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Killing speed and saving lives

The Government's strategy for tackling the problem
of excess speed on our roads

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Killing speed and saving lives

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Section 1

The extent of the problem

1.1

In 1991 in Britain there were 235,798 injury road accidents, of which 4,158 were fatal. There were 4,568 deaths, 51,605 serious injuries and 255,096 slight injuries.

1.2

Speeding by drivers and riders contributed towards a substantial proportion of these deaths and injuries.

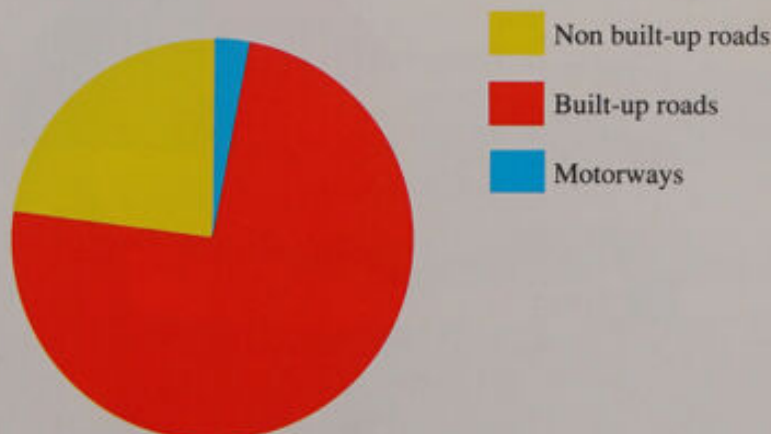
Investigations into thousands of road accidents by the Transport Research Laboratory (TRL) indicate that between 22 and 32 per cent of the accidents studied had excessive speed as a contributory factor. This is supported by research in the United States which suggests that about one third of all fatally injured vehicle occupants are involved in a speed-related accident.

In terms of the 1991 injury road accident figures for Britain, this would mean that speeding had been involved in up to 77,000 injury road accidents and in the deaths of approximately 900 vehicle occupants and motorcycle users.

1.3

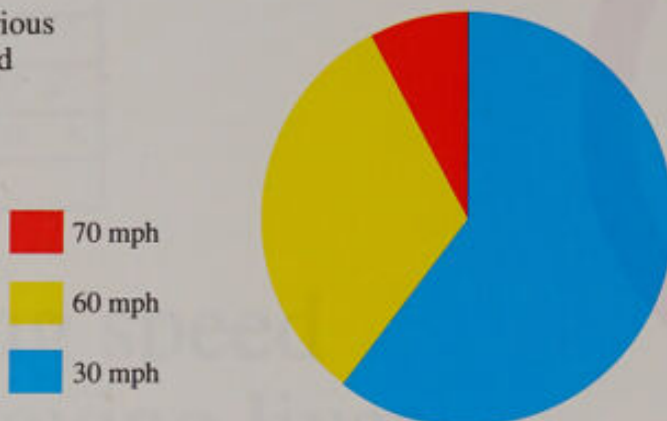
This is not to say that the roads with the highest vehicle speeds are the most dangerous. Motorways are by far the safest roads in the country: they carry nearly 15 per cent of the traffic but account for just over 3 per cent of the casualty accidents. Furthermore, the fatality rate on motorways is less than a third of that on built up roads and less than a quarter of that on non-built up roads.

Casualty accidents by road type



The relationship between speed, accidents and casualties

Deaths and serious injuries by road speed limit



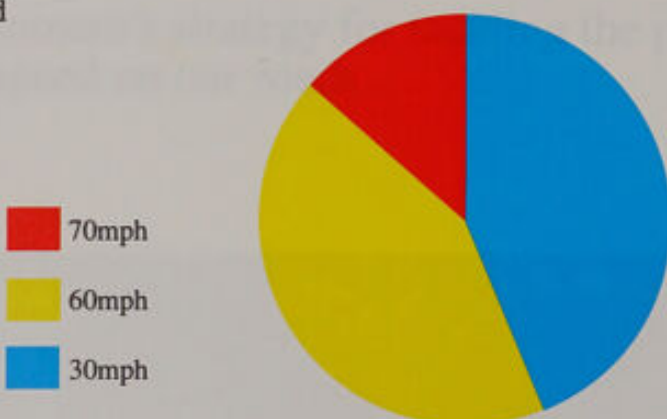
In 1991, 55 per cent of the total deaths and serious injuries occurred on roads with a 30 mph limit compared with 29 per cent in a 60 mph limit and only 7 per cent in a 70 mph limit.

Taking fatalities alone, 38 per cent occurred on roads with a 60 mph limit, 39 per cent in a 30 mph limit and 12 per cent in a 70 mph limit.

Roads with a 60 mph limit - mostly single carriageway roads in non built-up areas - are particularly dangerous for vehicle occupants. In 1991, some 53 per cent of all vehicle occupant deaths occurred on these roads. This compared with 22 per cent in a 30 mph limit and 16 per cent in a 70 mph.

The problem is driving too fast for the kind of road and for the prevailing road conditions.

Deaths by road speed limit



1.4.

There is considerable evidence that the number and severity of road accidents increase rapidly with speed.

The introduction of a national speed limit of 50 mph during the 1973-74 fuel crisis was followed by a 10 per cent reduction in accidents, while the volume of traffic fell by only 3 per cent. Measurements of vehicle speeds on motorways while the 50 mph limit was in force suggest that such speeds fell by an average of about 11 mph.

In 1979, in Denmark, a 10 kph reduction in the speed limits on motorways and other rural roads - to 100 kph and 80 kph respectively - led to a reduction in average speeds on each type of road of about 2 kph. At the same time, there was a reduction in the total number of accidents on motorways and a 17.5 per cent reduction in injury accidents on rural roads.

An analysis by the TRL of international experience indicates that a reduction in average speed everywhere of the order of 1 kph could save 5 per cent of all injury accidents and 7 per cent of fatal accidents.

Vehicle occupant deaths by road speed limit



In the United States, the decision by 40 States between 1987 and 1988 to raise the speed limit on inter-state highways from 55 mph to 65 mph led to an increase in average car speeds of about 3 mph. Over the same period, there was an increase in fatalities on these roads of between 20 and 25 per cent - an estimated 500 deaths a year. This is strong evidence that a relatively small increase in average speed - here about 5 per cent - can lead to a very large increase in road deaths.

20 mph 6m 6m 12m (40ft)

Shortest stopping distances

30 mph 9m 14m 23m (75ft)

40 mph 12m 24m 36m (120ft)

50 mph 16m 38m 53m (175ft)

60 mph 18m 55m 73m (240ft)

70 mph 21m 75m 96m (315ft)

Thinking distance

Braking distance

Overall stopping distance

1.5

Physical considerations show that, all other things being equal, accidents are more likely and, if they occur, become more severe as vehicle speeds increase.

Higher speeds result in longer distances travelled as the driver reacts to an incident. The 'thinking distance', the length of road covered while the driver is assessing the situation and deciding to brake, increases linearly with speed.

Moreover, the distance needed to bring a vehicle to a halt increases even more rapidly with its speed. This is because the 'braking distance' - the distance travelled from when the driver first applies the brakes to the point at which the vehicle is at complete rest - increases with the *square* of the speed.

The faster a vehicle is driven, the harder it is to estimate the speed of other road users accurately - thereby making wrong judgements more likely.

So, however fast a driver's reactions, as the speed of the vehicle increases the chances of being able to react successfully to an unforeseen incident or to correct a misjudgement decrease sharply.

Speed not only greatly increases the stopping distance of a vehicle; the energy imparted by a moving vehicle increases with the square of its speed; so a car travelling at 40 mph will dissipate four times more energy in an impact than one travelling at 20 mph.

1.6

It is no surprise, therefore, that there is a disproportionate relationship between speed and the severity of pedestrian injuries.

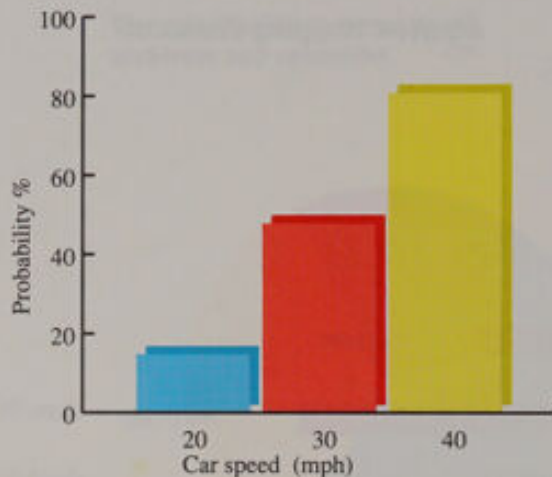
Research shows that when pedestrians are struck by a moving car:

- at 20 mph only 5 per cent are killed, most injuries are slight, and 30 per cent suffer no injury at all;
- at 30 mph 45 per cent are killed and many are seriously injured;
- at 40 mph 85 per cent are killed.

Transport Research Laboratory impact experiment



Probability of serious injury to car occupant by impact speed*



*Assuming that the car hits a solid immovable object or an oncoming similar car at the same speed; and the vehicle occupant is restrained and in the front seat.

1.7

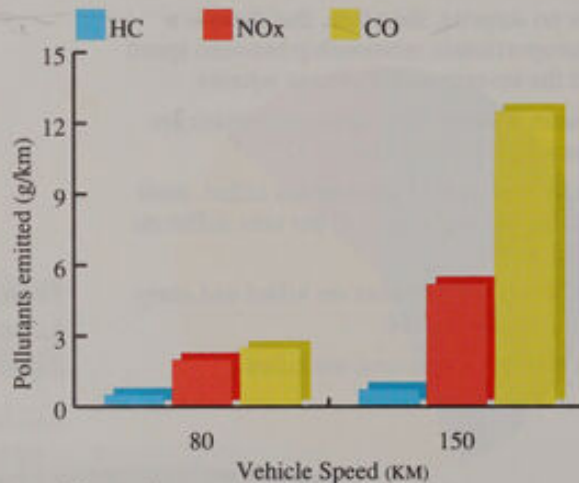
The relationship between speed and the severity of occupant injuries, although complicated by the kinds of vehicles involved and the type of accident, is also clear.

In a given type of accident, the risk of the vehicle occupants being seriously injured increases disproportionately with the speed of the impact.

TRL research indicates that, where a car hits a solid immovable object or an oncoming similar car travelling at the same speed in a head-on collision:

- at 30 mph the risk of serious injury to a belted occupant in a front seat is three times that at 20 mph;
- at 40 mph the risk is five times that at 20 mph.

Vehicle pollution by speed*



* Non-catalyst cars

1.8

The emission of pollutants by cars also increases disproportionately with speed.

A car travelling at 150 kph (93 mph), compared with one travelling at 80 kph (50 mph), emits:

- over four times more carbon monoxide (CO);
- more than double the nitrous oxide (NOx);
- more than one and a half times the hydrocarbons (HCs)



Speed limits

Type of Vehicle	Built-up areas	Elsewhere		Motorways
	MPH	Single carriageway	Dual carriageways	MPH
Cars (including car derived vans and motorcycles)	30	60	70	70
Cars towing caravans or trailers (including car derived vans and motorcycles)	30	50	60	60
Buses and Coaches (not exceeding 12 metres in overall length)	30	50	60	70
Goods Vehicles (not exceeding 7.5 tonnes maximum laden weight)	30	50	60	70
Heavy Goods Vehicles (exceeding 7.5 tonnes maximum laden weight)	30	40	50	60

These are the national speed limits and apply to all roads and unless signs show otherwise.

* The 30 mph limit applies to all traffic on all roads with street lighting and unless signs show otherwise.

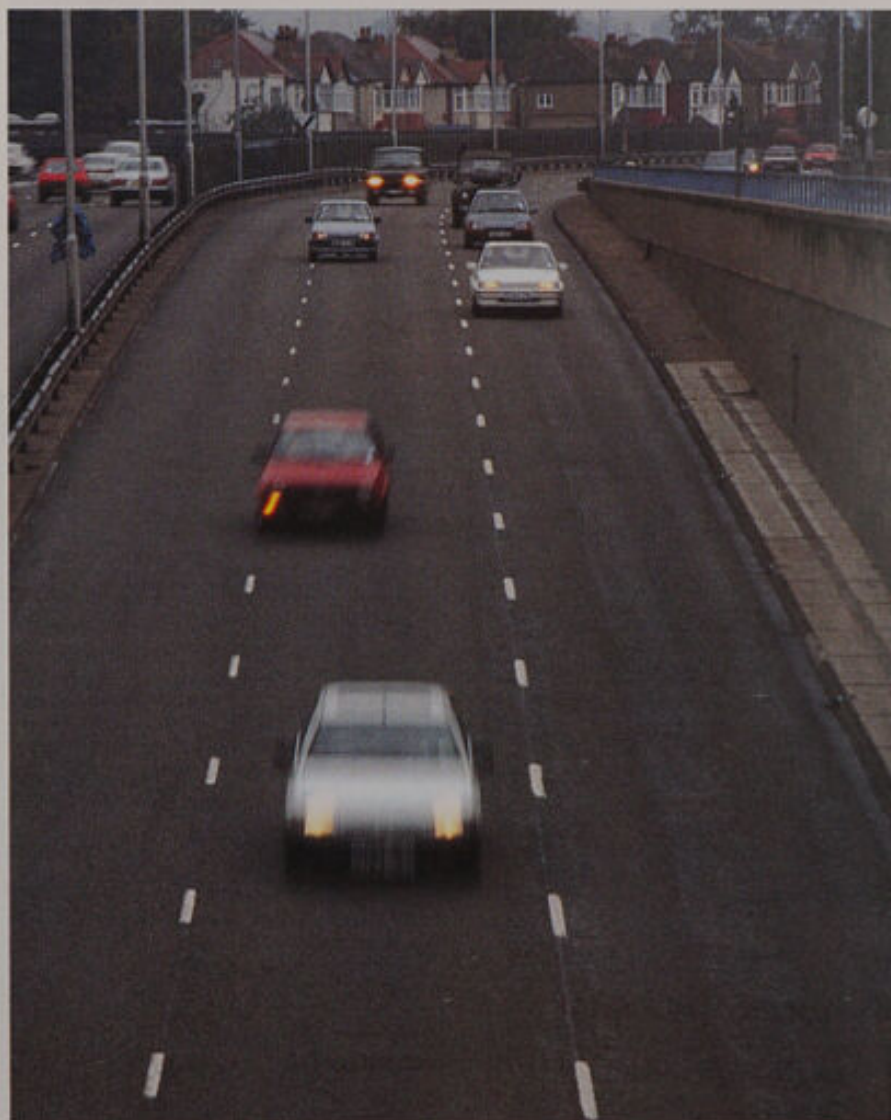
Speed Limits

1.9

Between 1865 and 1896 locomotives on the highway had to be preceded by a pedestrian carrying a red flag and were subject to a speed limit of 2 mph in cities, towns and villages and 4 mph elsewhere. The maximum speed limit was then increased to 14 mph and again, in 1903, to 20 mph. In 1930 speed limits for cars and motorcycles were abolished.

In 1934 a general 30 mph limit was imposed on roads in built up areas (which amounted to roads with street lighting). Other roads had no speed limits at all. It was not until 1965 that a national upper limit of 70 mph was introduced for all roads including motorways. Since 1977 the speed limit for cars and motorcycles on dual carriageways has been 70 mph, with a 60 mph limit on single carriageways.

The lowest speed limit to which a type of vehicle is currently subject is 5 mph. This limit must not be exceeded by track laying vehicles not fitted with resilient material between their rollers and the road surface.



Speeding

Until recently vehicle speed data were collected in irregular surveys using video camera. Now more sophisticated analyses are carried out using continuous information provided from data collection sites - some automatic - on motorways and on dual and single carriageways.

The 1991 survey into the free-flow speeds of over nine million vehicles on motorways and other trunk roads gave the following results:

Motorways

Motorway speeding is widespread.

- 60 per cent of cars exceed the 70 mph speed limit, one in four exceeds 80 mph and 3 per cent exceed 90 mph.
- Almost 60 per cent of motorcycles break the 70 mph limit, with one in three exceeding 80 mph and one in seven exceeding 90 mph
- 19 per cent of coaches and buses exceed 70 mph (although only 1 per cent travel at more than 75 mph, indicating the effectiveness of speed limiters in curbing high speeds).
- Around 40 per cent of heavy goods vehicles break their 60 mph limit.

Dual Carriageways

- Over three quarters of the largest heavy goods vehicles break their 50 mph limit.
- 38 per cent of cars and 43 per cent of motorcycles exceed the 70 mph limit. One quarter of motorcycles go faster than 80 mph.

Single Carriageway A Roads

- 70 per cent of heavy goods vehicles exceed their 40 mph limit.
- One third of motorcycles exceed the 60 mph limit with almost a quarter going over 70 mph.
- 10 per cent of cars break the 60 mph limit.

Comparing surveys carried out in 1983 and 1991, the proportion of cars breaking the speed limit has increased sharply on all three types of road.



Section 2

A strategy to cut speed

2.1

The problem of speeding is being tackled in a variety of ways by:

detering drivers from speeding by increasing the likelihood that they will be detected and successfully prosecuted and by increasing the penalties available to the Courts.

seeking to change drivers' attitudes towards speeding.

introducing road engineering measures which have the effect of slowing traffic down.

requiring speed limiters to be fitted more widely.

ensuring that speed limits are correctly set and take more account of the interests of vulnerable road users and local conditions.

Detection and Deterrence

2.2

The law allows the police to use approved radar devices to determine whether drivers are speeding. However, taking action against offenders has in the past been a cumbersome process because the legal procedures have been based on the premise that the driver will be stopped by the police at the time of the alleged offence. This either involves substantial demands on police resources, with one team of officers detecting offenders and another further along the road stopping them, or it involves the police in the danger of giving chase at high speed.

2.3

The new Road Traffic Act 1991 opens the way for speed detection equipment to be used more effectively. From 1 July 1992 it has been possible to convict motorists of speeding offences solely on the basis of photographic evidence from automatic roadside speed cameras type approved by the Home Office. The cameras will be triggered by every vehicle travelling faster than a given speed. The actual speed of the vehicle, together with the time and date, will be recorded on the photograph itself.

It will be possible to send a conditional offer of a fixed penalty to alleged offenders by post. Most offenders are likely to choose to pay the fine without further argument, particularly when confronted with the photographic evidence.

If cases go to Court, there will be no need for the police or other experts to give oral testimony in support of the photographic

evidence. A certificate that the camera was an approved device and that any conditions placed on its use had been satisfied will enable photographs from the camera to be admissible as sole evidence of a speeding offence.

Speed cameras will have most effect in reducing road casualties if they are used as a deterrent rather than simply to catch offenders. Police and highway authorities (in Scotland, Roads Authorities) will decide on how and where they are to be deployed but are likely to follow Government advice that they be used mostly at locations where there is a high risk of speed-related accidents.

Speed camera in action



2.4

The new automatic speed cameras will not replace traditional police radar equipment. Both will be used in the fight to detect and deter speeding drivers.

2.5

The Road Traffic Act 1991 also gives Courts for the first time the option of imposing up to 6 penalty points on a driver for a speeding offence, in place of the present maximum of 3 points. This opens up the possibility of a driver accumulating enough penalty points for disqualification from just two speeding offences. Moreover, on 1 October 1992, under the Criminal Justice Act 1991, the maximum fine for a speeding offence (a Level 3 fine) will increase from the present £400 to £1,000. The maximum fine for speeding on a motorway (a Level 4 fine) will go up from £1,000 to £2,500.

Changing Attitudes

2.6

The speed and performance capabilities of cars and motorcycles are deeply interesting to many drivers and riders. Motoring magazines and programmes often dwell upon the illegal top speeds of which modern cars are capable and how they perform at those speeds.

Part of the reason for this may lie in the way that cars are promoted by manufacturers. Car and motorcycle advertisements at the very least refer to the speed and acceleration which their models can achieve and often present fast driving as an enjoyable and acceptable activity - without pointing out consequences for drivers or other road users.

High speed car chases are a recurring element in many TV programmes - especially those aimed at the young.

2.7

This widespread fascination with speed may help to explain why motorists in general regard the breaking of speed limits - at least in a minor way - as not a very serious matter. We aim to change this attitude over the long term in the same way that the attitude of the public towards drinking and driving has changed. We intend to create a climate of opinion in which breaking speed limits is as socially unacceptable as driving with excess alcohol.

2.8

We have begun by seeking to persuade advertisers not to give undue prominence to speed and performance in car and motorcycle advertisements. The Committee of Advertising Practice, following discussions with the Government, has issued revised guidelines to advertisers and has taken action against several recent advertisements which emphasise speed and performance at the expense of other features.

Attitudes do seem to be changing with more manufacturers now basing their advertising campaigns on the range of safety features offered by their cars.

2.9

We will carry out a long-term publicity campaign to make drivers and riders aware of the dangers of excessive speed and the substantial safety benefits of even small reductions in speed.

This began with the national Child Pedestrian Safety Campaign, launched in October 1991 (based on the statistics quoted in paragraph 1.6). Television advertisements and posters show drivers how cutting their speed in residential areas can radically improve the

*TV commercial
'Kill your speed:
not a child'.*





chance of avoiding death and serious injury for any child pedestrian struck in an accident. The campaign continued with a second phase launched on 9 September 1992. The Scottish Road Safety Campaign which is mainly funded by the Government promotes additional anti-speeding publicity to augment the national campaigns.

Traffic Calming

2.10

Another important strand in the Government's strategy to cut traffic speed and save lives on our roads is the increasing use of road engineering measures to enforce speed limits. Some of these 'traffic calming' measures are engineered so as to prevent vehicles from exceeding the limit; others encourage drivers to cut their speed and take more care.

2.11

Road humps are extremely effective means of keeping vehicle speeds low. Regulations were introduced in March 1990 (January 1991 in Scotland) to make it easier for local highway or roads authorities to choose the shape of the humps and install them in more places at lower cost.

Humps, some taking the form of raised junctions or speed tables, together with other measures such as chicanes and road narrowings, have been used to establish 20 mph zones in a number of residential and shopping areas.

The engineering measures in a 20 mph zone make the low speed limit self-enforcing, creating a traffic environment in which the risk of death and serious injury to more vulnerable road users is sharply reduced.

The effectiveness of a zone depends on more than the physical engineering measures which prevent vehicles from exceeding the speed limit. Drivers should feel that they are in an area which is not predominantly for the use of motorists. This is achieved by the careful use of signs at the zone entry points and of different road textures and colours at selected locations within the zone. The use of planting, for example chicanes, can reinforce the impression that the area has a special character.

We have provided guidance to local highway authorities in England and Wales on the broad criteria which 20 mph zones must satisfy, on the possible traffic calming measures which might be used and on the authorisation procedure. Similar guidance has been issued in Scotland.

We have authorised 37 such zones on a trial basis since early 1991 and more are in the pipeline. Two zones, the Royal Borough of Kingston-upon-Thames and Sheffield, have been given permanent authorisation. The working of these initial schemes is being monitored, with TRL measuring the effects of the traffic calming measures on actual traffic speeds within the zones. We will provide more detailed technical guidance on the design of 20 mph zones as experience is gained.

Traffic calming

Experimental signs where national speed limits change to local limits



2.12

In response to widespread concern about the speed at which traffic passes along main roads through villages, we are seeking to develop a range of traffic calming measures suitable for these roads. A joint working party has been formed with the County Surveyors' Society in order to set up experiments employing a range of traffic calming measures in a number of villages so as to find out which measures succeed in actually lowering traffic speeds. Local highway and roads authorities have been invited to submit proposed schemes to the working group. There has been an enthusiastic response and many authorities have put forward potential schemes. The working group has selected an initial list of schemes for monitoring. Other measures are already being implemented by authorities and we are encouraging them to conduct their monitoring surveys.

The kind of measures being put forward fall into two groups. *Buffer* measures would be used at the approaches to villages where speeds can be high. Experience from elsewhere in Europe suggests that a combination of signing, surface changes and changes to the road alignment (visually breaking up straight roads) may be effective in reducing speeds at the entrance of a village. When all these measures are used together a 'gateway' effect is created which encourages drivers to appreciate that they are about to enter a different environment.

Once speeds have been reduced at the approach to the village, they may be kept low within the village itself by using 'vertical deflections' such as speed tables and 'horizontal deflections' such as chicanes and road narrowings. Mini-roundabouts may also prove effective.

There are other measures which could prove effective in encouraging drivers and riders to cut their speed as they approach villages. We have joined with seven counties in the eastern part of the country and the TRL in experimenting with the use of advisory countdown signs warning that a national speed limit is about to change to a local limit. In some cases it has been agreed that the message of the local speed limit sign be emphasised by painting a speed limit roundel on the surface of the road.

The final report of the working party is due in 1993. It will provide advice on suitable and effective speed reducing and control measures to be used on roads through villages and towns where speeding is a problem.

2.13

We have sought to ensure the availability to local authorities of a wide range of traffic calming measures by supporting the passage through Parliament of the Traffic Calming Bill, a private member's Bill which received Royal Assent in March 1992. This Act clarifies the powers available to local authorities for the introduction of traffic calming measures to promote road safety, or to preserve or improve the environment. Regulations to give effect to its provisions will be made in the near future.

2.14

We have increased (from £31m in 1991/92 to £42m in 1992/93) the amount of Transport Supplementary Grant available to support traffic calming schemes, some of which have been introduced in areas which have particular speed-related road accident problems. TSG is not available in Scotland but local road safety measures, including traffic calming schemes, are regarded as a special objective when determining local authority capital allocations.

2.15

We are encouraging local highway and roads authorities to draw on experience elsewhere in Europe of traffic calming measures, some of which might be suitable for general use in UK residential areas and in 20 mph zones in particular. To this end we have made available a translation of a manual from the Netherlands detailing a large number of possible measures and the important factors to be considered when designing low speed zones.

2.16

The building of a bypass around a town - the traditional solution for communities under pressure from through traffic - can lead to higher traffic speeds in the centre. Unless moves are made to introduce suitable engineering measures on the relieved roads in the centre, the vehicles there can take advantage of the lighter traffic flow to travel at higher speeds. The Bypass Demonstration Project, launched in January 1992, will examine the use of traffic calming measures and other means of enhancing the local environment in the centre of several small towns with current trunk road bypass schemes.

Speed Limiters

2.17

We have been ahead of the European Community in recognising the road safety benefits which flow from fitting speed limiters to lorries and coaches. These devices limit the maximum powered speed achievable by the vehicles by controlling the supply of fuel to engines.

We have introduced regulations requiring all new heavy goods vehicles over 7.5 tonnes maximum gross weight to be fitted with speed limiters from August 1992. In addition, existing articulated and drawbar HGVs over 16 tonnes which have been registered since the beginning of 1988 must also be fitted by July 1993. The limiters must be set to ensure that the lorries cannot exceed their maximum permitted speed on motorways of 60 mph.

All new coaches, and all existing coaches registered since April 1974, must also be fitted with speed limiters which restrict their top speed to 70 mph, their motorway speed limit.

We have also announced that speed limiters will in future have to be sealed at officially authorised centres to prevent them being illegally tampered with and adjusted.

Traffic calming





Traffic calming

2.18

We welcome, therefore, the recent decisions by the EC to require speed limiters to be fitted to heavy goods vehicles over 12 tonnes and coaches over 10 tonnes with more than 8 seats. All new such vehicles will have to be fitted from the beginning of 1994.

The decision of the Council of Ministers also requires limiters for coaches to be set at 62 mph (100 kph) while those for lorries must prevent those vehicles from exceeding 56 mph (90 kph). We shall shortly be consulting on Regulations to incorporate these requirements into our national legislation.

2.19

Speed limiters for other vehicle types are now technically possible. However such a development would depend upon an EC initiative and is not foreseeable in the near future.

Setting the Right Speed Limit

2.20

Speed limits on local roads (that is, non-trunk roads) of 30 mph or higher are set by local highway and roads authorities. However, each authority, when deciding upon the speed limit for a particular road, draws upon a body of advice provided by the Government. This takes the form of a set of criteria which all authorities can apply, thereby ensuring a degree of consistency in the limits set on local roads across Britain.

We were concerned that the previous advice to highway and roads authorities had encouraged an inflexible approach to the setting of speed limits. When deciding whether to impose a lower limit, too much weight had been placed on actual traffic speed and on the need for there to be an accident history on the road in question. Not enough account had been taken of the impact that vehicles can have on the local environment and quality of life, especially in communities which suffer from large volumes of fast through traffic.

2.21

Consultation has recently been completed on a new approach which will encourage each local authority to take account of a wider range of local factors when deciding on the correct speed limit for a particular road - including the needs of vulnerable road users and the environment through which the road passes. The new advice, which has now been issued, gives authorities greater freedom to set lower limits, for it recognises that a lower speed limit may be proper for a road even though it may not have a particularly poor accident rate.

The authority will still need to justify its judgement that a given vehicle speed was right for the road in question in the light of the estimated benefits and costs of introducing a limit. But the benefits could include improvements to the quality of the local environment, in the form of reductions in emissions and noise, and to the safety and hence mobility of vulnerable road users such

as cyclists and pedestrians, as well as actual reductions in accidents. The costs could include delays to traffic and the costs of road engineering and enforcement.

A crucial element of the new approach is that if the lower speed limit which the local authority considers desirable would not in itself reduce vehicle speeds to the desired level, then the authority needs to introduce engineering measures to make the limit effective.

2.22

A speed limit should take account of local conditions and the interests of vulnerable road users. On certain roads, these factors are not always constant. Thus on a motorway a lower limit might be needed under certain circumstances - for example, where there was a heavy traffic flow or an accident. At other times the normal limit would be correct. Again, outside a school, a standard 30 mph limit might be satisfactory for most of the day; but **not** at the times when children are arriving or leaving.

For this reason the Road Traffic Act 1991 includes a provision for the use by highway and roads authorities of variable speed limits - that is, compulsory speed limits which can be temporarily lowered to take account of local conditions. This could either be on an *ad hoc* basis in response to an unexpected incident such as an accident or on a regular basis in order to meet a recurring need, such as the need to slow down vehicles at certain times outside schools.

2.23

We shall shortly be conducting a number of trials of variable speed limits on trunk roads (for which the Department is responsible) and have invited local highway authorities to put forward up to 100 sites for trials on roads for which they are responsible. The new variable speed limit signs outside schools, with red roundels to show that they are compulsory, will indicate that a 20 mph limit is in force at the time in the morning when children are arriving and again in the afternoon when they are going home. There will be trial sites at other locations on trunk roads outside schools which are currently limited to 40 or 60 mph

Photo: Metropolitan Police



Section 3

The way forward-Research into speeding

3.1

We are conducting an extensive research programme into speeding. There are two main aspects of this research - we are looking closely at the reasons *why* drivers choose to drive at excessive speeds - and we are trying to learn more about the precise relationship between driving speed and accident risk.

The results of this research programme will help to mould future policies and publicity campaigns aimed at modifying the behaviour of speeding drivers.

Speeding Behaviour

3.2

We are trying to learn as much as possible about the kinds of drivers who speed and why they take part in such anti-social and potentially dangerous behaviour. This is just one aspect of the programme of research into road user behaviour as a factor in road accidents which has been carried out since 1987 by the Transport and Road Research Laboratory (now the TRL) in cooperation with a number of universities. We are convinced that, with a deeper understanding of the psychological mechanisms underlying speeding behaviour, we will be better placed to design policies and publicity which work to change that behaviour.

3.3

There have been some promising results. A major study indicates that speeding is generally the result of a deliberate choice by the driver to violate safe driving practice rather than a misjudgement or error. The accident-involved drivers in the study were in the main young and male, with a high annual mileage.

These drivers tend to have the skills necessary to enable them to drive safely. Why therefore do they choose to adopt a dangerous driving style? In-depth interviews revealed that they do not rate the dangers of risky driving behaviour in general - and speeding in built-up areas in particular - as seriously as other (older) drivers do. They also feel more social pressure from their friends and partners to take those risks.

These results suggest that the way to modify these drivers' behaviour, given that they have the abilities needed to drive safely, is to change their attitudes towards and beliefs about speeding. This could be attempted by means of both education and publicity. The training of young drivers could aim at increasing their awareness of the potential consequences of speeding.



3.4

A recent research programme has examined the extent to which a driver's style, including preferred speed, might be influenced by the way in which he or she makes decisions generally. Faster driving and higher accident rates have been shown to be associated with a lack of *thoroughness* in making decisions in everyday life, with a tendency to make impetuous decisions without thought of the possible consequences. The implication is that one way of encouraging motorists to drive more slowly is to persuade them to adopt a more careful approach to their decision making in the car.

The study has also shown that driving speed and aberrant driving behaviour are highly associated with *social deviance*, with the kind of personality which shows a general disregard for social morals and norms. More specifically, driving speed correlated highly with the degree to which the subjects were prepared, if they believed they would get away with it, to engage in anti-social behaviour - such as riding on public transport without paying a fare, earning cash payments without paying income tax on them, owning and watching an unlicensed TV or resorting to violence when upset.

This suggests a publicity approach which seeks to alter the social acceptability and image associated with fast driving. In this way, speeding (like drinking and driving) could begin to take on negative connotations.

The research programme has also included an analysis of descriptions of speed-related accidents. A large proportion of these occurred in poor weather conditions and slippery road surfaces. One problem with faster drivers may be that they are not aware of how much they should adjust their speed to reflect poor road conditions. This is something which could be addressed during their training.

Speed and accident risk

3.5

In addition to the study of behavioural and psychological factors underlying speeding, another important part of our overall research programme is to investigate the statistical relationship between traffic speed and such matters as accident risk and severity, the raising or lowering of speed limits, and the type and level of speed enforcement.



An important source of evidence about the consequences for average traffic speeds and casualty levels of increasing a speed limit was the raising of the limit on inter-state highways in the USA. Evidence such as this has convinced us that any increase in the motorway speed limit in Britain would inevitably lead to an increase in deaths and serious injuries - and that motorway limits should, in consequence, remain unchanged.

An examination of a range of cases in which speed limits in various countries were imposed or lowered has shown that significant reductions in road accidents and deaths can result. We are aiming to find out more about the causal mechanism by means of which introducing or lowering a speed limit reduces the speed of traffic on the road in question - and whether that mechanism depends on an increased level of police enforcement.

3.6

We are working towards developing a predictive model which will enable us to say with some certainty that a given percentage reduction in the average speed of traffic on a road leads to a given percentage reduction in the risk of an accident on that road.

The TRL is approaching this in the first instance by examining a substantial body of data relating to stretches of road where accidents involving heavy goods vehicles are particularly prevalent and trying to elucidate the statistical relationship between the accident rate and the volume of HGVs exceeding the limit. Similar studies may then be carried out for other vehicles if suitable data is available.

3.7

The Transport Research Laboratory is shortly to publish a research paper which draws together what is known on the subject. Of particular interest is the finding that for each 1 mile an hour increase in average speed, accidents rise by about 5 per cent.

3.8 Scottish Research

A recently completed survey of driver attitudes in Scotland has thrown up a number of further insights which are relevant for the development of publicity campaigns. Firstly, drivers are most likely to speed in situations where they perceive that to do so is not dangerous (eg if there is little traffic around). The implication here is that education should concentrate on persuading drivers of the dangers of driving fast.

Secondly, drivers appear to 'externalise' the problem of road safety (and of speeding in particular). They think that the roads on which they themselves drive are the 'safer' roads and that they are the ones where the chance of being caught speeding is lowest. Linked to this is the finding that inexperienced and young drivers are more likely to believe that poor brakes rather than driving too fast causes accidents. These drivers believe that accidents are caused by factors beyond their own control. This fits with the now well established pattern that almost all drivers think they are either 'average' or 'better than average' drivers. Again this places the focus of responsibility for accidents somewhere other than with the driver himself.

Thirdly, young women commit general traffic infringement much less often than their male counterparts. However if we look at speeding offences in isolation, the difference is much reduced.

Current research will attempt to look at some of these issues in more detail. A literature review is proposed that will look at the factors that influence perceptions of risk, and an in-depth study of the attitudes of young women drivers to road safety will pursue, amongst other things, why they speed.

Section 4

Conclusion

The speeding driver is a major cause of death and injury on our roads. He or she chooses to drive in such a way that the risk of being involved in a road accident and either suffering or causing severe injury or death is substantially increased.

We aim to bring the subject of speed to the centre of the road safety debate. This document shows the importance which the Government places on cutting speed on the road. The Government is committed to taking forward all these initiatives which are central to our policy of achieving a one third reduction in road casualties by the year 2000. In addition, other suitable measures will be brought forward as the strategy develops.



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