European Transport Safety Council

New Pan-European Emergency Call System

1. Background

The European Commission has launched further proposals to prepare the way for the introduction of emergency call (eCall) to improve road safety.

On the 13th of June, the European Commission proposed a Regulation requestig that all new types of vehicles in categories M1 and N1 entering the EU market after the 1st of October 2015 have an in-vehicle eCall system. On the same date, the European Commission adopted Decision 2013/0166 that will require EU Member States to deploy the necessary eCall Public Service Answering Points (PSAP) infrastructure required for the proper receipt and handling of all eCalls on their territory by 2015. This follows the adoption of specifications covering the upgrading of the PSAP infrastructure required for the proper receipt and handling of eCalls (Delegated Regulation 2013/305 adopted in November 2012).

These new steps follow on from Recommendation 750/2011/EU that had asked Member States to ensure that mobile phone network operators upgrade their infrastructure so that eCalls are efficiently passed on to emergency services. In 2012 the European Parliament had also adopted a Resolution supporting the need to progress in the implementation of this technology[1].

1.1 How eCall works

eCall technology, once in operation, will allow for an emergency call to be generated, either manually or automatically, from a crashed vehicle immediately after a road collision has occurred. Basic data, including the location of the vehicle, would then be transmitted to an eCall operator, while simultaneously establishing a voice communication channel with the vehicle occupants. For eCall to function, three types of measures are required: the fitting of a specific system in vehicles, the ability of the mobile network operators to transmit messages in a certain format and, lastly, the capacity of emergency call centres to receive the messages.

[1] European Parliament resolution (2012/2056(INI) of 3 July 2012 on eCall: a new 112 service for citizens. (2012/2056(INI))

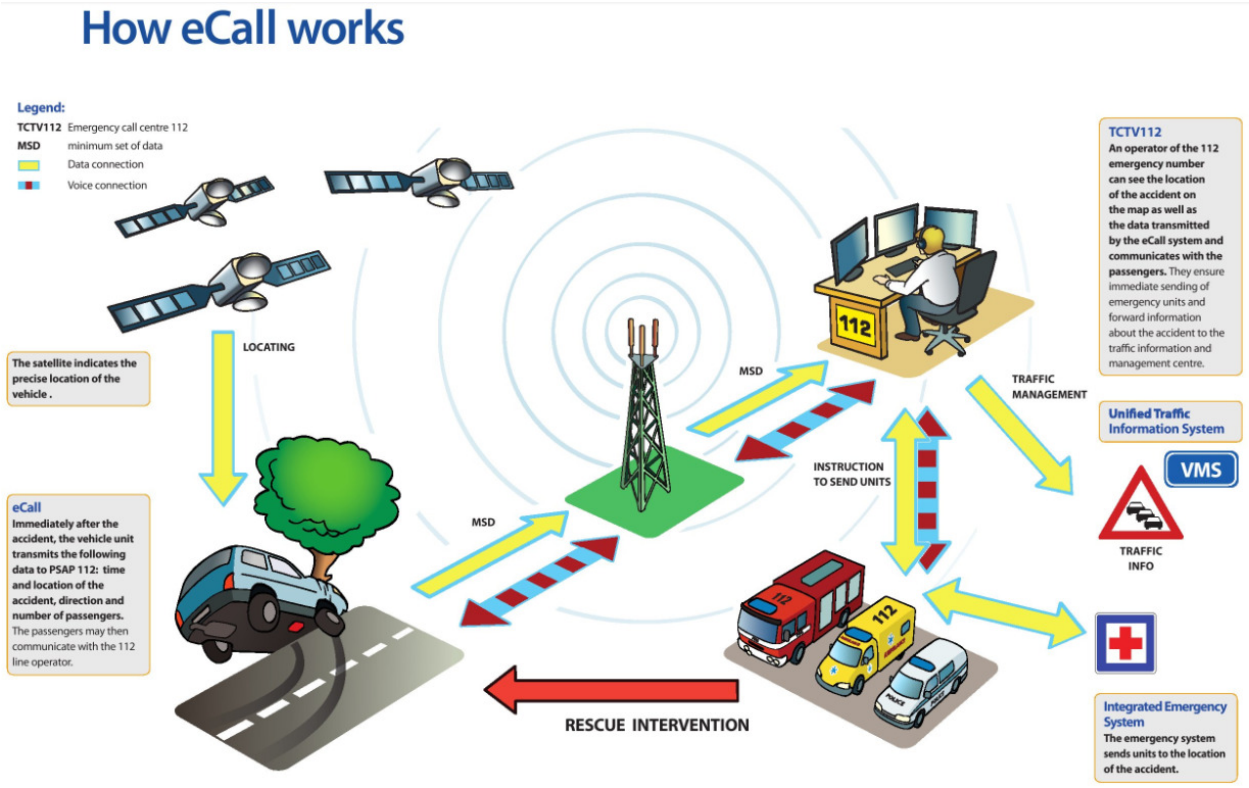


Figure 1 – How eCall Works

2. eCall's Road Safety Contribution

ETSC[2] broadly supports eCall deployment. eCall has the potential to save lives in Europe and reduce the severity of injuries. Although eCall will improve the response time the potential to affect the quality of emergency care may depend on different factors. This is why the recommendations from the ETSC Review on "Reducing the Severity of Injuries Through Post Impact Care" must be realised. The upcoming EC Strategy on Serious Injury, following on from the 'First Milestone Towards a Serious Injury Strategy[3]', which is expected in 2014, represents an opportunity to do this.

2.1 Life Saving Potential

Research shows that, with eCall, emergency services' response time would be reduced by 50% in rural areas and 40% in urban areas, leading to a reduction of deaths estimated to be between 2% and 10%, and reduction of severity of injuries between 2% and 15%,

[2] ETSC is a Brussels-based independent non-profit making organisation dedicated to reducing the numbers of deaths and injuries in transport in Europe. The ETSC seeks to identify and promote research-based measures with a high safety potential. It brings together 46 national and international organisations concerned with transport safety from across Europe. www.etsc.eu

[3] EC (2013) 'First Milestone Towards an Injury Strategy'.

depending on the country considered[4]. However, these figures must be viewed with caution. The EC's impact assessment stressed *"the difficulties of undertaking these evaluations due to the lack of data on the timing of the collision and the next steps in the emergency response chain".*

The German study "STORM" (Stuttgart Transport Operation by Regional Management)[5], showed almost 50% rescue time improvement in rural areas, with a net gain of around 10 minutes. Rescue time in urban areas would be improved by 40%.

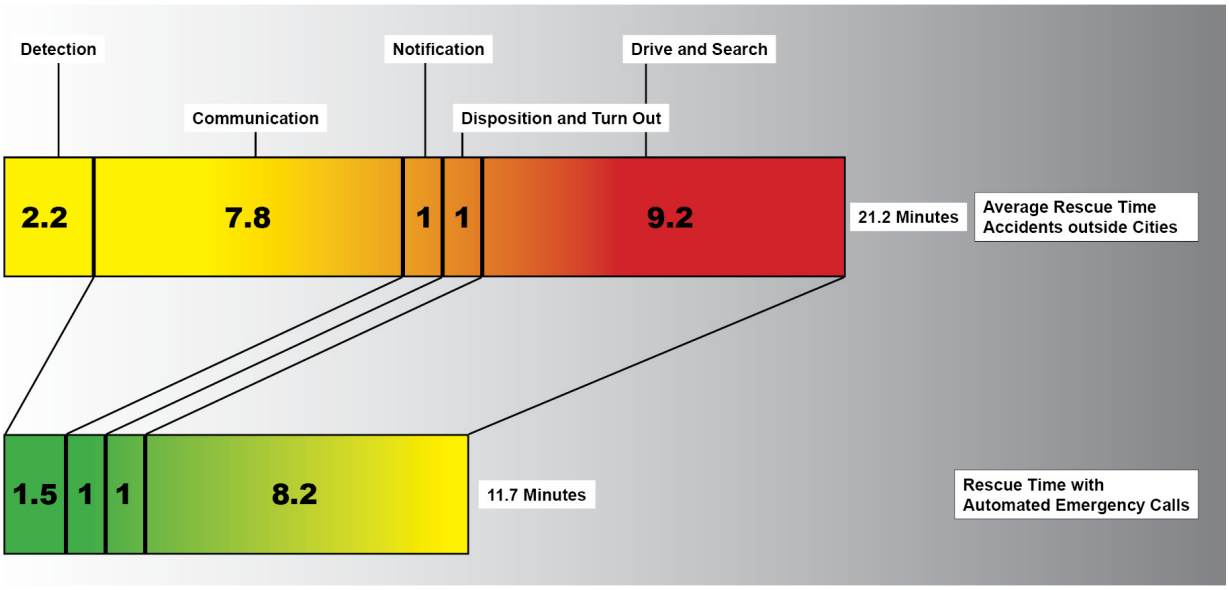


Figure 2 Average rescue time (minutes) outside urban areas with and without eCall.

The different studies cited in the EC Impact Assessment that have looked in general to the benefits of automatic in-vehicle emergency call systems have provided estimations of reduction of deaths going from 5% to 10% (E-MERGE, SEiSS), 3.5% to 6% (eIMPACT), 3.5% (SDB – UK), 1% to 6% (TRL, depending on the countries)[6].

2.2.1 Value of a Life

Putting a monetary value on prevention of loss of human life and limb can be debated on ethical grounds. However, doing so makes it possible to assess objectively the costs and the

[4] See studies available on www.esafetysupport.info/en/ecall_toolbox/related_studies/ referenced in the EC Impact Assessment accompanying the Commission Recommendation on support for an EU wide eCall service (2011).
[5] STORM" (Stuttgart Transport Operation by Regional Management), referenced in the EC Impact Assessment accompanying the Commission Recommendation on support for an EU wide eCall service (2011).
[6] Some countries have carried out national studies on the impact of eCall (Finland, Czech Republic, Sweden, Ireland, France, UK). See Annex IV of the EC's impact assessment.

benefits of road safety measures and helps to make the most effective use of generally limited resources. This is of relevance when calculating the benefit of introducing eCall.

ETSC has updated the Value of Preventing one road Fatality (VPF)[7] from 2009 to take account of the economic situation in the intervening years. As a result, ETSC has taken the monetary value of the human losses avoided by preventing one road fatality to be 1.88 million euro, average in Europe[8,9].

As well as a reduction of deaths, the EC Impact Assessment on eCall also included studies undertaken to evaluate the impact on reducing serious injuries. In-depth literature on this topic is limited. The estimation of the severe injuries that can be reduced with eCall ranges between 10-15% (USA – Mayday study, E-MERGE), 10% (eCall Driving Group, SEiSS, Norwegian study) 6-9% (Czech study), 5% (eIMPACT) 3.5-5% (Sweden), 3% (SDB 2006, UK) 1-5% (TRL, depending on the country).

2.2 Where and when would eCall be most beneficial?

eCall would be more beneficial in remote areas and during night-time for the safety of road users, whereas in busy roads (during daytime) it would produce more benefits in terms of improving incident management and reducing road congestion and secondary collisions.

In the absence of eCall, the emergency services may be informed with severe delays for several reasons:

- people involved in the collision are unconscious, in state of shock or unable to contact emergency services. This is particularly relevant in case of collisions involving Powered Two Wheelers (PTW);
- the collision occurs in rural or lowly populated areas (55% of deaths occurred on rural roads in 2010[10]);
- the collision involves only one vehicle (an average of 43% of vehicle occupants die in single-vehicle collisions in the EU[11]); single PTW collisions in Finland (50%)[12]
- people contacting the emergency services are unable to provide information on the collision location (especially on inter-urban roads and when travelling abroad);
- the collision occurs during night time.
- [1] In countries where the monetary value attributed to human losses avoided by Preventing one Fatality (VPF) is estimated on the basis known as Willingness-To-Pay (WTP). The use of

[7] In countries where the monetary value attributed to human losses avoided by Preventing one Fatality (VPF) is estimated on the basis known as Willingness-To-Pay (WTP). The use of WTP valuations in transport safety has been advocated by ETSC since 1997. ETSC (1997) Transport Accident Costs and the Value of Safety.
[8] See Methodological Notes, PIN Report 2013, www.etsc.eu/PIN-publications.php
[9] See Methodological Notes, PIN Report 2010, www.etsc.eu/PIN-publications.php
[10] ETSC (2011) 5th Annual PIN Report Road Safety Target Outcome: 100,000 fewer deaths since 2001 Chapter 2 Rural Roads.
[11] ETSC PIN (2013) for 18 EU Countries in 2008 (latest data available)
[12] Statistics Finland 2013

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- [1] See Methodological Notes, PIN Report 2013, www.etsc.eu/PIN-publications.php
- [1] See Methodological Notes, PIN Report 2010, www.etsc.eu/PIN-publications.php
- [1] ETSC (2011) 5th Annual PIN Report Road Safety Target Outcome: 100,000 fewer deaths since 2001 Chapter 2 Rural Roads.
- [1] ETSC PIN 2013 for 18 EU Countries
- [1] Statistics Finland 2013

In the aforementioned cases eCall will help to speed up emergency services.

2.3 The Golden Hour?

The first minutes are the most critical for recovery and severity of injuries. A study by medical experts in European high-income countries found that about 50% of deaths from road traffic crashes occurred within minutes, either at the scene or while in transit to hospital. For those patients taken to hospital, around 15% of deaths occurred within 1-4 hours after the crash, but approximately 35%, occurred after four hours[13]. Another study cited in the EC Impact Assessment, shows that approximately 50% of deaths occur within minutes, 30% of deaths occur within a couple of hours and 20% during the following days and weeks[14]. On the other hand, the World Report on Road Traffic Injury Prevention[15] underlined the importance of a chain of opportunities for intervening across a longer timescale.

2.4 Cross Border Travel

The EC Impact Assessment cites further advantages of introducing this technology for cross border travellers. It has calculated that there are over 100 million cross-border road trips per year in the EU. eCall will benefit road users travelling abroad who may be unfamiliar with the roads and their exact location. Problems with local languages would also be reduced by the harmonised use of the Minimum Set of Data (MSD). Moreover, as the MSD would be received in the language of the PSAP operator, language barriers would be to some extent overcome in the case of collisions involving non-resident drivers.

2.5 Public Support for eCall

According to the EC public consultation on eCall undertaken in 2010[16], more than 80% of respondents to the public consultation found the eCall system useful and would like their vehicle to be equipped with eCall. Among those interviewed, 68% were in favour of the mandatory introduction of eCall and 58% preferred eCall to be handled by public authorities. These results coincide with the major conclusions of previous consultations such as the Eurobarometer survey on the "Use of Intelligent Systems in Vehicles", in which

[13] ETSC (1999) Reducing injuries from post-impact Care.
[14] Akella M, Bang C, Beutner R, Delmelle E, Batta R, Blatt A, Rogerson P, Wilson G (2003) Evaluating the reliability of automated collision notification systems. 35:349–360.
[15] Peden, M. (2004) Work Report on Road Traffic Injury Prevention, WHO, Geneva.
[16] eCall Public Consultation (2010) Results. http://ec.europa.eu/digital-agenda/en/news/ecall-public-consultation-1907-19092010

70% of the respondents –sample of 25,000 citizens from 25 Member States- found eCall useful and wanted to have it on their next car.

2.6 Privacy and Data Protection

The 112 eCall is a "dormant" system, meaning that the eCall in-vehicle system is only active when a collision occurs or if it is manually triggered. It is not traceable and, when there is no emergency (its normal operational status), it is not subject to any constant tracking. A a consequence, there is no privacy issue related to any tracking of the car. For liability reasons, it is proposed that the emergency call centres (PSAPs) store the data related to the eCall for a determined period of time, in accordance with national regulations and with Directive 95/46/EC on the protection of individuals with regard to the processing of personal data and on the free movement of such data.

3. ETSC's Recommendations for Improvement to the Proposals

This next section sets out ETSC's main recommendations for improving the current set of proposals to implement eCall.

3.1 Adding other Vehicle Types - PTWs

In 2009 6,145 PTW riders were killed in road collisions in the EU 27 representing 17% of the total number of road deaths while accounting for only 2% of the total kilometers driven[17]. eCall would particularly benefit people involved in a collision where they are unconscious, in a state of shock or unable to contact emergency services, as mentioned earlier. In many of the collisions in which motorcycles are involved the rider remains unconscious for a certain period, and the motorbike careers off the road, becoming invisible to other road users in many more cases than passengers vehicles[18]. ETSC would further emphasise the need to implement eCall systems for PTWs due to the percentage of PTWs road deaths caused by single PTW collisions single, for example in Finland (50%[19]). There are some systems already offered on the market with very limited penetration. ETSC can support the recommendation of the EC Impact Assessment that, although some further research is needed, eCall should be extended to PTWs in the near future.

3.2 Adding other Vehicle Types – HGVs and Buses

In the European Union 4,254 people lost their lives in collisions involving heavy goods vehicles (HGVs) in 2011, 3,999 in collisions involving light goods vehicles (LGVs) – goods vehicles with a maximum permitted weight below 3.5 tonnes – and 722 in collisions

[17] ETSC (2011) 5th PIN Annual Report 2010 Road Safety Target Outcome: 100,000 fewer deaths since 2001.
[18] Aino (2003) Study on the impact of the introduction of eCall in Finland. See www.aino.fi
[19] Statistics Finland. 2013

involving a bus, coach or trolleybus, totalling 29% of the overall number of road deaths recorded in 2011[20].

Trucks would also benefit from the implementation of the eCall service in Europe. According to the EC Impact Assessment, although reliable mechanisms have not been deployed yet to trigger eCalls, the manual eCall may be beneficial in cases where heavy goods vehicles are involved in collisions. Normally heavy goods vehicle drivers suffer less severe consequences than passenger cars or vulnerable road users in case of collisions.

According to the latest data from ETSC, 50% of road deaths following collisions with HGVs are observed among the occupants of passenger cars, either drivers or passengers[21]. Unprotected road users amount to 28% of the road deaths recorded following collisions involving HGVs: 6% were riders of powered two-wheeled vehicles (PTW), 7% were cyclists and 15% were pedestrians. Other types of road user accounted for 10% of the road deaths[22]. The triggering mechanisms being developed for extending eCall to HGVs should take this into account, also allowing for HGVs to initiate eCalls following collisions with potentially deadly consequences. This would also be beneficial in cases where the opposing vehicle – which collided with an HGV – does not have eCall technology fitted, such as in the case of old cars.

Another benefit of eCall in heavy goods vehicles highlighted by the EC Impact Assessment is that, when the triggering mechanism will be refined, it can also be used to inform about the transport of hazardous goods. In case of a collision, authorities will be immediately informed about this fact and will be able to take the necessary measures to protect road users. A pilot has been run in the Netherlands in the framework of the EC funded HeERO project[23].

Road deaths in collisions involving buses and coaches make up a relatively small percentage of the total number of road deaths recorded yearly in the EU, 2.4% in 2011. Occupants of buses or coaches account for 14% of the total number of road deaths in collisions involving such vehicles. As expected – because of a high passenger to driver ratio – most of these are the passengers of the vehicle: 11% of the total compared to 3% of drivers. It is mostly road users outside the vehicle who lose their lives: 36% of those losing their lives in collisions involving buses or coaches are car occupants. Pedestrians account for 31% of these deaths, cyclists accounting for 6% and PTW users accounting for 5%.

[20] ETSC (2013) 7th Annual PIN Report Back on track to reach the EU 2020 Road Safety Target? 7th Annual Road Safety PIN Report.
[21] ibid
[22] ibid
[23] Presentation of HGV eCall Pilot Netherlands (2011). http://www.bmvbs.de/cae/servlet/contentblob/68734/publicationFile/41006/transport-logistic-2011-8-dangerous-goods-and-ecall-vhattem.pdf

Regarding buses, it would be important for the PSAPs to know the number of passengers travelling in the vehicle involved in the collision, as this will allow them to send the necessary resources to the incident scene without delays[24].

3.3 Periodic Technical Inspections

The EC would need to ensure that once eCall is in place that eCall is also included in Periodic Technical Inspections Directive 2009/40 and that a new uniform testing regime is developed to ensure its longevity and durability. The 2009/40 Directive is currently undergoing a revision, but there is a provision to add the testing of new equipment after its adoption.

3.4 Standards

ETSC would like to stress that there may be a risk of retro-fitting of older vehicles with sub-standard eCall devices not complying with EU standards. To avoid this from occurring, procedures should be put in place to ensure that, after market devices conform with EU standards.

3.5 Specifications

Under Article 5.7 of the proposed regulation, ETSC would ask that the technical specifications remain open to integrate the improvements coming from the evolution of the technology making it possible for eCall to efficiently send current and new information useful for the emergency process.

3.6 The Connected Car- Platform for Other In-Vehicle Telematics Applications

The mandatory introduction of eCall will contribute to speed up the deployment of other telematics services, both free of charge and commercial[25]. Safety-related applications include, for example, pay-as-you drive insurance schemes, dangerous goods tracking, dynamic navigation (including speed information) and roadside assistance calls. However, other applications without safety benefits (in-car 'infotainment') will also be increasingly introduced[26].

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[24] EC (2011) Impact Assessment accompanying the Commission Recommendation on support for an EU wide eCall service.

[25] " *The competitiveness of the European automotive embedded software industry*", Joint Research Centre – Institute for Perspective Technological Studies, 2010.

[26] 'Infotainment' is the combination of entertainment and information systems in cars. Car entertainment is primarily music and radio which has changed a lot recently moving to digital format. Infotainment systems also include embedded and mobile navigation systems, telematics systems and video systems that are used by passengers or when the car is parked. "*The competitiveness of the European automotive embedded software industry*", Joint Research Centre – Institute for Perspective Technological Studies, 2010.

This represents a growing new market. The need to manage the Human Machine Interface and possible resulting distraction may become urgent[27]. At present the EC proposal includes a recital that states that 'car manufacturers and independent operators may offer additional emergency and/or added value services in parallel with or building on the 112-based eCall in-vehicle system'. However, the recital also stresses that 'additional services should be designed not to increase driver distraction'. Any additional services that will be used in a vehicle must comply with clear safety standards.

3.7 Awareness Raising

The new eCall system will have to be accompanied by an awareness raising campaign undertaken by the EC and EU Member States to explain the benefits and functionalities of the new system to the citizens. This should be linked with a campaign to promote the emergency call number 112. There is still a great deal of unfamiliarity with the 112 number as only 27% of Europeans are aware of the unique emergency number[28]. The campaign should also aim to inform users how to use the system properly and thus avoid false calls.

4. ETSC Recommendations

- Prioritise research to identify suitable triggering mechanism to enable extending of automatically generated eCall to PTWs and subsequently amend the type-approval regulation for L-category vehicles to extend eCall to PTWs by 2017.
- Include trucks and buses for eCall fitment in the new legislation.
- Seize the opportunity to develop integrated safety applications onto the platform.
- Require that any additional services using the eCall platform should be designed so as not to increase driver distraction.
- Fast track safety applications.
- Launch an awareness raising campaign to explain the benefits and functionalities of eCall to the citizens. This should also include information on the 112 number.

5. Conclusion

ETSC welcomes EC action to introduce eCall. Clearly, eCall has the potential to save lives in Europe and will reduce the severity of injuries and numbers of deaths on European roads. ETSC supports the legislative approach as this is the only possible solution given the different parts of the chain that must work together for the entire eCall system to work. eCall will improve the response time but different measures will be needed to ensure that all EU citizens have equal access to high quality emergency care as set out in ETSC's Review[29]. ETSC supports the extension of eCall to include bus and trucks at this phase and in a later stage to include PTWs. ETSC has high expectations of the European Commission

[27] ETSC (2009) Study on the regulatory situation in the member states regarding brought-in (i.e. nomadic) devices and their use in vehicles.
[28] EC (2011) Eurobarometer Survey on 112 Awareness.
http://ec.europa.eu/public_opinion/flash/fl_339_en.pdf
[29] ETSC (1999) Reducing the Severity of Injuries Through Post Impact Care

to show leadership in adopting further in-vehicle safety measures as a matter of priority to improve vehicle safety[30].

ETSC Positions and Responses
All ETSC Positions and Responses are available from http://etsc.eu/documents.php?did=3

ETSC (2013) Back on track to reach the EU 2020 Road Safety Target? 7th Annual Road Safety PIN Report
ETSC (2013) ETSC Contribution to CARS 2020
ETSC (2013) ETSC Response to EC First Milestone Towards a Serious Injury Strategy
ETSC (2011) Response to the Transport White Paper
ETSC (2010) Response to the EC Policy Orientations on Road Safety
ETSC (2008) Blueprint for the 4th Road Safety Action Programme
ETSC (1999) Reducing the Severity of Injuries Through Post Impact Care

ETSC Contacts:
Ellen Townsend, Policy Director, ellen.townsend@etsc.eu
Telephone 00 32 2 230 41 06

ETSC is a Brussels-based independent non-profit making organisation dedicated to reducing the numbers of deaths and injuries in transport in Europe. The ETSC seeks to identify and promote research-based measures with a high safety potential. It brings together 46 national and international organisations concerned with transport safety from across Europe. www.etsc.eu

[30] ETSC (2013) ETSC Response to CARS 2020.