Road safety planning Good practice examples from national road safety strategies in the EU*. SWD web paper regularly updated.

Considerable scope exists to implement existing guidance, as well as creating and promoting new tools, particularly for countries that are starting to build their road safety management systems, adopt *Safe System* goals, targets and approaches. The importance of ensuring that plans are not paper plans but can translate into measurable, effective, funded activity is central in international advice.<sup>183 181</sup> Road safety management capacity review, as well as the funding of multi-sectoral *Safe System* demonstration projects provide pragmatic means of encouraging progress in effective directions.

#### The scope of the current road safety strategy

The summary review in Section 4 of interventions found that a broad range of intervention is carried out or foreseen within the *Policy Orientations* framework. There is, however, considerable scope for its further development and implementation if 2020 targets are to be met as well preparing for post-2020 efforts.

Meeting the challenges ahead requires a tight strategic focus on the 2020 road fatality reduction goal in (1) ensuring that intervention is largely evidence-based and (2) identifying intervention which reduces and prevents fatal injury (as opposed to interventions targeting crash prevention in general). Future intervention needs to be shaped by the current 2020 and 2050 goals as well as any new targets adopted.

In addition, while all continue to be relevant, the overlapping inherent in several of the seven strategic priorities of *Policy Orientations* is inefficient and needs to be resolved to enable a more holistic, focused approach to be adopted. One possible approach is to merge these strategic objectives within the evolving *Road Injuries Strategy* developing within Objective 6 (currently named 'Improve emergency and post-injuries services'). This would focus both on 2020 road fatality reduction target as well as any new serious injury targets and allow the creation of a new safety performance framework taking account of both fatal and serious injuries and intermediate outcomes which can also be targeted, measured and monitored (See Table 6) for implementation of a range of new *Policy Orientations* activity. It would also assist in the development of a meaningful longer term *Towards Zero* strategy seeking the eventual elimination of death and serious injury. Key *Safe System* strategies are outlined in Annexes 1 and 9.

Finally, while continuing with an explicit road safety strategy within the *Policy Orientations* framework, better integration of road safety into other areas of EU strategy, policy and budgets need fuller exploration, as originally foreseen. This would increase capacity for road safety through more effective sharing of responsibility across Commission Directorates. To date road safety has been successfully integrated into the Urban Mobility Strategy and this needs continuing activity to ensure follow through. An expansion of *Policy Orientations* to address work-related road safety issues and to encourage capacity building in neighbourhood and accession countries who want to improve their road safety performance is recommended. Meaningful integration of road safety into existing strategies or establishing strong links between these could be explored such as the *Health and Safety at Work Strategy*, the *Injury Prevention Strategy* and their successors.

#### Towards Zero: Road safety strategy beyond 2020

In view of the ambition of the Commission's 2050 goal, all Directorates who can deliver significant road safety results need to be involved in the development and the ownership of post-2020 *Towards Zero* road safety strategy, albeit it led, encouraged and supported by DG MOVE as the road safety lead for the Commission.

<sup>183</sup> Global Road Safety Facility (GRSF)(2009). Bliss T and Breen J, *Implementing the Recommendations of the World Report on Road Traffic Injury Prevention. Country guidelines for the Conduct of Road Safety Management Capacity Reviews and the Specification of Lead Agency Reforms, Investment Strategies and Safe System Projects*, World Bank, Washington DC.

While a full road safety management capacity review has not been undertaken in the current study, it is advised for the development of a highly ambitious post 2020 strategy needed to meet 2050 targets and in line with World Bank and OECD recommendations.<sup>184 185</sup> The aims of capacity review are to set out an integrated, multi-sectoral framework for dialogue with road safety agencies and stakeholders on potential road safety interventions and investments; to assess government ownership of safety results and identify related institutional responsibilities and accountabilities; to reach consensus on road safety management capacity weaknesses and institutional strengthening (particularly for delivery of lead agency, coordination and monitoring and evaluation functions) and to identify priorities to overcome them as well as identifying *Safe System/Towards Zero* implementation projects and programmes. Road safety management capacity review involves engagement with senior management in key government agencies and the private sector who are able to influence road safety results. The review is conducted over a period of around four months by experienced, internationally recognised, external road safety specialists.

Beyond the extension of fatal and serious injury targets, a new EU road safety performance framework focusing on intermediate outcomes will need to be established in support of the *Safe System* approach. Appropriate technical support will be needed to guide the identification of key problems and the targeting of challenging but achievable results (See later Monitoring and Evaluation section).

### Summary of recommendations for EU action

- A sharp focus is needed to address EU road fatality reduction objectives to ensure that interventions appropriately address goals and targets.
- The current focus on preventing and reducing the number of deaths of the results framework (2020 and 2050 goals) now needs to be expanded to include serious injury. The proposal for a 35% reduction in serious injuries by 2020 compared with 2014 seems an appropriate and challenging strategic target.
- It is suggested that the framework for the future development of *Policy Orientations* is provided by the evolving *Road Injuries Strategy* addressing fatal and serious injuries.
- Consistent with good practice road safety management, future road safety strategy needs to establish a clear road safety performance framework with specific objectives to allow targeting and monitoring and evaluation
- The scope of *Policy Orientations* might be extended to include activity towards reducing work-related road deaths and serious injuries.
- Consideration should be given to setting targets to 2020 and beyond to increase seat belt use and crash helmet use; reduce average speeds and speeding over the limit; reduce levels and drinking and driving and fatal injury outcomes; improving the safety quality of the new vehicle fleet through use of Euro NCAP star ratings or for the road infrastructure (at least for TEN-T) using road assessment programme ratings Euro RAP.
- A road safety management capacity review is recommended to assist the development of a post-2020 *Towards Zero* strategy, involving key Commission Directorates and road safety partners who can deliver road safety results.
- In view of the challenges to 2020 and beyond, lead road safety unit capacity needs strengthening in DG MOVE, particularly in any further development of its road safety strategy and targets, coordination, monitoring and evaluation functions, as well as in technical support for *Safe System* intervention.

<sup>184</sup> Global Road Safety Facility (GRSF) (2009). Bliss T and Breen J, *Implementing the Recommendations of the World Report on Road Traffic Injury Prevention. Country guidelines for the Conduct of Road Safety Management Capacity Reviews and the Specification of Lead Agency Reforms, Investment Strategies and Safe System Projects*, World Bank, Washington DC.

<sup>185</sup> OECD (2008). *Towards Zero: Achieving ambitious road safety targets and the Safe System approach*, Paris.

## 5.4 Coordination

In good practice road safety management, the coordination of regional or national road safety strategy is a leadership function carried out by the lead body for road safety. Its purpose is to orchestrate and encourage the effective multi-sectoral activity needed to achieve ambitious goals and targets. Coordination takes place across the principal governmental sectors which can influence road safety results; between levels of government at EU, national, regional and local levels; through coordination with elected representatives and through engagement with business and civil society. As the European Parliament observed, “the mainstreaming of road safety issues in all relevant policy areas and the combined involvement of local, regional, national and European authorities in the preparation and implementation of the measures all call for an exceptionally high degree of coordination”.<sup>186</sup> Unless special arrangements are put in place, achieving accountability, appropriate co-ordination and realizing the full potential of individual sectoral responsibilities and identified co-benefits will not be achieved.<sup>187</sup>

### Coordination across Commission Directorates

A high level of inter-service coordination and cooperation takes place in relation to specific EU Directives and Regulations. A number of regulatory committees with sub-working groups as well as expert groups are coordinated by the Commission. The integration of road safety into the Commission’s urban mobility policy is an example of excellent bi-lateral coordination, a practice which could be extended into other areas. Regular coordination, encouragement and cooperation is particularly important with DG GROW to ensure that road safety needs are addressed in Single Market harmonisation and in view of the importance of vehicle safety as a key EU strategy, No specific arrangements have been set up to coordinate *Policy Orientations* and the cross-cutting issues therein. EU activity impinging on road safety seems to be carried out in isolated units of different Commission Directorates. No evidence has been found of any multi-sectoral ownership of the road safety strategy or urgency in addressing road safety targets beyond DG MOVE’s involvement in *Policy Orientations* and the Urban Mobility Strategy. In delivering its coordination function, it is recommended that DG MOVE creates a full-time staff position dedicated to coordinating the future development and implementation of *Policy Orientations*. In addition, DG MOVE could set up and chair a *Policy Orientations* Steering Group bringing together all Directorates with day-to-day responsibilities relating to road safety.

### Coordination with Member States

DG MOVE coordinates with Member States through the Council Transport Working Party, the High Level Group on Road Safety and various thematic groups for example on enforcement, driving licences, infrastructure safety and technical vehicle inspections. The High Level Group has been formed to create a platform for exchange of experience between Member States and for exchange of views between the Member States and the Commission and meets twice a year. It has an established mandate with tasks which are clearly linked to *Policy Orientations* to:

- make recommendation to improve road safety policy
- provide appropriate guidance for the development of road safety policy and, in particular for the implementation of the *Policy Orientations on Road Safety 2011-2020*.

<sup>186</sup> European Parliament (2011). *European Parliament resolution of 27 September 2011 on European road safety 2011-2020* (2010/2235(INI)).

<sup>187</sup> Global Road Safety Facility (GRSF)(2009). Bliss T and Breen J, *Implementing the Recommendations of the World Report on Road Traffic Injury Prevention. Country guidelines for the Conduct of Road Safety Management Capacity Reviews and the Specification of Lead Agency Reforms, Investment Strategies and Safe System Projects*, World Bank, Washington DC.

- to monitor the progress achieved in the implementation of the *Policy Orientations on Road Safety 2011-2020* including:
  - the development by Member States of national road safety plans or initiatives; such plans could describe the means to achieve the common objective, draw up a timetable and publicise details of the national plan; they could also include specific national objectives in accordance with their particular situation;
  - close cooperation between the Commission and the Member States with a view to monitoring progress towards the common objective and to improving data collection, sharing experiences, twinning and exchanging best practices.
- to assist the Commission in reviewing the achievement of objectives contained in the *Policy Orientations on Road Safety 2011-2020*
- to address strategic issues related to the development of future road safety policy.

Excellent and efficient coordination between DG MOVE, the CARE expert group and the High Level Group on Road Safety has enabled resolution of the technical issues associated with the new common definition of serious injury. Study visits and technical discussions have been organised for the CARE group members. The Commission has also entered into a contract with the AAAM<sup>188</sup> for making available methodology and conversion algorithms from ICD codes to MAIS codes to all Member States. Member States started collecting injury data using the new definition during 2014 and the new data will be available in the first half of 2015. It is recommended that the Commission builds on this cooperation with the High Level Group towards further annual reporting of important road safety outcomes to allow closer monitoring and management of road safety strategy.

#### Parliamentary engagement

The Commission regularly engages with and reports to Parliament on road safety issues. The road safety unit regularly replies to written questions from Members of the European Parliament on a wide range of subjects.

#### Coordination with the business sector and civil society

Routine public consultation is carried out on strategy development and legislation. A range of stakeholder forums and advisory groups on key issues are found across Commission Directorates, for example, CARS 21 (DG GROW) and the European Alcohol and Health Forum (DG SANTE).

A European Road Safety Charter (ERSCharter) was established in 2004 to allow engagement with a wide variety of road safety stakeholders. The ERSCharter is a web-based platform<sup>189</sup> where public authorities, research institutions, civil society organisations, private companies and others can exchange best practice and make road safety commitments. More than 2000 signatories are listed on the website. A number of events and actions are linked to the ERSCharter, including national seminars, award ceremonies, local workshops, newsletters and testimonies. Municipalities, organisations and private enterprises who are interested in using the Commission logo as a road safety quality mark. The ERSCharter is managed by the road safety unit with the help of an external contractor (PAU Education). For this 3rd phase of 3 years the amount of the contract is €899 500. The road safety quality of commitments of the ERS Charter needs to be regularly monitored and it is recommended that this is formally reviewed to encourage focused activity toward EU targets.

<sup>188</sup> <http://www.aaam.org/ais-coder.html>

<sup>189</sup> <http://www.erscharter.eu/>

### Coordination with international agencies and organisations

The Commission participates as an observer in the United Nations Economic Commission for Europe, Working Party 1 on road safety, monitoring the 1968 Vienna Road Traffic Convention, to which most of the EU Member States are contracting parties. Commission Directorates also participate and coordinate the influential EU position in Working Party 29 on vehicles as well as on the technical work on transport of dangerous goods under the ADR agreement.<sup>190</sup>

### **Summary of recommendations for EU action**

- Some further expansion of inter-Directorate coordination is required to ensure multi-sectoral, day-to-day ownership of road safety goals, targets and strategy. It is recommended that DG MOVE creates at least one full-time staff position dedicated to coordinating the future development and implementation of *Policy Orientations* and post-2020 strategy.
- DG MOVE should consider setting up and chairing a *Policy Orientations* Steering Group (and subsequently a *Towards Zero* group) bringing together all Directorates with *day-to-day* responsibilities relating to road safety, reporting to Directors.
- It is recommended that the Commission builds on this cooperation with the High Level Group towards further annual reporting of important road safety outcomes to allow closer monitoring and management of road safety strategy.

## **5.5 Legislation**

The processes for impact assessment and public consultation are transparent. Regular inter-service consultation and coordination takes place on preparing legislative proposals. No new legislative proposals by DG MOVE are planned for 2015. Large scope exists for further legislation to address the road safety task and recommendations for future priority initiatives have been outlined in previous sections.

### **Summary of recommendations for EU action**

- Large scope exists for further legislation to address the road safety task to 2020, particularly within the framework of the General Safety Regulation, the Driver Licensing Directives and TEN-T initiatives. Recommendations for future priority actions have been outlined in previous sections.
- Guidance of impact assessments of road safety legislation need to include common protocols for assessing costs and benefits and the use of updated annual values (See next section).

## **5.6 Funding and resource allocation**

### Funding levels and budgets

Following the EC's adoption of its new road safety plan the European Transport Council invited "the European Commission to allocate the necessary resources with a view to developing coherent and cost-effective actions to implement *Policy Orientations* 2011-2020."<sup>191</sup>

The DG MOVE road budget comprises funding for projects, impact assessments, studies, implementation aspects of legislation, support for knowledge and data systems such as the CARE, CADaS, ICARE data systems and the European Road

<sup>190</sup> The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).

<sup>191</sup> Council Conclusions on Road Safety December 2010.

[http://www.consilium.europa.eu/uedocs/cms\\_data/docs/pressdata/en/trans/118150.pdf](http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/trans/118150.pdf)

Safety Observatory. The average annual spend on these since 2011 has been around €3.55 million.

It is not possible, within the scope and timescale of this study, to estimate the level of resource currently allocated to road safety across all Commission Directorates and their agencies. However, it is widely believed that the level of investment in activity to allow goals and targets to be reached is unlikely to be commensurate with the current level of road safety funding at EU level and in Member States. This important area deserves priority study to establish the level of the current EU road safety contribution as well as to review existing funding mechanisms, resource allocation processes and an annual method to be adopted by the Commission in assessing the costs of preventing deaths and serious injuries. In addition to informing Commission policy, one outcome of such study might also be best practice guidance in road safety funding to assist the efforts of Member States.

The main opportunities for road safety funding for work in EU countries are to be found in budgets for DG MOVE (support for road safety within the European Transport Policy), TEN-T (network safety management, tunnel safety, HGV rest areas) through the newly created Connecting Europe Facility (CEF)<sup>192</sup>, European Structural and Investment Funds for urban transport and mobility projects; DG GROW (Single Market vehicle safety standards development), the European Social Fund (for work-related road safety), DG SANTE (health sector surveillance of road traffic injury and public health), EU-OSHA (the European Agency for Safety and Health at Work; DG ELARG, DG REGIO (Regional Development Fund, IPA, TAIEX and other initiatives); DG RESEARCH (road safety research). For neighbourhood and accession countries in the European region, a new regional framework agreement for road safety has been established by the European Bank for Reconstruction and Development (EBRD) in 2014. Amongst a wide range of activities, including road safety management assessments and capacity building, the identification of road safety engineering improvements in EBRD projects will be carried out in line with the EU Directive on Road Infrastructure Safety Management (2008/96/EC) (See Section 4.5).

Despite the increasingly ambitious goals and targets sought, identified risks and demonstrated benefit to cost ratios of publicly acceptable measures, investment in preventing serious health loss in road crashes is not commensurate with the high socio-economic value of its prevention either at EU or national levels.<sup>193</sup>

#### Resource allocation procedures

Evaluating the direct and indirect socio-economic costs of the outcomes of road traffic crashes is necessary to allow measurement of the burden that road traffic crash injury imposes on society, the potential return on investment in road safety and the relative benefits and costs of different policy options in the allocation of resources. Cost benefit analysis is used widely in EU impact assessments and studies and is a recommended approach in helping to determine policy priorities and for resource allocation.

Review of a range of impact assessments relating to road safety intervention carried out since 2011 in this study indicates that a standard methodology assessing the costs and benefits of road safety measures is not in place. Of particular importance is the assessment of the value of preventing road fatalities and updating values (e.g. Value of a Statistical Life) annually. An average value of prevention of a road fatality for EU 28 (€1.87 million, estimated using 2010 figures and based on 'willingness to pay' for indirect costs) is presented in the updated handbook for the evaluation of external

<sup>192</sup> The first set call for grant proposals is underway.

<sup>193</sup> DaCoTA (2012) *Road safety management*, Deliverable 4.8p of the EC FP7 project DaCoTA.

costs (2014) and this should be used as a baseline for subsequent annual updating.<sup>194</sup> ETSC's estimate for 2013 based also on the willingness to pay methodology indicates an EU 28 value of €1.91 million for the prevention of a road fatality.<sup>195</sup>

It is also widely acknowledged that successful road safety policy addressing ambitious goals and targets can never rely fully on cost-benefit analyses.<sup>196</sup> Important considerations that may justify departing from the policy priorities implied by cost-benefit analyses include an objective of reducing inequalities in risk, thus giving high priority to measures benefiting pedestrians and cyclists, and an objective of giving priority to those measures that provide the largest reductions of the number of road accident deaths. These may have a lower benefit-to cost ratio than other measures with a higher benefit-to cost ratio which address a smaller casualty population.<sup>196</sup>

### Summary of recommendations for EU action

- Despite the increasingly ambitious goals and targets sought, identified risks and demonstrated benefit to cost ratios of publicly acceptable measures, investment in preventing serious health loss in road crashes is not commensurate with the high socio-economic value of its prevention either at EU or national levels.
- It is recommended that Commission Directorates adopt the standard methodology for assessing the costs and benefits of road safety measures as presented in the updated handbook for the evaluation of external costs (2014), updated to reflect annual values for the prevention of a fatality.
- Determining priorities for resource allocation and harmonisation should not always rely upon cost-benefit analysis, since measures which provide the largest number of road deaths and serious injuries many have a lower BCR than measures with higher BCRs which address a smaller number of casualties.

## 5.7 Promotion

In the traditional sense of the function, a wide range of awareness-raising/promotional activities has been carried out by DG MOVE which reach out to road users and stakeholders. Promotion, however, is being increasingly viewed as the promotion of road safety as a core responsibility of different levels and sectors of governmental and of different system providers of the road network, vehicles, emergency medical system - promotion of shared responsibility and the Safe System approach. The *Safe System* goal and strategy can be said to represent the new performance frontier and the new safety culture in road safety.<sup>197</sup> Promotion is needed at the highest level to communicate that preventable death and serious injury in road crashes need not be the inevitable price of our mobility. As with future coordination initiatives across the Commission, there is good potential to deepen current promotional activity against the background of increasingly challenging goals and targets within *Policy Orientations* and in any future *Towards Zero* strategy.

### Summary of recommendations for EU action

- It is suggested that the Commission promotes the *Safe System* goal and approach as the new safety culture, as well as interim targets and the shared responsibility for reaching them in all communication activities including the European Road Safety Charter.

<sup>194</sup> Ricardo-AEA (2014). *Update of the Handbook on External Costs of Transport*, Final Report for the European Commission: DG MOVE, ED57769 Issue Number 1.

<sup>195</sup> European Transport Safety Council (2014). *Ranking EU Progress On Road Safety*, 8th Road Safety Performance Index Report, June 2014.

<sup>196</sup> DaCoTA (2012). *Cost-benefit analysis*, Deliverable 4.8d of the EC FP7 project DaCoTA, Brussels.

<sup>197</sup> DaCoTA (2012). *Road safety management*, Deliverable 4.8p of the EC FP7 project DaCoTA, Brussels.

## 5.8 Monitoring and evaluation

### 5.8.1 Developing the safety performance framework to 2020 and beyond

The measurement of road safety outcomes is fundamental to effective road management towards their mitigation and prevention. In a *Safe System* approach, information is needed on risk exposure (traffic volumes, population data), final outcomes (deaths and serious injuries) and intermediate outcomes (e.g. mean speeds, levels of use of protective equipment etc.).

While information on traffic volume by road user type in several Member States is collected, traffic volume data is not available for EU 28. Traffic volume is an essential exposure indicator and this important data deficit needs to be addressed urgently by Member States, DG MOVE and Eurostat. It is recommended that annual traffic volume counts are requested from Member States to allow better understanding of travel trends for different user types and on all roads on which people are killed and seriously injured.

The CARE database provides a source of comparable data on road deaths for EU 28. Member States annually report deaths to an agreed definition and, following *Policy Orientations* initiatives, are expected to provide annual data to a new definition of serious injury for 12 months ending December 2014. The Commission has entered into a contract with the AAAM<sup>198</sup> for making available methodology and conversion algorithm from ICD codes to MAIS codes to all Member States. Member States started collecting injury data using the new definition during 2014 and the new data is expected to be available in the first half of 2015. CARE, CARE PLUS and ICARE initiatives provide the opportunity for disaggregated data analysis using a range of variables. The Commission also has an annual subscription to the IRTAD database. Supplementing EURO STAT data, EU projects such as SafetyNet and DaCOTA have assisted in the identification of key exposure data, safety performance indicators as well as setting out in-depth crash investigation protocols. Interventions and strategies are subject to impact assessment and periodic independent review, although guidelines are needed for road safety studies and assessments to ensure standardised use of methodologies and values (e.g. value of preventing a fatality).

In terms of monitoring the outcomes of *Policy Orientations*, the established performance indicator is the 50% reduction in deaths by 2020. Other indicators have been set recently which are taken into consideration in the review of each Policy Orientations objective in previous sections. Further development of the 2020 strategy and the post 2020 strategy presents an opportunity for the development and use of a new safety performance framework (mentioned in 5.1). The Commission could play a much more active role in targeting and monitoring outcomes and outputs which relate closely to the headline 2020 target(s) and the 2050 goal. The assessments carried out in Sections 3 and 4 indicate that the measures set out in Table 7 (with disaggregation by vehicle and road type where appropriate) are worthy of consideration for formal, annual reporting by Member States. These recommended indicators represent a selection of indicators in use in different countries, those recommended by various international organisations and projects concerned with road safety or indicators which seem particularly relevant to current EU activity. For further supporting information in safety performance indicators in general, see the SafetyNet project report.<sup>199</sup>

<sup>198</sup> <http://www.aaam.org/ais-coder.html>

<sup>199</sup> Hakkert AS and V Gitelman (2007). *Road Safety Performance Indicators: Manual*. Deliverable D3.8 of the EU FP6 project SafetyNet, Brussels.

The Commission is represented in the steering group of ETSC's Road Safety Performance Index (PIN), a key EU-wide monitoring system. However, it would be timely for a sub-group of the High Level Group on Road Safety of national CARE experts to be set up to propose and agree formal Commission indicators for EU road safety strategy and annual reporting.

*Table 7: Examples of key road safety performance indicators*

<i>Risk exposure indicators</i>
Vehicle/ person kilometres of travel
Number of registered vehicles
Number of licensed drivers
Gross Domestic Product levels
Population levels and age-group distribution
<i>Final outcome indicators</i>
Number of deaths
Numbers of deaths per 100,000 population
Number of deaths per 100,000 vehicle/person kilometres of travel
Number of serious injuries ( $\geq$ MAIS 3)
Number of serious injuries per 100,000 population
Number of serious injuries per 100,000 vehicle/person kilometres of travel
<i>Intermediate outcome indicators</i>
% of motor vehicles travelling within the speed limit by road type
Average speeds of motorised vehicles by road type
% of drivers and riders over the limit at roadside checks
% of fatally injured drivers and riders with excess alcohol
% of seat belt and child restraint use in front and rear seats by motor vehicle occupants
% of rural roads with Euro RAP 4* (TEN-T and secondary network)
% of the vehicle fleet with the highest Euro NCAP rating
% of passenger cars fitted with seat belt reminders in front and rear seats
% of motor vehicles using daytime running lights
% of motorcycles fitted with anti-lock braking systems
% of crash helmet use by motorcyclists and moped users
% of crash helmet use by school-aged pedal cyclists
% of correct fitment of crash helmets by motorcyclists and moped users
Average response time of emergency medical system from crash notification to scene
<i>Institutional output indicators</i>
Hours of Police enforcement targeting high risk behaviours
% of roadside alcohol breath tests per 1000 inhabitants
% of numbers of speeding tickets per 1000 inhabitants
% of numbers of seat belt checks per 1000 inhabitants

Finally, many EU interventions are underpinned by in-depth crash injury investigation. In-depth data are gathered on a sample basis by specialist teams and have been used to drive most of the key developments in the prevention of death and serious injury mitigation over the last 30 years. It can be used for routine evaluation of the safety benefits of in-vehicle and other safety technologies and for impact studies of proposed regulatory changes. It can also be used to monitor trends in serious injuries and to identify priority intervention. The EU has played an important role in supporting the development of crash investigation protocols in research projects.<sup>200</sup> The implementation of EU in-depth crash investigation to assist understanding of the causes of serious and fatal crashes and injury mechanisms and monitor the effectiveness of vehicle safety technologies and other intervention deserves consideration.

### Summary of recommendations for EU action

- While information on traffic volume by road user type in several Member States is collected, traffic volume data is not available for EU 28. Traffic volume is an essential exposure indicator and this important data deficit needs to be addressed urgently by Member States, DG MOVE and Eurostat.
- Extension of the current EU road safety performance framework is recommended and suggestions are made for a range of indicators for adoption to 2020 and beyond.
- Annual reporting on EU road safety performance could be undertaken within the High Level Group on Road Safety and CARE expert groups.
- The European Road Safety Observatory is a valuable source of road safety information. Country profiles and other statistical information need to be updated annually.
- The development of an EU-wide in-depth crash injury investigation system is recommended.
- The European Road Safety Charter should be reviewed regularly to encourage high quality road safety contributions.

## 5.9 Research and development and knowledge transfer

The EU plays a key role in supporting road safety research and development and has a stated road safety mission for its research policy. "We aim to improve safety and security on Europe's roads by reducing fatalities and severe injuries by 60% and reducing cargo lost to theft and damage by 70%. The stated general safety research priorities are:

- Advanced engineering systems and risk-analysis methodologies for designing vehicles and infrastructure
- Integrative approaches linking human elements, structural integrity, preventive, passive and active safety, rescue and crisis management.
- Inherent design of vehicles/systems for safety and security (special focus on human-machine interfaces), use of intelligent safety systems and integrated safety.
- Post-crash rescue technology and methods and new training systems to improve awareness of safety and security issues"

DG RESEARCH is supported in its road safety work by its European Road Transport Research Advisory Council (ERTRAC) which sets out a broad range of research priorities for road safety in Pillar 4.2 of its 2020 Map.<sup>201</sup> The road safety call for proposals within the *Smart, Green and Integrated Transport /Horizon 2020 Work Programme 2014-2015 MG-3.4-2014: Traffic safety analysis and integrated approach towards the safety of Vulnerable Road Users* aligns well with several Policy

<sup>200</sup> [http://ec.europa.eu/transport/wcm/road\\_safety/erso/safetynet/fixed/WP4/sn\\_wp4\\_d4p5\\_final.pdf](http://ec.europa.eu/transport/wcm/road_safety/erso/safetynet/fixed/WP4/sn_wp4_d4p5_final.pdf)

<sup>201</sup> ERTRAC (2013). *Multi-Annual Implementation Plan for Horizon 2020*, European Road Transport Research Advisory Council, Brussels.

*Orientations* objectives. Commission Directorates carry out additional safety studies. A list of DG MOVE's studies is presented in Annex 11.

Ongoing best practice guidelines and knowledge transfer have been developed and conducted since 2011 through the European Road Safety Observatory<sup>202</sup> (which is periodically updated – a recent call was launched during 2014 for the latest update) and by regional professional networks e.g. policing (TISPOL), data (CARE), engineering (Euro RAP, ERF, FEHRL), research (FERSI). Member States are encouraged to apply best TEN-T practice to their networks. Twinning and TAIEX projects have been carried out in neighbourhood and accession countries for exchange of best practice and experience. The High Level Group on Road Safety serves as an important forum for exchange of best practice.

### Summary of recommendations for EU action

- The EU plays a crucial role in research and development which has underpinned much of the successful life-saving intervention and tools implemented at EU level and in Member States. New focus is needed on *Safe System* intervention and 2050 goals
- The knowledge transfer role is also vital and long-recommended EU best practice guidance has emerged in the last 10 years.
- As recommended previously, the funding of *Safe System* demonstration projects in corridors, cities and areas is needed to accelerate knowledge transfer and to encourage roll out and inclusion of *Safe System* into the main stream of road safety activity in EU 28.
- The European Road Safety Observatory is a valuable tool for policymakers and professional and web texts and other information should be regularly updated.

## 6 Conclusions

A systematic, high level scan has been carried out of EU road safety activity within the framework of *Policy Orientations*. It has assessed what has been achieved so far by the EU and in what areas improvements can be made across the good practice road safety management dimensions of *results* (Section 3), *interventions* (Section 4) and *institutional management* (Section 5).

It has not been possible to address satisfactorily the question of what road safety outcomes and trends can be linked to specific EU initiatives in the first four years of the strategy since few specific interventions with immediate or certain (in view of, as yet, unknown national implementation arrangements) road fatality-reducing effects have been adopted or introduced at EU level since 2011. Information on implementation and impact assessment of these is ongoing. The following conclusions, however, can be drawn about what has been achieved to date, the continuing relevance of existing and new targets and the further development of *Policy Orientations* to 2020 and beyond.

### What has been achieved to date?

Very substantial progress in reducing road deaths has been achieved since 2001 through the establishment of EU targets and implementation of planned EU road

<sup>202</sup> The European Road Safety Observatory (ERSO) was developed as a result of the EU SafetyNet project (2004-2008) and elaborated and partly updated within the framework of the EU DaCoTA project (2010-2012). ERSO aims to provide scientifically sound road safety information in a concise and easily accessible manner and is acknowledged to be a useful tool for both policymakers, researchers and practitioners.

safety activities. The EU is a world-leading road safety region and in 2013 continued to record the lowest numbers of deaths and death rates, a record which the Commission and all road safety partners want to maintain and further improve.

EU action requires relatively long lead times. Whereas key actions taken in the previous decade will now be contributing to the 2020 target, few actions taken since 2011 are unlikely to have made a major contribution as yet. While a range of valuable preparation has been carried out and important steps taken, the most promising aspects of *Policy Orientations* intervention, whether in implementing proven vehicle safety technologies for a range of vehicle types; further developing infrastructure safety or ensuring safety-sensitive powered two wheeler rider and car driver licensing schemes, have yet to be adopted and implemented.

The motor vehicle safety legislation, in particular, implemented before 2011 is likely to be making a large contribution to reductions in deaths and serious injuries in all EU 28 countries in the current target period. This area of activity is by far the most efficient and effective of all Commission road safety activities, adds the most value to what can be achieved by Member States and represents the most promising strategic objective for next EU actions in *Policy Orientations*.

### **Is the 2020 road fatality reduction target still relevant and realistic and what additional targets would be relevant?**

The strategy period coincides with particularly uncertain and uneven economic developments across EU 28 which inhibits meaningful predictions about the level of future fatal outcomes in road traffic crashes. A strong influence on trends in road deaths is being exerted by external factors and a significant slowing of annual progress below that needed to reach the 2020 target can be expected in the event of stronger economic development, sustained lower fuel prices and a less than urgent approach to new, appropriately targeted intervention at EU and national levels.

However, the Commission and its road safety partners have a high level of ambition for improved road safety results for the interim and the longer term. The new Commission has announced that road safety is a leading priority and many Member States have set 2020 targets, encouraged by EU goals and targets. The focus of this study has been EU activity and a range of cost-effective EU intervention (See 4.1 Summary) has been identified, based on the substantial scientific work carried out at EU level and taking account of the related recommendations of EU road safety experts and professionals. Strengthened institutional delivery at EU level has also been identified (See 5.1 Summary). While, as noted above, effective EU activity generally requires longer lead times to implementation, enhanced national efforts, particularly in the enforcement of key road safety rules to best practice, will greatly increase the possibility of the 2020 target being met. Meeting the existing 2020 target in current conditions is certainly challenging, but further progress is, without doubt, achievable given new efforts by the EU institutions, Member States and the wider road safety partnership.

The Commission has drawn attention to the importance of addressing serious road traffic injuries at EU level which are many more numerous than road deaths and lead to unnecessary human suffering and societal cost to victims and their families, the health sector and employers. Valuable *Policy Orientations* initiatives have been undertaken which allow the setting of a meaningful serious injury target. A targeted reduction in the numbers of serious injuries by 35% by 2020 (2014 baseline) has been identified as challenging but achievable.<sup>203</sup> Such a target would be relevant and is

<sup>203</sup> ETSC (2014). *Ranking EU Progress on road safety, 8<sup>th</sup> PIN Report*, ETSC, Brussels.

strongly recommended based on the analysis of the current road safety problems and needs.

The Commission might also consider targeting intermediate outcomes to 2020 which are causally related to reducing road deaths and serious injuries. Intermediate outcome targets include increasing seat belt use and crash helmet use; reducing average speeds or speeding over the limit; reducing levels of drinking and driving; improving the safety quality of the new vehicle fleet through use of Euro NCAP star ratings or for the road infrastructure using road assessment programme ratings Euro RAP. This approach is key to *Safe System* and is highly recommended as international best practice by the OECD, World Bank, International Standards Organisation and other organisations and EU countries are increasingly working with these factors. Section 5.6 sets out suggestions on key road safety performance indicators.

### **Are the strategic objectives of the *Policy Orientations* still relevant?**

The summary review in Section 4 of interventions concluded found that there is, considerable scope for the further development of the strategy and implementation of key measures if progress towards the 2020 target and 2050 goal is to be achieved.

Meeting the challenges ahead requires more focus on the 2020 road fatality reduction goal to (1) ensure that harmonised intervention is largely evidence-based and (2) identify intervention which reduces and prevents fatal injury (as opposed to interventions targeting crash prevention in general). Future intervention needs to be shaped by the current 2020 and 2050 goals as well as any new targets adopted.

In addition, while all continue to be relevant, the overlapping inherent in several of the seven strategic priorities of *Policy Orientations* needs to be resolved to enable a more holistic, focused approach to be adopted. A suggested approach is to merge these strategic objectives within the evolving *Road Injuries Strategy* developing within Objective 6. The Road Injuries strategy would focus on the 2020 road fatality reduction target as well as any other new targets for serious injury reduction and intermediate outcomes. It would provide a framework for the development of a new safety performance framework with arrangements for measurement and monitoring, provide a framework for follow through on *Safe System* and assist in the development of a carefully prepared post-2020 *Towards Zero* strategy seeking the eventual elimination of death and serious injuries on roads in the EU.

Finally, while continuing with an explicit road safety strategy within the *Policy Orientations* framework, better integration of road safety into other areas of EU strategy, policy and budgets need fuller exploration, as originally foreseen. This would increase capacity for road safety through more effective business cases for important intervention and sharing of responsibility across Commission Directorates.