Young Drivers

A literature review and exploratory analysis of fatalities and serious injury collisions in relation to young drivers: Implications for education, engineering and enforcement initiatives
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Executive Summary

The aims of this report are to examine whether there are any differences between serious and fatal road traffic collisions involving young drivers and identify initiatives that may increase young driver safety. Young driver collision statistics (national and local) will be examined, along with young driver characteristics and the evidence regarding whether initiatives increase young driver safety on the roads. This report summarises and builds upon the main findings and recommendations from a literature review by Devon County Council and discusses recent additional evidence where appropriate.

Examination of national and local collision data suggests a number of key factors that are related to young drivers:

- Collisions tend to occur in the night time hours, at weekends on rural, A class, single carriageway roads
- Collisions tend to be those in which the young driver was driving straight ahead or negotiating a curve
- Loosing control, speeding and failing to judge another persons speed/path are key contributory factors to collision involvement for young drivers
- Young males seem to be predominantly vulnerable of being involved in a road collision

Differences between fatal and serious injury collisions were:

- More fatal collisions occurred on rural roads, compared to serious injury collisions
- More fatal collisions occurred between midnight and 5.59am, compared to serious injury collisions

A number of recommendations can be made from the evidence on young driver collisions and characteristics:

- Initiatives could target young males specifically as research shows they are more prone to being involved in fatal and serious injury collisions
- Initiatives could target speeding, loss of control, and excess speed for conditions, night time driving, and inexperience as these were the most common contributory factors in young driver collisions
- Parents could be informed that their driving behaviour influences their children from a young age. Therefore parents could promote safe driving when carrying passengers
- Parents could be informed that imposing restrictions on when and how their children can drive can influence young driver’s safety. Parents could be encouraged to engage with driving and enforcement
- Young drivers awareness of the risk of removing their attention from the road could be increased
- Young drivers attitudes towards the normality of risk taking whilst driving could be challenged
- Young drivers could be made aware of the importance of safety features when purchasing a vehicle
- Young drivers inexperience and the link this has with collisions could be made more salient to them
- Young drivers perceptions could be challenged in terms of what characteristics are related a good driver
- Young drivers awareness could be increased that risky driving behaviours may lead to collisions even though it may not be the drivers intention
• Raising awareness of the benefits of safe driving may be more effective for young males than using fear appeals which show the disadvantages of unsafe driving

Recommendations can also be made for designing effective young driver initiatives and adapting current training, education and awareness, and enforcement initiatives in order to improve their effectiveness for young driver safety.

Designing effective initiatives:
• Caution should be taken when using fear appeals as research has shown they can be ineffective in changing behaviour. If they are to be used methods of increasing self-efficacy could be included in the initiative as this will increase its effectiveness of changing behaviour
• Initiatives could use techniques prompting self-monitoring to increase their effectiveness
• Consideration should be given to factors affecting persuasive communication, such as wording, colour and graphics

Training:
• Training that targets higher order cognitive skills, such as hazard perception, attention, over confidence and motivations could be considered as these methods have been shown to be more effective in increasing safe driving behaviours in young drivers than traditional skills training
• Training could actively involve participants by providing feedback as this has been shown to increase safe driving behaviours in young drivers

Education and awareness:
• Initiatives could be designed/altered to include the components that have been shown to be effective; increasing self-efficacy in fear appeals, prompting self-monitoring, and persuasive communication
• Peer-to-peer initiatives could be considered as research suggests this may be an effective method of educating young people

Enforcement
• Parents could be involved in young driver initiatives as research suggests parental management has important influences on safe driving
• Parent driver agreements could be developed and negotiated which indicate promises about driving behaviour. These could focus on the main risky factors related to young drivers such as, night time driving and number of passengers
• Parents and drivers awareness of in-vehicle monitoring, the financial benefits, the resources available and the link with safer driving could be increased to encourage installation
• Initiatives could target those with previous offences as collisions have been shown to be linked to previous offences, both traffic and general
• Further research could investigate the effects of e-learning offender courses on future offences and road traffic collisions
1. Introduction

Drivers under 25 years of age are involved in a disproportionately large number of road collisions when compared with the proportion of drivers who are over 25. The riskiest time for all new drivers is the first year after passing the driving test. The number of young drivers involved in collisions falls with each year of age as they gain in both maturity and experience.¹

Figure 1 shows that young drivers are over-represented as casualties as a proportion of all licence holders across all injury severity.

In fact, in the UK in 2004, during their first six months of solo driving, newly licensed drivers are about eight times more likely to be involved in fatal collisions than more experienced drivers³. Even after more than six months licensed to drive alone, teens are two to three times more likely to be in a fatal collision than the most experienced drivers.⁴ In Great Britain, in 2009, 26% of all collisions involved at least one young car driver aged 17-24.⁵ Young drivers accounted for 12% of all driving license holders that year⁵, therefore, young drivers appear to be over represented in car collision statistics. The aim of this report is to identify initiatives that may increase their safety by examining factors involved in young driver collisions, young driver characteristics and the evidence regarding whether initiatives increase young driver safety on the roads.

Since 2002, KSI (killed and seriously injured) collisions involving young drivers in Cornwall have steadily decreased whilst fatal collisions remain fairly stable. This report examines factors that may be behind these trends by considering fatal and serious injury collisions separately. Data for Cornwall’s young driver serious injury collisions and national young driver fatal and serious injury collisions were taken from STATs¹⁹ (2005-2011); an established police recording format with specific definitions and details for contributory factors, location, vehicles, and injuries. Cornwall’s young driver fatal data was obtained from Cornwall’s fatal database (2003-2011), which includes information recorded in STATs¹⁹ and extra information from coroner’s inquests and engineering details. Additional national data from the Department of Transport in 2009 is considered to enable comparison between young
drivers (17-24) and other drivers (>24). It is important to note that Cornwall’s fatal figures are small in absolute numbers (103 fatal collisions involving a young driver from 2003-2011), therefore, national data has been included where appropriate.

It is important to note some factors relating to an increased collision risk for young drivers can be explained by the amount of driving they engage in (exposure). When considering reasons behind collisions, these factors would only be meaningful when considered as a measure of miles travelled, however, these factors are important when designing and developing intervention programmes.
2. Types of Collisions for Young Drivers

Due to young drivers being more at risk of being involved in a collision than older drivers, it is important to consider the types of collisions young drivers are having so initiatives can better target key factors of young driver safety. The national and local data considered below relate to collisions involving young drivers unless otherwise stated.

2.1 When do young drivers have their collisions?

Time of day

Nationally, from 2005-2011, a greater proportion of fatal collisions occur between the hours of 18.00-5.59 (63%), compared to day time hours of 6.00-17.59 (37%). Serious injury collisions are more evenly spread across the afternoon and evening between the hours of 15.00-23.59 (55%). Cornwall’s fatal, from 2003-2011, and serious injury collisions, from 2005-2011, show similar patterns. There are more fatal collisions, nationally and in Cornwall, from 21.00-5.59 (45% and 46%, respectively) compared to serious injury collisions (32% and 33%, respectively). These results are shown in figure 2.

In 2009, the Department for Transport (DFT) analysed young driver (17-24) collisions and compared them to older driver (>24) collisions. They reported a higher proportion of young drivers collisions occurred between 8pm and 4am on Friday/Saturday and Saturday/Sunday compared to older driver collisions. These findings show that in 2009 young drivers were more likely than older drivers to have collisions at weekends during the evening, and nationally, from 2005-2011, and in Cornwall, from 2003-2011, young drivers had more fatal collisions during the evening compared to serious injury collisions.
**Day of week**

Nationally, from 2005-2011, a higher proportion of fatal and serious collisions occur at the weekend, Friday – Sunday (53%), than during the week, Monday- Thursday (47%). In Cornwall, a higher proportion of fatal, from 2003-2011, (22%) and serious injury, from 2005-2011, (22%) collisions occurred on a Saturday than any other day of the week (Figure 3).

**Month of year**

Nationally, from 2005-2011, the number of fatal and serious collisions was fairly constant throughout the year. In Cornwall, there was slightly more fluctuation with fatal collisions, from 2003-2011, occurring most during June (13%) and December (12%), compared to an average of 8% for other months, and serious injury collisions, from 2005-2011, occurring most during the spring and summer months (61%), compared to autumn and winter months (39%) (Figure 4).
2.2 Where are young drivers having their collisions?

Urban/rural

Nationally, from 2005-2011, more fatal collisions occurred on rural roads (69%) compared to urban roads (31%). Serious injury collisions were more evenly spread across rural and urban roads (51% and 49%, respectively). In Cornwall, a higher proportion of both fatal collisions, from 2003-2011, (76%) and serious injury collisions, from 2005-2011, (84%) occurred on rural roads, compared to urban roads (Figure 5). This could reflect Cornwall’s highly rural nature.

![Figure 5 Cornwall and National fatal/serious injury collisions involving young drivers – percentage distribution by urban/rural roads](image)

Road type

Nationally, from 2005-2011, most fatal collisions occur on 60mph speed roads (45%), compared to other speed roads, and A roads; main roads that tend to have heavy traffic flow (55%), compared to other road types. Most serious injury collisions occur on 30mph roads (49%), compared to other speed roads, and A roads (45%), compared to other road types. In Cornwall, both fatal, from 2003-2011, and serious injury, from 2005-2011, collisions occur most on 60mph roads (62% and 56%, respectively), compared to other speed roads, and A roads (61% and 45%, respectively), compared to other road types. More serious injury collisions (25% and 21%, respectively) occurred on unclassified roads compared to fatal collisions (13% and 5%, respectively), both nationally and in Cornwall. Figure 6 shows the percentage of fatal and serious collisions, both nationally and local, by the speed limit of the road the collisions occurred on.
2.3 What are the circumstances of collisions involving young drivers?

Manoeuvre

Nationally, from 2005-2011, and in Cornwall, from 2005-2011 for serious injury collisions and 2003-2011 for fatal collisions, young drivers were most often driving straight ahead immediately before a collision (>46%), compared to all other manoeuvres (<20% individually) (Figure 8). Negotiating a curve (ahead left and ahead right) was also common for both fatal (36% nationally and 35% in Cornwall) and serious injury collisions (23% nationally and 29% in Cornwall), however, bending right was more common in fatal (15% nationally and 20% in Cornwall) than serious injury collisions (11% nationally and in Cornwall). In 2009, the DFT found negotiating a curve accounted for twice the proportion of young car driver manoeuvres, compared to older drivers, prior to a collision.¹
Vehicle

Nationally, from 2005-2011, and in Cornwall, from 2003-2011 for fatal collisions and 2005-2011 for serious injury collisions, most fatal (73% and 75%, respectively) and serious injury collisions (70% and 73%, respectively) involved the young driver driving a car with an engine size between 1 and 2 litres (Figure 9). Fatal collisions had a higher proportion of cars with engines sizes of 1550cc-2l (38% nationally and 42% in Cornwall) compared to serious injury collisions (30% nationally and 33% in Cornwall) and serious injury collisions had a higher proportion of cars with engine sizes of 1000cc-1549cc (40% nationally and in Cornwall) compared to fatal collisions (37% nationally and 33% in Cornwall).
The DFT examined average car ages involved in collisions from 2003-2009 and found the cars driven by young drivers were on average a year older than cars driven by older drivers. In 2009, the average age of cars driven by a young person was 7.3 years, compared to an average of 6.3 years for cars driven by older drivers. The average age of cars driven by young drivers involved in Cornwall’s fatal collisions from 2003-2011 was 10.2 years.

2.4 What are the contributory factors involved in young driver collisions?

Contributory factor is a term used in the STATs19 form to describe and factors that may have contributed to the collisions by any of the individuals involved or conditions on that day, for example, driver error, weather conditions and road surface.

Nationally, in 2009, the most common contributory factors assigned to young drivers in KSI collisions were ‘failed to look properly’ (21%), ‘loss of control’ (15%), ‘failed to judge another persons speed or path’ (13%), ‘careless, reckless or in a hurry’ (12%), ‘slippery road’ (12%), ‘learner or inexperienced driver’ (10%), ‘travelling too fast for conditions’ (10%), ‘poor turn or manoeuvre’ (8%), ‘exceeding speed limit’ (6%), and ‘sudden braking’ (6%). Cornwall’s data shows very similar findings. Tables 1 and 2 show the most common contributory factors assigned to young drivers in fatal and serious injury collisions from 2005-2011 in Cornwall.

<table>
<thead>
<tr>
<th>Contributory Factor</th>
<th>Fatal count</th>
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<tr>
<td>Loss of control</td>
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<tr>
<td>Exceeding speed limit</td>
<td>8</td>
</tr>
<tr>
<td>Travelling too fast for conditions</td>
<td>7</td>
</tr>
<tr>
<td>Aggressive driving</td>
<td>6</td>
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<td>4</td>
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<tr>
<td>Impaired by alcohol</td>
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<tr>
<td>Careless, reckless or in a hurry</td>
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<td>Slippery road (due to weather)</td>
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<tr>
<td>Poor turn or manoeuvre</td>
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<td>Sudden braking</td>
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Table 1 The 10 most common contributory factors assigned to young drivers in fatal collisions in Cornwall (2005-2011)

<table>
<thead>
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<th>Contributory factor</th>
<th>Serious injury count</th>
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<tr>
<td>Loss of control</td>
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<tr>
<td>Travelling too fast for conditions</td>
<td>50</td>
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<tr>
<td>Failed to look properly</td>
<td>42</td>
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<tr>
<td>Learner or inexperienced driver/rider</td>
<td>36</td>
</tr>
<tr>
<td>Careless, reckless or in a hurry</td>
<td>34</td>
</tr>
<tr>
<td>Poor turn or manoeuvre</td>
<td>30</td>
</tr>
<tr>
<td>Impaired by alcohol</td>
<td>25</td>
</tr>
<tr>
<td>Slippery road (due to weather)</td>
<td>24</td>
</tr>
<tr>
<td>Exceeding speed limit</td>
<td>24</td>
</tr>
<tr>
<td>Failed to judge other person’s path or speed</td>
<td>20</td>
</tr>
</tbody>
</table>

Table 2 The 10 most common contributory factors assigned to young drivers in serious injury collisions in Cornwall (2005-2011)
Many of the contributory factors assigned to young drivers are similar for fatal and serious injury collisions. However, ‘aggressive driving’ and ‘sudden braking’ were in the 10 most common contributory factors for fatal but not serious injury collisions in Cornwall.

Nationally, from 2005-2011, a much higher proportion of young driver collisions had ‘learner or inexperience’ and ‘loss of control’ attributed to them compared to other car drivers. There were also gender differences; factors such as ‘careless, reckless or in a hurry’ and ‘exceeding the speed limit’ were more often attributed to young males compared to female drivers. Young females were slightly more assigned factors such as ‘nervous or panic’ and ‘failed to judge other person’s speed or path’.

**Impaired by alcohol**

Nationally, in 2009, 4% of young drivers involved in KSI collisions were attributed ‘impaired by alcohol’, compared to 2% for other drivers. Cornwall’s fatal collisions showed a much higher proportion (18%) of young drivers being attributed ‘impaired by alcohol’.

**Weather conditions**

Nationally, from 2005-2011, and in Cornwall, from 2003-2011 for fatal and 2005-2011 for serious injury collisions, most fatal (79% and 77%, respectively) and serious injury collisions (78% and 73%, respectively) involving young drivers occurred when the weather was fine without high winds (Figure 10). 10-15% of fatal and serious injury collisions, both nationally and in Cornwall, occurred when it was raining without high winds.

![Figure 10](image-url)
Hitting an object

Nationally, from 2005-2011, and in Cornwall, from 2003-2011 for fatal and 2005-2011 for serious injury collisions, most fatal (89% and 91%, respectively) and serious injury (91% and 95%, respectively) collisions did not involve the driver hitting an object on the carriageway (Figure 11). For those that did involve hitting an object, kerbs were the most common type of object hit for both fatal (8% and 4%, respectively) and serious injury (5% and 2%, respectively) collisions.

Nationally, from 2005-2011, and in Cornwall, from 2003-2011 for fatal and 2005-2011 for serious injury collisions, most fatal (59% and 69%, respectively) and serious injury (71% and 75%, respectively) collisions did not involve the driver hitting an object off the carriageway (Figure 12). Both nationally and in Cornwall more fatal collisions (41% and 25%, respectively) hit an object off the carriageway compared to serious injury collisions (29% and 25%, respectively). In Cornwall, the most common type of object hit was a permanent road-side object (20% fatal and 15% serious injury collisions), whilst nationally both permanent road-side objects (12% fatal and 10% serious injury collisions) and trees (16% fatal and 8% serious injury collisions) were the most common types of objects hit.

Figure 11 Cornwall and National fatal/serious injury collisions involving young drivers – percentage distribution by hitting an object in carriageway
2.5 Who are involved in young driver collisions?

Gender

Nationally, from 2005-2011, and in Cornwall, from 2003-2011 for fatal and 2005-2011 for serious injury collisions, males accounted for a higher proportion of drivers in both fatal (81% and 83%, respectively) and serious injury (73% and 72%, respectively) collisions compared to females (Figure 13).

In 2009, the DFT found that males accounted for an increasing proportion of casualties resulting from young driver collisions as the injury severity increased; 55%
of all casualties were male, 66% of KSI casualties were male and 74% of fatal casualties were male.\textsuperscript{5}

**Occupants**

Research from the DFT suggests passenger casualties of young drivers were more often killed or seriously injured in a collision compared to car passenger casualties of older drivers. Passengers injured in collisions involving young drivers were of a similar age and sex as the driver.\textsuperscript{5}

2.6 Summary

Examination of national and local collision data suggests a number of key factors that are related to young drivers:

- Collisions, nationally and locally, tend to occur in the night time hours, at weekends on rural, A class, single carriageway roads
- Collisions, nationally and locally, tend to be those in which the young driver was driving straight ahead or negotiating a curve
- Loosing control, speeding and failing to judge another persons speed/path are key contributory factors to collision involvement for young drivers, both nationally and locally
- Young males seem to be predominantly vulnerable of being involved in a road collision

Differences between fatal and serious injury collisions were:

- More fatal collisions occurred on rural roads, compared to serious injury collisions
- More fatal collisions occurred between midnight and 5.59am, compared to serious injury collisions

2.7 Recommendations

- Initiatives could target young males specifically as research shows they are more prone to being involved in fatal and serious injury collisions
- Initiatives could target speeding, control and excess speed for conditions, and night time driving as these were the most common contributory factors in young driver collisions
3. Characteristics of Young Drivers

Collision data suggests young drivers are over-represented in fatal and serious injury road traffic collisions, nationally and in Cornwall. It is important to investigate characteristics of young drivers that may lead to this over-representation so road safety initiatives can be effectively targeted.

A literature review by Devon County Council identified a number of factors that may account for younger drivers being over-represented in road traffic collisions. This section of the report summarises the main findings and recommendations from that review and discusses recent additional evidence where appropriate.

3.1 Age vs. inexperience

Age and experience are very difficult to disentangle as both are highly correlated. Most people tend to be young when they pass their test, therefore making it difficult to separate the two factors. Research suggests a combination of both inexperience and age leads to involvement in collisions. In terms of inexperience, young drivers tend to lack the skills to transfer to new situations due to having little experience of driving situations, thus, making decisions more stressful and the young driver more likely to be distracted. Particular undeveloped skills in inexperienced drivers compared to experienced drivers include visual search (inexperienced drivers tend to be more vehicle focused than looking ahead at hazards), hazard detection (inexperienced drivers detect hazards slower), self-assessment (inexperienced drivers tend to overestimate their driving ability), perception of risk (inexperienced drivers tend to underestimate risks), vehicle control (inexperienced drivers are more vulnerable to over compensating and losing control), attention allocation (inexperienced drivers are more easily distracted), and anticipation (inexperienced drivers are less likely to look ahead). Inexperienced drivers also tend to have low self-control and harm avoidance, and use the car for pleasure and self-expression as opposed to transport.

This evidence suggests inexperience is a large cause of young driver’s increased collision risk. However, one study found a fall in collision liability in the first few years of driving suggesting inexperience reduced the risk of collisions. However, the driving liability of drivers over 30 year of age in their first year of age was half of the driving liability of 17 year olds, supporting the argument age is responsible for increased collision risk of young drivers.

Young drivers are going through a period of physical, cognitive and psychosocial change. As age increases expertise, regulatory competency (planning and management skills) and perceptions of driving risk (consideration of multiple aspects of driving and consequences) become improved. Young drivers have been found to have lower risk aversion and a stronger tendency towards ‘experience-seeking’, excitement, sensation-seeking, social influence, prestige-seeking, confidence/familiarity, underestimation of risk and irrelevance of risk, when compared with older drivers (see sections below).

This research implies a combination of both age and inexperience leads to increased collision risk for young drivers.
3.2 Individual differences

Sensation-seeking: Sensation-seeking is a personality construct defined as “The seeking of varied, novel, complex and intense sensations and experiences, and the willingness to take physical, social, legal and financial risks for the sake of such experiences.” Young drivers were found to be higher in sensation-seeking than older drivers which put them at increased risk of dangerous driving, traffic violations and collisions.

Sensation seeking has been linked to risky driving behaviours; drink-driving, unlicensed driving, speeding and not using seatbelts, collisions and traffic violations. These risky driving behaviours also influence the severity of collisions involving young drivers. Drink-driving, exceeding speed limits and not using seatbelts significantly increases the risk of fatal injury collisions. This relationship was also found for serious and minor injury collisions involving young drivers, however, as collision severity decreased the relationship between risky driving and risk of collision weakened. This suggests sensation-seekers are involved in more serious collisions. This may be an influence in the difference in trends between fatal and serious injury collisions as fatal collisions are more related to risky driving than serious injury collisions.

Recent research has found sensation-seeking was a stronger determinant of male’s intention to engage in risky speeding behaviour compared to females. Men have also been found to have higher sensation seeking than females. This may explain the over representation of males in collisions, other reasons include; males perceive more benefits from risk taking, risk taking results in a positive state of arousal for some men, and risk taking may be a way for males to strive towards masculinity.

Attitudes and values: It is important to understand young driver’s attitudes and values towards driving in order to better target initiatives to increase their safety. Research has found young drivers define a ‘good driver’ as confidence to deal with situations, concern over others safety, and being perceived as a better driver than others. A key finding was that car ownership for a young driver is very emotive. Young drivers attribute freedom, independence, convenience, status, personal space, and friendships to driving, and their concerns include killing someone, brain damage, and losing their licence. Taking risks was perceived as a normal part of driving. Young drivers are often aware they undertake risky behaviour, but generally feel they do not drive deliberately unsafely, suggesting education should increase awareness that risky behaviour can lead to unsafe driving even if this is not the intent of the drivers. The definition of a ‘good driver’ tends to differ between ‘safe’ and unsafe drivers. Safe drivers tend to focus on safety, whereas unsafe drivers emphasise driving skills. This implies education programs could challenge perceptions of what makes a good driver.

Research has found females tend to be more safety orientated than males. There were also differences in attitudes towards driving; males engaged in more risky driving such as not wearing seatbelts, speeding and had increased confidence, compared to females. This may explain the over representation of males in collisions. It has been suggested young male drivers may be most resistant to fear messages, which are used regularly in road safety, due to their over-confidence and risk taking. Examination of young driver’s self-enhancement biases (considering themselves superior to other drivers in ability and caution) demonstrated positive messages were most effective in reducing conscious self-enhancement bias. Neither positive nor negative messages were successful in reducing non-conscious self-enhancement bias. Other research has found young drivers who seldom use a
mobile phone when driving were more likely to focus on the advantages of abstaining from in-vehicle mobile phone use, whilst those who frequently use their mobile when driving focussed on the disadvantages. Researchers suggested road safety education should strengthen young drivers existing safety beliefs rather than using scare tactics. This implies raising awareness of the advantages of safe driving may be more effective than fear appeals which show the disadvantages of unsafe driving.

Recent research examined the differences in level of importance attributed to vehicle features when purchasing a vehicle. The younger the driver the less important safety was when considering vehicle purchase and young males rated safety lowest, compared to all other drivers.

**Attention:** The importance of maintaining attention toward the road has long been recognised as a major contributor to traffic collisions among all drivers. However there is now a body of research indicating this is a particular problem for novice drivers. For example; using a driving simulator, 12 newly-licensed and 12 experienced drivers were asked to perform various distracting tasks that were located either inside or outside the vehicle. Newly-licensed drivers had longer average glances and more glances longer than 2 seconds away from the road on in-vehicle tasks than experienced drivers. There were no differences between the two groups on outside vehicle tasks.

Recent research examined the differences in level of importance attributed to vehicle features when purchasing a vehicle. The younger the driver the less important safety was when considering vehicle purchase and young males rated safety lowest, compared to all other drivers.

There are a number of reasons why novice drivers are more likely to get distracted by distractions:

- Novice drivers may be more willing to engage in distracting activities
- Novice drivers lack experience to deal with additional tasks as well as operating the vehicle and obeying traffic laws
- Novice drivers tend to overestimate their ability to cope with distractions whilst driving

**Poverty:** The research suggests young drivers from poorer backgrounds are more likely to be involved in fatal collisions than those from richer areas. Factors found to predict collision involvement were; more occupants per vehicle, smaller vehicle size, older vehicles, and lower education levels.

**Fatigue:** Research suggests teenagers tend to have changes occurring in their sleeping habits as they progress through to adulthood. These changes have been shown to result in lower school grades, increased amount of sleeping during the day, depression and sleeping problems. Sleep disruption may also lead to driving when fatigued due to young driver’s busy lives of education, social engagements, and possibly work. This links to the over-representation of young driver collisions occurring during the evening and night.

### 3.3 Other influences

The research suggests young drivers tend to develop their driving behaviour from their parents. It was found anxiety for both mothers and daughters was associated with careless and reckless driving. For fathers and sons it was high sensation-seeking that was related to higher reckless driving. Parents can also influence young drivers by monitoring and managing their driving in terms of when they take
their test, supervising practise, enforcing the use of P plates and enforcing aspects of graduated licensing, such as restricting night-time driving and the number of passengers.

Peers can influence whether a young driver engages in risky driving. There is a need for a focus on implying safe driving is normal and acceptable behaviour. Carrying passengers can also influence risk taking among young drivers. Different types of passengers influence the type of driving, for example; both young male and female drivers drive at faster speeds when carrying a young male passenger, however, safe and slow driving was evident when passengers were parents, adults and girlfriends/partners.

3.4 Summary

The evidence available suggests reasons for young drivers being over-involved in road traffic collisions. Personality factors, such as sensation seeking, give young drivers a tendency to adopt risky attitudes and behaviours. Limited experience and the fact that young drivers are going through a period of rapid development, makes them more prone to risk taking and removing their attention from the road. Demographic factors, such as gender and poverty, and external factors, such as peer pressure and parental involvement, also influence risky driving.

3.5 Recommendations

- Parents could be informed that their driving behaviour influences their children from a young age. Therefore parents could promote safe driving when carrying passengers
- Parents could be informed that imposing restrictions on when and how their children can drive can influence young driver’s safety. Parents could be encouraged to engage with driving and enforcement
- Young drivers awareness of the risk of removing their attention from the road could be increased
- Young drivers attitudes towards the normality of risk taking whilst driving could be challenged
- Young drivers could be made aware of the importance of safety features when purchasing a vehicle
- Young drivers inexperience and the link this has with collisions could be made more salient to them
- Young drivers perceptions could be challenged in terms of what characteristics are related a good driver
- Young drivers awareness could be increased that risky driving behaviours may lead to collisions even though it may not be the drivers intention
- Raising awareness of the benefits of safe driving may be more effective for young males than using fear appeals which show the disadvantages of unsafe driving
4. Models of Young Drivers

Models of young drivers attempt to bring together factors relating to young driver collisions and characteristics to provide an explanation as to why young drivers are involved in road traffic collisions. These models should inform the design of initiatives aimed at young drivers.

Figure 13 shows a comprehensive view of all the factors linked to risky driving behaviour in young drivers. These factors have been explored in the previous section and relate to an increase in road traffic collisions for young drivers.

Wider behaviour models are also useful when considering which factors to target to influence behaviour change:

- The Theory of Planned Behaviour (TPB) maintains an individual's intentions determine their behaviour, and that intentions can be predicted by attitudes towards the behaviour, subjective norms (perceived pressure or approval to perform a behaviour), and perceived behavioural control (ease or difficulty of performing a behaviour). Perceived behavioural control can also be directly linked to behaviour. This theory suggests risky driving can be predicted by a positive attitude towards risky driving, perceived approval of others towards risky driving, and low perceived control over risky driving.

- The health belief model (HBM) suggests that behaviour is determined by:
  - Perceived susceptibility – assessment of the risk of being involved in a collision
  - Perceived severity – assessment of how serious the collision will be and potential consequences
  - Perceived barriers – to adopting a particular behaviour
Perceived benefits/costs – positive and negative consequences of adopting a behaviour

In addition to these aspects there are a number of mediating factors that link perceptions and behaviour. These include demographic variables, social psychological variables (social economic status, personality, coping strategies), perceived efficacy (individuals assessment to whether they can adopt the desired behaviour), cues to action (external influences promoting the desired behaviour), health motivation (whether an individual has the determination to commit to a behaviour), perceived control (self efficacy) and perceived threat (whether the danger of not adopting the behaviour is great). This theory suggests risky driving can be predicted by an individual having an over optimistic perception of the risk of being involved in a collision and the associated consequences, perceiving benefits to risky driving and barriers to safer driving.

- The Information, Motivation, Behavioural skills model (IMB) suggests behaviour change involves three components; “information” refers to knowledge to support the behaviour change, “motivation” refers to attitude towards behaviour change, and “behavioural skills” refers to the skills acquired that are necessary to maintain the behavior change. Many young driver initiatives focus on providing information about the dangers of risky driving; however, evidence suggests young drivers are already aware of the risk. Therefore, focusing on other components may be more beneficial. This model considers the conscious processes of behaviour change; however, it ignores behaviours that are subconscious or routine/habit.

- The Reflective-Impulsive model distinguishes between two systems that interact together to produce behaviour. The impulsive system makes decisions relatively quickly with little demand on cognitive resources whilst the reflective system is able to weigh up the pros and cons of decision making. Which system is used depends on motivation and self-control. It has been suggested teaching self-regulation skills may target the subconscious impulsive behaviours.
5. Design of Initiatives

The previous section considered young driver models that should inform the design of road safety initiatives aimed at young drivers. Research identifying successful components of interventions across multiple health fields should also inform the design of young driver initiatives. This section of the report identifies aspects of interventions, not just relating to road safety, which should increase their effectiveness as identified by research evidence.

5.1 Content

5.1.1 Fear appeals

Fear appeals are persuasive communication that attempt to arouse fear in order to promote precautionary motivation and self-protective action.\textsuperscript{60} Fear arousal is an unpleasant emotional state triggered by the perception of threatening stimuli.\textsuperscript{60} Fear appeals give two types of information; presenting a threat and its severity, and recommending protective action.\textsuperscript{60}

The Extended Parallel Process Model (EPPM) suggests fear appeals work in the following way; when an individual perceives a threat they are motivated to take protective action to reduce the threat. If the recommended action shown in the fear appeal is deemed to be effective and feasible, the individual is likely to follow the recommendations. If the individual deems the recommended action to be ineffective (response-efficacy) or impossible (self-efficacy) they will avert the message in another way; by denying or derogating the message.\textsuperscript{61}

Research suggests fear arousal may easily result in individuals averting the threat in other ways, such as denying the threat applies to them, processing the information regarding the threat in a biased way, and removing their attention from the threat message.\textsuperscript{62} These defensive responses are most likely to occur among those members of the target population who are most at risk to the threat.\textsuperscript{63} One study demonstrated highly relevant information tends to result in defensive processing of the threatening message. Coffee drinkers and non-coffee drinkers were shown messages with threatening information linking coffee drinking to the development of fibrocystic disease. Findings showed coffee drinkers were less persuaded by the link than non coffee drinkers. Coffee drinkers had processed the message in a defensive, biased manner; they were less critical of the information questioning the link and more critical of the information supporting the link.\textsuperscript{63} Another study demonstrated frightening AIDS messages were least effective for those most at risk. Those who had unsafe sex more often were less persuaded and more likely to discount or reject the message; they had greater questioning of personal susceptibility of contracting AIDS, the severity of consequences and the effectiveness of condom use. Those who had not had unsafe sex in the past were more likely to intend to have safe sex in the future than those who had engaged in unsafe sex in the past.\textsuperscript{64} A final study showed threatening information motivates people to avoid it. Daily smokers attended less to high threatening information about smoking than to low threatening information (measured using EEG). This effect was not found for non-smokers.\textsuperscript{65} These studies suggest people do attend to fear appeals but in a defensive way.

Fear appeals are popular and used regularly in relation to road safety, however, this evidence suggests they have the potential to cause the opposite of the desired reaction. This research suggests fear appeals do not change behaviour, at best they
result in maintenance of the current behaviour.68 This is good for people who don’t engage in the behaviour but bad for those who do, which is essentially the target audience.

As fear appeals in road safety are common and popular it is important to consider how we can increase the effectiveness of the fear appeals that are used. Evaluation of the EPPM shows an individuals perception of the threats severity and susceptibility, and the individual’s response efficacy and self-efficacy are linked to protective actions. However, when examining individual’s intentions to carry out protective actions, response efficacy and self-efficacy had a strong and consistent link, whilst the links with perceived severity and susceptibility were weak.66,69 When examining future behaviour, self-efficacy and intention have been found to be strong predictors, whilst perceived severity and susceptibility and response efficacy do not predict future behaviour.67

These findings suggest the elements of fear appeals that are most likely to motivate risk reduction behaviours are; promotion of response efficacy (suggesting recommended action will avoid danger) and strengthening self-efficacy (suggesting the audience can successfully perform the recommended actions), not messages suggesting the threat is severe or the audience is susceptible. Therefore, when designing fear appeals it is important to include the following aspects:

- Convince the audience they themselves are at risk by increasing perception of susceptibility, self-monitoring and feedback can help with this. This process provides personally relevant risk assessments.
- Convince the audience that risk reduction responses are effective (e.g. not speeding will dramatically reduce their chance of a fatal collision).
- Inducing a strong belief that they themselves can successfully engage in effective risk reduction actions (increasing self-efficacy); providing action specific instructions, volitional prompts, planning and goal setting. This is the most important aspect of fear appeals, if the audience do not have a strong self-efficacy their behaviour is much less likely to change.70

Recent evidence points towards the effectiveness of using positive emotional messages as an alternative to threat appeals in road safety campaigns, particularly for males.71 Public health literature suggests that negative appeals might have a diminishing effect over time while positive appeals become more persuasive over time.71 One study conducted an experiment in which participants viewed road safety ads with different appeals. The study found greater persuasiveness of negative (fear) appeals immediately after exposure but greater improvement for positive humorous appeals over time (up to a month).72

5.1.2 Behaviour Change Techniques (BCTs)

Research examining behaviour change interventions across multiple health fields has identified techniques that may be effective in encouraging individuals to change behaviours.76 The inclusion of techniques derived from Control Theory has been found to significantly increase the effectiveness of interventions compared to those which don’t include techniques from this theory.143 Specifically the inclusion of ‘prompting self-monitoring’ technique was found to significantly increase the effectiveness of interventions aimed at increasing physical activity, healthy eating143, and reducing excessive alcohol consumption144. This was found to be most effective when used with at least one other technique derived from Control Theory; ‘goal setting’, ‘action planning’, ‘set graded tasks’, ‘prompt review of goals’, or ‘provide feedback on performance’. The number of BCT’s used in an intervention did not
influence its effectiveness; quality may be affected if too many techniques are implemented. As yet, no research into specific BCTs in road safety interventions has been undertaken, however, previous research in driving behaviours has shown support for Control Theory techniques; specifying goals were found to increase driver's compliance with speed limits. Other types of interventions have also been shown to reduce risky driving behaviour, for example; the use of rewards and punishments were found to influence the risky driving behaviour of young drivers, and providing normative information and prompting anticipated regret were found to effect offending drivers speeding behaviour.

5.2 Design of communication

Persuasive communication programmes attempt to introduce new prominent beliefs (beliefs that first come to mind when asked a question) to reduce risky driving behaviour. One study designed 4 videos to target changing 4 different beliefs surrounding speeding behaviours of car drivers; normative beliefs (beliefs about what others think about their behaviour), behavioural beliefs (beliefs about the consequences of performing a behaviour), perceived behavioural control (beliefs about factors that may facilitate or impede the performance of a behaviour), and anticipated regret. The normative beliefs and anticipated regrets videos had a significant positive impact on car driver's attitudes and beliefs towards speeding however, the perceived behavioural control video decreased driver's perceptions of control. It was suggested that the persuasive communications introducing normative beliefs and anticipated regret, used in this study, may induce a shift from a pre-contemplative state of mind (being unaware of the issue) to a contemplative state of mind, in which individuals start to consider that they should change their behaviour.

A review of the evidence in designing effective communications for warning signs with a view to persuading and influencing the public showed a number of important factors that may be useful when developing education and awareness campaigns for young drivers:

- Effective warning information components include; a signal word (attract attention/indicate level of hazard), explanation of the consequences of being exposed to the hazard and clear instructions for avoiding the hazard. When it is not possible to include all information components, the hazard and instruction statements are the most important to retain.
- The way in which warning communication is worded has been shown to be an important determinant of outcomes; explicit wording increases perceived warning appropriateness and behavioural compliance when compared to non-explicit. Definitive wording increases the perception of a hazard and believability of the message content.
- The public must feel that they are receiving the whole truth otherwise they may not believe the message or perceive it to be credible.

5.3 Summary

This section has reviewed evidence regarding aspects that may make initiatives more effective, including content and communication style. These factors should be considered when developing young driver interventions.
5.4 Recommendations

- Caution should be taken when using fear appeals as research has shown they can be ineffective in changing behaviour. If they are to be used methods of increasing self-efficacy could be included in the initiative as this will increase its effectiveness of changing behaviour.
- Initiatives could use techniques prompting self-monitoring to increase their effectiveness.
- Consideration should be given to factors affecting persuasive communication, such as wording, colour and graphics.
6. Initiatives for Young Drivers

Young driver initiatives ultimately aim to reduce young driver casualties and collisions. It is difficult to link initiatives to a reduction in road traffic collisions, therefore, most initiatives target individuals knowledge, skills, attitudes and behaviour towards safe driving, assuming changes in these factors will lead to collision reduction. The following section of this report examines current young driver initiatives and the evaluation of the effectiveness of these initiatives.

6.1 Training

The main focus of training tends to be developing individual’s skills for safe driving. Methods traditionally centre upon vehicle-handling and control skills, with instruction taking place in the form of theory and off and on-road practice. These approaches often tend to ignore higher order skills, such as cognitive-perceptual skills which cover hazard perception, information processing and attention control, and motivational factors behind driving. Some skills programmes have even been shown to increase young driver’s risk of being involved in a collision. Skid training has been shown to increase young driver’s confidence of coping with difficult driving situations, increasing their exposure to collisions.

Other types of training that are less commonly used with young drivers may be more effective in reducing collision risk:

- Elaboration involves individuals expanding on situations and potential outcomes of these situations. Initiatives that do not involve elaboration may lead to only short term changes in attitude which can be influenced by other factors, such as peer pressure. Research suggests individuals should be encouraged to elaborate on a persuasive message in order for useful changes in attitude to be achieved. A study has examined the potential of this approach with 352 young male drivers, aged 18-23. The experimental group were asked to imagine a severe collision scenario and visualise their feelings and consequences on their future lives. Self-reported risk-taking was measured pre-initiative and at follow up. All the groups reported less risk-taking behaviour at follow up than pre initiative. The main limitation was that results were based on self-reports which could be biased and it is unclear how long effects would last.

- Prediction training involves drivers watching videos of potential hazards and predicting what the following scenarios would be. One study found novice drivers risk perception skills increased following this training.

- Attention-focused training is designed to limit the duration of glances that novice drivers take away from the road to under 2 seconds. This is done by error learning in which the novice driver can make errors (glances away from the road for more than 2 seconds) and then correct their errors after being given feedback. This is a similar method to that used in hazard perception training, which has proved a success among novice drivers by being associated with a reduction in subsequent collision liability. A study examined the efficacy of a computer based attention-focused training programme on 37 novice drivers. After the training the trained group were compared to a placebo group in an on road test. The trained group made significantly fewer glances
away from the road that were more than 2 seconds, compared to the placebo group.85

This evidence suggests training targeting higher order cognitive skills may be more effective than traditional vehicle handling and skills training in reducing risks for young drivers.

Evidence suggests actively involving young drivers in initiatives by providing feedback, may be effective in increasing safe driving behaviour.86 In an event-based training programme three common situations experienced by motorists were given to 58 young drivers. There was a significant reduction in speeding in the group that was given feedback compared to a control group.87 Other research has found providing feedback during training led to an increase in internal beliefs (perceiving events to be dependent on their own behaviour) and a decrease in external beliefs (perceiving events to be a result of luck, chance, fate or under the control of others) which predicted an improvement in safe driving behaviours.86 Another study found young drivers that received video-based road commentary training during a hazard perception task had a higher percentage of hazards detected compared to a control group, which matched that of more experienced drivers.88 These findings suggest providing accurate appraisal of driver’s performance may increase their safe driving behaviours.

Relatively few drivers take additional driving training following licensure which may be due to a lack of incentives.89 Some incentive schemes have been shown to be effective at encouraging positive health behaviours where a simple action is required, and increasing safe driving styles, however, few initiatives have been evaluated for effectiveness at reducing collisions.90

6.1.1 Summary

There is little evidence to suggest skills’ training is effective in increasing young driver safety. However, evidence suggests recent approaches to training, which include higher order aspects such as the social and emotional aspects to driving as well as the physical, reduce risky driving and encourage safe behaviour.

6.1.2 Recommendations

- Training that targets higher order cognitive skills, such as hazard perception, attention, over confidence and motivations could be considered as these methods have been shown to be more effective in increasing safe driving behaviours in young drivers than traditional skills training
- Training could actively involve participants by providing feedback as this has been shown to increase safe driving behaviours in young drivers

6.2 Education and awareness

Education programmes often aim to increase driver’s knowledge of the number of collision casualties and the risks of dangerous driving. Generally, these initiatives have not been shown to change behaviour.91 For example, highlighting the dangers of drink-driving is not enough as drivers are already aware of the risks and there is little evidence to show this is a problem.92 This may reflect the evidence of the ineffectiveness of fear appeals unless self-efficacy is increased.
A good practice guide for driver education has been developed by collecting information from road safety units around the UK, UK non-government providers and four international organisations. A summary of good practice was identified through a review of the evidence in driver education, training and testing. The review only considered papers with a high quality research methodology and best practice was identified when a number of papers had shown an aspect of driver education/training to be effective. The best practice identified included the following steps:

- Requirement analysis – identification of target audience
- Parental involvement – parents having a significant influence on road safety attitudes developed by their children. Education should be targeted at parents to ensure they have appropriate attitudes towards driving, riding and being a passenger
- Practical driver training – should not be included in pre-driver education. Overseas studies linked it to possible increases in collision rates
- Instructor credibility – influences the likelihood of a change in attitude. Programme delivery and content should be carefully considered
- Peer-to-peer interventions – to some extent effective for pre-driver education
- Learning method – most success when include active participation, discussion, use of personal experiences and reflective thinking
- Evaluation – initiatives should be evaluated rigorously

Some programmes involve parents in driver education. There are a number of resources available but seems to be a gap in resources which aid parents to support their teenagers during the ‘transition to unsupervised driving’. A resource should focus on crash risk, limited effectiveness of driver training, passenger risk, peer pressure and night time driving. It should inform parents of the risks of driving and how to reduce them, persuade parents to take steps to reduce risks and provide a framework to work from to manage exposure to high-risk driving scenarios. Research has suggested parents are generally willing to participate in teenager driver education. A recent resource for parents is The Honest Truth leaflet which is given to young driver and parents by driving instructors. The leaflets highlight key messages; including the use of mobile phones when driving, drink driving, wearing seatbelts, distractions, driving after taking drugs, speed, anti social driving and insurance. However, the leaflets have not been evaluated for their effectiveness in changing young driver’s safe driving behaviours.

There is evidence that peer education may have some benefits in terms of road safety education. A practical child pedestrian programme found that peers trained in small groups showed increased skills level and capacity to explain judgements compared to those individually treated. Peer education has also been evaluated in other health areas. In a peer-led HIV programme, significant improvements were found in knowledge, peer pressure, self-efficacy and the number of people given condoms. An asthma education programme delivered by year 11 students to year 10 students showed significant improvements in asthma knowledge in both students with asthma and their peers. A peer-led programme was also found to reduce risky sexual behaviours among Turkish University students. However, no differences were found between peer education and teacher education in the proportion of pupils reporting unprotected first heterosexual intercourse by 16 years of age or unwanted pregnancies by 18 years. The advantages of peer trainers are that they can relate to the group and facilitate discussion.
Although some initiatives have shown positive increases in young drivers' knowledge and attitudes to driving, there is limited evidence to show driver education has an effect on reducing road collisions involving young drivers.\textsuperscript{106} Research suggests there are several reasons for this\textsuperscript{107, 108}:

- Short duration of courses
- Focusing on acquiring basic skills
- Using fear appeals without increasing self-efficacy to encourage safe driving
- Promoting safe driving messages that are overwhelmed by other influences on driving behaviour, such as peer pressure
- Not emphasised on critical age and experience related factors
- Few pre-driver programmes are extensively evaluated

This may also reflect gaps between current education design and evidence of effective design. It has been suggested other areas should be explored to reduce young driver collisions, for example, graduated licensing.\textsuperscript{109}

6.2.1 Summary

There is limited evidence to show that driver education initiatives have an effect on reducing road traffic collisions. This may be due to there being gaps between the design of current education initiatives and evidence base demonstrating effective design. However, some show a positive increase in young driver's knowledge and attitudes.

6.2.2 Recommendations

- Initiatives could be designed/altered to include the components that have been shown to be effective; increasing self-efficacy in fear appeals, encouraging self-evaluation and monitoring, and persuasive communication
- Peer-to-peer initiatives could be considered as research suggests this may be an effective method of educating young people

6.3 Enforcement

Law enforcement is responsible for ensuring compliance with laws and regulations intended to promote and maintain road safety. Young men are over-represented in road traffic offences, whilst young women are under-represented, after taking into account rates of exposure.\textsuperscript{110} Research has found young people are more likely to reduce speeding to enforcement related messages than other publicity campaign messages\textsuperscript{111}, suggesting enforcement may be the most effective approach in increasing safe driving behaviour among young people.

6.3.1 Graduated driver license (GDL)

GDL is a three stage approach. Prior to the test there is a learner stage where driving must be supervised at all times, then after passing the test there is an intermediate stage where unsupervised driving is allowed but is limited with restrictions and conditions (passengers, night time driving etc), and an unrestricted stage.\textsuperscript{112} Research suggests GDL is critical for reducing road traffic collisions involving young drivers.\textsuperscript{113, 114, 115, 116, 117} Evaluations of GDL programmes suggest it is an effective way of reducing young driver collisions and that stricter GDL systems, those
incorporating all three stages, result in a higher reduction of young driver collisions than less strict systems.\textsuperscript{118, 119, 120} The reduction of collisions through GDL in other countries has lead road safety professionals in the UK recommending the adoption of the licensing in the UK.\textsuperscript{140}

Some programmes have used aspects from GDL by encouraging young people to sign a behavioural contract, giving them benefits such as price reductions from diving schools, car equipment stores, garages and insurance companies.\textsuperscript{93} Behavioural contracts tend to contain limitations and expectation on driving behaviour and consequences of compliance and non-compliance. Parents that tend to set limits on driving, such as night time and passenger restrictions report teenagers to have less risky driving behaviours.\textsuperscript{94, 95} The main problem is that parents and teenagers often fail to agree on the restrictions and monitoring.\textsuperscript{96} Evidence has shown parental management has important influences on safe driving, however, parents often fail to perceive teens driving as highly risky.\textsuperscript{97} There is a lack of evidence suggesting how effective behavioural contracts may be.

Parent driver agreements have also been used to reduce young driver's exposure to collision risk. The agreements involve both parties negotiating and agreeing on behaviour. These should be flexible and fit individual needs in order to increase young driver's safety. Topics in the young driver section of the agreement include:\textsuperscript{121}:
- Night time driving
- Alcohol and drug use
- Seatbelt usage
- Distractions (mobile phones etc)
- P plates
- Passengers
- Destinations
- What to do in an emergency/collision
- Law enforcement issues

Topics in the parent section of the agreement include:
- Act as role models
- Support and help young driver when gaining experience
- Accept a call for lift with no questions asked at the time
- Review of the agreement

Agreements often include advice for parents on negotiating compliance and rewards and consequences.

Research has identified acceptability of parent driver agreements is generally high and the agreement had an additional benefit of making parents more aware of the risks associated with driving.\textsuperscript{122} These restrictions support GDL by placing restrictions on night time driving and passengers which have been proven to be risk areas for young drivers.\textsuperscript{123} Although there has been limited evaluation of parent/driver agreements the effectiveness of GDL systems suggests these may also be beneficial in reducing young driver collisions.

Although it is beyond the scope of this report to make recommendations for implementing a GDL, certain components of the programme could be incorporated into current systems. Specifically behavioural contracts and parent driver agreements with restrictions on night time driving and passengers are likely to be effective.
6.3.2 In-car technology

Various types of technological safety systems can be installed in vehicles driven by young drivers.\textsuperscript{124, 126, 128, 127} These include technologies that provide assistance to the driving task (e.g. adaptive cruise control, ABS), help raise awareness of risk-related situations (e.g. forward collision warnings), help raise awareness of risk-related conditions of the driver (e.g. drowsiness detection systems), provide the driver with information (e.g. navigation systems, speed alerts), and interfere with actual driving (e.g. emergency braking, intelligent speed adaption). Other technology can provide a systematic record of driving incidences and a periodic report of driving patterns.\textsuperscript{128} This can provide drivers and their parents/guardians with feedback allowing for young drivers to modify their unsafe behaviour and parents/guardians to monitor behaviour. These technologies are often linked to insurance companies to reduce costs for new drivers when safe driving is presented.

Findings from recent studies suggest combining data on young drivers from in-vehicle technology and parental involvement can reduce new driver’s unsafe driving events.\textsuperscript{129, 130, 131, 132} For example, the National Safety Commission found using in vehicle monitoring systems increased teen’s seatbelt use, and reduced stops and starts, speeding and risky behaviours. The changes were most significant when parents were notified of the teens driving behaviours.\textsuperscript{142} These results could reflect that the type of people who put themselves forward for these studies may be safe drivers anyway. The installation of these technologies relies on parents/guardians willingness and involvement. One study conducted interviews with 906 families of young drivers to learn about the views of young drivers and their parents regarding the technology.\textsuperscript{131} The main finding was that parent willingness was high but barriers included monetary costs and imposing upon the young driver’s privacy. The research came up with 5 areas for consideration:

- Parents are more likely to install the technology in the early stages of their son/daughter passing their test; this is when most concern was expressed regarding safety
- Promotion of technology should focus on the financial benefits to combat monetary concerns
- Concerns of confidentiality should be addressed, e.g. the legal implications in the case of a collision
- Installation is likely to be highly dependent on the resources available to parents to guide their son/daughter in safe driving practises
- Young driver privacy issues should be considered

6.3.3 Re-education for young offenders

Evidence suggests collisions are correlated with offences, specifically traffic offences. Research in the UK found that 47% of those involved in road traffic collisions had a PNC (Police National Computer) and/or DVLA (Driver and Vehicle Licensing Agency) offence. Of those with offences 66% had traffic offences, the most frequently recorded being speed limit offences (37%) followed by drink-driving offences. The most frequent general offence of those involved in collisions was violence (17%), followed by theft and handling stolen goods (14%). The highest percentage of traffic offences was found for the 20-24 year age group; 46% compared to an overall average of 30%. 26% of general offences were also committed by this age group, compared to an average of 20%.\textsuperscript{134}
When caught by the police, offending drivers are often faced with a fine, and an offence record (points). This does not however seem to have an all-out deterring effect as speeding, for example, is very common. Some government bodies have therefore turned to further training/education as an alternative to fines. These usually fall into two categories; practical training, which involves on road lessons, and classroom-based education, which involves information and theory. Both types of programme have had mixed evidence of success. Some studies have concluded that such measures are ineffective in reducing subsequent violation frequency and collision involvement\textsuperscript{135, 136, 137} whilst others found such schemes were effective in their aims.\textsuperscript{138, 139} One study differentiated between collision-prevention programmes which seek to foster safe driving practises and recidivism-prevention programmes which encourage lawful driving practises. Results revealed offenders that participated in the recidivism-prevention programmes were involved in significantly fewer collisions and committed fewer violations in the following year than those who attended the collision-prevention programmes. An e-learning course for 665 offending young drivers was evaluated for its effects upon subsequent offences 6 months after the scheme. Significant reductions in number of offences and penalty points were found for the e-learning group, however, this was not the case for drivers who had been fined only, or had taken a more traditional solely class-room based programme.

6.3.4 Summary

Evidence suggests there are a number of methods to enforce safe driving in young drivers. The reduction of collisions through GDL in other countries has lead road safety professionals in the UK recommending the adoption of the licensing in the UK. Aspects of GDL could be encouraged through behavioural contracts or parent/driver agreements. Research also suggests in-car technology may be beneficial in increasing safe driving for young drivers. Evidence points to education for offenders being more effective in reducing future risky driving, compared to traditional points or fines.

6.3.5 Recommendations

- Parents could be involved in young driver initiatives as research suggests parental management has important influences on safe driving
- Parent driver agreements could be developed and negotiated which indicate promises about driving behaviour. These could focus on the main risky factors related to young drivers such as, night time driving and number of passengers
- Parents and drivers awareness of in-vehicle monitoring, the financial benefits, the resources available and the link with safer driving could be increased to encourage installation
- Initiatives could target those with previous offences as collisions have been shown to be linked to previous offences, both traffic and general
- Further research could investigate the effects of e-learning offender courses on future offences and road traffic collisions
7. References

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