

Synthesis title:

Speed

Category: Drivers



Other Relevant Topics:

- ▶ Rural Roads (Drivers)
- ▶ Urban Roads (Drivers)
- ▶ Traffic Calming (Drivers)
- ▶ Telematics (Vehicles)
- ▶ Safety Cameras
(Compliance and the Law)
- ▶ Convictions and Violations
(Compliance and the Law)

Keywords:

Excessive Speed,
Inappropriate Speed,
Casualties,
Speed

About the Road Safety Observatory

The Road Safety Observatory aims to provide free and easy access to independent road safety research and information for anyone working in road safety and for members of the public. It provides summaries and reviews of research on a wide range of road safety issues, along with links to original road safety research reports.

The Road Safety Observatory was created as consultations with relevant parties uncovered a strong demand for easier access to road safety research and information in a format that can be understood by both the public and professionals. This is important for identifying the casualty reduction benefits of different interventions, covering engineering programmes on infrastructure and vehicles, educational material, enforcement and the development of new policy measures.

The Road Safety Observatory was designed and developed by an Independent Programme Board consisting of key road safety organisations, including:

- ▶ Department for Transport
- ▶ The Royal Society for the Prevention of Accidents (RoSPA)
- ▶ Road Safety GB
- ▶ Parliamentary Advisory Council for Transport Safety (PACTS)
- ▶ RoadSafe
- ▶ RAC Foundation

By bringing together many of the key road safety governmental and non-governmental organisations, the Observatory hopes to provide one coherent view of key road safety evidence.

The Observatory originally existed as a standalone website, but is now an information hub on the RoSPA website which we hope makes it easy for anyone to access comprehensive reviews of road safety topics.

All of the research reviews produced for the original Road Safety Observatory were submitted to an Evidence Review Panel (which was independent of the programme Board), which reviewed and approved all the research material before it was published to ensure that the Key Facts, Summaries and Research Findings truly reflected the messages in underlying research, including where there may have been contradictions. The Panel also ensured that the papers were free from bias and independent of Government policies or the policies of the individual organisations on the Programme Board.

The Programme Board is not liable for the content of these reviews. The reviews are intended to be free from bias and independent of Government policies and the policies of the individual organisations on the Programme Board. Therefore, they may not always represent the views of all the individual organisations that comprise the Programme Board.

Please be aware that the Road Safety Observatory is not currently being updated; the research and information you will read throughout this paper has not been updated since 2017. If you have any enquiries about the Road Safety Observatory or road safety in general, please contact help@rospa.com or call **0121 248 2000**.

How do I use this paper?

This paper consists of an extensive evidence review of key research and information around a key road safety topic. The paper is split into sections to make it easy to find the level of detail you require. The sections are as follows:

Key Facts	A small number of bullet points providing the key facts about the topic, extracted from the findings of the full research review.
Summary	A short discussion of the key aspects of the topic to be aware of, research findings from the review, and how any pertinent issues can be tackled.
Methodology	A description of how the review was put together, including the dates during which the research was compiled, the search terms used to find relevant research papers, and the selection criteria used.
Key Statistics	A range of the most important figures surrounding the topic.
Research Findings	A large number of summaries of key research findings, split into relevant subtopics.
References	A list of all the research reports on which the review has been based. It includes the title, author(s), date, methodology, objectives and key findings of each report, plus a hyperlink to the report itself on its external website.

The programme board would like to extend its warm thanks and appreciation to the many people who contributed to the development of the project, including the individuals and organisations who participated in the initial consultations in 2010.

Key Facts

- In 2016, excessive or inappropriate speed was a contributory factor to 331 road deaths, 22 per cent of the total. Fifty-eight per cent of fatalities (193) had 'exceeding the speed limit' as a contributory factor in the accident, and a further 31 per cent (102) had a vehicle 'travelling too fast for the conditions' and the remaining 11 per cent (36) had both factors.(RRCGB, DfT, 2017).
- There is a clear relationship between speed and risk: as average traffic speed reduces so does the likelihood of a crash resulting in injury that is recorded by the police. If a crash does happen, the risk of death and serious injury is higher at higher speeds.
- Evidence from a variety of sources, e.g. in-depth accident investigations, conviction data, and self-report surveys, indicates that male drivers and young drivers are more likely to speed. Analysis of in-depth accident data found that male drivers under the age of 30 were over-represented in speed-related collisions, and this was particularly so for males aged under the age of 21.

Summary

- Driving too fast for the conditions contributes to significant numbers of deaths and serious injuries.
- In 2016, excessive or inappropriate speed was a contributory factor to 331 road deaths, 22 per cent of the total. Fifty-eight per cent of fatalities (193) had 'exceeding the speed limit' as a contributory factor in the accident, and a further 31 per cent (102) had a vehicle 'travelling too fast for the conditions' and the remaining 11 per cent (36) had both factors.(RRCGB, DfT, 2017).
- There is a clear relationship between speed and risk: as average traffic speed reduces so does the likelihood of a crash resulting in injury that is recorded by the police. If a crash does happen, the risk of death and serious injury is higher at higher speeds.
- Evidence from a variety of sources, e.g. in-depth accident investigations, conviction data, and self-report surveys, indicates that male drivers and young drivers are more likely to speed. Analysis of in-depth accident data found that male drivers under the age of 30 were over-represented in speed-related collisions, and this was particularly so for males aged under the age of 21.
- Compliance with speed limits has improved in the past few years – particularly on 30mph roads. The percentage of cars exceeding the speed limit has fallen on every road type since 2001.
- The number of Fixed Penalty Notices (FPNs) issued for speeding has decreased over recent years, but this is in parallel with opportunities to complete a Speed Awareness Course rather than receive the FPN.
- Effective speed management policies are likely to include an integrated package of measures, including credible speed limits, enforcement, education and engineering. Different approaches and messages are likely to be required for different segments of the driving population.

Methodology

A detailed description of the methodology used to produce this review is provided in the Methodology section of the Observatory website at <http://www.roadsafetyobservatory.com/Introduction/Methods> .

This synthesis was compiled in March 2012, and updated in May 2013, March 2014 and December 2015. In December 2017, statistics from Reported Road Casualties Great Britain were updated to [Reported Road Casualties Great Britain 2016](#).

Searches were carried out on the pre-defined sources identified in the methodology section. Search terms used to identify relevant papers included: speed, speeding, excess/ive speed, inappropriate speed, casualties, speed limits, attitudes. Thirty seven pieces of research, statistical reports or policy documents have been included in this review.

A distinction is made between ‘excessive speed’, when a driver exceeds the posted speed limit for the road section/their vehicle type, and ‘inappropriate speed’, when a driver’s speed is inappropriate for the conditions despite being within the speed limit. These can be assigned as contributory factors in national accident and casualty data (STATS19) if it is judged by the police officer or investigator that the speed contributed to the accident occurring. It is recognised that STATS19 is likely to under record the role of speed in collisions. This is because it may be difficult for a police officer, attending the scene after an accident has occurred, to identify certain factors that may have contributed to a cause of an accident. In addition, contributory factors are disclosable in court and police officers would require some supporting evidence before reporting certain factors. As a result some contributory factors, such as those relating to injudicious action, may be less likely to be reported. (Reported Road Casualties Great Britain: 2011 Annual Report)

This synthesis relates to published statistical and research evidence on speed. Guidance on Setting Local Speed limits is provided by the Department for Transport (Circular 01/2013).

Key Statistics

Role of speed in collisions

- In 2015, excessive or inappropriate speed was a contributory factor to 436 road deaths, 23 per cent of the total. Sixteen per cent of fatalities (244) had 'exceeding the speed limit' as a contributory factor in the accident, and a further 12 per cent (189) had a vehicle 'travelling too fast for the conditions'.
- In 2015, there were 108,211 road traffic injury accidents where the police attended the scene and recorded at least one contributory factor; 'exceeding the speed limit' was a contributory factor in 5,272 (5 per cent) of them and inappropriate speed in a further 7,361 (7 per cent).

(RRCGB DfT, 2016).

- Excessive or inappropriate speed was a factor in 33 per cent of car occupant and 34 per cent of motorcyclist fatalities in 2014.
- Excessive or inappropriate speed was reported as a contributory factor in the deaths of 48 per cent of all 16-24 year-old men killed in road traffic injury accidents (where a police officer attended the scene and in which a contributory factor was reported) in 2014.
- In 2014, 10 per cent of all injury accidents recorded by the police on rural roads had 'travelling too fast for conditions' recorded as a contributory factor; 5 per cent had 'exceeding the speed limit'.
- In 2014, excessive or inappropriate speed was a factor in 19 per cent of injury accidents recorded by the police on minor rural roads with a 60 mph speed limit, 10 per cent of accidents on rural A roads with a 60 mph speed limit and 7 per cent of accidents on rural roads with a 30 mph speed limit, 8 per cent with speed limit of 40 mph on rural roads and 9 per cent with a speed limit of 50 mph on rural roads (grouping A roads and minor roads together).

(STATS19 data)

- In 2012, just over 7 out of every 8 drivers associated with one of the two speed-related contributory factors above had at least 1 other contributory factor reported. 'Exceeding the speed limit' was recorded more often than 'travelling too fast for the conditions' when factors related to other illegal activities, e.g. "stolen vehicle", "vehicle in course of crime" or "impaired by drugs" were also recorded.

(STATS19 data)

Extent of speeding

- On motorways, 46 per cent of cars and 46 per cent of motorcycles exceeded the 70mph speed limit in 2014. Eleven per cent of all cars and 17 per cent of motorcycles were travelling 10 mph or more above the speed limit (motorcycles make the highest proportion of vehicles travelling at this speed).
- On single carriageways, 7 per cent of cars and 20 per cent of motorcycles exceeded the speed limit in 2014. Eight per cent of motorcycles were more than 10 mph over the limit.
- Around 79 per cent of heavy goods vehicles exceeded their 50 mph speed limit on dual carriageway non-built-up roads in 2014, whilst 70 per cent exceeded the 40 mph limit on single carriageway non-built-up roads. Very few heavy goods vehicles exceeded their speed limit of 60 mph on motorways (as they are fitted with speed limiters which should prevent them travelling at more than 56 mph).
- On 30 mph roads, 45 per cent of cars and 47 per cent of motorcycles exceeded the speed limit in 2014. Fifteen per cent of cars and 21 per cent of motorcycles were more than 5 mph over the limit.
- The number of cars exceeding the speed limit on 30 mph limit roads has dropped by 19 percentage points from 65 per cent in 2001, to 45 per cent in 2014.
- The percentage of cars exceeding the speed limit has fallen on every road type in the 10 years since 2001. For all vehicle types, more vehicles exceeded the speed limit on 30 mph roads than on 40 mph roads; this pattern has been observed for many years.

(Free Flow Vehicle Speeds in Great Britain 2014; Tables SPE0101 and SPE0102, 2015)

- The number of fatalities on British roads fell markedly from 2007 to 2010. The obvious step change during this period was the recession, research has shown that this is not a direct link between fatalities and the recession, the link is indirect: the recession appears to have caused changes in driver behaviour (for example speed choice and drink driving) which, in turn, make drivers safer and reduces collisions. It is suggested that drivers tend to behave more cautiously when uncertain about their financial future which tends to restrict the types of extreme behaviour that can lead to fatal accidents.

(Lloyd et al 2013)

Convictions for speeding

- The majority of speeding offences are dealt with by fixed penalty notices.
- In 2013, just over 700,000 fixed penalty notices (FPNs) were issued for speed limit offences in England and Wales (62 per cent of all FPNs issued in 2013). This number has fallen from its peak at 1.98 million in 2005, having been rising prior to that.
- Safety cameras provided evidence for 86 per cent of all speeding offence FPNs issued in 2013.

(Police Powers and Procedures England and Wales 2013/14, 2015)

Instead of offering a fixed penalty notice to those who exceed the speed limit but do not require prosecution, forces can now use their discretion to offer a speed awareness course. Those who accept the offer and complete the course, at their own expense, are not subject to any other sanction. The majority of forces in England and Wales now offer such courses. These initiatives should be borne in mind when interpreting changes over time.

- In 2015, 1,207,570 people attended a National Speed Awareness Course, with a further 8,229 attending a National Speed Awareness Course for 20mph.
- This is a significant increase in speed awareness course attendance compared to 2010, where 447,724 drivers attended a National course. However, not all police forces were members of the National Driver Offender Retraining Scheme (NDORS) and many were offering their own version of speed awareness courses previously.
- The National Speed Awareness Course system means that drivers committing an offence in one part of the country may take a course at a venue of their choice provided that venue has been approved to deliver the national course.

<https://ndors.org.uk>

- There were approximately 148,000 findings of guilt in courts for speed limit offences in 2014 in England and Wales. This is an increase compared to recent trends of around 115,000 between 2010 and 2013. Approximately 3.3 times more males than females were found guilty in courts for speed limit offences in 2014.

(Criminal Justice Statistics in England and Wales 2014, 2015)

Attitudes towards speeding and speeding behaviour

The following section considers attitudes towards speeding. Evidence suggests that there is sometimes an apparent contradiction between attitudes and behaviour with regards to speeding. Self-reported opinion on how dangerous speeding is considered to be varies by speed limit, and whether speeding is defined as too fast for the conditions.

- The vast majority of adults (91 per cent in 2011) agree that people should drive within the speed limit.

(British Social Attitudes Survey 2011, 2012)

- In 2011, the THINK! Annual Survey reported that:
 - Fifty-two per cent of motorists agreed completely that driving at 40 mph in a 30 mph area is dangerous. However, 50 per cent of motorists admitted to doing so.
 - Forty-two per cent agreed that driving at 90 mph on a motorway when there is no traffic is dangerous. However, 31 per cent of motorists admitted to doing so.
 - Eighty-one per cent of motorists agreed completely that it is dangerous to drive too fast for the conditions. However, 26 per cent of motorists admitted to driving too fast for the conditions.

(THINK! Annual Survey 2011, 2012)

- While 85 per cent of respondents agreed that most drivers will drive a bit over the speed limit if they think it is safe, 67 per cent agreed that people should always stay within the speed limit. Even among those who had themselves broken the speed limit, over half (58 per cent) agreed that drivers should always stay within the limit.

(Lee and Humphreys, 2010)

- When asked to spontaneously describe the influences that affect the speed at which drivers drive, the speed limit (17 per cent), road conditions (11 per cent), safety/personal safety (10 per cent) and other traffic (10 per cent) were most commonly referenced by drivers.
- Fifty-two per cent of drivers agreed that driving 35mph in 30mph areas is dangerous. Women were more likely to agree that someone who drives at 35mph in a 30mph area is driving dangerously (58 per cent compared with 47 per cent of men) and also to strongly agree that this is the case (28 per cent compared with 19 per cent).

(THINK! Road Safety Campaign Evaluation, 2009)

- In line with other research, speeding on 30 mph roads was more commonly reported than speeding on 60 mph roads. Men and younger drivers were more likely to report exceeding the speed limit than were other groups.

(Lee and Humphrey, 2010)

- The introduction of 20mph limits in Great Britain is increasing and so a population wide survey of drivers was undertaken to explore how support for 20mph limits and compliance with them were interlinked.
 - Whilst as expected many supporters said they would comply with the limits, and many opponents might not comply, more surprisingly it was also found that some supporters claimed not to comply, while some opponents of 20mph limits were compliers.
 - Results indicated that self-enhancement bias, social contagion and habitual/inattentive driving were important factors in explaining non-compliance.
 - Pro-active behaviour change strategies are required to create higher compliance levels.

(Tapp et al., 2015)

Research findings

Summaries of key findings from several research reports are given below. Further details of the studies reviewed, including methodology and findings, and links to the reports, are given in the References section.

The influence of speed on accident frequency and severity

Studies have used various sources of in-depth data and statistical modelling to examine the relationships between speed and both accident frequency and accident severity. Higher speeds are associated with increases in the probability of crashing and in the severity of the outcome.

- The relationship between speed and road accidents has been studied extensively and is very clear: the higher the speed, the greater the probability of a crash and the severity of crashes.
(ETSC, 1995)
- Research suggests that a 1 mile per hour reduction in average speed on a road typically reduces accident frequency by 5 per cent, varying between 2 per cent and 7 per cent depending on road type.
- Reducing the speeds of the fastest vehicles (i.e., those travelling most in excess of the average speed of vehicles using the road) yields the greatest benefits in reducing the likelihood of deaths and injuries occurring.
(Taylor et al, 2000)
- Accident frequency rises rapidly with the mean traffic speed on a given road. The relationship can be used to estimate the change in accident frequency resulting from a change in mean speed on a given road and to estimate the effects of different speed management strategies.
- Accident frequency for all categories of accident increases rapidly with mean speed – on average, the total injury accident frequency increases with speed to the power of approximately 2.5 – thus indicating that a 10 per cent increase in mean speed would be expected to result in an average of approximately a 26 per cent increase in the frequency of all injury accidents, all other things being equal.
(Taylor et al, 2002)
- Based on over 100 studies, another power model has been developed to describe the relationship between changes in speed and changes in road accidents/casualties in terms of a set of power functions.
- The effect of changes in speed on accidents and casualties is dependent on the initial speed. In general, changes in speed have a smaller effect at low speeds than at high speeds.
- Traffic environment is an important moderating variable, and separate estimates of the power value have been developed for rural and urban roads.
- Speed is a very powerful factor for explaining the risk of accidents and injuries.
(Elvik, 2009)

A research project explored the relationship between speed and the risk of being killed for three groups of casualties in road traffic collisions: pedestrians hit by the front of a car, belted car drivers involved in a frontal impact with another car, and belted car drivers in a side impact with another car.

- Three different pedestrian datasets were studied and all showed a similar pattern in terms of the risk of a pedestrian being killed having been hit by the front of a car. This risk increases slowly as impact speed increases until around 30 mph. The probability has been found to increase by 6% from 20mph to 30mph. Above this speed, this risk increases by a factor of between 3.5 and 5.5 times as impact speed increases from 30 mph to 40 mph.
- Based on in-depth data from Great Britain for 2000–09, the risk of a pedestrian being killed having been hit by the front of a car is estimated to be approximately 1 per cent at an impact speed of 20 mph, 7 per cent at 30 mph and 31 per cent at 40 mph. These are estimates which are subject to margins of error, but the pattern shown is consistent with similar analyses of other datasets.
- The risk of a fatality was generally higher for the earliest of the three datasets (from the 1970s) indicating that the risk of a pedestrian fatality has reduced over the last 40 years. Although this finding should be treated with some caution as it is based on a relatively small sample, factors that might have contributed to the risk reducing could include improvements in car design and improvements in medical care.
- Generally, it appears that the risk of being killed having been hit by the front of a car is similar for a child pedestrian as it is for an adult pedestrian, but that the risk is higher for elderly pedestrians.
- Even though the risk of a pedestrian being killed if hit by the front of a car at 30 mph is lower than at higher speeds, approximately half the pedestrians who are killed having been hit by the front of a car involve cars travelling at this impact speed or below. This is because most accidents involving a pedestrian occur at lower speeds.
- If a car driver is wearing a seat belt, the risk of them being killed in an impact with another car is much higher when this is a side impact than when this is a frontal impact, for any given change of velocity.

(Richards, 2010; Richards and Cuerden, 2009)

The Characteristics of Speed Related Collisions

A research project has examined collisions where vehicles were exceeding the speed limit or travelling at an inappropriate speed, using data from in-depth accident investigations. The main findings were:

- Loss of control of the vehicle was over-represented in speed-related collisions.
- Collisions occurring on unclassified rural roads were over-represented in speed-related accidents. Excess speed was over-represented on 30 mph roads, and inappropriate speed was over-represented on 60 mph rural roads.
- Male drivers under the age of 30 were over-represented in speed-related collisions. This was particularly so for males aged under 21.
- Drivers/riders of cars and motorcycles were over-represented compared to drivers of other vehicles, as were drivers of older vehicles. Drivers of sports cars and hatchbacks were over-represented, as were cars containing two or more occupants.
- For drivers exceeding the speed limit, contributory factors that were over-represented included 'aggressive driving', 'careless, reckless or in a hurry', 'impaired by alcohol' and 'stolen vehicle'. These highlight the link between excess speed and other types of risk-taking behaviour.
- For drivers travelling at inappropriate speed, contributory factors that were over-represented included 'careless, reckless or in a hurry', 'vision affected by road layout', 'vision affected by rain, sleet, snow or fog' and 'slippery road (due to weather)'. At a high level, these describe the combinations of risk-taking behaviour and reasons why the vehicle speed was inappropriate at that time.
- Further analysis of the reasons why the speed was inappropriate showed that, in the majority of cases, the vehicle in question was travelling too fast around a bend and swung wide or lost control. Other reasons included vehicles travelling around blind bends, or following other vehicles too closely.

(Richards et al, 2010).

- Speed is a factor in loss of control accidents leading to overturning. This type of accident is more likely than other accidents to result in a very serious injury or death. Over 60 per cent of fatally-injured drivers under 30 (over 75 per cent of drivers under the age of 20 years) were judged to have been driving too fast before crashing (excessive speed).

(Ward et al, 2007)

Nature of speed related collisions

- Collisions in which excessive speed is recorded as a factor are disproportionately recorded as also having been contributed to by other types of risk-taking behaviours e.g. aggressive or careless driving.
- Collisions in which inappropriate speed is recorded as a factor usually involve travelling too fast around a bend, resulting in either swinging wide or a loss of control. Other reasons include following the vehicle in front too closely. Contributory factors that are over-represented in collisions in which inappropriate speed is also a contributory factor include various adverse road and environmental conditions.

(Richards et al, 2010)

Motivations for speeding

- Speeding can be opportunistic, in which drivers adjust to road conditions or the speed of other traffic and travel above speed limits if they feel it is safe to do so, or reactive in which the drivers' internal motivations and emotional state are bigger factors.

(Stradling et al, 2008)

- Most drivers recognise the relationship between speed and collision risk but make judgements of acceptable speed based on how they perceive the task difficulty, their own capability and their personal risk threshold.

(Fuller et al, 2008)

- The installation of automatic speed enforcement in France was associated with changes in responses to a survey based on the extended Theory of Planned Behaviour (TPB). Men, beginner and more-experienced drivers expressed more intention to speeding within the next 12 months before cameras were used and showed a higher decrease in intention after, compared to women and novice drivers. The main predictors of behaviour were lower perceived behavioural control over speeding, less social pressure, lower perceived similarity with the prototypical deviant drivers, and higher comparative optimism.

(Delhomme et al., 2014)

- Attitudes can exert an automatic influence on behaviour. Interventions to reduce speeding could usefully increase the accessibility of anti-speeding attitudes and reduce the accessibility of pro-speeding attitudes.

(Elliott et al., 2015)

Extent of speeding

Evidence from self-reported data supports the data obtained from traffic counters in relation to the extent of speeding. The research suggests that it is common for drivers to break the speed limit, though only a minority frequently report driving at speeds considerably above the posted limit.

- Non-compliance with the speed limit is generally regarded as potentially dangerous, but not necessarily so where road and traffic conditions permit.
- In a 30 mph limit, 33 per cent of drivers admitted to driving at 35 mph three or more times per week (24 per cent admitted to doing so on most days); 11 per cent similarly admitted to driving at 40 mph and 2 per cent at 50 mph or over.
- On a single-carriageway A road with a 60 mph limit, 23 per cent admitted to driving at 70 mph three or more times per week and 4 per cent at 80 mph or over.
- Only 13 per cent of individual drivers said they had never exceeded any of the speed limits referred to in the research (30mph, 60mph and 70mph).
(Stradling et al, 2008)

A typology of speeding behaviour

Several studies have identified a typology of drivers according to their attitudes or behaviour in relation to speed, indicating that there are three or four groups of driver. Although the definitions and percentage of drivers falling into each group vary slightly across studies, the broad conclusions are consistent.

- Excessive speeders (about 15 per cent of drivers) – comprising socially deviant speeders who express deviance in a number of different ways, have high risk thresholds, and those who routinely exceed the speed limit by a considerable margin on most roads. While most are opportunistic speeders, many are also reactive.
- Moderate speeders (about a third) – comprising default speeders who unintentionally speed, as well as those who speed but tend to remain within 10 mph of the speed limit. Most are opportunistic speeders. Although this group is usually compliant, they frequently drive at 35 mph in 30 mph areas.
- Low speed (about half of the driving population) – includes the fully compliant who never exceed speed limits (about 5 per cent) and those who may occasionally, perhaps unintentionally, transgress but do not exceed the speed limit by a large amount.

(Stradling et al, 2008)

- Excessive speeders are predominantly young male drivers, who are more likely to report an intention to speed, exceed the speed limit more often and do so more excessively than older drivers. Young males are also more likely to exhibit a cluster of risk-taking behaviours while driving. A range of factors influence this: immaturity and lack of self-knowledge; lack of skills and experience; and perceived normative influences and peer pressure.
- Drivers who are compliant with speed limits have been found to have a lower than average accident rate; excessive speeders were over represented in such accidents.

(Fuller et al, 2008; Stradling et al, 2008)

Attitudes to safety cameras

- In 2014, 55 per cent of adults surveyed agreed with the statement “speed cameras save lives”. This percentage has risen gradually in similar surveys in recent years from 46 per cent in 2007, having fallen from a peak of 55 per cent in 2006. Twenty-one per cent of adults disagreed with this statement, a decrease from a peak of 31 per cent in 2009.
- However, 49 per cent of adults agreed with the statement “speed cameras are mostly there to make money”, whilst 22 per cent disagreed with this statement. Thirty-six per cent agreed that “there are too many speed cameras”, while 30 per cent disagreed.

(British Social Attitudes 2014 Survey, 2015; Table ATT0354, ATT0355, ATT0356)

- Previously disqualified drivers are most likely to ‘manipulate’ speed cameras (slow down at camera sites and then speed up again) and least likely to comply with speed limits. Drivers who accumulate a number of points often rely on technology (warning them of camera locations) to avoid getting more points. (Corbett et al, 2008).

How effective?

An integrated package of measures is most likely to be successful in speed management. The typology of drivers suggests that different approaches and messages may be required for different segments of the driving population and consideration should be given to drivers risk threshold and perceptions of their own capability in relation to the driving task.

Education

- Although road safety campaigns containing risk information may be useful in deterring drivers en masse, these campaigns may be ineffective in tackling the worst offenders.

(Fylan et al, 2006)

- There may be scope to develop knowledge of the consequences of high speed - only around a quarter of drivers disagreed with fact based statements that associate speed with collision risk.
- Drivers significantly overestimate the time gained by driving 10mph faster than - and time lost by driving 10mph more slowly than - 60 mph, suggesting there is scope for education in this area.

(Stradling et al, 2008)

- Implementation intentions have the potential to break unwanted habits and help individuals behave in line with their goal intentions. Linking critical situations in which a driver is tempted to speed with goal-directed responses to resist the temptation resulted in decreases in self-reported speeding. The use of a volitional help sheet is easy to administer and cost effective to help change habits.

(Brewster et al., 2015)

Speed awareness courses

- The Department for Transport, in conjunction with the Road Safety Trust, has commissioned an evaluation of the National Driver Offender Retraining Scheme (NDORS) speed awareness course. The work is expected to be completed in 2016. The main objective of this research is to conduct an impact evaluation of the course scheme, including the impact of the courses on reoffending/reconviction rates and collisions.

(Department for Transport, 2016)

- Evidence suggests that, to be effective, speed awareness courses should be based on information and education, use credible and forceful materials and involve interactive group discussions.

(Fylan et al, 2006)

- An evaluation of the National Speed Awareness Course demonstrated that the course produces changes in key psychological predictors of speeding, e.g. attitudes and intentions. For example, after the course, participants believed they would gain less enjoyment from speeding, positive attitudes towards speeding decreased, and negative attitudes towards speeding increased.
- Participants who responded at follow-up (3 months post course) reported that they had changed their driving after attending the course, notably driving more slowly, being more aware of the road environment and of their speed, and feeling less stressed while driving.

(Brainbox, 2011)

Speed Limits

- Setting appropriate, safe, and credible speed limits is an absolute priority for a good speed management policy.

(ETSC, 2010)

- Speed limits are an important dimension of road safety management, but driving at speeds in excess of the posted speed limit is common in Britain. Speed limits should not be set in isolation and should be used alongside other speed-management methods, such as engineering measures, education, training, publicity and enforcement.
- The appropriate speed for a section of road takes account of safety, mobility and environmental considerations as well as the impact of the speed on the quality of life for people living alongside the road.
- Most drivers speed at some time in their lives and some regularly break speed limits. In uncongested conditions about half of traffic exceeds the speed limits on built-up roads and motorways but this proportion has fallen in recent years.
- Speeding on residential roads is seen as less acceptable than speeding on motorways – especially by men – and generally younger drivers are more likely to speed than older drivers.

(Box, 2012)

Enforcement

- Many drivers are deterred from speeding if they believe they are going to be detected, though a 'hard core' minority with positive attitudes to speeding are not deterred.

(Corbett et al, 2008)

- Research suggests that penalties, or the fear of penalties, can reduce speeding but penalties need to be perceived to be fair.

(Webster and Wells, 2000)

- Drivers adapt to changes in the amount of speed enforcement carried out by speeding less when enforcement increases and speeding more when enforcement is reduced.

(Elvik, 2015)

There has been much debate regarding the effectiveness of safety cameras. Several reviews have been published which provide some evidence that safety cameras are effective at reducing speeds and casualties. The evidence is presented in the Safety Camera synthesis (main topic of Compliance and the Law) - <http://www.roadsafetyobservatory.com/KeyFacts/compliance-and-law/safety-cameras>

Engineering/technology

A variety of engineering measures have been shown to reduce speeds, and examples of these are provided below.

- Highway measures to reduce speed are usually most effective if there is a reason for drivers to slow down e.g. for a bend. Physical measures appear effective in urban environments, peripheral hatching effective in rural areas and vehicle activated signs on approaches to junctions.

(Jamson et al, 2008)

- The potential for reducing accidents by means of general engineering and enforcement strategies for speed restraint appears greater for urban roads than rural roads. On rural roads, speed management measures that target specific problems or roads are more likely to be cost-effective than 'blanket' measures.

(Taylor et al, 2000)

- Research evaluating the impact of 20 mph zones with traffic calming found considerable reductions in the average speed, with large falls in collisions. Twenty mph speed limits without traffic calming have lower benefits in speed and casualty reduction.

(cited in AECOM, 2009)

Further evidence on the effectiveness of 20mph zones and limits is contained in the Traffic Calming synthesis (main category of Roads - <http://www.roadsafetyobservatory.com/KeyFacts/roads/traffic-calming>).

The Rural Demonstration Project (King and Chapman, 2010) trialled a variety of initiatives, across 4 counties, in order to reduce rural road casualties. Several measures were effective in reducing speeds on rural roads, whilst others appeared to increase speeds. Examples include:

- Strategic planting at village entries reduced traffic speed (mean speed tended to reduce by about 1.5 per cent). (Norfolk)
- The removal of vegetation had the effect of increasing vehicles' speeds. There was a slight but statistically significant increase in the proportion of vehicles being driven at higher speeds. (Norfolk)
- When reducing the speed limit from 60mph to 50mph on certain road sections, the 85th percentile vehicle speeds fell by around 3 mph. (Lincolnshire).
- A programme of enhanced verge maintenance on sections of the B1188 and A15 in Lincolnshire saw an increase in both vehicle speeds and collisions.

(King and Chapman, 2010)

Recent UK research indicates advisory Intelligent Speed Adaptation (ISA) has the potential to reduce excessive speeding (and therefore reduce the number and severity of road casualties):

- Advisory ISA was fitted to cars and buses in a recent trial in Lancashire:
 - When drivers chose to activate the system, their speeding was reduced by 30 per cent on 30 mph roads and by 56 per cent on 70 mph roads.
 - Being able to use the system (but not necessarily having it active) reduced speeding on 30 mph roads by 18 per cent and on 70 mph roads by 31 per cent.
 - For car drivers aged 25 and below, active use of advisory ISA resulted in a reduction in speeding of 22 per cent on 30 mph roads and 37 per cent on 70 mph roads.

(Lai et al, 2012)

REFERENCES

(References are listed by order given in synthesis)

Title:	Reported road casualties Great Britain: 2011 Annual Report and Stats19 data
Published:	Department for Transport, September 2012
Link:	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/9280/rrcgb2011-complete.pdf
Objectives:	Presents detailed statistics regarding the circumstances of personal injury road accidents, including the types of vehicles involved, the resulting casualties, and factors which may contribute to the accidents.
Methodology:	Majority of statistics in the report are based on information about accidents reported to the police. The contributory factor system allows the recording of up to 6 factors in injury road accidents where the police attended the scene of the accident. It should be borne in mind that the contributory factors are largely subjective and dependent upon the skill and experience of the reporting police officer. Evidence is required to support the officer's opinion, so some contributory factors may be less likely to be reported than others.
Key Findings:	<ul style="list-style-type: none"> • In 2011 excessive or inappropriate speed was a contributory factor to 405 road deaths, 23 per cent of the total. Fourteen per cent of fatalities (242) had 'exceeding the speed limit' as a contributory factor in the accident, and a further 9 per cent (163) had a vehicle 'travelling too fast for the conditions'. • At least one of 'exceeding the speed limit' and 'travelling too fast for the conditions' was reported in 11 per cent of all accidents and these accidents accounted for 23 per cent of all fatalities. • In 2011, of all 118,403 road traffic accidents where the police attended the scene and recorded a contributory factor, 'exceeding the speed limit' was a contributory factor in 5,576 (5 per cent) and inappropriate speed in a further 7,669 (6 per cent).
Keywords:	Accidents, casualties, contributory factors.
Comments:	National statistics. Further detailed analysis of Stats19 data for 2010 and 2008 accident and casualty data is presented.

Title:	Reported road casualties Great Britain: 2013 Annual Report
Published:	Department for Transport, September 2014
Link:	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/359311/rrcgb-2013.pdf
Objectives:	To present detailed statistics regarding the circumstances of personal injury road accidents, including the types of vehicles involved, the resulting casualties, and factors which may contribute to the accidents.
Methodology:	Majority of statistics in the report are based on information about accidents reported to the police. The contributory factor system allows the recording of up to 6 factors in injury road accidents where the police attended the scene of the accident. It should be borne in mind that the contributory factors are largely subjective and dependent upon the skill and experience of the reporting police officer. Evidence is required to support the officer's opinion, so some contributory factors may be less likely to be reported than others.
Key Findings:	<ul style="list-style-type: none"> • In 2013 excessive or inappropriate speed was a contributory factor to 458 road deaths, 27 per cent of the total. Sixteen per cent of fatalities (249) had 'exceeding the speed limit' as a contributory factor in the accident, and a further 13 per cent (209) had a vehicle 'travelling too fast for the conditions'. • At least one of 'exceeding the speed limit' and 'travelling too fast for the conditions' was reported in 9 per cent of all accidents and these accidents accounted for 27 per cent of all fatalities. • In 2013, 'exceeding the speed limit' was a contributory factor in 4,753 (4 per cent) of reported road accidents and inappropriate speed in a further 7,477 (7 per cent).
Keywords:	Accidents, casualties, contributory factors.
Comments:	National statistics.

Title:	Reported road casualties Great Britain: 2014 Annual Report
Published:	Department for Transport, September 2015
Link:	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/463797/rrcgb-2014.pdf
Objectives:	To present detailed statistics regarding the circumstances of personal injury road accidents, including the types of vehicles involved, the resulting casualties, and factors which may contribute to the accidents.
Methodology:	The majority of statistics in the report are based on information about accidents reported to the police. The contributory factor system allows the recording of up to 6 factors in injury road accidents where the police attended the scene of the accident. It should be borne in mind that the contributory factors are largely subjective and dependent upon the skill and experience of the reporting police officer. Evidence is required to support the officer's opinion, so some contributory factors may be less likely to be reported than others.
Key Findings:	<p>In 2014:</p> <ul style="list-style-type: none"> • Excessive or inappropriate speed was a contributory factor to 408 road deaths, 25% of the total. • 17% of fatalities (282) had 'exceeding the speed limit' as a contributory factor in the accident, and a further 8% (126) had a vehicle 'travelling too fast for the conditions'. • At least one of 'exceeding the speed limit' and 'travelling too fast for the conditions' was reported in 10% of all accidents and these accidents accounted for 25% of all fatalities. • 'Exceeding the speed limit' was a contributory factor in 5,309 (5%) of reported road accidents and inappropriate speed in a further 6,772 (6%).
Keywords:	Accidents, casualties, contributory factors.
Comments:	National statistics.

Title:	Free Flow Vehicle Speeds in Great Britain 2014
Published:	Department for Transport, October 2015
Link:	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/466543/free-flow-vehicle-speeds-2014.pdf
Objectives:	Statistical Release presenting the speed of traffic in free flowing conditions on roads in Great Britain during 2014.
Methodology:	The estimates are based on traffic speed data collected from a sample of 93 Automatic Traffic Counters (ATCs) from a national network of around 180 ATCs. The sample was deliberately chosen to include ATCs located where external factors which might restrict driver behaviour (including junctions, hills, sharp bends and speed enforcement cameras) are not present.
Key Findings:	<ul style="list-style-type: none"> • On motorways, 46 per cent of cars and 46 per cent of motorcycles exceeded the 70mph speed limit in 2014. Eleven per cent of all cars and 17 per cent of motorcycles were travelling 10 mph or more above the speed limit (motorcycles make the highest proportion of vehicles travelling at this speed). • On single carriageways, 7 per cent of cars and 20 per cent of motorcycles exceeded the speed limit in 2014. Eight per cent of motorcycles were more than 10 mph over the limit. • Around 79 per cent of heavy goods vehicles exceeded their 50 mph speed limit on dual carriageway non-built-up roads in 2014, whilst 70 per cent exceeded the 40 mph limit on single carriageway non-built-up roads. Very few heavy goods vehicles exceeded their speed limit of 60 mph on motorways (as they are fitted with speed limiters). • On 30 mph roads, 45 per cent of cars and 47 per cent of motorcycles exceeded the speed limit in 2014. Fifteen per cent of cars and 21 per cent of motorcycles were more than 5 mph over the limit. • The number of cars exceeding the speed limit on 30 mph limit roads has dropped by 20 percentage points from 65 per cent in 2001, to 45 per cent in 2011. • The percentage of cars exceeding the speed limit has fallen on every road type in the 10 years since 2001. For all vehicle types, more vehicles exceeded the speed limit on 30 mph roads than on 40 mph roads; this pattern has been observed for many years.
Keywords:	Free flow vehicle speeds, cars, motorcycles, speed limit.
Comments:	National statistics. The statistics provide insight into the speeds at which drivers choose to travel and their compliance with speed limits.

Title:	Investigating the reduction in fatal accidents in Great Britain from 2007-2010
Published:	TRL Website 2013
Link:	https://trl.co.uk/reports/PPR663
Objectives:	The aim of this research was to investigate the causes of the major reduction in the number of road accident fatalities in Great Britain between 2007 and 2010.
Methodology:	A literature review was undertaken to collate any existing analytical methods for investigating reasons for the rapid reductions in the number of fatal road accidents experienced by other countries in recent years. It also reviewed reports from the Netherlands and the United States.
Key Findings:	<ul style="list-style-type: none"> • The obvious step change during this period was the recession, however this research has shown that there is not a direct link between fatalities and the recession, the link is indirect: the recession appears to have caused changes in driver behaviour (for example speed choice and drink driving) which, in turn, make drivers safer and reduces collisions and in particular, high severity collisions. It is suggested that drivers tend to behave more cautiously when uncertain about their financial future which tends to restrict the types of extreme behaviour that can lead to fatal accidents. • Not all observed changes are positive for road safety – the research observed an increase in the age of the car fleet, and no evidence to suggest that the recession has had any positive effect on seatbelt use or mobile phone use. • There remains the possible added effect of weather on the fatality trend. Weather patterns cannot be influenced, but the research speculates that cold weather encourages people to change their behaviour and drive more cautiously.
Keywords:	Statistical modelling, fatalities, trends
Comments:	Transport Research Laboratory Research Report

Title:	Police Powers and Procedures England and Wales 2013/14
Published:	Home Office, April 2015
Link:	https://www.gov.uk/government/publications/police-powers-and-procedures-england-and-wales-year-ending-31-march-2014/police-powers-and-procedures-england-and-wales-year-ending-31-march-2014
Objectives:	Statistical release drawing together statistics on the following topics: arrests for recorded crime; stops and searches under the Police and Criminal Evidence Act 1984 (PACE); breath tests and police action in relation to motoring offences.
Methodology:	Data is sourced from statistical returns received from the 43 police forces in England and Wales.
Key Findings:	<ul style="list-style-type: none"> • The majority of speeding offences are dealt with by fixed penalty notices. • In 2013, just over 700,000 fixed penalty notices (FPNs) were issued for speed limit offences in England and Wales (62 per cent of all FPNs issued in 2013). This number has fallen from its peak at 1.98 million in 2005, having been rising prior to that. • Safety cameras provided evidence for 86 per cent of all speeding offence FPNs issued in 2013.
Keywords:	Speed limit offences, fixed penalty notices (FPNs).
Comments:	Provides FPN data for motoring offences in the calendar year 2013. National statistics.

Title:	Criminal Justice Statistics in England and Wales
Published:	Ministry of Justice, May 2015
Link:	https://www.gov.uk/government/statistics/criminal-justice-system-statistics-quarterly-december-2014
Objectives:	Statistical release presenting key trends on activity in the Criminal Justice System (CJS) for England and Wales.
Methodology:	Data in the publication comes from a variety of administrative systems, including data submitted by police forces, data extracts from court database systems, and data extracts from the Police National Computer.
Key Findings:	<ul style="list-style-type: none"> • There were approximately 148,000 findings of guilt in courts for speed limit offences in 2014 in England and Wales. This is an increase compared to recent trends of around 115,000 per year between 2010 and 2013.
Keywords:	Speed limit offences, courts.
Comments:	National statistics.

Title:	British Social Attitudes 2014: public attitudes towards transport
Published:	Department for Transport, December 2015
Link:	https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/481877/british-social-attitudes-survey-2014.pdf
Objectives:	The survey collects data on public attitudes towards a range of topics through a combination of face-to-face interviews and self-completion questionnaires.
Methodology:	Representative household survey of adults aged 18 and over. The sampling frame is the Postcode Address File (PAF) and is limited to those living in private households. Fieldwork for the 2014 survey was carried out between July and September 2014.
Key Findings:	<ul style="list-style-type: none"> • The vast majority of adults (88 per cent in 2014) agree that people should drive within the speed limit. • In 2014, 55 per cent of adults surveyed agreed with the statement “speed cameras save lives”. This percentage has risen gradually since 46 per cent in 2007 (peak of 55 per cent in 2006). Twenty-one per cent of adults disagreed with this statement (decrease from peak of 31 per cent in 2009). • However, 49 per cent of adults agreed with the statement “speed cameras are mostly there to make money”, whilst 22 per cent disagreed with this statement. Thirty-six per cent agreed that “there are too many speed cameras” (30 per cent disagreement).
Keywords:	Attitudes, speeding, speed cameras.
Comments:	Robust survey methodology

Title:	THINK! Annual Survey 2011
Published:	Department for Transport, February 2012
Link:	http://webarchive.nationalarchives.gov.uk/20120925015135/http://assets.dft.gov.uk/publications/think-research/think-annual-report-2011.pdf
Objectives:	<p>To measure:</p> <ul style="list-style-type: none"> • Awareness of, attitudes towards, and perceptions of the THINK! Road safety brand as a whole. • General attitudes towards road safety, and its perceived importance in relation to other social issues. • Attitudes towards driving, and influences on driving behaviour. • Driving and road safety behaviour among different users, including prevalence of dangerous driving behaviour.
Methodology:	Representative survey of adults aged 16 and over in Great Britain. The sample was drawn by means of Random Location sampling. Fieldwork for the 2011 survey was carried out in November 2011. N=2,007 interviews were conducted. Of these, 1,184 were motorists.
Key Findings:	<ul style="list-style-type: none"> • Fifty-two per cent of motorists agreed completely that driving at 40 mph in a 30 mph area is dangerous. However, 50 per cent of motorists admitted to doing so. • Forty-two per cent agreed that driving at 90 mph on a motorway when there is no traffic is dangerous. However, 31 per cent of motorists admitted to doing so. • Eighty-one per cent of motorists agreed completely that it is dangerous to drive too fast for the conditions. However, 26 per cent of motorists admitted to driving too fast for the conditions.
Keywords:	Attitudes, speeding, motorists.
Comments:	Robust survey methodology.

Title:	Attitudes to road safety: Analysis of driver behaviour module, 2010 NatCen Omnibus Survey
Published:	Lee and Humphrey (2011) Road Safety Research Report No. 122, Department for Transport
Link:	http://webarchive.nationalarchives.gov.uk/20120606181145/http://www.dft.gov.uk/publications/rsrr-theme5-natcen-2010-survey/
Objectives:	To provide a baseline measure of public attitudes to road safety, with more detailed modules on speeding, drink driving and seatbelt wearing. Some questions focus on general public opinions, others on driver perceptions and behaviour.
Methodology:	A random probability survey of adults aged 16 and over, with questions asked face to face in the respondent's home and via self-completion.
Key Findings:	<ul style="list-style-type: none"> • While 85 per cent of respondents agreed that most drivers will drive a bit over the speed limit if they think it is safe, 67 per cent agreed that people should always stay within the speed limit. Even among those who had themselves broken the speed limit, over half (58 per cent) agreed that drivers should always stay within the limit. • In line with other research, speeding on 30 mph roads was more commonly reported than speeding on 60 mph roads. Men and younger drivers were more likely to report exceeding the speed limit than were other groups. • Mostly, drivers exceeded the speed limit on roads they knew well (69 per cent of those who had exceeded the limit on a 60 mph road cited this as a circumstance where they were more likely to do so; 61 per cent for a 30 mph road). • Reasons given for exceeding the speed limit included 'keeping up with other drivers' and 'lack of awareness'.
Keywords:	Driver attitudes, driver behaviour, speed.
Comments:	Robust survey methodology.

Title:	THINK! Road Safety Campaign Evaluation - Pre-stage: 'Live with it' speed campaign
Published:	Department for Transport, February 2009
Link:	http://webarchive.nationalarchives.gov.uk/+http://think.dft.gov.uk/pdf/332982/3329861/0902-livewithit.pdf
Objectives:	Research undertaken prior to the 'Live with it' campaign.
Methodology:	2,022 interviews in GB with those aged 15+ in January 2009. In total, 1,301 interviews were carried out with drivers.
Key Findings:	<ul style="list-style-type: none"> • When asked to spontaneously describe the influences that affect the speed at which drivers drive, the speed limit (17 per cent), road conditions (11 per cent), safety/personal safety (10 per cent) and other traffic (10 per cent) were most commonly referenced. • There was little change in attitudes towards risks of speeding since the end of the 'Lucky' campaign, with half (52 per cent) of drivers agreeing that driving 35mph in 30mph areas is dangerous. • Women were more likely to agree that someone who drives at 35mph in a 30mph area is driving dangerously (58 per cent compared with 47 per cent of men) and also to strongly agree (28 per cent compared with 19 per cent). • 75 per cent of drivers agreed that every mile an hour above the limit increases the risk of having an accident. • 69 per cent of drivers thought 30 mph was the maximum safe limit in residential areas, 40 per cent felt 20 mph was the maximum safe limit (note that these were different questions and although one would expect the results to sum to 100 per cent or less they do not). • 82 per cent considered driving at 40 mph in 30 mph areas to be unacceptable, compared with 59 per cent who consider driving at 35 mph unacceptable.
Keywords:	Speed, driver attitudes.
Comments:	

Title:	Characteristics of speed related collisions
Published:	D. Richards, R. Cookson, S. Smith, V. Ganu, M. Pitman (2010) Road Safety Research Report No. 117, Department for Transport
Link:	http://webarchive.nationalarchives.gov.uk/20120606181145/http://www.dft.gov.uk/publications/rsrr-theme5-report-117/
Objectives:	This project provides a unique insight into the range and diversity of collisions of all injury severity (fatal, serious, slight and no injury) which are attributed to speed, both excessive and inappropriate.
Methodology:	Analysis of data collected from the On The Spot study, an ongoing on scene accident investigation study which investigates accidents of all severity (damage only to fatal). OTS contains more details of accidents than STATS19.
Key Findings:	<ul style="list-style-type: none"> • The majority of speed-related collisions involved some loss of control of the vehicle, usually loss of control on a bend. • For drivers exceeding the speed limit, contributory factors that were over-represented included 'aggressive driving', 'careless, reckless or in a hurry', 'impaired by alcohol' and 'stolen vehicle'. These highlight the link between excess speed and other types of risk-taking behaviour. • For drivers travelling at inappropriate speed, contributory factors that were over-represented included 'careless, reckless or in a hurry', 'vision affected by road layout', 'vision affected by rain, sleet, snow or fog' and 'slippery road (due to weather)'. At a high level, these describe the combinations of risk-taking behaviour and reasons why the vehicle speed was inappropriate at that time.
Keywords:	Speed, contributory factor, collision characteristics.
Comments:	In-depth accident analysis.

Title:	Reducing traffic injuries resulting from excess and inappropriate speed
Published:	European Transport Safety Council (ETSC), 1995
Link:	http://www.etsc.eu/documents/Reducing%20traffic%20injuries%20from%20excess%20and%20inappropriate%20speed.pdf
Objectives:	To provide a set of recommendations to policy makers on actions that could be taken to reduce the number of casualties related to excess and inappropriate speed of motor vehicles on different types of road.
Methodology:	Review of international research and best practice.
Key Findings:	<ul style="list-style-type: none"> • The relationship between speed and road accidents has been studied extensively and is very clear: the higher the speed, the greater the probability of a crash and the severity of crashes. • All review studies indicate that small changes in mean speeds can be expected to result in much larger changes in crash outcomes. • The energy of a moving car increases in relation to the square of the car's speed. Thus the energy in a 66 km/hr impact is some 70 per cent greater than a 50 km/hr impact. The risk of injury increases accordingly. • Severe crashes (resulting in serious injuries and deaths) are much more sensitive to speed changes than crashes in general. • Research and international experience point to the effectiveness of speed limits, where perceived as realistic by drivers, in reducing the frequency and severity of road accidents and casualties, despite the fact that many drivers exceed speed limits.
Keywords:	Speed, casualties, accidents, limits.
Comments:	

Title:	The effects of drivers' speed on the frequency of road accidents
Published:	M.C. Taylor, D.C. Lynam, A. Baruya (2000) TRL report TRL421
Link:	https://trl.co.uk/reports/TRL421
Objectives:	To investigate the impact of traffic speed on the frequency of road accidents.
Methodology:	Extensive road-based and driver-based studies. Statistical modelling to develop relationships between: accident frequency on urban and rural roads, and how it depends on the speed of traffic, volume of traffic movement and characteristics of road layout; the speeds at which individuals choose to drive and how often they have accidents.
Key Findings:	<ul style="list-style-type: none"> • Evidence is compelling that in a given set of road and traffic conditions the frequency of accidents increases with the speed of traffic, and the higher the speed the more rapidly does accident frequency rise with increases in speed. • Reducing the speed of the fastest drivers (i.e. those travelling faster than the average for the road) would yield the greatest benefits in reducing death and injury. • There is value of engineering and enforcement measures which target <i>the fastest drivers</i>. • The scope for reducing accidents by means of speed management depends on the operational characteristics of the road. The percentage reduction in accident frequency achievable per 1 mph reduction in average speed is between 2-7 per cent. The earlier 5 per cent figure remains a robust <i>general</i> rule. • The reduction achievable varies according to the road type and the average traffic speed. Specifically, it is about: <ul style="list-style-type: none"> ○ 6% for urban roads with low average speeds; ○ 4% for medium speed urban roads and lower speed rural main roads; ○ 3% for higher speed urban roads & rural main roads. • The overall national potential for reducing accidents by general engineering and enforcement strategies aimed at speed restraint is greater for urban roads than rural roads and greater for residential than major urban roads. • On rural roads, speed management measures that target <i>specific</i> problems or specific roads are more likely to be justifiable in terms of accident reduction than <i>'blanket'</i> speed management measures. • Annual savings of about 23,000 injury accidents could be expected, resulting from a reduction in average speeds (averaged across the whole network) of just 2 miles/h. This would mean that each year more than 200 deaths and about 3,500 serious casualties would be prevented.
Keywords:	Speed, accident frequency, rural roads, urban roads.

Title:	The relationship between speed and accidents on rural single-carriageway roads
Published:	M.C. Taylor, A. Baruya, J.V. Kennedy (2002) TRL report TRL 511
Link:	https://trl.co.uk/reports/TRL511
Objectives:	To develop a speed-accident relationship for English rural single carriageway 60 mph roads which is straightforward to interpret.
Methodology:	The collection and analysis of data from 174 rural road sections with a speed limit of 60 mph; the application of statistical techniques to group the sections; and statistical modelling to relate accident frequency to factors such as traffic flow, vehicle speed and other characteristics of the road.
Key Findings:	<ul style="list-style-type: none"> • Accident frequency rises rapidly with the mean traffic speed on a given road. The relationship can be used to estimate the change in accident frequency resulting from a change in mean speed on a given road and to estimate the effects of different speed management strategies. • Accident frequency for all categories of accident increased rapidly with mean speed – the total injury accident frequency increased with speed to the power of approximately 2.5 – thus indicating that a 10 per cent increase in mean speed results in a 26 per cent increase in the frequency of all injury accidents. • Accident frequency varied between different groups of roads. It was highest on the Group 1 roads – roads which are very hilly, with a high bend density and low traffic speed. • The frequency of total injury accidents also increased rapidly with two further measures: the density of sharp bends and the density of minor crossroad junctions. • A 1 mph reduction in mean speed implied by the relationship developed for total accidents depends on the mean speed. It ranges from 9 per cent at a mean speed of 27 mph to 4 per cent at a mean speed of 60 mph. • A 10 per cent increase in mean speed would be expected to result in a 30 per cent increase in the frequency of fatal and serious accidents.
Keywords:	Speed, accident frequency, rural roads.

Title:	The Power Model of the relationship between speed and road safety
Published:	R. Elvik (2009)
Link:	https://www.toi.no/getfile.php/Publikasjoner/T%C3%98I%20rapporter/2009/1034-2009/1034-2009-nett.pdf
Objectives:	To present an update and re-analysis of the Power Model to describe the relationship between speed and road safety.
Methodology:	Meta-analysis and meta-regression of speed/accident datasets.
Key Findings:	<ul style="list-style-type: none"> • Based on over 100 studies, a model (the Power Model) has been developed to describe the relationship between changes in speed and changes in road safety (accidents/casualties) in terms of a set of power functions. • The effect of changes in speed on accidents and casualties is dependent on the initial speed. In general, changes in speed have a smaller effect at low speeds than at high speeds. • Traffic environment is an important moderating variable, and separate estimates of power should be developed for rural and urban roads. • Speed remains a very powerful risk factor for accidents and injuries.
Keywords:	Power model, speed, road safety, accidents, casualties.
Comments:	Technical paper.

Title:	Relationship between speed and risk of fatal injury: Pedestrians and car occupants
Published:	D.C. Richards (2010) Road Safety Web Publication No. 16, Department for Transport
Link:	http://webarchive.nationalarchives.gov.uk/20120606181145/http://assets.dft.gov.uk/publications/pgr-roadsafety-research-rsrr-theme5-researchreport16-pdf/rswp116.pdf
Objectives:	To examine the relationship between speed and injury for pedestrians in collision with cars.
Methodology:	Analysis of data collected from several contemporary in depth accident investigation studies in England, supported by re-analysis of data collected in previous studies and in Germany.
Key Findings:	<ul style="list-style-type: none"> • The three pedestrian datasets studied show a similar pattern in fatality risk. The risk increases slowly until impact speeds of around 30 mph. Above this speed, risk increases rapidly – the increase is between 3.5 and 5.5 times from 30 mph to 40 mph. • Based on in-depth data from Great Britain for 2000–09, the risk of pedestrian fatality is estimated to be approximately 1 per cent at an impact speed of 20 mph, 7 per cent at 30 mph and 31 per cent at 40 mph. These are estimates which are subject to margins of error, but the pattern shown is consistent with similar analyses of other datasets. • The risk of fatality is generally higher for the dataset from the 1970s, indicating that the risk of pedestrian fatality has reduced over the last 30 years. Although this finding should be treated with some caution as it is based on a relatively small sample, this may be expected for two reasons: an improvement in car design and an improvement in medical care. • Generally, it appears that the risk of pedestrian fatality is similar for children and adults, but higher for elderly pedestrians. • Even though the risk of pedestrians being killed at 30 mph is relatively low, approximately half of pedestrian fatalities occur at this impact speed or below, because of the relatively large number of pedestrian accidents at lower speeds.
Keywords:	Speed, injury, impacts, pedestrian.
Comments:	

Title:	Trends in Fatal Car-occupant Accidents
Published:	H. Ward, N. Christie, R. Lyons, J. Broughton, D. Clarke, P. Ward (2007) Road Safety Research Report No. 76, Department for Transport
Link:	http://webarchive.nationalarchives.gov.uk/20110509101621/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme5/trendsfatalcar76.pdf
Objectives:	To review existing data sources to gain a better understanding of the trends and circumstances of fatal car occupant accidents.
Methodology:	Analysis of a range of data sources - STATS19, OTS, CCIS, HES, mortality data.
Key Findings:	<ul style="list-style-type: none"> • The under 30s are more likely than older drivers to have excessive speed recorded as a contributory factor when involved in an accident. • Over 60 per cent of fatally-injured drivers under 30 (over 75 per cent of drivers under the age of 20 years) were judged to have been driving too fast. • Speed is a factor in loss of control accidents leading to overturning. Newer cars are more likely to overturn in an accident and the number of cars that overturn has risen. • There is the potential for speed management, including enforcement, and other measures to moderate speed at bends, approaches to junctions and when overtaking to reduce this type of accident which leads to very serious injury and death.
Keywords:	Speed, young drivers, fatal collisions.
Comments:	

Title:	Understanding inappropriate high speed: a quantitative analysis
Published:	S. Stradling, P. Broughton, N. Kinnear, C. O'Dolan, R. Fuller, M. Gormley, B. Hannigan (2008) Road Safety Research Report No.93, Department for Transport
Link:	http://webarchive.nationalarchives.gov.uk/20090417002224/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme2/safety93.pdf
Objectives:	To explore driver experiences and perceptions regarding speed choice and to identify the extent to which the concept of the Task-Capability Interface reported in Road Safety Research Report No. 92 applies. To help inform media campaigns.
Methodology:	Four focus groups involving professional drivers, participants on a speed awareness course and riders of motorcycles (36 participants in total). Survey of 1,005 drivers (928 were current drivers)
Key Findings:	<ul style="list-style-type: none"> • Drivers significantly overestimated the time gained by driving faster and time lost by driving slower than 10 mph above/below 60 mph. • Just under a fifth (17%) of drivers had been involved in an accident as a driver in the last 3 years, with 12% of these drivers saying driving too fast for the conditions was a factor. • 43 per cent of drivers said they drove at 35 mph in a 30 mph area at least once a week (33% drove at 35 mph in a 30 mph area at least 3 times a week). Around a quarter said they never exceeded the limit in a 30 mph area. • 19 per cent of drivers had driven at 70 mph on a 60 mph single carriage road at least once a week, with around one in ten doing so at least 3 times a week. The figures are similar for driving at 80mph in a 70 mph area. • People were far more likely to view 40 mph in a 30 mph area as speeding and unacceptable than driving at 35 mph, with just over 15 per cent doing so at least weekly. • Around a quarter of drivers disagreed with fact based statements that associate speed with collision risk. • 13 per cent of drivers said they never exceeded any of the speed limits asked about (30, 60 and 70); 7 per cent had exceeded all limits by a large margin at least once in the month prior to interview. • Drivers could be classified into a typology of drivers based on the frequency of their speeding and the extent to which they exceed the posted limits. This resulted in three groups being identified: excessive speeders (14 per cent); moderate speeders (33%) and speed limit compliant (52%).
Keywords:	Speed, driver behaviour, driver attitudes,
Comments:	Mixed method study.

Title:	Understanding inappropriate high speed: a qualitative analysis
Published:	R. Fuller, B. Hannigan, H. Bates, M. Gormley, S. Stradling, P. Broughton, N. Kinnear, C. O'Dolan (2008) Road Safety Research Report No. 94, Department for Transport
Link:	http://webarchive.nationalarchives.gov.uk/20090417002224/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme2/analysis.pdf
Objectives:	To explore driver experiences and perceptions regarding speed choice and to identify the extent to which the concept of the Task-Capability Interface reported in Road Safety Research Report No. 92 applies. To help inform media campaigns.
Methodology:	Four focus groups involving professional drivers, participants on a speed awareness course and riders of motorcycles (36 participants in total). Survey of 1,005 drivers (928 were current drivers).
Key Findings:	<ul style="list-style-type: none"> • Participants were aware that high speeds reduced the time available to deal with contingencies. • Non compliance with speed limits was generally regarded as potentially dangerous but not in all conditions. • Speed was related to mood state (frustration, annoyance), circumstances (wanting to get home) and social norms (perceptions of the norms of speeding, aggressive driving being acceptable). • There was a perception that minor levels of infringement were acceptable. • There was no striking difference between the different groups of participants.
Keywords:	Speed, driver behaviour, driver attitudes.
Comments:	

Title:	Rural Road Safety: Drivers and Driving
Published:	E. Collins, C. Eynon, P. MacLeod, S. Stradling, L. Crinson, J. Scoons, J. Broughton (2008) Scottish Government Social Research
Link:	http://www.scotland.gov.uk/Resource/Doc/240084/0066272.pdf
Objectives:	The main aims of the research were to: <ul style="list-style-type: none"> • Explore the causes of rural road accidents in Scotland and build up typologies of rural road drivers. • Provide advice to Road Safety Scotland on future communication strategies on rural road safety.
Methodology:	A multi-method study incorporating secondary analysis of STATS19 data, quantitative research (surveys of the general population, n=992, and regular rural road drivers, n=1020), and qualitative research (6 focus groups with 17-34 year old drivers). Fieldwork took place in 2007.
Key Findings:	From the survey of rural road drivers: <ul style="list-style-type: none"> • The most common reasons given for increasing driving speed on rural roads were: when overtaking, on an empty road in the daytime, when confident that they could drive safely at a higher speed and when running late. • Significantly more male drivers and younger drivers reported exceeding the speed limit on all road types (including rural roads). • Based on their responses to questions about speeding behaviours, drivers were clustered into 3 groups: <ul style="list-style-type: none"> ○ Compliers, who tend to observe the speed limit; ○ Exceeders, who exceed speed limits by up to 10mph but no more; and ○ Excessives, who exceed the speed limit more often and by a larger margin. • Based on their responses to statements about driving on rural roads, drivers were clustered into 5 groups: Confident, Accident Aware, Risk Takers, Frustrated and Apprehensive. The drivers belonging to each group shared similar attitudes to driving and risk. • Survey respondents saw driving on rural roads as low risk, due to fewer vehicles and pedestrians, and lower police presence. Risky driving was not perceived as likely to have negative consequences. From the focus groups: <ul style="list-style-type: none"> • Younger male drivers' high levels of self-confidence and belief in their own abilities minimised the perception of risk.
Keywords:	Rural roads, surveys, qualitative, driver attitudes, driver behaviour.
Comments:	Mixed method study.

Title:	The Relationship between Speed and Car Driver Injury Severity
Published:	D. Richards and R. Cuerden (2009) Road Safety Web Report No. 9, Department for Transport
Link:	http://webarchive.nationalarchives.gov.uk/20090417002224/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme5/rsrr9.pdf
Objectives:	To explore the impact of speed (delta-v) on injuries sustained to car drivers in frontal and side impacts.
Methodology:	Analysis of data collected from several contemporary in depth accident investigation studies in England – On the Spot and Co-operative Crash Injury Study. Delta v is used as the impact speed. Only seat belted drivers are included.
Key Findings:	<ul style="list-style-type: none"> • Side impacts have greater impact at a given delta v than front impacts and an increase in delta v from 30 mph to 40 mph considerably increases the risk of fatality. • 50 per cent of fatally injured drivers in frontal impacts were in collisions with a delta v of 34mph or less, while 50 per cent of fatally injured drivers in side impacts were in collisions with a delta v of 24mph or less. • It is estimated that 3 per cent of seat belted drivers injured in frontal impacts would be killed in collisions with a delta v of 30 mph, 19 per cent at 40 mph and 65 per cent at 50 mph. • It is estimated that 40 per cent of seat belted drivers would be killed in a side impact collision with a delta v of 30 mph and 90 per cent would be killed in a side impact with a delta-v of 40 mph.
Keywords:	Speed injury impacts, delta-v.
Comments:	

Title:	Does the threat of disqualification deter drivers from speeding
Published:	C. Corbett, E. Delmonte, A. Quimby, G. Grayson (2008) Road Safety Research Report No. 96, Department for Transport
Link:	http://webarchive.nationalarchives.gov.uk/20090417002224/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme2/threat.pdf
Objectives:	To explore the extent to which penalty points and the 'totting up' system acts a deterrent to speeding.
Methodology:	Postal survey of 1,100 drivers, with different groups of drivers covered e.g. those with points on licence, combined with in depth interviews and focus groups, of drivers, including those with points on their licence and those who had attended a speed awareness course.
Key Findings:	<ul style="list-style-type: none"> • The threat of disqualification appears to be an effective deterrent but among those previously disqualified this is less apparent. • Many drivers are deterred from speeding if they believe they are going to be detected, though a 'hard core' minority with positive attitudes to speed are not deterred. • A half of drivers with points claimed that their speeding was inadvertent. Many felt that being caught was 'bad luck' and speeding was not a serious or criminal activity, with a sizeable number thinking it reasonable to slow down only at camera sites or to use devices to warn of camera sites. • Knowledge of the points system and 'totting up' was reasonably good. • Previously disqualified drivers were most likely to manipulate speed cameras and least likely to comply with speed limits. Drivers who had accumulated a number of points often relied on technology to avoid getting more points. • Drivers with points were more likely to be male, 35-64, have high annual mileage and drive for work. This group also had poorer knowledge of speed-related facts than those without.
Keywords:	Speed, driver behaviour, driver attitudes, enforcement, penalties.
Comments:	

Title:	Effective Interventions for Speeding Motorists
Published:	F. Fylan, S. Hempel, B. Grunfeld, M. Conner, R. Lawton (2006) Road Safety Research Report No. 66, Department for Transport
Link:	http://webarchive.nationalarchives.gov.uk/20110509101621/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme2/effectiveinterventionsforspe.pdf
Objectives:	To identify the components of interventions that are most likely to change speeding driver behaviour, including a list of components that national speed awareness schemes should include, and how such schemes should be evaluated.
Methodology:	Literature review, interviews with experts, evaluation of existing speed awareness courses.
Key Findings:	<ul style="list-style-type: none"> • The strongest predictors of behaviour are intentions, attitudes, perceived behavioural control and self-efficacy. The models do not indicate which of these constructs are more amenable to change. • Social cognitive components predict speeding, and that the perceived benefits of speeding may be as important as the perceived risks. • There is a need to distinguish between the majority of drivers for whom speeding is moderate and those who adopt speeds that are considerably higher than the norm. This second group of drivers appear to be those who are least deterred by speed cameras and for whom the negative consequences associated with speeding may be least important. • Road safety campaigns containing risk information and speed enforcement strategies may be useful in deterring drivers en masse, but these same strategies may be ineffective in tackling the worst offenders. • Four different sub-types of speeding drivers were identified <ul style="list-style-type: none"> ○ Unintentional speeders - not aware of the limit, lapse of attention, underestimate their speed ○ Moderate occasional speeders - consider themselves to be safe and skilled, and exceed the limit by a level they believe to be relatively low ○ Frequent high speeders - positive attitude to speed, aware that they drive fast and may acknowledge the increased risk, but believe they are safe ○ Socially deviant drivers - acknowledge that their behaviour is dangerous, and they enjoy taking risks and breaking rules. • Persuasive messages should be paired with strategies that promote elaboration (e.g. group discussion), and there should be interactive problem-solving sessions to help individuals identify and adhere to appropriate speeds.

	<ul style="list-style-type: none"> Evidence suggests that effective speed awareness courses should be based on information and education, and make use of materials that are credible and forceful.
Keywords:	Speed, education, enforcement.

Title:	Evaluation of the national speed awareness course
Published:	Brainbox Research (2011), ACPO
Link:	https://ndors.org.uk/files/6614/4983/2018/Final_Speed_Awareness_Evaluation_Report_v1.4.pdf
Objectives:	To evaluate the effectiveness of the national speed awareness course.
Methodology:	A mixed methods approach using questionnaires and focus groups. Questionnaires were completed pre-course and post-course (immediately and 3 months following). N=2070 completed the questionnaires pre- and immediately post-course (100 per cent response rate). The response rate at 3 month follow-up was 31 per cent. Questionnaire data was collected between Sep-Dec 2010 from a wide range of course providers. Focus groups (n=28 participants) were conducted in Feb-March 2011.
Key Findings:	<ul style="list-style-type: none"> Males made up 62 per cent of the participants. Pre-course, males reported speeding significantly more frequently than females, and to a greater extent. The results provide evidence that the National Speed Awareness Course produces changes in key psychological predictors of speeding, namely instrumental and affective attitudes, moral norms, self-efficacy and intentions. <ul style="list-style-type: none"> The course was effective in changing affective attitudes – after the course, participants believed they would gain less enjoyment from speeding. After the course, positive attitudes towards speeding decreased and negative attitudes increased. A total of 99% of clients who responded at follow-up reported that they had changed their driving after attending the course, notably driving more slowly, being more aware of the road environment and of their speed, and feeling less stressed while driving.
Keywords:	Speed awareness courses, predictors of speeding, evaluation.

Title:	Speed Fact Sheet 7
Published:	European Transport Safety Council (ETSC), 2010
Link:	http://www.etsc.eu/documents.php?did=5
Objectives:	To identify the main elements that need to be taken into account in setting speed limits
Methodology:	Review.
Key Findings:	<ul style="list-style-type: none"> • Setting appropriate, safe, and credible speed limits is an absolute priority for a good speed management policy. • A road's function should be taken in to account when setting speed limits.
Keywords:	Speed limits, safety.
Comments:	Factsheets cover a range of road safety topics.

Title:	Speed limits: A review of evidence
Published:	E. Box (2012) RAC Foundation
Link:	http://www.racfoundation.org/assets/rac_foundation/content/downloadables/speed_limits-box_bayliss-aug2012.pdf
Objectives:	<p>Aims:</p> <ul style="list-style-type: none"> • To present research on the impact of speed and speed limits. • To illustrate some of the more significant issues that the government's forthcoming review of speed limits should address.
Methodology:	Literature review.
Key Findings:	<ul style="list-style-type: none"> • Speed limits are an important dimension of road safety management, but driving at speeds in excess of the posted speed limit is common in Britain. • Most drivers speed at some time in their lives and some regularly break speed limits. In uncongested conditions about half of traffic exceeds the speed limits on built-up roads and motorways but this proportion has fallen in recent years. • Speeding on residential roads is seen as less acceptable than speeding on motorways – especially by men – and generally younger drivers are more likely to speed than older drivers. • Whilst not the only measure to encourage driving at safe speeds, speed limits are an important means of letting drivers know what is considered to be the safe maximum speed for the type of road they are driving along. • Speed limits are an important dimension of road safety management, but driving at speeds in excess of the posted speed limit is common in Britain. Speed limits should not be set in isolation and should be used alongside other speed-management methods, such as engineering measures, education, training, publicity and enforcement.

	<ul style="list-style-type: none"> • The appropriate speed for a section of road takes account of safety, mobility and environmental considerations as well as the impact of the speed on the quality of life for people living alongside the road. • Recent guidance encourages a more measured approach by local highway authorities to determining appropriate speed limits. A range of factors must be taken into account including accident risk, environmental considerations, the types of road users and severance, as well as journey times. • In setting speed limits it must be recognised that they will not automatically be conformed with, and the wider the gap between the posted limit and what drivers judge to be appropriate, the lower – all other things being equal – the level of compliance will be. Research has found that, in the absence of other changes, actual speeds will usually change by only about a quarter of the change in the posted limits. • To achieve compliance with speed limits needs an effective enforcement regime, which requires clear information on the prevailing limits, effective detection and appropriate penalties for infringements.
Keywords:	Speed limits, speed, compliance.

Title:	The Characteristics of Speeders
Published:	D.C. Webster, P.A. Wells (2000) TRL report TRL 440
Link:	https://trl.co.uk/reports/TRL440
Objectives:	To link together an understanding of speed and accident risk.
Methodology:	Literature review.
Key Findings:	<ul style="list-style-type: none"> • Many different people are speeders and a majority of drivers admit to speeding at some times. • Faster drivers (relative to the mean) tended to be young, to drive high annual mileages in large cars (i.e. those with engine sizes of 2000cc or more) and tended to be travelling alone when observed. • Passengers affect speed, with most drivers choosing slower speeds when carrying passengers, but higher speeds being associated with young drivers carrying male passengers. • Drivers' reaction times in a hazard perception test are not correlated with speed choice, but hazard perception training has been shown to result in drivers choosing to drive more slowly. • There is strong evidence that speed in excess of the speed limit and speed greater than the average for the situation are associated with increased accidents. Many of the characteristics of speeders also correlate with accidents. • The research suggests that penalties, or the fear of penalties, can reduce speeding but penalties need to be perceived as fair. • Drivers justify their personal speeding choices by assuming that they are 'ordinary, safe speeding drivers' while others are 'dangerous speeding drivers'.
Keywords:	Speed, speeders, drivers, penalties.

Title:	Interaction between speed choice and road environment
Published:	S. Jamson, F. Lai, H. Jamson, A. Horrobin, O. Carsten (2008) Road Safety Research Report No. 100, Department for Transport
Link:	http://webarchive.nationalarchives.gov.uk/20110504093109/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme4/interaction/
Objectives:	To better understand how and why highway features such as highway surface, geometric characteristics, barriers, traffic signs, roadside furniture, traffic management characteristics, and landscaping, or a combination of them, can influence choice of speed. To identify those features that tend to encourage excessive speed and investigate how features can be redesigned to reduce the severity of injury.
Methodology:	A review of speed reduction treatments used and evaluations (through engagement with Local Authorities), design of treatments for problem issues/road types by 'experts' and simulator experiments of 20 treatments to identify the most promising solutions.
Key Findings:	<ul style="list-style-type: none"> • The evaluation of speed reduction measures is patchy and where it is undertaken Local Authorities had not been sharing their results (e.g. via MOLASSES). The study concluded that there needed to be more standardisation in evaluation and reporting of results. • The expert review and simulator tests suggested that: <ul style="list-style-type: none"> ○ Measures to reduce speed were generally more effective if there was a reason for drivers to slow down e.g. bend or a clear change in limit. On straight roads the treatments trialled only resulted in small speed reductions. ○ Physical measures appeared effective in urban environments, while peripheral hatching was appropriate to rural roads. Peripheral hatching was judged to be more effective than central hatching. ○ Vehicle activated signs were effective on approach to junctions, particularly in rural areas. • Measures that had high contrast with the environment appeared most effective.
Keywords:	Speed reduction measures, highways, engineering.

Title:	Review of 20 mph Zone and Limit Implementation in England
Published:	AECOM (2009) Road Safety Research Report Findings, Department for Transport
Link:	http://webarchive.nationalarchives.gov.uk/20090417002224/http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme4/20mphzoneresearch.pdf
Objectives:	To review where 20 mph zones and limits are being implemented, the rationale for their use and characteristics of traffic calming measures.
Methodology:	Analysis of DfT database combined with in depth interviews with road safety officers at each 14 case study local highways authorities.
Key Findings:	<ul style="list-style-type: none"> • At the time of the review there were estimated to be 2,159 20 mph zones in operation in England. • The majority of zones (96 per cent) use vertical traffic calming measures such as road humps. • The most common rationale for introducing 20 mph zones/limits was in the vicinity of schools, although this was not always supported by casualty figures. • Previous research evaluating the impacts in 250 zones with traffic calming found considerable reductions in the average speed, by about 9 miles an hour, with large falls in collisions. Evidence indicates that 20 mph speed limits, without traffic calming, have lower benefits in speed and casualty reduction.
Keywords:	20mph zones, speed.

Title:	Taking on the Rural Road Safety Challenge
Published:	B. King, S. Chapman (2010) Department for Transport
Link:	http://www.pacts.org.uk/docs/pdf-bank/Taking_per_cent20on_per_cent20the_per_cent20Rural_per_cent20Road_per_cent20Safety_per_cent20Challenge.pdf
Objectives:	The rural road safety demonstration project showcases work done by four county councils in response to an invitation to apply for specific funding support from the Department for Transport and to show the impacts of measures to improve rural road safety. The aim of the project was to discover innovative interventions and innovative approaches to bring new insight to the issue of managing casualties on rural roads.
Methodology:	Four county councils (Devon, Lincolnshire, Norfolk and Northamptonshire) were identified as beacon councils for road safety in 2006. Road safety projects were implemented between 2008 and early 2010. Some of the interventions were high cost and complex, whereas others were smaller and specifically focussed.
Key Findings:	<ul style="list-style-type: none"> • Strategic planting at village entries reduced traffic speed (mean speed tended to reduce by about 1.5 per cent). (Norfolk) • It appears that the removal of vegetation in order to remove roadside obstacles had the effect of increasing vehicles speeds. Although fairly slight, there was a clear shift of more vehicles driving at higher speeds. This result was statistically significant. (Norfolk) • When reducing the speed limit from 60mph to 50mph on certain road sections, the 85th percentile vehicle speeds fell by around 3 mph. (Lincolnshire). • A programme of enhanced verge maintenance on sections of the B1188 and A15 in Lincolnshire saw an increase in both vehicle speeds and collisions.
Keywords:	Rural road safety
Comments:	In many cases the interventions have been completed relatively recently – too recently to be able to provide a robust set of casualty data.

Title:	Lancashire ISA final report: the effect of Advisory ISA on drivers' choice of speed and attitudes to speeding
Published:	F. Lai, S. Jamson, O. Carsten (2012) Institute for Transport Studies, University of Leeds
Link:	http://www.its.leeds.ac.uk/fileadmin/documents/research/Lancs-ISA-Final-Report.pdf
Objectives:	To trial the use of Intelligent Speed Adaptation (ISA).
Methodology:	A large number of cars and a smaller number of buses were equipped with an Advisory ISA system based on a commercial satellite navigation system. The system displayed the speed limit and gave visual and auditory warnings as soon as the speed limit was exceeded. A speed limit map covering the whole of Lancashire was prepared. Drivers drove two months without the system active in the baseline condition and then seven months with the system enabled. The drivers were able to drive without the screen being connected, but data on speed and position was still recorded. Data for the full nine months was obtained for 402 cars and 19 buses.
Key Findings:	<ul style="list-style-type: none"> • When car drivers chose to use advisory ISA, speeding was reduced by 30 per cent on 30 mph roads and by 56 per cent on 70 mph roads. • Being able to use the system (but not necessarily having it active) reduced speeding of the car drivers on 30 mph roads by 18 per cent and on 70 mph roads by 31 per cent. Thus non-use reduced effectiveness but did not eliminate it. • For car drivers aged 25 and below, active use of advisory ISA resulted in a reduction in speeding of 22 per cent on 30 mph roads and 37 per cent on 70 mph roads. • The effect of system availability on 85th percentile speed was observable but relatively small. This indicates that much of the speeding that was curtailed by the system was in a range that was relatively close to the speed limit. • On average, the car drivers were willing to pay around £100 for an advisory ISA system.
Keywords:	Intelligent Speed Adaptation, speed, speeding.
Comments:	

Title:	Support and compliance with 20mph speed limits in Great Britain
Published:	A. Tapp, C. Naccarrow A. Davis (2015)
Link:	http://www.sciencedirect.com/science/article/pii/S136984781500042X
Objectives:	To understand the links between support of 20mph limits and compliance with them.
Methodology:	A population wide survey of GB drivers to explore how support and compliance were linked.
Key Findings:	<ul style="list-style-type: none"> • Data were collection via a survey to examine support-opposition and compliance-non-compliance amongst the GB population • Four categories of driver according to support/opposition and compliance/non-compliance were examined in detail. • Whilst, as expected, many supporters said they would comply with the limits, and many opponents might not comply, more surprisingly it was also found that some supporters claimed not to comply, whilst some opponents of 20mph limits were compliers. • Results indicated that self-enhancement bias, social contagion and habitual/inattentive driving were important factors in explain non-compliance. • Pro-active behaviour change strategies are required to create higher compliance levels.
Keywords:	20mph limits, Speed, Speeding, Compliance, Support
Comments:	

Title:	Implementation of automatic speed enforcement: Covariation with young drivers reported speeding behaviour and motivations
Published:	P. Delhomme, M. Cristea, F. Paran (2014)
Link:	http://trid.trb.org/view/2014/C/1340162
Objectives:	In order to examine its efficiency on speeding and its motivations, young drivers' intentions and beliefs about speeding were compared before the introduction of automatic speed enforcement and its completion.
Methodology:	A large survey based on the extended Theory of Planned Behaviour (TPB)
Key Findings:	<ul style="list-style-type: none"> • 1,192 young participants (49.7 per cent men) were divided into novice, beginner and more experienced drivers and filled in a questionnaire about their driving behaviour before speed cameras were installed and 24 months later. • Men, beginner and more experienced drivers expressed more intention to speeding within the next 12 months before the camera installation and showed a higher decrease in intentions afterwards, compared to women and novice drivers. • The extended TPB accounted for 59 per cent of the variance in the decrease of the intention to speeding. Its main predictors were: lower perceived behavioural control over speeding; less social pressure; lower perceived similarity with the prototypical deviant drivers; and higher comparative optimism. Slightly more positive behavioural beliefs and more negative outcome evaluations also predicted this decrease. • In order for a behavioural change to be effective, an attitudinal change in favour of the target behaviour may be required. Campaigns and trainings should both teach young drivers, who lack experience, that complying with the speed limit is really in their own benefit because transgressing the speed limits increases the probability of negative consequences arriving to them.
Keywords:	Speed, Speeding, Young Drivers, Enforcement, Compliance, Behaviour Change
Comments:	Use of TPB to understand changes in intention to speed

Title:	Evidence that attitude accessibility augments the relationship between speeding attitudes and speeding behaviour: A test of the MODE model in the context of driving
Published:	M. A. Elliott, E. Lee, J.S. Robertson, R. Innes (2015)
Link:	http://www.sciencedirect.com/science/article/pii/S0001457514003042
Objectives:	To test whether attitude accessibility augments the attitude-speed behaviour relation
Methodology:	<p>Study 1 (correlation design) involved 130 participants completing an online questionnaire measuring the valences and accessibilities of their attitudes towards speeding. Two weeks later, an online questionnaire measured subsequent speeding behaviour.</p> <p>Study 2 (experimental design), attitude accessibility was manipulated with a repeated attitude expression task. Immediately after the manipulation, 122 participants completed an online questionnaire measuring attitude valence and accessibility, and two weeks later, subsequent speeding behaviour.</p>
Key Findings:	<ul style="list-style-type: none"> • Increased attitude accessibility in the experimental (verses control) condition generated an increase in attitude-behaviour correspondence. • These findings are consistent with the MODE model's proposition that attitudes can exert an automatic influence on behaviour. • Interventions to reduce speeding could usefully increase the accessibility of anti-speeding attitudes and reduce the accessibility of pro-speeding attitudes.
Keywords:	Speed, Speeding
Comments:	

Title:	Evidence that implementation intentions reduce drivers' speeding behaviour: Testing a new intervention to change driver behaviour
Published:	S.E. Brewster, M.A. Elliott, S.W. Kelly (2015)
Link:	http://www.sciencedirect.com/science/article/pii/S0001457514003406
Objectives:	To test the effects of implementation intentions in the context of drivers' speeding behaviour.
Methodology:	<p>A randomised controlled trial was used where speeding behaviour, goal intentions and theoretically derived motivational pre-cursors of goal intentions were measured at both baseline and at one month follow up, using self-report questionnaires.</p> <p>Immediately after baseline, the experimental group (N=117) specified implementation intentions using a volitional help sheet, which required the participants to link critical situations in which they were tempted to speed with goal-directed responses to resist the temptation. The control group (N=126) instead received general information about the risks of speeding.</p>
Key Findings:	<ul style="list-style-type: none"> • The experimental group reported exceeding the speed limit significantly less often at follow up than did the control group. • This effect was specific to 'inclined abstainers' (participants who reported speeding more than they intended to at baseline and were therefore motivated to reduce their speeding) and could not be attributed to any changes in goal intentions to speed or any other measured motivational construct. • The findings imply that implementation intentions are effective at reducing speeding and that they do so by weakening the effect of habit, thereby helping drivers to behave in accordance with their existing goal intentions. • The volitional help sheet designed in the study was easy to administer and cost effective at achieving the aim. • Whilst implementation intentions were found to reduce speeding for inclined abstainers only, it should be noted that this group comprised 45.3 per cent of the overall sample.
Keywords:	Speed, Speeding, Goal setting, Behaviour change
Comments:	There is the potential to use the techniques employed in this study to bring about widespread reductions in speeding.

Title:	Speed enforcement in Norway: Testing a game-theoretic model of the interaction between drivers and the police
Published:	R. Elvik (2015)
Link:	http://www.sciencedirect.com/science/article/pii/S0001457515300506
Objectives:	To probe the relationship between changes in the risk of apprehension for speeding in Norway and changes in the amount of speeding.
Methodology:	A game-theoretic model of speed enforcement was proposed and tested empirically.
Key Findings:	<ul style="list-style-type: none"> • A game-theoretic model of how the rate of violations and the amount of enforcement is determined by the interactions and the police. • The model makes predictions both about how drivers will adapt to changes in the amount of enforcement (the more enforcement, the fewer violations) as well as how the police will adapt to changes in the rate of violations (fewer violations leading to less enforcement). • Drivers adapt to changes in the amount of speed enforcement by speeding less when enforcement increases and speeding more when enforcement is reduced. • Increasing the fixed penalties for speeding is associated with a weak, not statistically significant, reduction of speeding • Results suggests that the police adapt the amount of enforcement to changes in the rate of speeding, although the results are not statistically significant. • There is no conclusive evidence showing that increasing the fixed penalties for speeding influences enforcement, but the sign of the coefficient is consistent with the game-theoretic model.
Keywords:	Speed, Speeding, Enforcement
Comments:	

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