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# Motor Vehicle Speed in the EU

The speed of motor vehicles is at the core of the road safety problem. Higher speed increases both the risk of crash and the consequences of a crash.

## Lower average speeds reduce the risk of an accident

The rule of thumb that results from various studies is that an average speed decrease of 1 km/h leads to a 3% lower risk of an injury accident. The effect of speed depends, however, on the road type concerned. The greatest improvement is found on busy urban roads where there is a lot of slow traffic and large speed differences (6% accident reduction per km/h reduction). On rural roads, 1 km/h speed reduction only results in 2% less injury accidents. But the 3% accident reduction per 1 km/h average speed reduction remains a useful rule of thumb[1].

In the NETHERLANDS , the general urban speed limit of 50 km/h was introduced on 1 November 1957. Before this, fixing a speed limit was left to the municipal road authorities. As a result, in 1958 there were 17% less fatal accidents on urban roads[2].

## Lower average speeds reduce the severity of an accident

In a collision at 80 km/h, car occupants run a 20% higher risk of being killed than at 30 km/h. In the case of a collision between a car and a pedestrian or a cyclist, a similar relation between speed and survival chances applies. If the collision speed exceeds 45 km/h, the likelihood for a pedestrian or cyclist to survive the crash is less than 50%. If the collision speed is less than 30 km/h, more than 90% of those struck survive[3].

## Lower average speeds provide for lower fuel consumption and $CO_2$ emissions

Average speed between 80-90 km/hour brings cars into their most efficient fuel consumption point. Lowering average speeds to that level makes therefore both economic and environmental sense. Fuel consumption is 30% higher at speeds above 120 km/hour than at 90 km/hour[4].

## Speed limits in the European Union

In Europe general speed limits for cars inside urban areas are effectively harmonised. However they vary widely outside urban areas and to some extent on motorways as shown by the table below[5]:

| | |
|---|---|
| Inside urban areas | 50 km/h (except Slovakia, Poland) |
| Outside urban areas | 65 - 100 km/h |
| Motorway | 100 - 130 km/h (except Germany) |

Recent results from a SARTRE survey indicate that 79.4% of the drivers would support the introduction of the same speed limits on similar types of roads across Europe.

## Speed limits need to be adapted to the infrastructure

At present, many roads in the EU are multifunctional and used by different types of vehicle users with substantial differences in speed, mass of vehicle and degree of protection. It helps to define a road hierarchy that takes into account the different road functions when designing roads in detail, as this in return encourages appropriate choice of speed and hence makes road transport more efficient and safer.

In HUNGARY, general speed limits for rural roads, expressways and motorways were all raised by 10 km/h in 2001 without any adaptation of the infrastructure. This has led to some 20 additional fatalities per month outside built-up areas, compared with the general trend.

In DENMARK, the speed limit was raised from 110 km/h to 130 km/h on half of the motorway network on 30 April 2004. This change was preceded by infrastructure changes. In addition, signs were put up every 1.5 km on roads where the speed limit remained at 110 km/h to remind drivers of the lower limit. Both the old and the new limits were strictly enforced, speeding penalties were increased and a comprehensive road safety campaign was run.

## Speed limits need to take risk into account

Each European country has an upper speed limit for urban roads, non-urban roads and motorways. However, increased risk on some stretches of roads as well as particular weather conditions suggest that these upper limits should be supplemented by local speed limits operating in line with weather, traffic and road conditions.

In IRELAND, the measurement of speed limits was changed on 20 January 2005 from miles per hour to kilometres per hour. As a result of these changes, the speed limit for rural regional and local roads was reduced by 20% from 60 mph to 50 mph (from 96,6 km/h to 80 km/h) as latest EuroRAP results had shown that on this type of road, present on 91% of Ireland's road network, the risk of a fatal collision was as high as 11.5 fatal crashes per billion vehicle kilometres (i.e. six times the motorway collision rate).

In NORWAY, speed limits were lowered in 2001 from 90 km/h to 80 km/h and from 80 km/h to 70 km/h on hazardous road sections, i.e. road sections with a high number of fatal or serious injury accidents per kilometre of road. Lowering the limit from 80 km/h to 70 km/h has successfully reduced speeds (-2.1 km/h to -4.1 km/h), the number of injury accidents (-14%) and the number of injured road users (-23% to -35%). The effects of lowering the speed limit from 90 km/h to 80 km/h were however less clear. While speeds were effectively reduced (-1.6 km/h to -2.8 km/h), there was no drop in the number of accidents or injured road users[6].

In FINLAND, wintertime speed limits on about half of the secondary roads have been lowered from 80 to 70 km/h as of October 2004.

In ESTONIA, Parliament decided in 1997 to raise speed limits on inter-urban roads, but the Ministry decided that this was only feasible during summertime and only on some stretches of road.

In the U.K., experience has been very positive with so-called Vehicle-Activated Signs (VAS). First VAS were installed in the UK in the 1970s. Different types of VAS include bend warnings, junction warnings and safety camera repeater signs. VAS have shown to be effective in reducing speeds and were approved by the public. There is no evidence that drivers became less responsive to signs with time.

## Speed limits need to protect vulnerable road users

Speed of motor vehicles in urban areas is critical to the safety of vulnerable road users. At low speeds drivers have more time to react to an unexpected situation and avoid collisions. If the collision is unavoidable more than 90% of those struck survive at a speed of 30 km/h or less.

Zones 30 in urban areas are useful to reduce speed and can be supported by means of traffic calming measures including various physical modifications: vertical and horizontal deflections, changes in surface colour and texture, a reduction in overall carriageway area, and signs and other symbols to convey to drivers that they need to have greater awareness of vulnerable road users. Gateways may indicate entries into traffic calmed areas.

In BELGIUM, the cities of Gent, Mons and Kortrijk have developed large "Zone 30" areas particularly in all areas surrounding schools.

In FRANCE, "Zone 30" areas are developing in most city centres.

In POLAND, the cities of Krakow, Gdansk and Warsaw have implemented "Zone 30" in some parts of the urban perimeter.

In SLOVENIA, the systematic implementation of "Zone 30" in residential areas is taking shape.

In HUNGARY, "Zone 30" areas (coupled with the use of road humps) have started to be very common in the city centres.

In CYPRUS, traffic calming measures (mainly road humps) have been introduced in the recent years: these measures were implemented mainly outside schools but also on trunk roads through villages and in locations where high speeds coupled with the crossing of vulnerable road users.

## Speed limits need to be strictly enforced

Intensive speed enforcement actions are an important means of enhancing road safety. Such actions, if carried out according to best practice standards, can lead to a rapid, massive and cost-effective reduction in deaths and injuries.

In FRANCE, after the introduction of a fixed safety camera scheme in 2003, fatalities on the intercity motorways decreased by 34.5%.

In the NETHERLANDS, the general limit on motorways was increased in May 1988 from 100 km/h to 120 km/h; remaining 100 km/h on a limited length of the motorway network. This change was accompanied by extensive information, publicity and enforcement campaigns. However, average speeds on 100 km/h roads increased again after a first period of introduction of the new measures. Later on, after 1996, it was observerd that the average speed on 100 km/h roads was much more respected and often even slightly lower than just after the differentiation was introduced. The number of offenders also decreased from 50% to 40% in 2000 and there were 30% less fatal accidents and 15% less injury accidents on motorways.
This success has been attributed not only to the fact that there were increased volumes of traffic, but also to a large extent to the increased police surveillance.

## A scenario: Intelligent speed limits and ISA

In order to reduce accidents and casualties resulting from over-speeding, speeds should not only remain within the legal general limit, but also be adapted to the prevailing weather and traffic conditions. Ideally, limits should therefore not be static but variable over time. In places where variable limits have been introduced on motorways, they were met with large acceptance and compliance by motorists..

The signalling of variable limits on the roadside is however expensive and little attractive. In the future, limits should therefore be indicated by in-car devices. Studies are underway to enable Intelligent Speed Adaptation (ISA) technology to "tell" the appropriate speed to the driver.

ISA field trials across Europe have demonstrated that in-vehicle speed control is both technically feasible and publicly accepted. There is ample scientific evidence that ISA is an effective road safety measure and a key technology in improving fuel efficiency.

**References**


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**European Transport Safety Council**
**Rue du Cornet 22 - B-1040 Brussels**
**Tel. + 32 (0) 2 230 4106 - Fax. + 32 (0) 2 230 4215**
**E-mail: information@etsc.be - Internet: www.etsc.be**