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In 2012, road safety in Finland developed in a positive direction. The number of people killed or injured in road traffic reached an all-time low. This is a welcome contrast to the past, giving us reason to believe that stringent safety targets will be met, and that the number of traffic fatalities will be halved in ten years, by 2020.

The safety targets set for Finnish road traffic are in line with European targets. By international comparison, Finland is not among the leading countries in terms of road traffic safety. European Union statistics for 2012 show that the number of people killed in road accidents decreased by 2,661 from 2011. According to calculations, this translated into EUR 5 billion in cost savings to society, demonstrating that safety is an important economic factor.

At least two conclusions can be drawn from the fall in fatal traffic accidents and other accidents. Firstly, to improve road safety, statistics should include non-fatal as well as fatal accidents. There is a widespread consensus in Europe and Finland about the need to improve statistics gathered on serious road accidents, which would bring them into line with figures calculated for other modes of transport. Trafi is strongly committed to these efforts.

Secondly, while the number of people killed in traffic has decreased, the number of accidents among certain groups of road users has, relatively speaking, increased in the last few years, i.e. the number of accidents in these groups has not fallen or the downward trend has been slow. In heavy goods vehicle traffic, for instance, the number of fatal accidents has been rising. Although heavy goods vehicle traffic rarely causes accidents, the severity of accidents involving such traffic would justify paying separate attention to them. Last year, 112 people died in Finland in accidents involving heavy goods vehicles, representing 44 per cent of all deaths in traffic. The corresponding figure elsewhere in Europe is less than a third.

Sami Mynttinen
Road Transport Director
In 2012, a total of 27,700 people were killed in the European Union’s 27 member states, equivalent to 55 people per million inhabitants. Road deaths decreased by 9 per cent from 2011, to a record low. The reduction from 2010 to 2011 was three per cent, while from 2009 to 2010 it was eleven per cent. Since 1965, the number of road deaths has fallen by two thirds.

In addition to lives lost, more than 300,000 people are seriously injured in European road traffic every year, with many more suffering minor injuries.

Malta, the UK, Norway, Sweden and Denmark were the countries showing the best traffic safety figures relative to their population in 2012. Finland ranked 12, with the number of road deaths per million inhabitants falling just under the European average.

Latvia and Spain, where the number of deaths fell by nearly 70 per cent from a poor baseline, saw the greatest reductions in road deaths from 2001 to 2012. Similarly, Ireland, Denmark, Lithuania, Estonia, Portugal and France have recorded faster than average decreases, with the number of deaths falling by at least 55 per cent. By contrast, the ten-year reduction of 41 per cent in Finland is below the EU average (-49 per cent).
Determined efforts to improve traffic safety began following President Urho Kekkonen’s New Year speech in 1973. In the early 1970s, more than one thousand people died in road traffic every year – four times as many as in 2012.

In his speech, President Kekkonen expressed the wish “that steps will be taken in 1973 to improve traffic safety in our country. I am sure this is the unanimous wish of all our citizens, not just the thousands of households that have personally experienced a traffic accident.” Kekkonen also addressed traffic safety in a speech given in 1967: “Although I do not believe harsh punishments are the best way to fight crime, I have come to the conclusion that society is left with no alternative but to impose much harsher punishments on drunk drivers for their irresponsible behaviour.”

Consequently, several legislative actions were taken in the 1970s to improve traffic safety in Finland. In July 1975, use of seatbelts in the front seats of passenger cars was made mandatory by law. In April 1977, a law enabling the definition of and punishment for drink driving came into force. In June of the same year, the use of helmets was made mandatory by law for motorcyclists, and five years later for moped drivers.

In July 1978, road-specific speed limits were imposed. Nine years later, a decision was made to introduce reduced speed limits for the winter time. At this time, use of seat belts in the back seats of passenger cars and in vans became compulsory. Since December 1978, drivers have been required by law to use winter tyres, since the beginning of 2003 bicyclists have been required to wear a helmet, and since August 2011 vehicles taking children to school and daycare centres must be equipped with a breath alcohol ignition interlock device.

Despite the good intentions, legislation cannot be used to change the behaviour of all road users. Failure to wear a seatbelt is predominant in motor vehicle accidents resulting in death. The seatbelt wearing rate in accidents investigated by traffic accident investigation teams was lower than 70 per cent, even if follow-up studies conducted by the Central Organisation for Traffic Safety in Finland indicated that the rate exceeded 90 per cent in the front seat of passenger cars. Accidents investigated and reported by investigation teams involved more than one hundred people per year driving or travelling without a seatbelt. Approximately 70 per cent of these people had died as a result of the accident in which they were involved. One third of these fatalities would
probably have been avoided if the victims had been wearing seatbelts.

Advanced vehicle safety technology, which has seen dramatic development since the 1970s, has made a contribution to traffic safety that can be considered comparable to legislative measures. A growing number of fatal road accidents involve a passenger car and heavy goods vehicle. In a collision between two passenger cars, both the driver and the passengers have a better chance of surviving or even escaping injury, thanks to the passive safety features of vehicles.

A LARGE NUMBER OF AUTHORITIES INVOLVED

The number of authorities involved in road traffic is fairly large, which reduces Trafi’s role compared to its work with other transport authorities (aviation, maritime and rail transport). Due to the large number of players involved, smooth and interactive co-operation between the parties is essential.

In addition to the Ministry of Transport and Communications, many other ministries contribute to traffic safety improvement efforts. The Finnish Transport Agency and the Centres for Economic Development, Transport and the Environment (ELY Centres) focus on route maintenance, traffic system development, and safe and effective travel and delivery routes. The Central Organisation for Traffic Safety in Finland participates in municipal traffic safety development through its regional office network.

Professional drivers are trained in driving schools and vocational institutes. Before receiving their licenses, drivers must take a test in which examiners assess their skills, on the basis of a service agreement signed with Trafi. A doctor’s certificate is required in order to obtain such a driving licence. Doctors are also responsible for regularly monitoring the drivers’ driving capacity. Doctors have an obligation to inform the police if a driver no longer meets the minimum health requirements for a driving licence. Among other things, the police are responsible for traffic enforcement and granting driving licences. Traffic offences are addressed in courts of law. Trafi is responsible for granting the necessary permits and for quality assurance in the vehicle inspection business.

Steps are being taken to clarify the roles and responsibilities of the Finnish Transport Agency and the Finnish Transport Safety Agency Trafi as these were not sufficiently assigned during the administrative overhaul. In any event, Trafi’s role will change in 2015, when Trafi, rather than the police, begins issuing driving licences. Having just one authority in charge of all driving licence related matters, such as maintenance and development of the driving licence register, will render operations more efficient and transparent. Another major issue in terms of the future of the traffic safety work is the discontinuation of the National Traffic Police and its amalgamation with local police departments. During this administrative reform, it is essential that traffic control remains adequate, both in terms of quantity and quality.
National guidelines for safety improvement work

The Government’s decision in principle, issued in December 2012, provides next year’s guidelines for national road safety improvement work. Consisting of ten key points, the decision continues along the lines of the road traffic safety plan extending to 2014 prepared by the Advisory Board for Transport Safety and the Government’s transport policy report issued in April 2012.

The first three points focus on ways of reducing accidents that involve the use of intoxicants. Although the proportion of intoxicant-induced road accidents has decreased, they continue to pose a major problem for Finnish road traffic. The objective identified in point one is to provide more channels for preventing and intervening in case of driving under the influence of an intoxicating substance. No changes are proposed to the current legal blood alcohol limit (0.5 per mille) as the evidence on the safety benefits of lowering the limit is inconclusive. Instead, the Government decision proposes that the powers of the road traffic supervisory authority – the police – be extended to allow police officers to interrupt the travel of a person driving under the influence of alcohol or another intoxicating substance, even if the criteria specified for drink driving are not met.

Other proposed measures to prevent drink driving include more extensive use of alcohol interlocks and imposing longer minimum driving bans on drunk drivers (point 2). Efforts should be made to help drunk drivers, particularly drivers aged under 25, through early intervention (point 3).

Another proposed set of measures involves more traffic control with more advanced tools. Extending to 2015, a joint development programme by the National Police Board, Ministry of the Interior and Ministry of Transport and Communications will be launched to improve traffic control (point 4). Steps will be taken to develop, increase and finance automatic traffic control, particularly at municipal level (point 5). Special attention will be paid to the safety of pedestrian crossings, as more than half of road accidents occur in built-up areas. Enhancing safety at pedestrian crossings will be a key priority under the police traffic control strategy (point 6).

The remaining points focus on improvements sought through road traffic regulations and administration. Actions to render the traffic safety planning more systematic, goal-oriented and cross-disciplinary include improvements in accident statistic compilation methods and the indicator system developed under Trafi’s leadership (point 7). Due to the ageing of the population, developing an effective system for driving capacity assessment is a key priority (point 8). In addition, a complete overhaul will be initiated of the Finnish Road Traffic Act of 1981, and the possibility of introducing a demerit point system will be explored (point 10).
Safety situation

The safety vision for traffic envisages the prevention of deaths and serious injuries in traffic. This vision has been translated into the following safety objectives: to continuously improve traffic safety, to cut fatal road accidents by half, and to reduce injuries by a quarter by 2020 from the 2010 baseline. Furthermore, a provisional target for 2014 involves reducing the number of deaths to a maximum of 218.¹

Finland’s road safety improvement targets are founded on the goal set by the European Commission: to halve the number of deaths in road accidents by 2020 from the 2010 baseline. The Commission’s previous goal was to reduce the number of deaths in road accidents by half between 2001 and 2010.²

In 2012, Trafi and some other authorities developed a system of indicators for traffic safety monitoring. These indicators support the work of the traffic safety authorities, as well as the preparation of traffic safety policy. Road traffic is clearly focused on strategy.

First-level indicators are used for comparing the total casualty trends with set targets. Second-level indicators help in monitoring the causes and risks of accidents resulting in personal injury, while third-level indicators focus on factors that affect the risk magnitude.

First-level indicators are primarily based on accident data reported by the police. Commercial transport and private passenger traffic are monitored separately for fatal accidents. A commercial transport vehicle accident means an accident involving a heavy goods vehicle. A heavy goods vehicle refers to lorries (a vehicle manufactured for goods transport, with a total weight exceeding 3.5 tonnes) and buses (a vehicle manufactured for passenger transport, which has room for more than 8 passengers in addition to the driver). All other road accidents are considered passenger accidents.

DEATHS AND INJURIES
The road safety development trend took a positive turn in the second half of 2012, and the year’s total death toll of 255 was a record low. Fortunately, this trend continued in 2013. An examination of the 12-month rolling sum indicates that the trend in early 2013 was almost parallel with the target curve, albeit that the provisional figures for May 2013 suggest a turn for the worse. In terms of the number of people injured in accidents, the trend is more positive than for deaths.

COLLISIONS
In 2012, the number of accidents resulting in personal injury decreased by approximately ten per cent from the previous year. The same positive trend was seen in all types of accidents involving personal injury. The number of road deaths seems to follow the same pattern, with the exception of one accident type: the number of people killed in collisions increased, even though the number of collisions decreased. Examination of the risk of death in a collision reveals the same trend. This may be explained by the fact that such accidents more often involved a heavy goods vehicle. When a passenger car collides with a heavy goods vehicle, even the most advanced safety features are unable to reduce the force of the impact.

PASSENGER VEHICLE TRAFFIC AND HEAVY COMMERCIAL VEHICLE TRAFFIC
Separate examination of heavy commercial vehicle traffic indicates that the positive safety trend in road traffic in 2012 can be primarily attributed to advances made in passenger vehicle traffic. One factor explaining the positive trend is the reduction in alcohol-induced accidents (see chapter Drink and drive behaviours changing).

Meanwhile, with the number of fatalities rising and the trend heading in the wrong direction, the outlook is darker for heavy commercial vehicle traffic. However, heavy commercial vehicles are rarely at fault. The number of suicides committed in road traffic affect the accident statistics but do not fully explain the increase in the number of heavy commercial vehicles involved in accidents. Moreover, the number of observations is small and therefore subject to substantial fluctuation. It is difficult to estimate which way the safety situation will develop in the future. According to data recorded by accident investigation teams, nearly all fatal collisions in 2012 involved a heavy goods vehicle. Since no drastic measures are currently under way to prevent such devastating accidents, it is only natural that this problem will continue to grow.
Number of people killed in passenger vehicle traffic in 2010–2012 (relative to the target).
Source: Statistics Finland.

Number of fatalities per hundred collision accidents in 2009–2012.
Source: Statistics Finland.

Number of people killed in accidents involving a heavy commercial vehicle in 2010–2012 (relative to the target).
Source: Statistics Finland.
In more than 90 per cent of cases, the cause of the accident is between the wheel and the seat

**DRIVERS’ DRIVING CAPACITY**
In the majority of road accidents, the driver’s actions were a contributing factor. Human error is a major risk factor in traffic, and the driver’s health and driving capacity are of key importance in this respect. In other modes of transport – aviation, maritime and rail transport – the health of transport professionals is more efficiently monitored than in road transport, which accounts for the greatest quantity of traffic. Drivers’ health and their fitness to drive are insufficiently monitored; this applies to both professional drivers and passenger car drivers.

The population, including drivers, continues to age. Although age as such presents no obstacle to driving, there can be considerable variation in the general health and driving capacity of individuals. This requires closer observation of drivers’ health and fitness to drive. Consequently, new driving licence legislation includes provisions requiring an extended health check for elderly drivers (aged 70+).

Another frequent cause of accidents or near miss situations is fatigue or distractions affecting the driver. As many as 30 per cent of fatal road accidents are caused by driver fatigue. It is important that drivers and healthcare professionals recognise fatigue as a serious safety risk. Fatigue can be controlled through lifestyle changes and by addressing underlying causes, such as sleep apnoea.

Professional drivers often work unusual hours, which disrupts the normal human biological rhythm. Unlike most other people working in the transport sector, professional drivers rarely have access to occupational health care systems. In order to address this problem and enable early diagnosis and treatment of potential illnesses, the health and driving capacity of drivers should be more closely and extensively monitored.
DRINK AND DRIVE BEHAVIOURS CHANGING
Driving and drinking is always a bad idea. Even a low blood alcohol level (0.2 per mille) affects the driver’s attention and observation capacity, thereby increasing the risk of accidents.

Approximately one quarter of deaths and one tenth of injuries sustained in European road traffic involve alcohol.

In 2012, 41 road users were killed and 617 injured in road traffic accidents in Finland involving drinking while intoxicated. Of all people killed in road accidents 16 per cent were killed in DUI accidents, compared to 22 per cent in 2011. The number of alcohol-induced accidents has fallen from nearly 950 in 2005 to approximately 540 last year. The number of alcohol-induced accidents decreased by 20 per cent between 2011 and 2012.

Besides alcohol-induced accidents, the number of drink driving incidents reported to the police has fallen. Reported cases of drink driving decreased from the highest ever – 30,000 in 1990 – to approximately one third, or 19,000, in 2012. The number of alcohol-induced accidents has fallen from nearly 950 in 2005 to approximately 540 last year. The number of alcohol-induced accidents decreased by 20 per cent between 2011 and 2012.

Overall alcohol consumption in 2012 had decreased to 9.6 litres of pure alcohol per capita from 10.5 litres in 2007. This decrease in overall alcohol consumption as well as the smaller amount of time dedicated by the police to drink-drive checks explain the reduction in drink driving incidents recorded by the police. Similarly, the use of alcohol interlock devices to some extent explains the decrease in drink-driving offences.

The changing profile of the drink-driver
The proportion of women among drink-drivers keeps growing year after year. From slightly over six per cent in 1989, the percentage of women has nearly doubled, to approximately 12 per cent in 2012. The number of female driving licence holders has remained largely unchanged at approximately 45 per cent.

The percentage of foreign nationals among drink-drivers has increased. In 2012, 12.7 per cent of drink-drivers were not Finnish citizens, up from 7.2 per cent in 2006. Of all foreigners guilty of drink driving in 2012, 56 per cent were Estonian and 16 per cent were Russian.

Approximately one third of drink drivers recommit the drink driving offence. The proportion of women among multiple offenders has increased: 7.4 per cent of drink drivers recommitting the offence were women in 2007 compared to 9 per cent in 2012.

Repeat offenders are also getting younger. The proportion of offenders under the age of 30 has increased from 19.7 per cent in 2007 to 27.2 per cent in 2012.
Referral for treatment and the substance addiction evaluation programme are not functioning as intended

According to Finnish regulations, drivers suffering from alcohol addiction or unable to refrain from driving while intoxicated should not be on the roads. This provision is based on the European Union’s driving licence directive. However, in practice, the procedures for evaluating the substance addiction of driving licence holders and for referring drink-drivers for treatment are not functioning as intended. If the customer is not motivated, but rather seeks only to recover his or her driving licence as quickly as possible, the substance addiction evaluation programme constitutes an unnecessary burden on health care resources.

Drink driving is frequently associated with other health problems. The alcohol-related mortality rate of drink-drivers is high compared to that of the general population. Causes of death predominantly include alcohol-induced diseases, accidental alcohol poisoning and suicide. In fact, drink driving can be considered an indicator of alcohol abuse.

Driving bans short in Finland, inconsistent in Europe

By international comparison, driving bans imposed in Finland are short. In 2010, 40 per cent of driving bans imposed for drink driving (= 0.5 per mille) had a duration of 3–6 months, and 46 per cent of driving bans imposed for driving while seriously intoxicated (= 1.2 per mille) had a duration of 6–12 months. In several European countries, driving bans are imposed for a minimum of one year, and repeat offenders may be banned for five years or for life.

The White Paper on Transport, approved by the European Commission in 2001, set targets for the harmonisation and impact of sanctions in all member states. In practice, however, no harmonisation has taken place.

Insufficient use of alcohol interlocks

Alcohol interlock devices used by drivers found guilty of drink driving have prevented at least 12,000 drink-driving incidents in Finland in the last four years. On a total of more than 40,000 occasions, alcohol interlocks have prevented drivers with a blood alcohol level of more than 0.2 per mille from driving. Alcohol interlock users are significantly less likely to commit a repeat offence than drink drivers in general. Increasing the use of alcohol interlocks, both for persons guilty of drink driving and as a pre-emptive measure, has been set as a national target several times, but the related projects have never progressed according to plan.

Alcohol interlocks have also been fitted in more than 10,000 commercial vehicles. Alcohol interlocks are mandatory by law in vehicles transporting children to schools and daycare centres. A number of transport companies have voluntarily equipped their vehicles with酒精locks, in order to ensure flawless transport quality. In Europe, in addition to Sweden and the Netherlands, Finland is one of the leading three countries in terms of alcoholock use.

SPEED AS A RISK FACTOR

Speed is an undeniable factor in road safety. Speed affects the risk of being involved in an accident. A person driving at a higher speed has less time to react if something unexpected happens. If an accident occurs, speed significantly affects the resulting injuries.

Driving at excess or the wrong speed is very common. According to speed measurements conducted at the Finnish Transport Agency’s automatic speed enforcement points, almost half of the vehicles on Finnish roads travel too fast. In the summer, approximately 54 per cent of drivers observe the speed limits, compared to 47 per cent in the winter time. The average speed of heavy goods vehicles on main roads is higher than the vehicle-specific limit. In the summer, the average speed of heavy goods vehicles is 83 kilometres per hour (km/h) and 81 km/h in the winter.

According to the data collected by the traffic accident investigation teams, one out of four drivers involved in a fatal accident in 2011, whether as the guilty party or otherwise, was speeding. It is fair to assume that inappropriate speed is a contributor to almost all accidents.

Why do drivers speed? The risk experienced by drivers is a major factor. Despite the fact that high speed is unquestionably linked to traffic safety issues, the risk seems small from an individual driver’s perspective. Shorter travel times appear to be the motivation for many road users, even though the time saved in regular travel may be insignificant. For some road users, speeding offers pleasure and excitement. This is a classic example of a situation where the objectives of the individual and society conflict. This makes speed control in road traffic challenging for traffic safety authorities.

Speed management should be addressed as a package, built on the basis of an effective speed limitation system. Under the guidance of the Finnish Transport Agency, in Finland the authority responsible for road management (ELY Centres) imposes speed limits for roads. At the same time, municipal or city authorities are responsible for setting speed limits in street networks. Speed limits should be consistent, appropriate for the road environment in question, and logical for road users. In built-up areas in particular, various road engineering features such as speed bumps should be introduced in order to lower speed. Drivers must be aware of the local speed limit at all times. In addition to the traditional road signs and road markings, other increasingly popular speed management tools include in-vehicle systems that provide information and remind the driver of the relevant speed limits. Another important element in speed management is traffic control, particularly automatic speed enforcement.

YOUNG PEOPLE AS PASSENGER CAR DRIVERS

Fewer young people obtaining a driving licence

Fewer young people aged 18, particularly in the metropolitan Helsinki area, are obtaining driving licences. People often postpone obtaining a driving licence to a later time, for example when they start a family. It is also estimated that the number of people who never obtain a driving licence will grow; this is largely due to excellent public transport systems in bigger cities, and the growing environmental awareness of young people.

In the metropolitan Helsinki area, only 40 per cent of young people aged 18 obtain a driving licence as soon as they turn 18. In earlier scenarios it seemed that young people postponed obtaining a driving licence until they were 24–26, but it now appears that a growing number of young people choose not to obtain a driving licence at all.

Of all young Finnish people aged 18, approximately 60 per cent obtain a licence to drive a passenger car. In total, more than 70 per cent of all young Finnish people aged 19 have a driving licence.

By contrast, only nine per cent of 18-year-olds in metropolitan Stockholm area obtain a licence to drive a passenger car. Despite good public transport and the growing popularity of bicycling and ecological value, it will still take quite a while for the Helsinki region to achieve this level.

Driving instruction reform

The overall reform of the national Driving Licence Act entered into force in January 2013. This reform is based on the implementation of the European Union’s third driving licence directive. The national passenger car driving instruction guidelines were also revised with the objective of reducing young drivers’ accidents, especially in the early stages of their unsupervised driving.

In 2012, 708 young people aged 18–20 were injured and 15 were killed in road accidents in Finland. Ten people driving a passenger car died and 366 were injured. Although the number of drivers killed in accidents has declined, the trend has not been equally positive with respect to injuries. Of all injured passenger car drivers, the percentage aged 18–20 remained by and large unaltered from 2007 to 2012.

The objective of driving instruction provided in three stages is to ensure that the driver can drive responsibly and safely, even when unsupervised. Newly licensed drivers must understand their responsibility not only towards themselves and their vehicles, but towards other road users, particularly pedestrians and other similar traffic. A safe driver can identify, anticipate

### Passenger car drivers killed and injured in 2007–2012.
The number of drivers aged 18–20 shown separately.

Source: Road accident statistics, Statistics Finland.

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<td><strong>Passenger car drivers killed in accidents</strong></td>
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<tr>
<td>aged 18–20</td>
<td>26</td>
<td>16</td>
<td>16</td>
<td>17</td>
<td>16</td>
<td>10</td>
<td>-61.5 %</td>
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<tr>
<td>Total across all age groups</td>
<td>176</td>
<td>148</td>
<td>110</td>
<td>118</td>
<td>128</td>
<td>120</td>
<td>-31.8 %</td>
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<td>Percentage of drivers aged 18–20 of all drivers killed</td>
<td>14.8 %</td>
<td>10.8 %</td>
<td>14.5 %</td>
<td>14.4 %</td>
<td>12.5 %</td>
<td>8.3 %</td>
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<td><strong>Passenger car drivers injured in accidents</strong></td>
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<td></td>
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<tr>
<td>aged 18–20</td>
<td>463</td>
<td>472</td>
<td>472</td>
<td>390</td>
<td>363</td>
<td>366</td>
<td>-21.0 %</td>
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<tr>
<td>Total across all age groups</td>
<td>5,014</td>
<td>2,881</td>
<td>2,705</td>
<td>2,552</td>
<td>2,604</td>
<td>2,516</td>
<td>-16.5 %</td>
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<tr>
<td>Percentage of drivers aged 18–20 of all injured drivers</td>
<td>15.4 %</td>
<td>16.4 %</td>
<td>17.4 %</td>
<td>15.3 %</td>
<td>15.9 %</td>
<td>14.5 %</td>
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and avoid risks. A responsible driver can take account of risks by reducing the vehicle’s speed or pre-planning a safe route.

The driving licence reform was followed by an exceptionally heated public discussion. The reform was criticised for the excessive costs incurred by those obtaining a driving licence. The price of a driving licence obtained by taking lessons with an instructor holding an instruction permit increased disproportionately, as the new system requires that both instructor and student also participate in the tuition provided in driving schools. A driving licence obtained by taking lessons in a driving school can cost well over 2,000 euro, or even close to 3,000 euro.

The following months and years will show whether the safety effects sought through the driving instruction reform are achieved. Trafi intends to investigate the effects of the reform.

Any decision-making geared towards road safety improvement should be based on analysed data. Better safety information and safety statistics play a key role here. In Finland a wealth of information is available on fatal road accidents. The greatest shortcomings are related to injury statistics; for example, injuries are not classified according to their severity. Furthermore, statistical coverage of bicycle and moped accidents is insufficient. Insufficient coverage in the official accident statistics compiled by Statistics Finland can be attributed to the fact that, since all accident material is currently collected from police records, it does not include accidents in which the police are not called to the scene of the accident.

Trafi is working in close co-operation with various stakeholders to improve injury statistics. The European Commission’s High Level Group on Road Safety agreed in January 2013 on common definitions of serious injury. The selected method is based on the The Abbreviated Injury Scale (AIS) used in the United States. The AIS system has been specially developed for the classification of injuries sustained in traffic accidents. The maximum AIS(MAIS) is used to describe the overall severity of injuries. The MAIS value is highest if the patient has multiple injuries. MAIS 3+\(^4\) is used to indicate grave injuries.

The objective is to include injury statistics for 2014 in the 2015 EU CARE database\(^5\). A longer term objective is to achieve continuous improvements in statistics, which requires the amalgamation of accident and hospital care records.

Suicides are included in Finland’s official road accident statistics. A death certificate issued by a medical examiner indicates whether or not the death was caused by suicide. Although the number of suicides can be an indication of serious problems within society, such cases should not be included in traffic accident statistics. In any event, the work carried out by investigation teams provides information on the number of suicides. In Finland, each fatal road and off-road accident is thoroughly investigated by a multidisciplinary investigation team. Regional teams also investigate a proportion of accidents that result in serious injury.

According to the definition by the EU statistical office Eurostat\(^6\), injury accident means any accident involving at least one road vehicle in motion on a public road or private road to which the public has right of access, resulting in at least one injured or killed person. A suicide or attempted suicide is not an accident but an incident caused by a deliberate act intended to injure oneself fatally. However, if a suicide or attempted suicide causes injury to another road user, the incident is regarded as an injury accident.

The Eurostat definition is not entirely simple and straightforward. Common sense would suggest that any personal injuries caused by a person attempting suicide should not be included in accident statistics. However, this definition could be interpreted as implying that, if other people sustain personal injuries due to attempted suicide, then all injuries sustained by all parties should be recorded in accident statistics.

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\(^4\) Under the AIS system, the injured person’s most serious injury is assigned a minimum value of three.

\(^5\) Contains information on all road accidents resulting in injury.

AVERAGE AGE OF PASSENGER CARS
The average age of all registered passenger cars in Finland was 12.6 years at the end of 2012. When cars registered as museum vehicles are excluded, the average age falls to 10.6 years. The average age of passenger cars in traffic was 10.9 years.

From the traffic safety and environmental perspective, it is more relevant to consider the average age of vehicles in active use in traffic. Our total passenger car fleet includes approximately half a million decommissioned vehicles, which are unlikely to be used in traffic again. The average age of vehicles in active use best describes the age of vehicles on Finnish roads.

The average age of passenger cars in traffic varies slightly during the calendar year. The average age rises in the summer as the number of vehicles in traffic increases, when recreational vehicles, vintage cars and other vehicles used only in the summer appear on the roads. Some of these vehicles are very old models. The vintage car culture is very strong in Finland. Although some vintage cars are very old, they are often in excellent condition.

Besides average age, there are other indicators for measuring the age of the car fleet. Median age, for instance, indicates the age of cars on the mid-point of the age scale. The median age of passenger cars in traffic at the end of 2012 was more than a year lower than the average age.
An accurate comparison of the average age of the European car fleet is difficult, since information on the age of vehicles or measurement methods is not as readily available in other countries as in Finland. The available information indicates that the average age of passenger cars in traffic in Finland is approximately two years higher than elsewhere in Europe.

New regulations adopted in Finland ten years ago made it considerably easier to import used passenger cars. However, the increase in imports did not materially affect the average age of the passenger vehicle fleet. The average age of used passenger cars imported to Finland is lower than the average age of the existing fleet. The life span of a vehicle is usually the same, approximately 18–20 years, both for new cars and imported used cars. Some vehicles are decommissioned early due to damage sustained in accidents, while others remain registered for decades as museum cars.

Ratings in safety tests

One of the objectives of the Euro NCAP (New Car Assessment Program) safety tests is to encourage car manufacturers to design and build safer cars. Following the introduction of more advanced car safety features, the testing methods are revised. In 2009, the testing methods were fully overhauled to feature only one overall star rating from one to five stars instead of the three separate ratings used previously: adult passenger protection, child passenger protection and pedestrian protection. In addition, a test for whiplash neck injury protection during rear impact was included. Minor changes to the testing method have been made since its introduction. The most recent change was adopted in February 2013.

This overall safety rating is composed of scores in four areas: adult protection on impact, child protection on impact, pedestrian injury risk on impact and in-vehicle safety assist devices and systems.

Of all registered vehicles in Finland at the end of 2012, 13.9 per cent were given the full score of five stars in safety tests performed using the method introduced in 2009 or later. Of all new vehicles commissioned in 2012, nearly 67 per cent achieved five stars in safety tests.

Additional information is available from: Euro NCAP (www.euroncap.com) and Statistics Finland: Motor vehicle fleet 2012.
The percentage of vehicles awarded five stars in EuroNCAP tests by commissioning year (2009–2012).

Source: EuroNCAP and Trafi, Vehicular and Driver Data Register.
Carbon dioxide emissions (CO$_2$) represent one of the key environmental indicators for vehicles. European Union legislation adopted in 2009 sets mandatory emission reduction targets for new cars. The fleet average to be achieved by all new cars is 130 grams of CO$_2$ per kilometre by 2015. By 2020, average emissions may not exceed 95 g/km.

The 2015 and 2020 targets represent reductions of 18 per cent and 40 per cent respectively compared with the 2007 fleet average of 158.7 g/km. In 2012, the average emissions amounted to 132.2 g/km for new cars, showing a decrease of 2.6 per cent from the previous year.

In 2008, Finland introduced a vehicle tax system based on carbon dioxide emissions. In 2011, the basic component of the vehicle tax was also tied to carbon dioxide emissions.

The CO$_2$ emissions of first-time registered vehicles took a downward turn in 2008. The average CO$_2$ emissions of first-time registered passenger cars have decreased by 21 per cent since 2007. In the same period, the average CO$_2$ emissions of petrol-powered passenger cars fell by 22 per cent and those of diesel-powered vehicles fell by 18 per cent. The average CO$_2$ emissions of first-time registered passenger cars in 2012 amounted to 139.7 g/km. Average emissions from petrol-powered cars (138.8 g/km) were slightly lower than from diesel-powered cars (141.2 g/km).

Finland has been able to outperform other EU countries in terms of emissions reduction because the carbon dioxide emission level was relatively high in Finland at the outset. Nevertheless, the average carbon dioxide emission rate in 2012 was higher than the EU average. To achieve the 2020 target (maximum of 95 g/km), average carbon dioxide emissions from first-time registered vehicles need to be reduced by another 32 per cent.
VEHICLE DRIVING POWER

The number of first-time registered new passenger cars in 2012 was 111,251. Of all cars, 60 per cent were petrol-powered and nearly 39 per cent were diesel-powered. The number of first-time registered hybrid vehicles was 1,493 and that of electric passenger cars was 51. Of all first-time registered vans in 2012, 99 per cent (11,348) were diesel-powered. The number of first-time registered electric vans was 12.

There has been a significant increase in the number of hybrid passenger cars since 2007. In 2007, the number of hybrid vehicles in traffic was 360, compared to 1,135 in 2008 and 6,114 at the end of 2012. At the end of 2012, there were 3,383 passenger cars using another alternative fuel, the majority, or 2,443 vehicles, being flexible fuel vehicles that run on petrol and ethanol.

Of all lorries first-time registered in 2012, eleven were powered by petrol, one by petrol and compressed natural gas, one by petrol and ethanol, one by petrol and liquefied petroleum gas and one by diesel/electricity. In the case of nine lorries the fuel type or power source is unknown. The remaining 3,228 are diesel-powered. Of the 533 first-time registered buses, two were diesel/electric hybrids and one was fully electric. 528 buses were diesel-powered the fuel type or power source of two buses was unknown. The number of first-time registered motorcycles was 4,994. Two of them were electric and the rest were petrol-powered. The number of first-time registered electric mopeds was 199 and that of mopeds in total was 12,999.

The engine power source of vehicles commissioned in 2012.

Source: Trafi, Vehicular and Driver Data Register.

<table>
<thead>
<tr>
<th>Driving power</th>
<th>Passenger car</th>
<th>Van</th>
<th>Lorry</th>
<th>Bus</th>
<th>Motorcycle</th>
<th>Moped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petrol</td>
<td>66,753</td>
<td>92</td>
<td>11</td>
<td>0</td>
<td>4,992</td>
<td>12,800</td>
</tr>
<tr>
<td>Diesel</td>
<td>43,035</td>
<td>11,348</td>
<td>3,228</td>
<td>528</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Petrol/CNG</td>
<td>45</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Petrol/Ethanol</td>
<td>1,281</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Petrol/Electricity</td>
<td>63</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Petrol/LPG</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CNG</td>
<td>18</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Diesel/Electricity</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Electric</td>
<td>51</td>
<td>12</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>199</td>
</tr>
<tr>
<td>Unknown</td>
<td>3</td>
<td>1</td>
<td>9</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>111,251</td>
<td>11,469</td>
<td>3,252</td>
<td>533</td>
<td>4,994</td>
<td>12,999</td>
</tr>
</tbody>
</table>
Transport of dangerous goods

Dangerous goods transported on Finnish roads primarily consist of flammable liquids. Flammable liquids represented nearly 60 per cent of the more than 11 million tonnes of cargo transported in 2012. Corrosive substances were the next biggest group of dangerous substances transported.

The total transport volume has grown by nearly 20 per cent from 2011. By contrast, the volume of dangerous goods transport (ADR) has decreased by 27 per cent in ten years.

Trafi will publish a report on dangerous goods transport in 2013. Dangerous substances on Finnish roads and the transport routes have been examined in more detail for this report.

ADR ACCIDENTS

In 2012, four accidents occurred during the transport of dangerous goods were reported to the Finnish Safety and Chemicals Agency (Tukes). The Decree of the Ministry of Transport and Communications on the Transport of Dangerous Goods by Road lists accidents that must be reported to Tukes immediately. The decree specifies the gravity of the personal injuries caused by the accident and of the spill of the transported substance, or immediate risk thereof, that necessitate filing a report. Only a few accidents occur each year that exceed the reporting threshold.

In 2012, in its statistics the Finnish Rescue Services noted 42 road accidents involving a dangerous goods transport vehicle. Over the last five years, the number of such accidents has ranged between 36 in 2008 and 57 in 2010.
**ADR VEHICLE FLEET**

Vehicles intended for the carriage of explosives or tankers carrying dangerous goods must be ADR approved and ADR inspected on an annual basis. ADR approvals may be issued by vehicle inspection facilities authorised by Trafi, as well as by individual approval bodies. To be ADR approved, a vehicle must be suitable for dangerous goods transport in terms of its structure, technical properties and equipment. At the end of 2012, there were 2,020 ADR approved vehicles in Finland; 38 per cent were class N3 lorries and 57 per cent were class O4 trailers.

**ADR DRIVER LICENCES**

Drivers transporting dangerous goods are required to have an ADR licence if the volume of transported goods exceeds the minimum volume. Drivers are required to complete the related training and to take a test in order to obtain the licence. The licence is issued for five years, and must be renewed before its expiry.

The ADR licence is valid for domestic and international carriage alike. The basic driver’s licence entitles the driver to transport all dangerous goods, excluding explosives and radioactive substances. Further training is required in order to qualify as a tanker driver and for carrying radioactive substances. To renew their licences, drivers must attend further training and pass the final examination.

At the end of 2012, the number of valid ADR driver licences was 32,732. A total of 6,458 ADR licences were issued in 2012; 3,289 basic licences and 3,169 tanker driver’s licences. A total of 8,964 ADR driver’s licence tests were taken in 2012.

**DANGEROUS GOODS SAFETY ADVISERS**

Companies engaged in carrying dangerous goods must appoint a dangerous goods safety adviser. It is the safety adviser’s duty to explore and promote ways of transporting dangerous goods as safely as possible and in compliance with the transport regulations.

At the end of 2012, there were 1,007 safety advisers for road carriage, 85 of whom were also qualified to act as a safety adviser for dangerous goods transport by rail. The certificate issued to qualified safety advisers is in effect for five years. Validity may be extended by five years if the person passes a supplementary safety adviser test during the year of expiry.

In 2012, 122 people took the safety adviser test. In addition, 27 people took the supplementary test.

### ADR vehicles by vehicle class in 2012. (Weight indicates total vehicle mass.)

Source: Trafi, Vehicular and Driver Data Register.

<table>
<thead>
<tr>
<th>Vehicle category</th>
<th>N2</th>
<th>N3</th>
<th>N3G</th>
<th>O2</th>
<th>O3</th>
<th>O4</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lorry, more than 3,500 kg, less than 12,000 kg</td>
<td>7</td>
<td>774</td>
<td>5</td>
<td>22</td>
<td>2</td>
<td>1,152</td>
<td>58</td>
<td>2,020</td>
</tr>
</tbody>
</table>

European Agreement concerning the transport of Dangerous Goods by Road
Dangerous goods transport (ADR) in 2012.
Source: Statistics Finland.

<table>
<thead>
<tr>
<th>Dangerous goods</th>
<th>Volume of goods in 1,000 tonnes</th>
<th>Tonne kilometres, in millions</th>
<th>Drive kilometres, in 1,000 km</th>
<th>Average transport distance, in km</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explosives</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2. Compressed, liquefied and dissolved under pressure gases</td>
<td>579</td>
<td>121</td>
<td>7,682</td>
<td>196</td>
</tr>
<tr>
<td>3. Flammable liquids</td>
<td>6,904</td>
<td>682</td>
<td>30,990</td>
<td>119</td>
</tr>
<tr>
<td>4. Other substances liable to spontaneous combustion</td>
<td>44</td>
<td>7</td>
<td>240</td>
<td>128</td>
</tr>
<tr>
<td>5. Oxidising substances</td>
<td>1,358</td>
<td>76</td>
<td>2,245</td>
<td>63</td>
</tr>
<tr>
<td>6. Toxic and infectious substances</td>
<td>262</td>
<td>27</td>
<td>826</td>
<td>103</td>
</tr>
<tr>
<td>7. Radioactive substances</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8. Corrosive substances</td>
<td>1,894</td>
<td>158</td>
<td>4,149</td>
<td>73</td>
</tr>
<tr>
<td>9. Miscellaneous dangerous substances and articles</td>
<td>627</td>
<td>128</td>
<td>3,710</td>
<td>211</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11,668</strong></td>
<td><strong>1,199</strong></td>
<td><strong>49,842</strong></td>
<td><strong>119</strong></td>
</tr>
</tbody>
</table>

The volume of dangerous goods transport (1,000 tonnes) in 2003–2012
Source: Statistics Finland.

Road accidents involving a dangerous goods transport (ADR) vehicle.
Source: Finnish Rescue Services, PRONTO.
The number of people killed in road accidents in Finland in 2012 was exceptionally small: 255. However, to reach the 2020 target of no more than 136 traffic-related deaths, traffic safety efforts must be continued vigorously.

Although the number of fatal accidents was at an all-time low, the number of heavy goods vehicles involved in accidents was alarmingly high. Heavy goods vehicles and their drivers rarely cause accidents, but due to the large vehicle mass involved the consequences of such accidents are often devastating. Safety management systems are already required of professionals in other forms of transport. These systems have improved the safety culture of professional transport. The recently published ISO standard for road traffic safety management system (ISO 39001) will promote the road safety management and safety culture.

Trafi is in the process of developing a responsibility model that takes into account all safety, quality and environmental perspectives. This model is intended for all freight carriers and public transport companies, as well as organisations using transport services. The responsibility model will be based on voluntary participation, and its objective is to provide a practical and useful operating model that is easy for a transport company of any size to adopt and implement.

The environmental friendliness and safety of passenger car traffic greatly depends on vehicle age. New vehicles equipped with advanced technology generate a smaller amount of harmful emissions. Smart systems help drivers to cope in traffic and avoid accidents, and protect people when they are involved in accidents. To accelerate the modernisation of the vehicle fleet, lower car taxes should be introduced for safe and ecological cars. Trafi offers assistance to car buyers in choosing a safe and ecological car. People can compare the environmental features of different makes and models through the EkoTrafi service. By the end of 2013, vehicle performance in the EuroNCAP test will be included as part of this service.
The tax guidance on vehicle carbon dioxide emissions introduced in 2008 appears to have been rather successful in reducing CO\textsubscript{2} emissions. However, achieving the European Union’s target for 2020 (95 g/km) will be challenging, but not entirely impossible.

Road traffic accident statistics need to be improved in order to enable more efficient identification of safety problems. It is particularly important to obtain more extensive data on injuries and their severity, since this would enable better targeting of transport safety measures. After the adoption of a common European definition of serious injuries, it will be easier to compare traffic safety statistics between EU member states.

In the context of work undertaken to improve accident statistics, the issue of including suicides in road traffic in accident statistics requires discussion. In Sweden, suicides in road traffic have not been included in accident statistics since 2010. Likewise, the definition issued by the European Union’s Eurostat does not support their inclusion. This is not to say that the importance of deliberate fatal crashes should be underplayed; but the fact remains that our road traffic system is not the cause of the problem. Cross-disciplinary actions should be taken to identify a solution to this problem.

The driver’s actions were a major contributor in more than 90 per cent of accidents. The three most common driver-related safety risks include the use of intoxicating substances, driving too fast, and failure to use safety devices. Besides driving under the influence of intoxicating substances, driver fatigue is another major challenge in this regard. Including drivers, the population continues to age, which further underlines the significance of driver health and driving capacity. Consequently, investments in a driving capacity monitoring system are urgently required.

The alcohol interlock has proven to be a more effective tool in reducing drink driving than the enforcement of a driving ban as a disciplinary measure. Swift action should be taken to promote more extensive use of alcohol interlock devices by convicted drink-drivers. Approximately 40 people a year are killed and more than 600 are injured in drink-driving accidents while we wait for alcohol interlocks to become a standard feature in new vehicles.

Road users are required to follow the rules and use safety equipment, but the traffic system should also be adapted in line with human conduct, needs and abilities so as to prevent the more serious consequences of human error.

Our neighbouring country Sweden is one of the highest-ranking EU member states in terms of traffic safety. On Swedish roads with a speed limit of 80 km/h or above, 71 per cent of traffic travels along roads where a median separates lanes on which traffic is travelling in the opposite direction. In Finland, a speed limit of more than 80 km/h is permitted on roads where lanes for opposing traffic are not separated by a structural device. Most serious head-on collisions occur on such roads.