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Impact Evaluation of the National Speed Awareness Course

Final Report

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Table 1.1: Glossary

Acronym	Definition
ACPO	Association of Chief Police Officers
DfT	Department for Transport
DVLA	Driver and Vehicle Licensing Agency
FPN	Fixed Penalty Notice
NDIS	National Driver Improvement Scheme
NDORS	National Driver Offender Retraining Scheme
NPCC	National Police Chiefs' Council (formerly ACPO)
NSAC	National Speed Awareness Course
NTS	National Travel Survey
RDD	Regression Discontinuity Design
VRM	Vehicle Registration Mark
Concept	**Definition**
Reoffending	For the purpose of this study, reoffending refers to subsequent speed related offences after the first offence recorded for a driver.
Reoffences	Reoffences refer to each individual offence committed after the first offence recorded for a driver.

Executive summary

Ipsos MORI (in association with George Barrett) and the Institute for Transport Studies the University of Leeds were commissioned by the Department for Transport to undertake an assessment of the effects of the National Speed Awareness Course (NSAC) on the subsequent speed reoffending of participants. This executive summary summarises the key findings from the evaluation.

The National Speed Awareness Course

The National Speed Awareness Course is offered by nearly all police forces in England and Wales and provides eligible offending drivers with a short course of retraining as an alternative to punishment for low-level speeding offences. It has the primary objective of encouraging and facilitating compliance with speed limits. The course aims to influence the attitudes and behaviour of drivers by directly challenging attitudes towards speeding, offering motorists insight, awareness and understanding about their speed choices, and helps equip participants to change their behaviour. Improved compliance with speed limits is expected to lead to further benefits for individuals and society as the literature establishes a link between higher speeds and more frequent/severe accidents[1]. As such, while the NSAC was not designed to reduce the incidence of collisions, participation in the course may lead to indirect road safety benefits of this nature. The national scheme was established in 2007 with the number of course participants increasing to just under 1.2 million in 2017.

Evaluation Methodology

The effects of the course were tested using records of speed offending data made available by 13 police forces in England for the period from 2012 to 2017. The data was provided for 2.2 million drivers, of whom 1.4 million had accepted an offer to participate in the NSAC. Records of offending were matched to driver licence details, information on injury accidents and course provision details by the Driver and Vehicle Licensing Agency (DVLA). A series of analyses were carried out using two comparison groups to give greater confidence in the findings. The first group comprised drivers who were offered the course but did not accept the offer, and the second was composed of drivers who were detected at speeds marginally above the upper threshold for a course offer as recommended in NPCC guidance[2].

What impact has the course had on reoffending?

The results of the evaluation indicated that participation in the NSAC was more effective at reducing speed reoffending than a FPN (comprising a fine and penalty points) over a period of 3 years following the initial offer to attend (the data available did not permit an assessment of the effects of the course beyond three years). This result was obtained using a variety of analytical approaches[3] giving greater confidence that differences in reoffending rates are due to participation in the course rather than other factors (such as differences in the attitudes or characteristics of those who do and do not take the course).

[1] See for example: Taylor, M., Lynam, D., Baruya, A. (2000). The effects of drivers' speed on the frequency of road accidents. Department of the Environment, Transport and the Regions. Available at: https://trl.co.uk/sites/default/files/TRL421.pdf; Tang, C., K. (2017). Do Speed Cameras Save Lives?. SERC, London School of Economics. Available at: http://www.spatialeconomics.ac.uk/textonly/SERC/publications/download/sercdp0221.pdf

[2] These thresholds reflect ACPO Speed Enforcement Policy Guidelines 2011-2015: Joining Forces for Safer Roads. Available from http://library.college.police.uk/docs/appref/ACPO-Speed-Enforcement-Guidance.pdf (Accessed: March 2018)

[3] The first approach to data analysis compared drivers accepting a course to those declining and controlled for the characteristics of drivers in standard regression analysis. Propensity score matching was used to validate these findings. The third approach exploited the national guidance to implement a Regression Discontinuity Design whilst a fourth analysis made use of an Instrumental Variables method. Detail on the analytical approaches can be found in the main report and technical details can be found in Annex A.

An overview of the findings is set out in the following table. The findings also suggested that the effects of the course were greater among those drivers who had held a licence for a longer period of time.

Table 1.2: Effects of Participating in the NSAC on Reoffending – Summary of Results

Time elapsed since the offer to participate in NSAC	Estimated reduction in the rate of reoffending[4] as result of participating in NSAC	Estimated reduction in the number of reoffences as a result of participating in NSAC
6 months	12-23%	13-23%
1 year	9-17%	11-17%
2 years	9-11%	9-12%
3 years	6-13%	6-18%

Source: Ipsos MORI analysis

What impact did the course have in reducing the number and severity of collisions?

The data gathered for the evaluation suggested that drivers who were more likely to reoffend were also more likely to be involved in a collision. However, this study did not find that participation in NSAC had a statistically significant effect on the number or severity of injury collisions (though some results were on the border of statistical significance) relative to a Fixed Penalty Notice. The data showed that injury collisions were rare amongst both participants and non-participants in NSAC, and despite the large number of drivers included in the sample for this research, the numbers of collisions available for analysis was too small to draw definitive conclusions. Given the observed relationship between reoffending rates and collision rates, and other research showing that greater compliance with speed limits reduces collision rates, it is considered probable that the participation in NSAC has positive road safety effects that could not be demonstrated due to the low statistical power of these sets of analyses.

Conclusions

The findings from this evaluation showed that participation in the National Speed Awareness Course has a larger effect in reducing speed reoffending than the penalty points and fine associated with Fixed Penalty Notices for the types of driver offered the course. As far as it is possible to assess within the constraints of the available data, these effects can be interpreted as a causal effect of the course rather than a result of differences between drivers who participated in the course compared with those who did not complete one. These effects appeared to persist for as long as it is possible to assess with the data available (i.e. 3 years).

Although this evaluation did not demonstrate a statistically significant impact on the likelihood of involvement in an injury collision (relative to a Fixed Penalty Notice), it did suggest that further research into this aspect may be beneficial if a sufficiently large sample of participants can be secured (a national study may be required to reach a definitive conclusion). The findings also showed that non-compliance with speed limits after an offence and the likelihood of involvement in an injury collision are correlated – groups of drivers that were most likely to reoffend were also those most likely to have been involved in an injury collision reported to the police. As NSAC has been found to reduce the reoffending rate (and other

[4] These reductions should be interpreted as the percentage reduction in the reoffending rate for course participants compared to the comparison group e.g. The reoffending rate for course participants after 3 years is 21 percent, a 10 percent reduction would imply that this reoffending rate would otherwise have been 23.3 percent.

studies show that greater speed limit compliance reduces collisions), it may be reasonable to anticipate that participation in the course also encourages and facilitates safer driving behaviour generally, indirectly reducing the injury collision risk.

1 Introduction

Ipsos MORI (in association with George Barrett) and the Institute for Transport Studies, University of Leeds were commissioned to undertake an assessment of the effects of the National Speed Awareness Course (NSAC) by the Department for Transport (DfT) in March 2015. This report sets out the findings of the study, which explores the effects of participating in the course in reducing speed reoffending and the likelihood that course participants are subsequently involved in injury collisions reported to the police[5].

1.1 Evaluation Aims and Objectives

The overall aims of the evaluation were to assess the impact of NSAC on:

- Reoffending and reconviction rates for speed offences; and
- Road safety outcomes including collision involvement and severity.

The primary focus of this evaluation was the assessment of the effects of the course on speed reoffending. Secondary objectives of this study included exploration of the intentions and attitudes to speed of drivers (e.g. acceptance of the legitimacy of speed legislation and enforcement) and their understanding and knowledge of speed limits. Additionally, the study aimed to develop an evaluation methodology that could be suitable for future evaluations of the NSAC and transferable to the evaluation of other National Driver Retraining Scheme (NDORS) driver retraining schemes.

1.2 Methodology

Evidence to support the evaluation and to assess the impact of the course was collected using the following methods:

- Data assembly - The evaluation involved the creation of a large dataset bringing together records of speed and other driving offences associated with 2.2 million drivers who were detected driving at speeds faster than statutory limits in 13 police force areas[6] between 2012 and 2017. These police forces volunteered to take part in the study following an invitation to all 41 forces offering the course and together they cover a range of metropolitan and rural regions in England, with the majority having adopted the NSAC before September 2009. These offence and offender details were then linked to records held by the Department for Transport describing injury collisions reported to the police.
- Statistical analysis - Statistical analyses exploring the effects of the course were completed. These analyses were based upon comparing the subsequent speed offending of individuals participating in the course to both those who were offered the course but either did not accept the offer or failed to complete a course so would then have received an FPN, and to those detected at speeds slightly above the maximum threshold speed for making a course offer

[5] An impact evaluation sets out to answer the question of what difference a policy has made in relation to its outcomes. This includes an assessment of the extent to which changes in the outcomes can be attributed to the policy. A fuller description of what this means in practice can be found in the Magenta Book. See: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220542/magenta_book_combined.pdf

[6] The 13 police forces were: Hampshire Constabulary, Thames Valley Police, Greater Manchester Police, Gloucestershire Constabulary, South Yorkshire Police, Hertfordshire Constabulary, Bedfordshire Police, Cambridgeshire Constabulary, Northamptonshire, Merseyside Police, West Mercia Police, Warwickshire Police and Staffordshire Police.

recommended in guidance prepared by the National Police Chiefs' Council (NPCC)[7]. This report focuses on reporting the findings of these analyses. A detailed report on the methodology used is set out in Annex A.

As part of the evaluation, interviews with a group of 15 stakeholders involved in the design, administration and delivery of the course were completed alongside 15 in-depth interviews with individuals that had participated in the National Speed Awareness Course between September and October 2017. The purpose of these interviews was to provide supporting evidence for the statistical analysis described and to explore the secondary objectives mentioned in section 1.1 above. Detailed findings from these interviews are not reported in the main body of this report but are provided separately in Annex B and summarised in section 2.5.

1.3 Data used

The evaluation was based on records of speed offending associated with drivers detected at speeds faster than the statutory limit between April 2012 and April 2017 across a total of 13 police forces that volunteered to participate in the study. Data from four key datasets were linked and utilised in the analysis:

1. PentiP (police forces): The PentiP database contains records of all speed offending across the 43 police Forces and formed the core data for analysis. Information on each offence and the course offers made by a police force were extracted by a third-party data processor before being sent to the Driver and Vehicle Licensing Agency (DVLA). Some information on the individual characteristics of drivers were included for the purpose of matching drivers between sources of data[8].

2. Drivers90 (DVLA): Driving licence records for the individuals included in the PentiP extract were then matched by the DVLA using their driver licence number to give their complete offending record for the period from April 2012 to April 2017. The Drivers90 data contains complete records of each driver's licence status, when the licence was first issued and past motoring convictions.

3. STATS19 (DfT): DfT records of collisions involving an injury that were reported to the police were then extracted by the DfT and sent to the DVLA to be matched with the combined PentiP and Drivers90 dataset. These records capture the Vehicle Registration Mark (though not the license number of the driver) which was used to identify drivers included in the PentiP or Drivers90[9].

4. NSAC provision data (compiled by Ipsos MORI): NDORS records on the locations at which courses were held and the price charged in each police force area were compiled into a panel dataset by Ipsos MORI. Records were matched to the full dataset using the home postcode. The distance from a driver's home postcode to the nearest course location postcode was calculated.

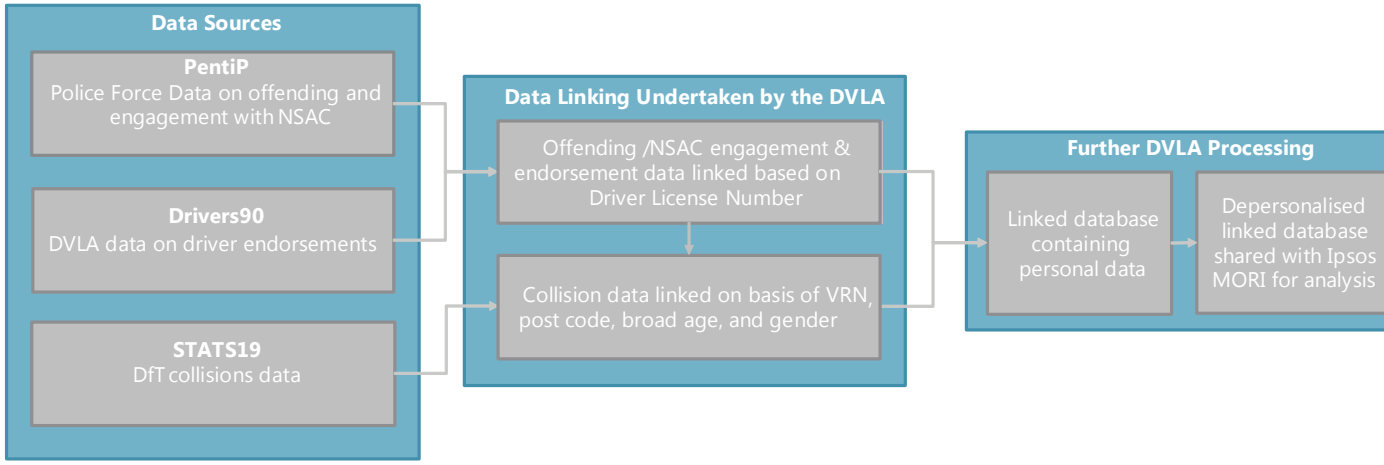
[7] While the decision to offer an individual the opportunity to participate in a speed awareness course is at the discretion of the police force where detected, the guidance does not recommend a course offer for those detected at speeds in excess of 10 percent of the statutory limit plus 9mph. Moreover, drivers are ineligible if they have completed an NSAC within the previous three years. Copy of the guidelines available at: http://library.college.police.uk/docs/appref/ACPO-Speed-Enforcement-Guidance.pdf (Accessed: March 2018)

[8] This included, date of birth, gender and postcode.

[9] It was not possible to ascertain that the driver matched to the vehicle is one and the same across all datasets and there is no presumption that the driver was at fault or that speed was a contributory factor in the collision.

All variables marked as personal data, including gender, age and home postcode, were then removed from the data by DVLA before being transferred to Ipsos MORI via the DfT[10]. This was done to ensure the compliance of the project with the data protection agreements and reflects the importance of data confidentiality to the project.

Figure 1.1: Data sources and linking process



Source: Ipsos MORI

The final dataset contained records of 2,712,057 separate driving offences between April 2012 and April 2017 associated with a total of 2,288,456 individual drivers. In addition, the dataset contained information on the offence details for each offence, years holding a valid licence for each driver and total 'live' penalty points on the licence at the time of each offence. The final dataset did not contain any data identified as personal. Further details on the data sources and data linking process are provided within Annex A.

1.4 Structure of this report

The remainder of this report is structured as follows:

- Section 2 provides an overview of the National Speed Awareness Course and its anticipated outcomes.
- Section 3 presents the findings from the statistical analysis of reoffending.
- Section 4 presents the findings from the statistical analysis of collisions.
- Section 5 sets out a brief overview of the costs and benefits of the NSAC.
- Section 6 sets out the conclusions of the analysis and discusses recommendations for the delivery of future NDORS programme evaluations.

Annexes A & B set out the detail of the statistical analysis and the discussion of the qualitative findings respectively. Annex C presents a more detailed description of the cost/benefit analysis.

[10] For more detail see table 1.1 and section 1.2 of Annex A

2 What is the National Speed Awareness Course?

This section provides a summary of the context in which the National Speed Awareness Course (NSAC) emerged, the operation of the course, and an exploration of the desired outcomes from participation in the course.

2.1 National Speed Awareness Course

The idea of introducing a national course to educate drivers detected at speeds above statutory limits can be traced back as far as the 1988 Road Traffic Law Review Report[11]. The possibility of retraining as an alternative to the use of Fixed Penalty Notices (FPN) gained traction during the 1990s as the widespread adoption of fixed speed cameras by police forces and local authority road safety departments led to an increase in the number of motorists being prosecuted for speeding offences. While majority opinion was positive, increasing public dissatisfaction with the prosecution of motorists who were close to the speed limit gave further momentum to the introduction of driver retraining schemes as an alternative to penalty points[12].

The diverse and local ad-hoc speed awareness courses that developed in some police force areas were brought together under one banner in 2007 by the Association of Chief Police Officers (ACPO) to form the National Speed Awareness Course (NSAC). In total, 24 police forces were delivering the National Speed Awareness Course by September 2009. This has now expanded to include 41 of the 43 forces in England and Wales with the exceptions being Dorset, which offers a speed awareness course that differs from the national model, and Wiltshire which did not offer a course at the time of writing.

2.1.1 What are the aims and objectives of the NSAC?

The National Speed Awareness Course provides driver retraining as an alternative to punishment for low-level speeding offences. Its primary and secondary objectives are to:

- Encourage compliance with speed limits: The primary objective of the course is to equip participating drivers with a better understanding and awareness of the benefits associated with speed limit compliance and the consequences of speeding, as well as enhancing their knowledge of speed limits. Its aim is to produce similar effects on compliance with speed limits as sanctions in the form of penalty points.

- Maintain public acceptance of the speed limit enforcement regime: A secondary objective of the NSAC discussed by several stakeholders interviewed as part of the study is to maintain public acceptance and perceived legitimacy of the speed limit enforcement regime. While support for speed cameras has always been generally strong among the public and continues to be so,[13] a minority were not in favour of the introduction of speed cameras and the resulting rise in the number of prosecutions of motorists driving close to (but above) the speed limit[14]. The course was seen

[11] Department for Transport/Home Office. 1988. *Road traffic law review report*. London: HMSO

[12] For a discussion of the causal relationship here see Wells, H. (2012) *Fast and Furious, Drivers, Speed Cameras and Control in a Risk Society (Human Factors in Road and Rail Transport), Ashgate; New edition (1 Jan. 2012)*

[13] See for example, Department for Transport (2017). *British Social Attitudes Survey 2016: Public attitudes towards transport*. London.

[14] This was suggested by stakeholders and is identified in Wells, 2012.

by several stakeholders as a more acceptable way to deal with certain speeding offences, particularly where a low-level traffic violation did not – in the police view – warrant prosecution in the public interest.

2.1.2 How is the NSAC administered?

The NSAC is offered at the discretion of the Chief Constable in each local police force area to motorists who have been detected driving in excess of the speed limit and no faster than 10% plus 9mph above the limit[15]. Motorists attending a speed awareness course in the three years prior to the new offence are not eligible. Drivers exceeding the speed limit in 20 mph areas are eligible for participation in a separate NSAC designed for drivers detected in 20mph zones but police forces also have discretion regarding to whom the course offer is extended – and will consider specifics relating to each individual offence. For example, a course offer may not be extended to a motorist detected at speeds within the criteria above but in a particularly dangerous location, such as by the gates to a school. Similarly, drivers detected above the motorway speed limit are eligible for the separate NSAC designed for exceeding the 70-mph limit, again subject to the Chief Constable's discretion.

Table 2.1: Eligibility for the National Speed Awareness Course at different speed limits (mph)

	Device tolerance	Fixed penalty when education is not appropriate	Speed awareness if appropriate	Summons in all other cases and above
20 mph limit	22	24	24-31[16]	35
30 mph limit	32	35	35 – 42	50
40 mph limit	42	46	46 – 53	66
50 mph limit	52	57	57 – 64	76
60 mph limit	62	68	68 – 75	86
70 mph limit	73	79	79 – 86[17]	96

Source: ACPO (2013) ACPO Speed Enforcement Policy Guidelines 2011-2015: Joining Forces for Safer Roads

2.1.3 Course content

The structure and content of NSAC provision is based on a behavioural model drawing on the work carried out by Fylan et al. (2006) on the predictors of speeding and effective interventions to change driver behaviour[18]. This study explored various models for behaviour and public health intervention, the particular types of drivers who would use excess speed, and which of the beliefs of speeding drivers should be targeted most. The report suggested that behaviour was most strongly guided by intentions, attitude, perceived behavioural control (beliefs about how easy or difficult it was to do something) and self-efficacy (how strongly individuals felt able to do something) - and put forward a delivery model involving group discussion and joint problem-solving to change behaviour[19].

[15] These thresholds reflect ACPO Speed Enforcement Policy Guidelines: Available from http://library.college.police.uk/docs/appref/ACPO-Speed-Enforcement-Guidance.pdf (Accessed: March 2018)

[16] A separate course, NSAC 20, exists for offences detected in 20 mph zones.

[17] Similarly, a separate motorway course exists for offences detected on motorways.

[18] Fylan, F., Hempel, S., Grunfeld, B., Conner, M., Lawton, R. (2006) *Road Safety Research Report Effective Interventions for Speeding Motorists. No. 66,* London: Department for Transport.

[19] Ibid, pp.7

The specification for the National Speed Awareness Course developed in 2011 reflects these messages in its core structure. The course specification confirms that the course units are designed to address all aspects of drivers' thoughts and perceptions about the speed they drive, such as: their motives, their views on risk, their assessment of the consequences and how heavily they weigh their own responsibility. The course specification also clarifies the amount of time required for a course and how it should be used. This includes classroom time of 240 minutes, only 50 minutes of which are taken up with 'presentations' and the remainder (180 minutes) must include 'interactive' teaching, reflecting the recommendations set out in the 2006 report already mentioned. The 'interactive' component covers a range of group discussions, group exercises and individual exercises[20].

2.2 What are the behavioural outcomes that the NSAC hopes to achieve?

The National Speed Awareness Course is intended to produce the following direct changes in driver behaviour which could indirectly lead to wider social benefits:

- Effects on driver behaviour: The design of the National Speed Awareness Course rests on the hypothesis that driver education tackles the negative effects associated with non-compliance with speed limits by improving driver attitudes and behaviour. As set out in the DfT's 2011 Strategic Framework for Road Safety[21], there is a belief that driver education can deliver complementary outcomes to sanctions - whether they focus on deterrence (such as fines and penalty points) or withdrawing driving licences from unsafe motorists. Focus groups delivered by Brainbox Research as part of the 2011 Evaluation of the National Speed Awareness Course (NSAC) provided evidence to support the view that driver education can positively influence behaviour and compliance - identifying three mechanisms through which speed awareness courses influence the attitudes of drivers towards speeding: directly challenging attitudes towards speeding, offering motorists insight and understanding, and equipping participants to make a change[22].

- Road safety and other benefits: The NSAC also has the potential to deliver improvements in overall social welfare by reducing the costs suffered by third parties in the event of collisions. It is important to note that this is not an explicit objective of the course which instead focuses on teaching compliance with the speed limit, rather than collision avoidance. There is, however, a relationship between the failure to comply with the speed limit and the risk of collision - and its severity - which could result in wider social benefits:

  - Higher collision rates: Driving more quickly has been shown to be linked to increased risk of collision (and associated injury risk) [23]. However, a rational and informed motorist will consider the risks to themselves and make an informed decision about their speed behaviour choices (reflecting perhaps their desire to spend less time travelling or other psychological factors) versus the perceived personal risks. They will not necessarily consider the consequences of driving more quickly - and the increased risk of collision (and the associated injury risk) - to others.

[20] National Driver Offender Retraining Scheme: Speed Awareness, Course Specification, pp.15, unpublished

[21] Strategic Framework for Road Safety (2011) Department for Transport. Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/8146/strategicframework.pdf

[22] Brainbox research for ACPO, (2011). Evaluation of the National Speed Awareness Course. London: Brainbox Research. Available at: http://www.roadsafe.com/pool/files/SpeedAwarenessResearch%5B1%5D.pdf

[23] See for example: Taylor, M., Lynam, D., Baruya, A. (2000). The effects of drivers' speed on the frequency of road accidents. Department of the Environment, Transport and the Regions. Available at: https://trl.co.uk/sites/default/files/TRL421.pdf or Richards, D. C. (2010) 'Road Safety Web Publication No. 16: Relationship between Speed and Risk of Fatal Injury: Pedestrians and Car Occupants'

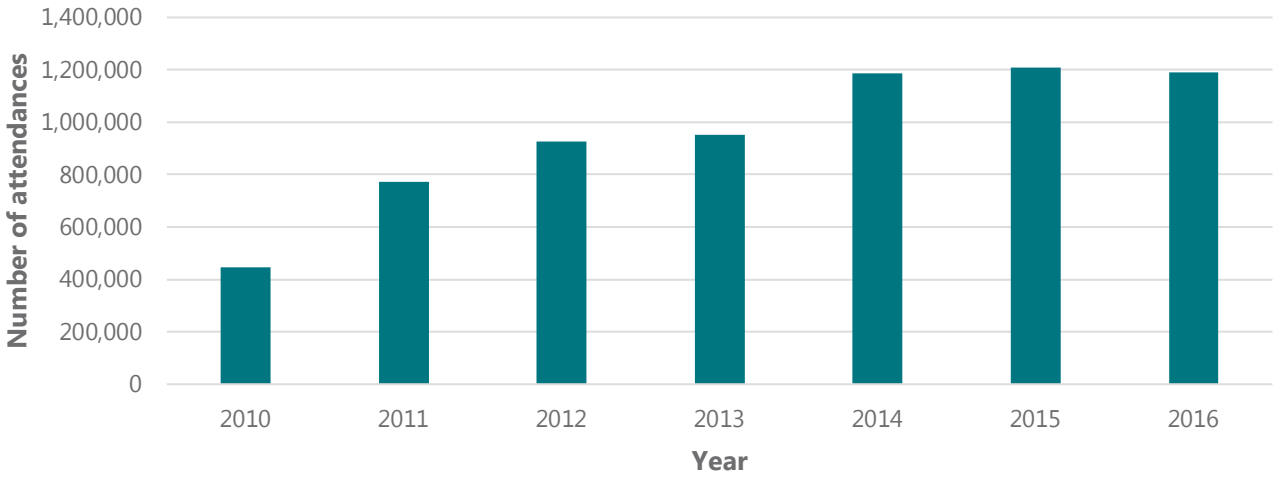
- Other potential benefits: Drivers also do not incur the full costs of their driving choices in relation to pollution, environmental degradation and congestion and there are further potential benefits to be gained from increased compliance with speed limits. Improved compliance may also result in reductions in the public-sector costs involved in the processing of penalty notices or appeals.

Further discussion of the expected outcomes of NSAC can be found in Annex A.

2.3 What are the characteristics of drivers participating in the NSAC?

Participation in the NSAC has increased since 2010 as an increasing number of police forces have adopted the course. NDORS figures available as of December 2017 report a total of more than 6.6m individual attendances at an NSAC session between 2010 and 2016. Participation in the course tripled between 2010 and 2016 as more forces began offering the course.

Figure 2.1: Number of participants in the National Speed Awareness Course, 2010 to 2016



Source: NDORS Trends and Statistics 2017 (https://ndors.org.uk/trends-stats/)

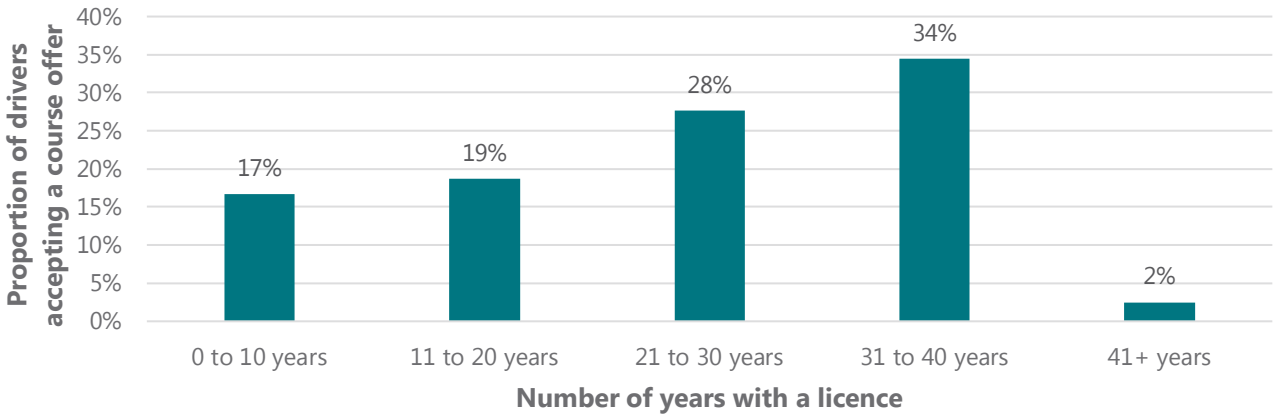
There are no published figures breaking down course attendees by characteristics such as age, gender and location. A previous evaluation of the course in 2011 did collect information on the characteristics of more than 2000 participants taking part in the research. The sample comprised mostly males, accounting for 62 percent of all participants, with drivers having an average age of 47 years. The majority (70 percent) did not have any penalty points on their licence at the time of the offence[24].

The data gathered for this evaluation gave an opportunity to explore a limited range of demographics of course participants, though excluded age and gender, for example, so does not provide a full picture. Moreover, the evaluation only covers 13 police force areas. However, given the rural and metropolitan spread of participating forces and the large samples of driver and offence data gathered from each, there is no reason to think that the results would not apply to other police forces:

[24] Brainbox research for ACPO, (2011). Evaluation of the National Speed Awareness Course. London: Brainbox Research. Available at: http://www.roadsafe.com/pool/files/SpeedAwarenessResearch%5B1%5D.pdf

- Length of time with a licence: On average, participants in the NSAC in the sample of drivers had held a driving licence for 24.6 years at the time they were detected driving at speeds above statutory limits (and 37 percent had held a valid licence for 31 years or more – see figure 2.3 below). If it is assumed that, on average, participants obtained a licence for the first time between the ages of 17 and 25, this would place the average age of participants between 42 and 50 (not dissimilar to the sample achieved in the previous evaluation of the NSAC).

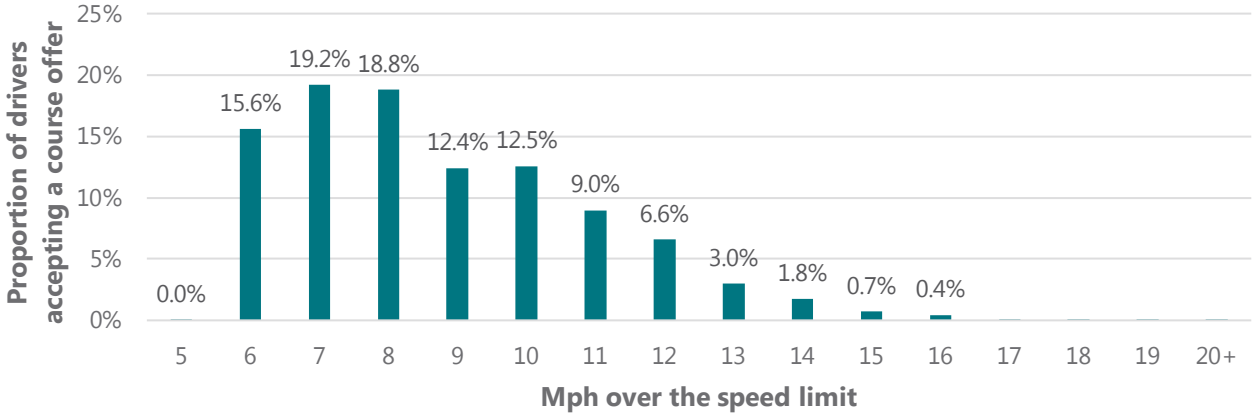
Figure 2.2: NSAC participants by years with a driving licence at the time they were first offered the course



Source: Ipsos MORI analysis

Looking at the vehicle speed at the time of the offence for which participants were offered a place on a course, figure 2.4, shows that 61 percent of drivers were detected travelling at between 35 and 40mph (implying a 30mph statutory limit). Comparing all vehicle speed to the inferred speed limit[25] shows that just over 54 percent of course participants were detected at speeds between 6 and 8 mph over the speed limit.

Figure 2.3: NSAC participants by mph over the inferred speed limit at the time they were first offered the course

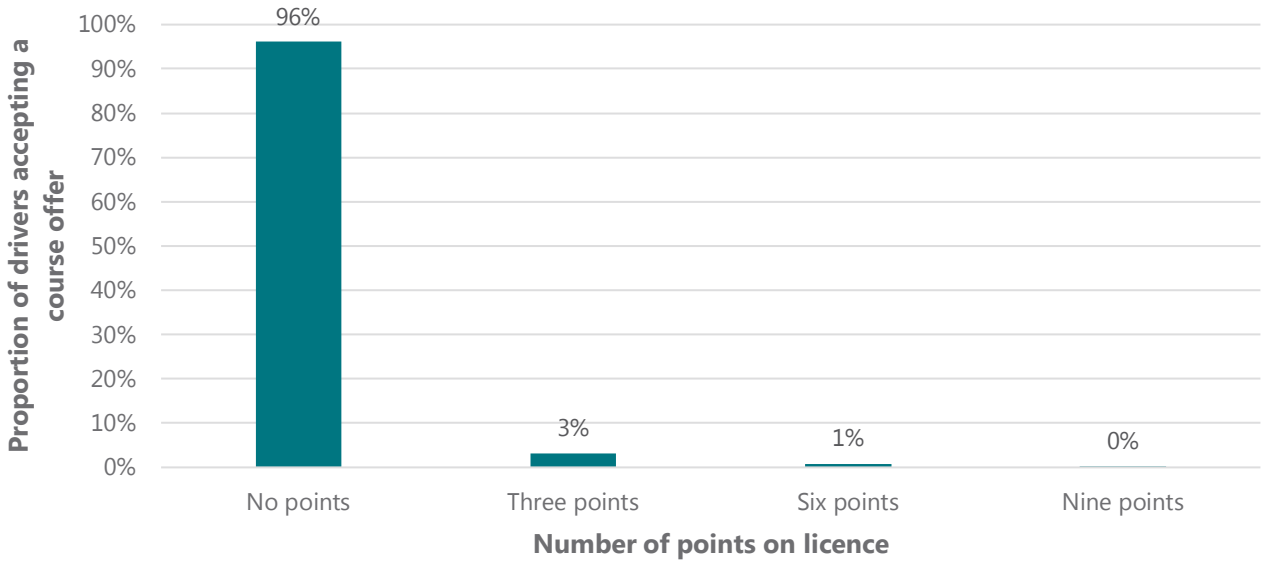


Source: Ipsos MORI analysis

[25] The speed limit relating to a detection was not recorded in the data and was therefore derived using variables identifying whether or not an eligibility check was carried out and the speed the vehicle was travelling. If an eligibility check was carried out it was assumed that the driver was travelling within the speeds set out in the national guidance allowing a unique speed limit to be identified. Where no course eligibility check is present, the next lowest speed limit (30, 40, 50, 60 or 70) for which they would be ineligible for a course was taken as the speed limit.

Figure 2. 4 indicates that most course participants did not have a record of recent speed offending at the time they were offered a place on the course. Ninety-six percent of participants had zero 'live' points on their licence while one percent of the sample had 6 or more points (which differs slightly from the sample achieved in the 2011 evaluation of the course in which 70 percent had no points). This is consistent with the targeting of the course at low level offenders, however it is not entirely clear as to why this sample differs so much from that obtained previously. It is probable that the respondents to the previous evaluation were not representative of the overall population of participants.

Figure 2.4: NSAC participants by the number of 'live' points on licence at the time they were first offered the course



Source: Ipsos MORI analysis

2.4 What does past research tell us about the effectiveness of the NSAC?

As driver retraining schemes as an alternative to prosecution are still relatively new, limited research has been undertaken that explores their effectiveness on compliance with driving law and road safety. Whilst there are studies that provide evidence of the positive effects of interventions that have similar elements to that of the NSAC and provide evidence of improvement to driver safety[26], these primarily provide a rationale for implementation rather than seek to evaluate driver training programmes. Past studies also carry limitations - for example, Edwards' (2003)[27] report on six existing speed awareness courses offered to those marginally over the speed limit focused primarily on the duration of the course, whilst Meadows (2003)[28] evaluated the Lancashire County Council Speed Awareness course but did not include a control group, limiting the extent to which the results observed can be attributed directly to the programme.

There has been one evaluation of a driving retraining programme in the UK that included a control group (the National Driver Improvement Scheme (NDIS) - which focuses on careless driving, rather than speeding specifically)[29]. This scheme

[26] See for example: Department for Transport (2006). Road Safety Research Report No.66: Effective Interventions for Speeding Motorists. Available at: https://www.researchgate.net/profile/Susanne_Hempel/publication/252907631_Effective_Interventions_for_Speeding_Motorists/links/00b49535ffeded73e3000000/Effective-Interventions-for-Speeding-Motorists.pdf

[27] Edwards, I. (2003). Initial analysis of speed questionnaire data. Unpublished report for Association of National Driver Improvement Scheme Providers.

[28] Meadows, M.L. (2003). Evaluation of Lancashire County Council's speed awareness course. Unpublished report.

[29] Department for Transport, (2005), Evaluation of the effectiveness of the National Driver Improvement Scheme. London: DfT. Available at: https://ndors.org.uk/files/6215/0636/0392/No64_evaluationoftheeffectiveness_2005.pdf

consisted of taught classroom sessions on theory followed by on-road practical sessions with an instructor. The evaluation comprised longitudinal surveys of both course attendees and a comparison sample which examined impacts of self-reported driving attitudes and behaviours and a study of on-road driving behaviour. The study found a moderate positive effect of the NDIS on self-reported attitudes and behaviour over 6 and 12 months. However, the results were qualified as observations of on-road driving behaviour by advanced driving instructors did not produce similar results, though samples sizes were small.

The previous evaluation of NSAC mentioned in section 2.3 was completed in 2011 by Brainbox Research[30]. This study involved surveys of course attendees before and after the course, and a follow-up questionnaire to measure how well the course aims were met, including improving knowledge of speed limits and skills in identifying speed limit areas. The evaluation reported positive changes to clients' perceptions of speeding, their attitudes towards speeding and safety, and their behaviours, between both the start and the end of the course, and between the course and the follow up survey three months later. The course challenged perceptions around the advantages of speeding, the danger of the driving environment and the need for speed limits achieving, for example, a reduction in the percentage of participants identifying at least one positive reason for speeding, from 81 percent to 51 percent. Additionally, 99% of participants that responded to the follow-up survey (31% of the total) claimed they had changed their driving behaviour since the course, being more aware of the environment and their speed. The evaluation also suggested experiences differed depending on the type of course attended, with those attending longer sessions with hands-on in-car elements improving more. Again, the absence of a comparison group limits the extent to which these positive findings could be attributed to the course, and the relatively short term nature of the study meant that it was difficult to assess how far effects may decay in the longer term. It may also be expected that respondents to the follow-up survey would have more positive views than non-respondents.

The current study adds considerably to the literature available on the effectiveness on driver retraining programmes by targeting a sample of drivers that is substantially larger than prior studies, explores effects over a longer timeframe, focuses on observed (rather than self-reported) reoffending, and includes two comparison groups of drivers that that did not participate in the course.

2.5 Summary of evidence from stakeholder and participant consultations

As part of this evaluation study, qualitative research was carried out with stakeholders as well as a small number of course participants to gather views on the course's overall effectiveness and its possible effects on driver behaviours, attitudes and offending behaviour. Overall the findings largely aligned with prior research.

- Motivations for accepting a course offer: The views put forward by all stakeholders and those from course participants are very similar in that the overwhelming majority held the view that the avoidance of penalty points and probable increases in insurance premiums are the main reasons drivers choose to accept a course offer. In addition, there was agreement that the avoidance of points was more important for some drivers who rely on a clean licence for their employment.

- Course delivery: Most stakeholders stressed the importance of the behavioural mechanisms underpinning the design of the course and the importance of adhering to the specification to achieve the desired results. The findings from the participant interviews suggest that the course is being delivered in line with the specification.

[30] Brainbox research for ACPO, (2011). Evaluation of the National Speed Awareness Course. London: Brainbox Research. Available at: http://www.roadsafe.com/pool/files/SpeedAwarenessResearch%5B1%5D.pdf

- Effects of participation on attitude and behaviour: Most stakeholders held the view that the course has the potential to result in attitudinal and behavioural changes in participants which may in turn manifest themselves in the form of reduced reoffending, more so than a FPN. The participant interview evidence largely corroborates these perspectives with many examples of changes in behaviour reported by drivers.

- Public perceptions to speed enforcement: From the stakeholder consultations, it was thought that the course would improve public perception of education as an approach to speed enforcement through the positive experiences course participants share with other drivers. Although course participants did not indicate whether or not they had shared their view of the course with other drivers, they did hold overwhelmingly positive views of the course supporting the stakeholders' belief. In addition, course participants and stakeholders agreed that the course was successful in dispelling some pre-conceived beliefs about speed enforcement such as speed camera placement and that it improved/reinforced public acceptability of speed enforcement.

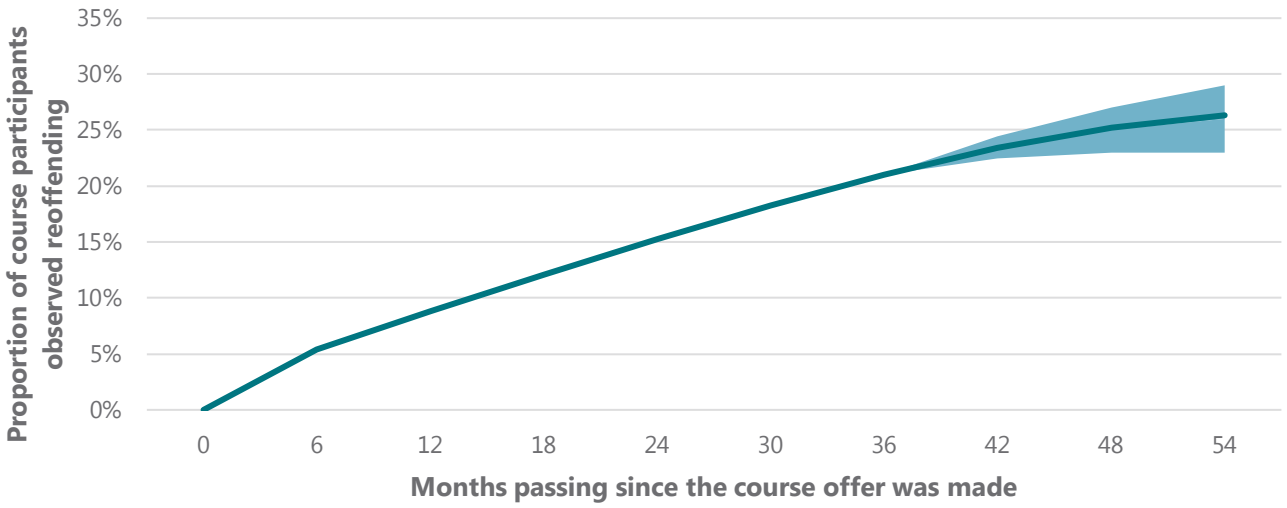
3 What has been the effect of the NSAC on reoffending?

This section of the report provides an assessment of the impact of the National Speed Awareness Course on reoffending. The results set out in this section are based on a set of statistical analyses comparing the subsequent reoffending patterns of course participants with groups of drivers who did not take the course. Further detail on the methodology can be found in Annex A.

3.1 How many drivers participating in the NSAC reoffend?

The data provided to support the evaluation covered just over 1.4m drivers who accepted the course offer the first time they were detected driving at speeds above the statutory limit between April 2012 and April 2017. A total of 13.4 percent (196,000[31]) of these drivers were also detected driving at speeds faster than the statutory speed limit on at least one other subsequent occasion[32]. The following figure shows that the cumulative reoffending rate rises from 5 percent at 6 months following participation in the course to over 21 percent after 36 months. The figure also illustrates the increasing uncertainty with which reoffending is measured after 3 years - drivers appear in the data from the date that they were first offered a course and remain in the sample for a variable amount of time (truncating the sample over longer timeframes). Owing to this uncertainty, the analysis of the effects of the course have been limited to 3 years following the course offer.

Figure 3.1: Percentage of NSAC participants observed reoffending after being offered the course



Source: Ipsos MORI analysis. The shaded area represents the 95% confidence interval for the reoffending rate past 3 years and gets larger over time as the sample size decreases.

[31] All figures rounded to nearest 1,000 unless otherwise stated.

[32] For the purposes of this analysis, reoffending is defined as any instances where a driver was detected driving in excess of any statutory speed limit after the first instance recorded between April 2012 and 2017. This includes occasions where drivers did not accept the offer to participate in a course for the first incident described in the data, but did accept a course offer when they were detected a second (or subsequent) time – which would not appear as an endorsement on their license and would not normally be described as an offence.

3.2 What effect does taking the course have on reoffending?

To provide credible conclusions regarding the impact of the NSAC, it was necessary to identify an appropriate group of individuals who did not participate in the course to assess what might have occurred in its absence (i.e. a comparison group). Such a comparison group should ideally be comprised of drivers who were equivalent to those completing the course in terms of the characteristics that determine future driving behaviour. Two comparisons groups were identified for the purposes of this study – those who were offered a course but did not accept the offer, and those who were detected at speeds marginally higher than the upper threshold recommended in NPCC guidance (both groups of drivers would likely have received a FPN and 3 penalty points):

- Drivers declining a course offer: The reoffending rate of drivers participating in the NSAC was compared to the reoffending rate of drivers who did not accept an offer and would have received a FPN and three penalty points instead. Such comparisons were then augmented to control for observed differences (such as the number 'live' points on their license at the time of the offer) between these drivers and NSAC participants. This removes any effects such characteristics might have on the observed reoffending rate to give an estimate of the causal effect of course participation – though there may be unobserved characteristics of drivers (such as their attitudes) that could also influence their subsequent reoffending.

- Drivers detected at speeds marginally higher than the recommended upper threshold – comparisons between drivers who were detected at speeds slightly below and above the maximum threshold speed recommended for a course offer helps to mitigate against these issues (as both groups of drivers can be assumed to share similar characteristics). However, the findings from this approach cannot be generalised to the population of course participants.

All approaches tested suggested that participation in the NSAC reduces the likelihood and frequency of reoffending relative to taking an FPN and penalty points. This gives greater confidence that reductions in reoffending rates are driven by participation in the course rather than other factors (such as differences between those that accepted and did not accept the course offer).

3.2.1 Comparisons with drivers who did not accept the course offer

The first set of results are based on comparisons between course participants and drivers who were offered a course but did not accept the offer. The latter group comprises drivers declining the course offer and those who did not respond to the offer before the deadline set. In principle, these drivers should be more similar to drivers participating in the course than any comparison group drawn from the general population of drivers as they had also been detected driving at similar speeds in the same police force areas. These drivers received a Fixed Penalty Notice (comprising a fine + three penalty points) and comparisons between these two groups provide a measure of the effectiveness of the NSAC in reducing reoffending relative to a fine and penalty points.

Records were available for just over 192,000 drivers who did not accept the course offer. Just under 30,000 (15.5 percent), were detected reoffending by April 2017 compared to 13.4 percent of course participants, suggesting that the likelihood of reoffending was higher amongst those that did not accept the course offer. As illustrated in the following figure, reoffending rates rise from 7 percent six months after being offered the course to 23 percent after 3 years (compared to 5 and 21 percent for course participants respectively) and were persistently higher than amongst those that had not taken part in the course.

Figure 3.2: Percentage of drivers observed reoffending, NSAC participants and drivers that did not accept the course offer, 2012 to 2017

Source: Ipsos MORI analysis; Error bars indicate 95 percent confidence intervals

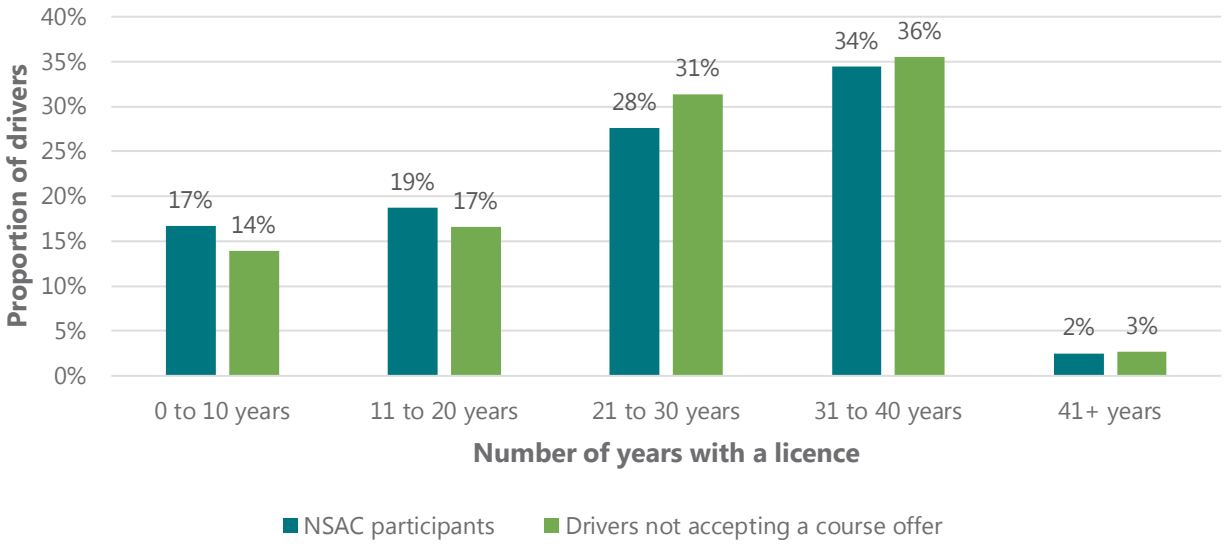
The differences shown in figure 3.2 alone should not be taken as a measure of the effects of the course as they do not allow for the possibility that there may be differences between drivers accepting a course offer and those that did not which may also influence their driving behaviour. For example, the data showed that drivers declining the course were more than twice as likely to have a previous motoring conviction[33], including speed related convictions,[34] on their record prior to being offered the course than course participants which may be indicative of a greater risk-taking attitude towards driving.

On average, course participants had held a licence for a shorter amount of time when compared to drivers declining the offer as shown in figure 3.3. More experienced drivers also appeared to be slightly more likely to decline a course offer. This may in part reflect the larger incentive for younger drivers to avoid receiving penalty points, only needing 6 within the first 2 years of holding a licence to have their licence revoked. Younger drivers also face higher insurance costs increasing the attraction of accepting a course offer when one is made.

[33] See table 1.5 in Annex A

[34] Motoring convictions cover a wider array of offences than just those relating to speeding. They include any offence covered by a motoring code at https://www.gov.uk/penalty-points-endorsements/endorsement-codes-and-penalty-points

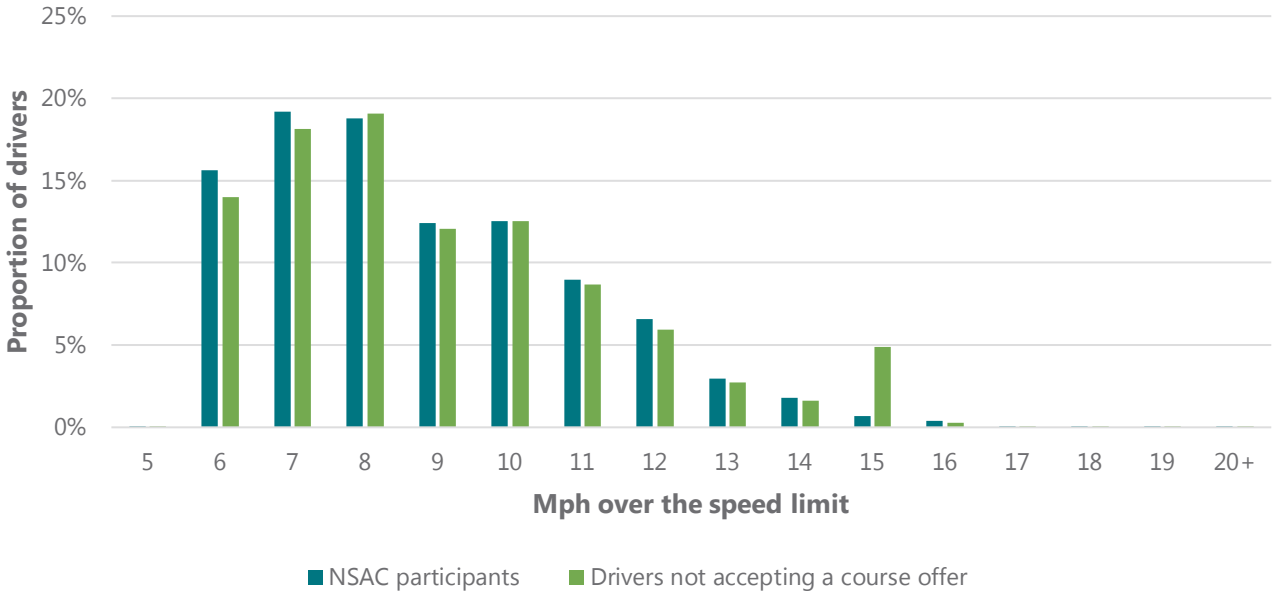
Figure 3.3: Drivers by number of years holding a valid licence



Source: Ipsos MORI analysis

There were few differences between course participants and drivers declining the course in their extent of inferred excess speed above the statutory limit as evidenced in figure 3.4.

Figure 3.4: Drivers by mph over the inferred speed limit at the time they were first offered the course

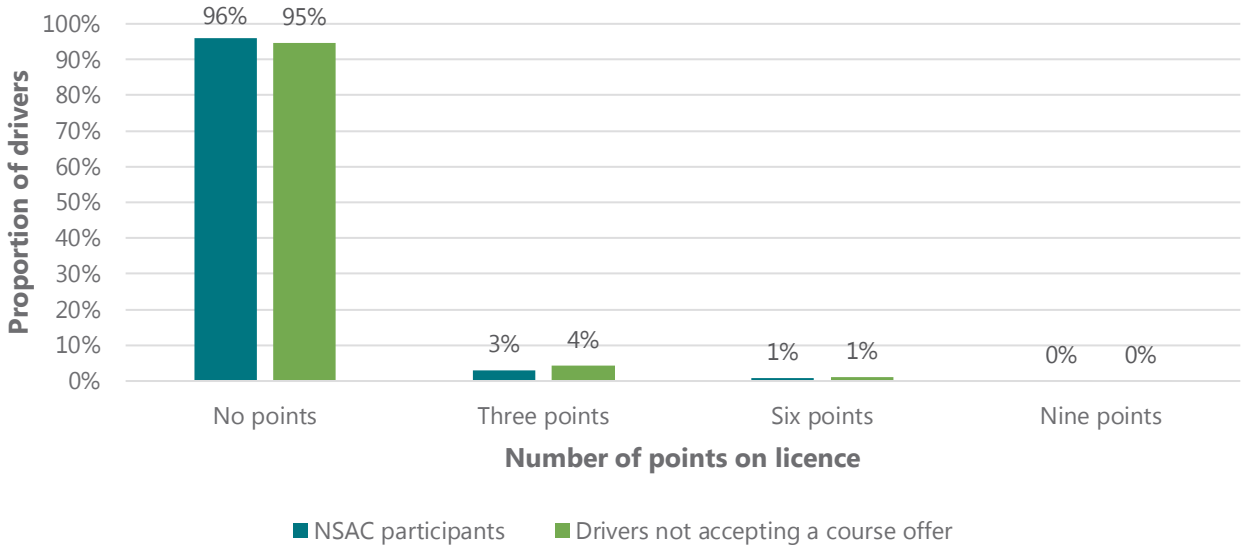


Source: Ipsos MORI analysis

Drivers across the two groups appeared to have a similar number of points on their licence when the course offer was made. Figure 3.5 shows that more than 95 percent of both groups of drivers accepting a course offer and those declining had no live points on their licence. However, drivers declining a course offer were twice as likely to have a prior motoring conviction.

Over 2.7 percent of drivers declining a course had had a motoring offence conviction prior to receiving a course offer compared to just 1.6 percent for drivers who accepted an offer[35].

Figure 3.5: Drivers by number of 'live' points on licence at time of being offered the course



Source: Ipsos MORI Analysis

Controlling for observable differences between drivers

Statistical models were developed that controlled for the differences between those who accepted the course offer and those who did not. The variables that were included were the number of years a driver had held a valid licence, prior motoring convictions, offence type, vehicle speed, distance to nearest course location, price offered at the nearest course location and live points on licence. The findings of these analyses showed:

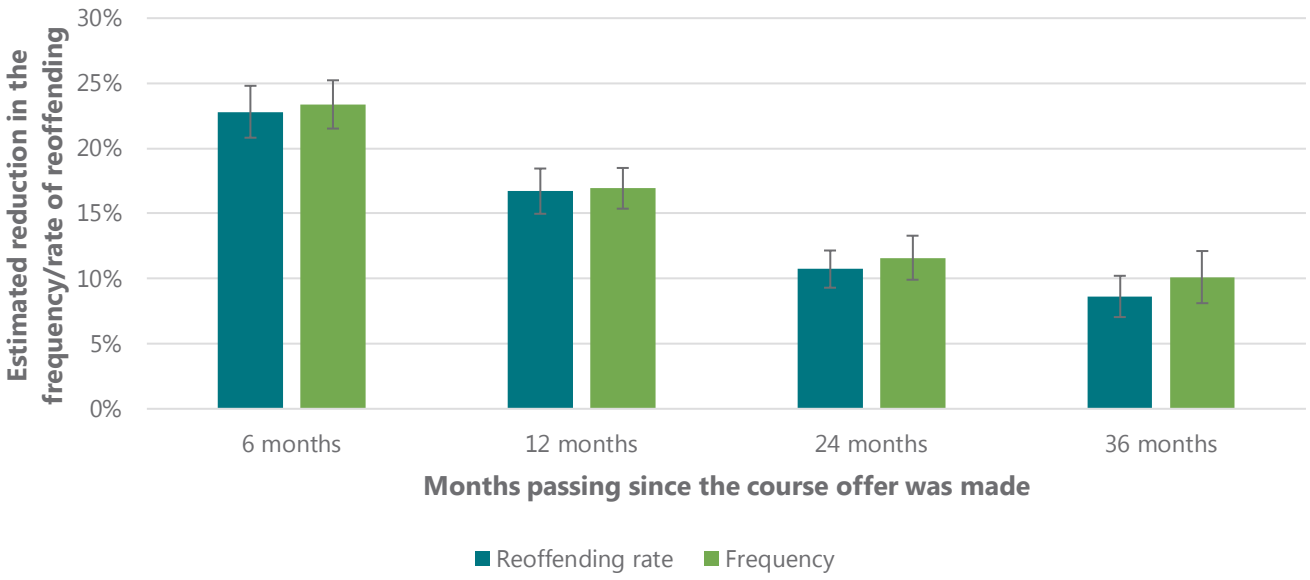
- Likelihood of reoffending: Figure 3.6 below presents the estimated effect of participating in an NSAC on the likelihood that someone is detected reoffending – exceeding a statutory speed limit - compared to someone who did not accept the course offer and therefore received a FPN and penalty points. It was estimated that NSAC participants were 23 percent less likely to be detected reoffending up to six months following receipt of a course offer compared to drivers who did not accept the course offer. This would suggest that 2 percent[36] fewer NSAC participants were detected reoffending following participation than would have been the case in the absence of the course. The size of this effect decreases over time but appears to be persistent, with course participants estimated to be 9 percent less likely to reoffend up to 3 years after receipt of a course offer.

- Frequency of reoffending: The above assessment does not allow for repeat reoffending and further analysis was undertaken comparing the frequency of reoffending by course participants to that of those who did not accept the offer. This gave broadly similar findings, suggesting that, 6 months after receiving a course offer, course participants reoffended on 23 percent fewer occasions and on 10 percent fewer occasions after 3 years (see Figure 3.6).

[35] See table 1.5 in Annex A.

[36] This has been calculated by converting the coefficient obtained in the logistic regression model into a probability of having reoffended for each group of drivers which was then applied to the number of drivers in the relevant group to give the estimated proportion reoffending.

Figure 3.6: Estimated effect of participating in the NSAC on the reoffending rate and frequency of reoffending compared to a Fixed Penalty Notice (while controlling for driver characteristics)



Source: Ipsos MORI analysis; Error bars indicate 95 percent confidence intervals[37]; The effect size can be interpreted as the percentage reduction in the rate of reoffending/frequency of reoffending as a result of NSAC participation over the defined timeframes.

- Impacts of the course by years a licence had been held: The results suggested the course had a larger positive effect on those drivers who were more experienced with every extra year on a participant's licence associated with an additional 0.1% reduction in the likelihood of reoffending. This would seem to suggest that more experienced drivers benefited slightly more from participation.

- Effect of later participation in NSAC: Around 15 percent of drivers who did not accept a course offer subsequently went on to accept a later course offer for a subsequent speeding offence. These 27,000 drivers are included in the comparison group but their behaviour may have been influenced by participating in the course at a later date (resulting in an understatement of the effects of participation in NSAC). However, analyses attempting to accommodate this possibility found no statistically significant effects were evident for later course participation by drivers who did not accept a course offer initially but accepted a later one. This is likely a result of the relatively smaller sample of drivers declining the course offer and then accepting a subsequent offer.

The findings also identified a number of results that apply to both course participants and drivers declining a course offer:

- Drivers with past motoring convictions were 23 percent more likely to be observed reoffending within 6 months of an offer being made than those drivers without a previous conviction and were consistently more likely to reoffend up to 3 years following a course offer.

[37] These indicate the range within which the true value is estimated to lie with 95 percent confidence.

- More experienced drivers are less likely to reoffend in the short term. After six months following an offer, a driver is 0.8 percent less likely to reoffend for every extra year they have held a licence. Up to 12 months following a course offer, this risk falls to 0.6 percent and after 36 months to 0.3 percent.

- Drivers with more points on their licence at the time of receiving the course offer were also more likely to reoffend. This would seem to suggest that the number of points on a driver's licence could be predictive of future driving behaviour. However, the deterrent effect of penalty points on reoffending increases as points rise, with the likelihood of reoffending falling as drivers approach the threshold for licence disqualification (12 points), confirming previous research into the effect of penalty points[38].

The findings presented above were corroborated by findings from a separate exercise that identified a sample of drivers that did not accept a course offer but who were similar to drivers who did[39]. Reoffending behaviour was then compared between the two groups. Estimates from this exercise suggest that course participants are less likely to be observed reoffending than the sample of drivers who did not accept the course offer. This exercise showed a slightly smaller effect of 20 percent over 6 months and 5.5 percent over 3 years when compared to estimates obtained above and it also suggests that the reduction in reoffending reduces over time as the effect of the course wears off.

3.2.2 Comparisons with drivers detected just above the maximum threshold speed

The findings set out above suggest that participation in the National Speed Awareness Course reduced reoffending in comparison with the sanction of penalty points and fine associated with a Fixed Penalty Notice, and that this effect – while reducing with time - persisted over 36 months[40]. However, these results will only provide a reliable measure of the impact of the course if there are no unobserved differences between drivers that influence both their decision to accept the course offer and their subsequent driving behaviour. The data available gave information on only a relatively limited range of characteristics of drivers and no information on their driving attitudes, and there is a risk that failure to control for such factors may mean that the results reported above may overstate or understate the impact of the course.

Another group of analyses was completed to probe the robustness of the findings given this possibility. These analyses were based on comparing participants in the NSAC to drivers detected driving slightly above maximum speed threshold recommended for course eligibility. In general terms, this group of drivers can be expected to differ in systematic ways to those who are offered the course – with driving at these higher speeds likely to be associated with attitudinal and behavioural characteristics that put the drivers involved at higher risk of persistent reoffending. This is borne out in the data supplied for this evaluation, which included records associated with 428,000 drivers who were detected driving at speeds higher than the upper recommended thresholds for course eligibility. The overall reoffending rate associated with this latter group of drivers was 17.4percent (compared to 15.5 percent amongst those who did not accept the course offer and 13.4 percent for course participants).

However, the NPCC guidance provides a basis for identifying groups of drivers who were detected at speeds that were only 'just' lower or higher than these thresholds. While the former group was eligible to participate in the National Speed Awareness Course and the latter was not, it might be assumed that differences between the two groups are random in

[38] Corbett, C., Delmonte, E., Quimby, A. and Grayson, G. (2008). The deterrent effect of penalty points on speeding drivers. *Proceedings of the Behavioural Research in Road Safety, Eighteenth Seminar*, p. 175

[39] This refers to the application of Propensity Score Matching which is detailed further in section 1.5 of Annex A. The comparison sample of drivers were identified based upon the characteristics thought to influence future offending set out in Annex A.

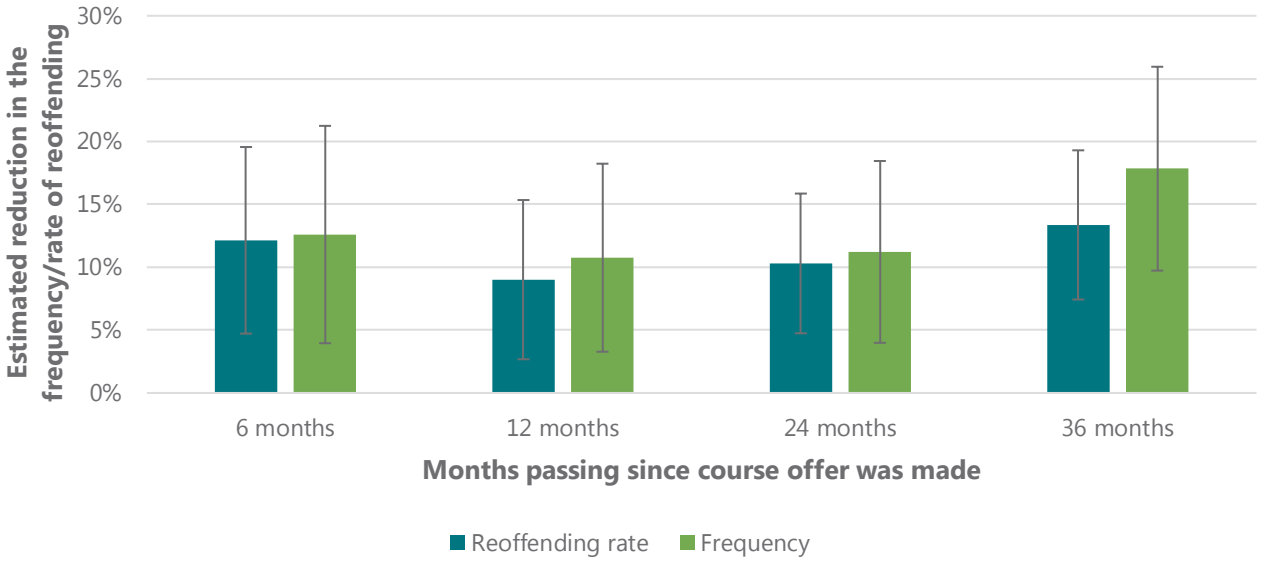
[40] See section 1.6 of Annex A

nature[41]. As such, comparisons between the two groups[42] have the potential to produce highly robust findings[43]. It should be noted that these findings cannot be generalised beyond the group of drivers to which the analysis applied – i.e. those course participants detected at the highest speeds just below the threshold (though the assumption is that this group of participants carry the greatest risk of reoffending).

In applying this approach, the sample of drivers included in the analysis was restricted just to those drivers detected driving at speeds within 3mph of the maximum threshold speed[44]. A range of models was then applied to the data as outlined in Annex A., The most reliable of these allowed for the fact that some drivers detected above the maximum speed recommended for a course offer were offered a course while some under it were not.

The results obtained from these analyses are set out in the following figure and provide general confirmation of the results set out above – that a driver participating in the NSAC is less likely to reoffend than one who has received a Fixed Penalty Notice and that the effect is persistent over time. These more robust findings suggest that the short-term effect of the course for this group of drivers is smaller - reducing the likelihood of reoffending by around 12 percent after six months, compared to 20 to 23 percent suggested by the previous analyses. However, the findings also suggest that the impact of the course is more stable (and may even increase) over time. It should also be noted that the level of uncertainty regarding the size of the impacts of the course is higher with these results.

Figure 3.7: Estimated effect of participating in an NSAC on the reoffending rate and frequency of reoffending compared to drivers detected marginally above maximum threshold speed



Source: Ipsos MORI analysis; Error bars indicate 95 percent confidence intervals; The effect size can be interpreted as the percentage reduction in the rate of reoffending/frequency of reoffending as a result of NSAC participation over the defined timeframes.

[41] There are situations in which this assumption may not hold – for example, if those detected inside the eligibility threshold had greater access to cruise control technology. However, this cannot be tested within the scope of the data available for the study. Tests examining the validity of other assumptions underlying this approach are reported in Annex A.

[42] An approach known as Regression Discontinuity Design.

[43] Approximating the level of robustness associated with a Randomised Control Trial.

[44] Models limiting the sample to just 2 mph can also be found in Annex A

3.2.3 Comparisons between drivers living closer and further away from course delivery locations[45]

The evaluation involved a third set of analyses to test the robustness of findings. As noted above, estimates of the effects of the course might be over or understated if there are differences between drivers who do and do not take the course in factors that influence their future driving behaviour. However, if it is possible to focus on factors that influence the decision to participate in the course but which do not influence future driving, then it is possible to obtain unbiased estimates of the effects of participating in the course[46]. In the context of this study, a driver living further from their nearest course provider would face a higher cost of participating in the course (because of the inconvenience and the travel time involved in attending) and could be expected to be less likely to accept the offer as a result. However, it appears reasonable to assume that distance from the nearest course location will be unlikely to influence their future driving behaviour. As such, comparing drivers who live closer and further away from their nearest course provider has the potential to offer robust estimates of the effects of participating in the course.

Findings from analyses that adopted this approach found similar effects to those described above - with the size of effects apparently declining over time. They suggested that participation in an NSAC reduces the likelihood of reoffending by 21 percent after 6 months, and by 7 percent after 3 years. Similarly, for the frequency of reoffending, we find a reduction of 23 percent after 6 months falling to 8 percent after 3 years.

In principle, these findings should be of equivalent robustness to those set out in the preceding section. However, statistical tests suggested that course price and distance to the nearest course site may have some direct influence on the likelihood of reoffending. On the assumption that those drivers with further to travel are more concentrated in rural areas, this could imply that rural and urban drivers have different attitudes to driving which influences their driving behaviour.

3.3 Disqualifications

One of the aims of the study was to examine the effect of participating in the NSAC on the likelihood of disqualification. However, no drivers included in the dataset provided were disqualified between April 2012 and April 2017 precluding assessment of this element of the logic model.

3.4 Summary

- The findings from this evaluation suggests that among eligible drivers, participation in the National Speed Awareness Course has a larger effect in reducing speed reoffending than the penalty points and fine associated with Fixed Penalty Notices. The same pattern of findings emerged using two different statistical approaches to understand the effects of the course, increasing confidence that the course was the causal factor determining differences in reoffending rates, rather than other factors such as differences between drivers who participate and those who do not.

- The effect of the course also appears to persist over time, with an impact still visible up to three years following initial participation.

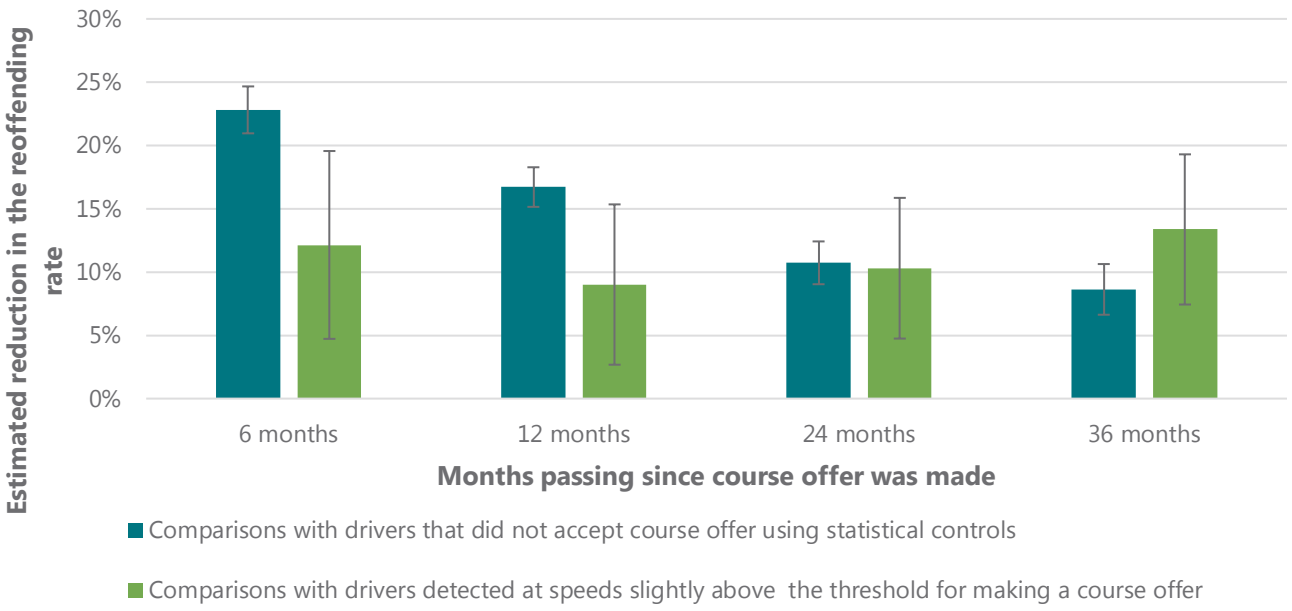
[45] See section 1.6 of Annex A

[46] This refers to the Instrumental Variables approach described in detail in section 1.7 of Annex A.

- There is some uncertainty regarding the size of the impact of the course – particularly in the short term where different approaches to analysis produce varying effect sizes. The figure below summarises the findings across the range of analyses developed through this evaluation.
- The limited information available describing the characteristics of drivers has made it challenging to explore how far the course is equally effective for different groups of drivers, although the findings do indicate that the effect of participation is larger for drivers who have held a licence longer.
- The wider findings of the evaluation also support the results of other studies. Firstly, the present findings suggest that penalty points are increasingly effective at reducing reoffending as the driver accumulates points. Secondly, the findings of the evaluation also confirm that those detected at speeds above the maximum thresholds for course eligibility recommended in NPCC guidance are more likely to reoffend.

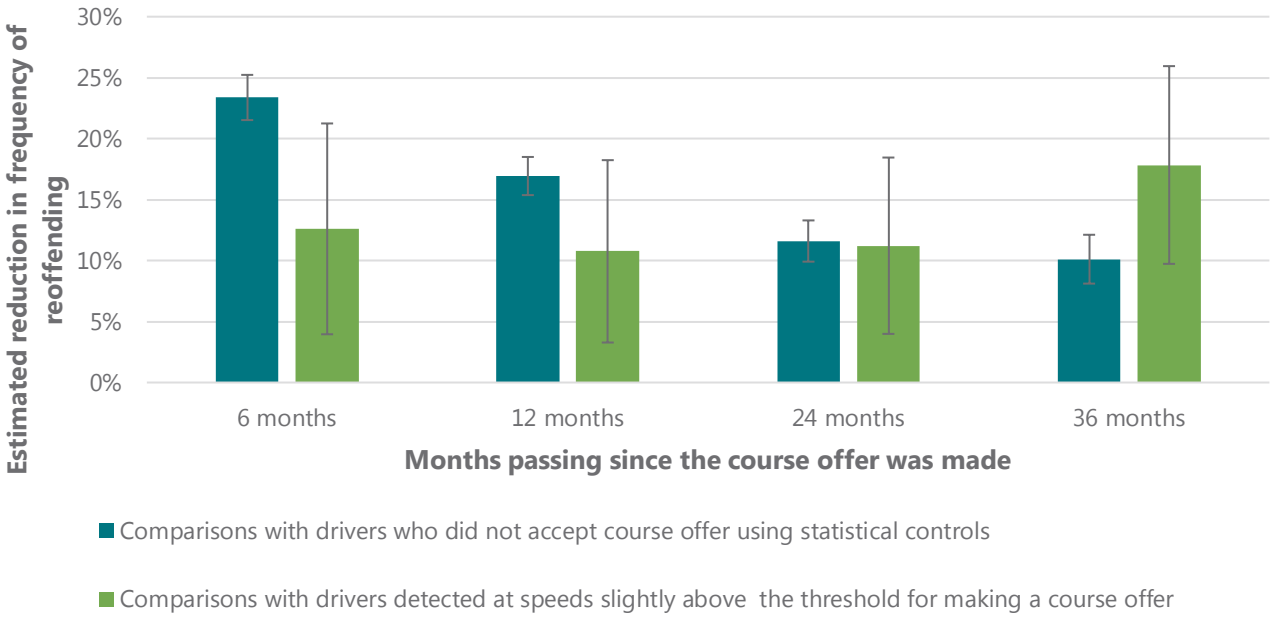
Figure 3.8 and 3.9 graphically illustrate the estimated effect sizes on the likelihood and frequency of reoffending respectively.

Figure 3.8: Estimated range of effects from participating in NSAC on the reoffending rate



Source: Ipsos MORI analysis; Error bars indicate 95 percent confidence intervals; The effect size can be interpreted as the percentage reduction in the rate of reoffending/frequency of reoffending as a result of NSAC participation over the defined timeframes.

Figure 3.9: Estimated range of effects from participating in an NSAC on the frequency of reoffending



Source: Ipsos MORI analysis; Error bars indicate 95 percent confidence intervals; The effect size can be interpreted as the percentage reduction in the rate of reoffending/frequency of reoffending as a result of NSAC participation over the defined timeframes.

4 What has been the effect on collisions?

Although the NSAC has not been designed directly to target a reduction in the number of collisions or the severity of collisions, anticipation of such an indirect effect is plausible given the role of speed in many injury collisions and the content of the course. This section sets out the key findings of an assessment on the effect of participating in an NSAC on collisions that were reported to the police involving physical injury to one or more individuals. This analysis draws on data captured in the Department for Transport's STATS19 database that records the details of individuals involved in injury collisions that were reported by the police.

4.1 How many course participants are involved in collisions?

As described in section 1.3, the DVLA matched drivers' licence details to vehicle registration details to identify any drivers in our sample who were involved in an injury collision since April 2012[47]. Of the 401 collisions recorded in the data, 225 involved NSAC participants. This represents a collision rate of 1.48 collisions per 10,000 drivers in this group – indicating that an injury collision is a highly infrequent event.

These results are likely to understate the true collision rate for the following reasons:

- STATS19 was matched to driver licence details based on the Vehicle Registration Mark and may mean that not all relevant collisions per driver have been captured;
- The data only cover injury collisions reported by the police to STATS19 and this is known to understate the total number of injury collisions. Prior research using National Travel Survey data suggests there are an estimated 2.6 unreported injury collisions[48] per reported injury collision.
- The data exclude any information on the much higher frequency but lower cost minor collisions which do not result in injury.

In addition, it should be noted that STATS19 data does not record blame and contextual detail is absent, meaning that it is not possible to ascertain in exactly what capacity an individual was involved in a collision.

4.1.1 How do course participants compare to other drivers?

Table 4.1 below breaks drivers down into the different groups used in the evaluation - with NSAC participants having the lowest collision rate per 10,000 drivers, with just 1.48 collisions for every 10,000 course participants. Collision rates were also positively correlated with reoffending rates, also shown below, suggesting a relationship between non-compliance with speed limits and injury collision risk.

[47] Injury collisions are defined as accidents in which a person is killed or injured and where the incident was reported to the police. An explanation of how records were linked is set out in Annex A.

[48] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/648081/rrcgb2016-01.pdf

Table 4.1: Recorded injury collisions by driver group

Group	Individual drivers involved in a collision (rate per 10,000 drivers)	Number of collisions (rate per 10,000 drivers)	Reoffending rate
Course participants	216 (1.48)	225 (1.54)	13.4%
Did not attend a course	33 (1.72)	34 (1.77)	15.5%
Detected above maximum threshold for a course offer	77 (1.80)	82 (1.91)	17.4%
Ineligible for course offer	55 (2.72)	60 (2.97)	24.0%
Total	381 (1.67)	401 (1.75)	15.3%

Source: Ipsos MORI analysis

4.2 What effect does taking the course have on collisions?

Analysis of the effect of the NSAC on collision rates (again, relative to a Fixed Penalty Notice) was carried out using similar approaches to those used to explore its effects on reoffending, though statistical modifications were made to account for the highly infrequent nature of the outcome being explored.

4.2.1 Comparisons with drivers declining the offer of the course

Comparisons between drivers accepting and declining the course offer completed similarly to those set out in the preceding chapter did not show that the course had a statistically significant effect on collision rates. However, the estimated effect of the course (a reduction in injury collision risk of just over 14 percent) was close to being significant at the 90 percent level of confidence across several approaches. It is considered a likely possibility that the failure to find a statistically significant effect is driven by the limited number of observations available for these analyses (and a larger sample size would be needed for a definitive result).

4.2.2 Comparisons with drivers caught just above the maximum threshold speed

Comparisons were also made between drivers detected driving at speeds slightly above and below the maximum threshold speeds recommended in NPCC guidance for eligibility for a course offer. These also did not find a statistically significant relationship between course participation and collisions. However, sample size issues are particularly acute for these analyses given that analysis is restricted to drivers detected within a narrow speed band on either side of the maximum recommend threshold speed only.

4.3 Summary

- The findings of the evaluation suggest that non-compliance with speed limits after an offence and the likelihood of involvement in an injury collision are linked, with those groups most likely to reoffend also most likely to have been involved in a reported injury collision. Given the impact of the NSAC in terms of reducing the likelihood of speed reoffending, it may be reasonable to anticipate that course participation also encourages safer driving behaviour in general, indirectly reducing future injury collision risk.

- It has not been possible to demonstrate a statistically significant effect of participation in the NSAC on the likelihood of involvement in injury collisions. Injury collisions happen infrequently and it is considered likely that the failure to

find such an effect was due to the small number of observations available for analysis. There may be benefit in completing further analysis using larger samples of drivers than were available for this study to help explore such a relationship.

5 What are the costs and benefits of the NSAC?

The aims and objectives for this evaluation included an aspiration to provide an assessment of the costs of the NSAC and its associated benefits, primarily in the form of improved road safety. However, there are substantial challenges involved in making a robust assessment, stemming largely from uncertainties regarding the nature of the road safety effects of the course. This uncertainty is due to the following issues:

- The level of confidence associated with the estimates of effects of the course on injury collisions reported to the police (as described in section 4.2) and how long those effects may be expected to endure in the future.
- There is no data available on injury and minor collisions that are not reported to the police, preventing judgements as to how far participation in NSAC reduces the overall number of collisions or reduces their severity.
- A number of the potential benefits of the course cannot be quantified.

In response to these uncertainties, an indicative cost-benefit analysis of the NSAC was prepared to explore the relevant costs and benefits under a variety of scenarios. Full details of the analysis are set out in Annex C, and this section provides an overview of these results and offers some tentative conclusions.

5.1 Costs and Benefits of NSAC

The basis for the cost benefit analysis is set out in section 2.2. The costs and benefits of the course relative to a Fixed Penalty Notice and penalty points determined primarily by the relationship between:

- Additional costs to deliver the course compared to issuing fixed penalties[49];
- Cost savings for the criminal justice system resulting from reduced reoffending; and,
- Costs savings resulting from any reduced collisions (though this was not a direct objective of the NSAC).

As noted in section 2, there may be a range of other benefits associated with improved speed compliance (such as improved flow of vehicles on major roads or reduced carbon emissions) that we have not been able to quantify as part of this evaluation (or cannot be quantified even in principle).

5.2 What are the costs of NSAC provision?

The average cost per participant attending a course is approximately £87.44[50], however this includes a cost recovery element covering the cost to the police force in detection and processing of offenders. This element equated to £35 before

[49] Participants will also incur costs in the form of the time foregone to attend the course. However, as participation in the course is choice made by participants, it can be assumed that they expect to derive a benefit that is at least equal to the costs involved.

[50] As the price of the NSAC varies across the country, and detail regarding the number of course participants paying which prices is unavailable, the total cost has been estimated using an unweighted average of the price charged by all course providers up to July 2017.

September 2017[51]. It is assumed that these costs would also be incurred were the course not offered, and the cost of the NSAC relative to processing a Fixed Penalty Notice is estimated to be £52.44 per participant. This may overstate the net cost of the course, if the Police cost recovery element does not reflect the full administrative costs of processing a Fixed Penalty Notice, including uncaptured elements such as processing license endorsements or opening court proceedings in the event of non-payment[52].

5.3 What are the benefits from NSAC participation?

Estimates of the benefits of the course were estimated over three time periods (3, 5 and 10 years) to reflect the uncertainty regarding long-term persistence. The results of the analysis gave the following ranges for the estimated value of the course:

- Road safety outcomes: The cost savings associated with reduced collisions are estimated at between £56.66 and £91.33 per participant depending on how long the effects of the course are expected to endure. This assessment depends on a number of assumptions regarding the effects of the programme on unreported injury and minor collisions. The assessment also draws on an estimate of the effect of the course on injury collisions that can be accepted at the 89 percent level of confidence but not at the 95 percent level of confidence[53].

- Cost savings for the criminal justice system: Costs savings for the criminal justice system from reduced reoffending are estimated at between £0.66 and £1.26 per participant depending on how long the effects of the course are expected to endure. These cost savings are a relatively trivial component of the overall benefits of the course.

5.4 Conclusions

- The results of the analysis suggest that the cumulative benefits of the NSAC would outweigh its costs after three years. This evaluation found that the effects of NSAC on reoffending last for at least three years, raising confidence that the course is cost-effective. The benefits of the course could exceed its costs by a larger margin if its effects last for longer than three years. However, the data available does not allow a full assessment of how long the course continues to influence driver behaviour.

- There are some key uncertainties around this conclusion, (as outlined in this chapter) and the results should be treated as indicative rather than definitive.

- These uncertainties could be partially resolved with a larger scale national study completed over a longer time period as more drivers would help provide a definitive conclusion regarding NSAC's effects on reported injury collisions. However, this would not help address the issues caused by the unobserved nature of unreported collisions. As such, a definitive economic evaluation of the NSAC is unlikely to be feasible unless a solution to this problem can be found.

[51] The cost recovery element directed to the police force processing the offence rose from £30 to £41 in September 2017. The initial £30 value has been used for this analysis as this was the prevailing rate throughout the time period for which we have data.

[52] It was not possible to identify and published research that sought to measure the administrative costs associated with Fixed Penalty Notices.

[53] This level of significance is commonly used in social sciences as the generally accepted level of confidence required for statistical significance. The findings can be interpreted as providing encouraging pilot results to suggest the course improves road safety outcomes, but a larger study with a larger sample of drivers would be needed to provide a definitive conclusion.

6 Conclusions

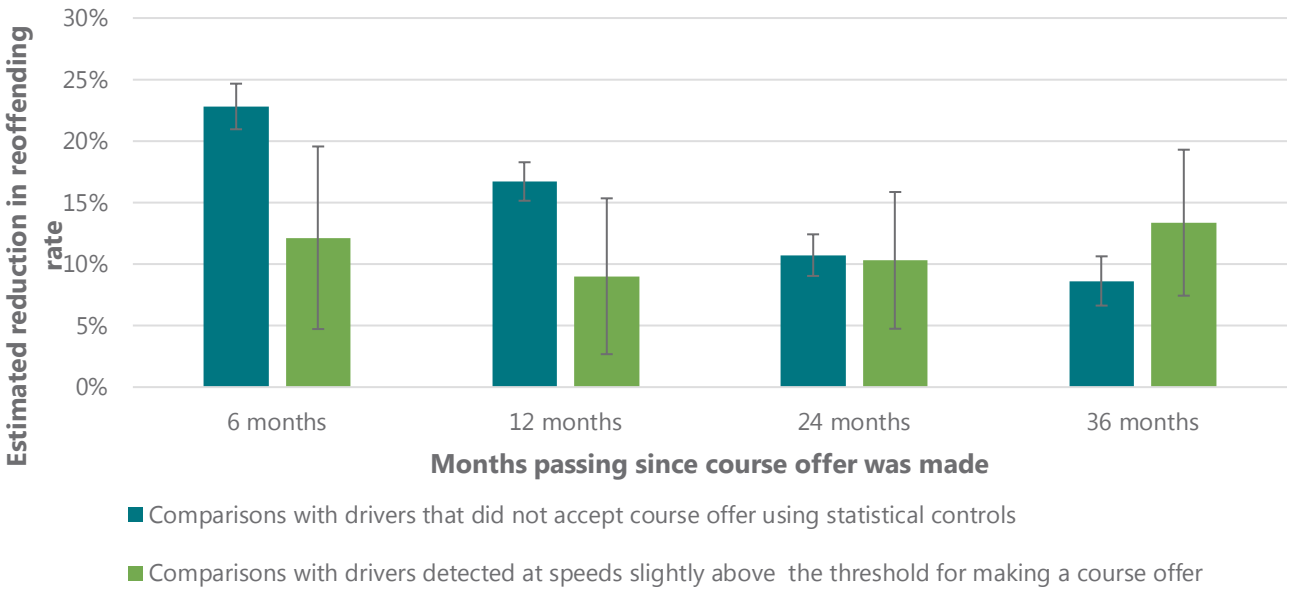
This final chapter of the report draws together the findings from the analysis above and its implications for the NSAC. It ends with an outline of how the methods used in this evaluation can be applied to other similar courses and in particular to other NDORS driver retraining courses.

6.1 What can we conclude about the impact of the NSAC?

Reoffending

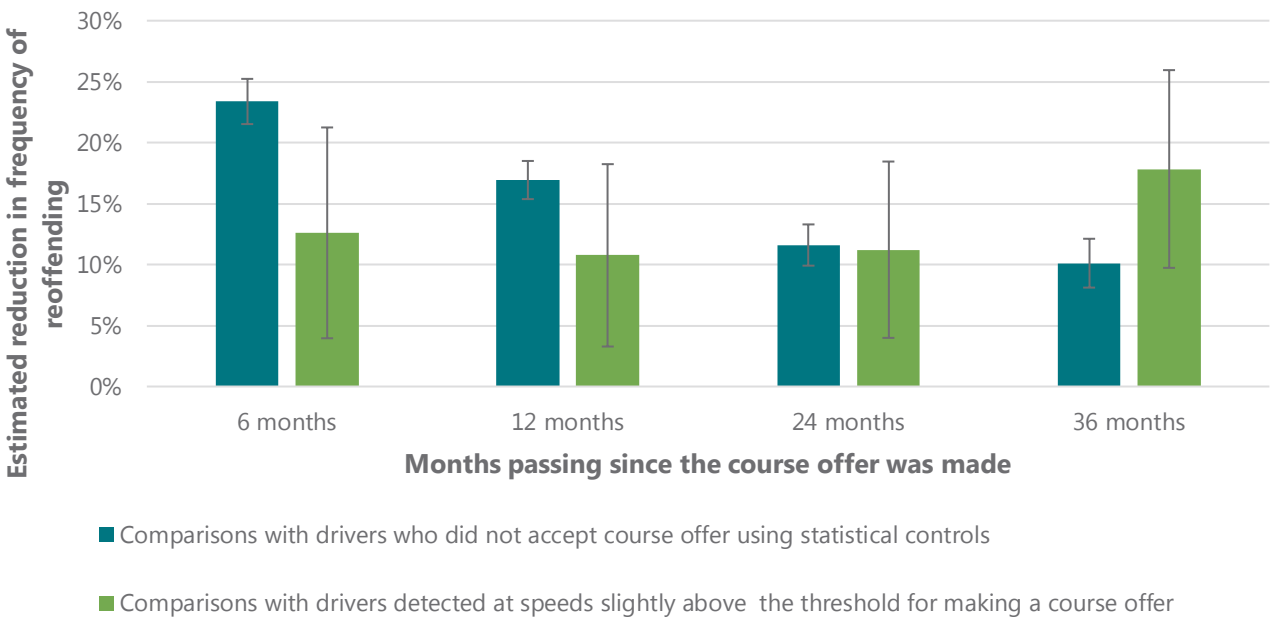
- The findings from this evaluation indicate that participation in the National Speed Awareness Course has a larger effect in reducing speed reoffending than the penalty points and fine associated with Fixed Penalty Notices. As far as it is possible to assess within the constraints of the available data, these effects can be interpreted as a causal effect of the course rather than an effect of differences in the observed and unobserved characteristics of drivers who participate in the course compared with those who do not.
- The effect of the course also appears to persist over time, with an impact still visible up to three years following initial participation (the maximum period over which it was possible to explore the effect of the course).
- There is some uncertainty regarding the size of the impact of the course – particularly in the short term. The most robust findings suggest an impact of a 12 percent reduction on the likelihood of reoffending after 6 months but another analysis suggests an impact of 23 percent over the same period. Figures 6.1 and 6.2 illustrate the uncertainty around the estimates.

Figure 6.1: Estimated range of effects from participating in NSAC on the reoffending rate



Source: Ipsos MORI analysis; Error bars indicate 95 percent confidence intervals; The effect size can be interpreted as the percentage reduction in the rate of reoffending/frequency of reoffending as a result of NSAC participation over the defined timeframes.

Figure 6.2: Estimated range of effects from participating in NSAC on the frequency of reoffending



Source: Ipsos MORI analysis; Error bars indicate 95 percent confidence intervals; The effect size can be interpreted as the percentage reduction in the rate of reoffending/frequency of reoffending as a result of NSAC participation over the defined timeframes.

- The limited information available describing the characteristics of drivers has made it challenging to explore how far the course is equally effective for different groups of drivers, although the findings do indicate a larger effect for drivers who have held a licence longer.

- The wider findings of the evaluation support two results of other studies. Firstly, the present findings suggest that penalty points are increasingly effective at reducing reoffending as the driver accumulates points [54]. Secondly, the findings of the evaluation also confirm that those detected at speeds above the maximum thresholds for course eligibility recommended in NPCC guidance are more likely to reoffend.

Collisions

- The findings of the evaluation suggest that non-compliance with speed limits after an offence and the likelihood of involvement in an injury collision are linked – with those groups most likely to reoffend also most likely to have been involved in an injury collision reported to the police. Given the effect of the NSAC in terms of reducing the likelihood of reoffending, it may be reasonable to anticipate that participation in a course also encourages safer driving behaviour in general, indirectly reducing the risk of injury collision involvement.

- It has not been possible to demonstrate a statistically significant effect of participation in an NSAC on the likelihood of involvement in injury collisions. Such collisions happen infrequently and it is considered likely that the failure to find such an effect resulted from the small number of observations available for analysis. There may be benefits in

[54] Corbett, C., Delmonte, E., Quimby, A. and Grayson, G. (2008). The deterrent effect of penalty points on speeding drivers. *Proceedings of the Behavioural Research in Road Safety, Eighteenth Seminar*, p. 175

completing further analysis using larger samples of drivers than were available for this study to help understand the impact (or otherwise) of the course on road safety.

Further research would be necessary to draw firm conclusions about the impact of the NSAC on the number and severity of injury collisions but findings from this evaluation do, however, suggest that this may be worth pursuing provided a sufficiently large sample can be achieved.

6.2 How can the NSAC and other NDORS courses be evaluated in the future?

A requirement of this evaluation was that the evaluation methodology devised should be suitable for future evaluations of NDORS speed awareness course and be transferable to other NDORS retraining schemes. At present, there are eight NDORS courses outlined on their website, each aimed at a different group of road users but all subject to referral by police forces and at the discretion of each Chief Constable[55]. There are a number of relevant issues to be considered when exploring the options available for evaluating other speed awareness and NDORS courses but some potential options are described below:

1. Comparing drivers who accept a course offer to those who decline: Comparing relevant outcomes, most likely including reoffending, between drivers choosing to accept a course offer and those declining in favour of a FPN and penalty points will be a viable option for evaluation for all courses where drivers face such a choice. A comparison group of drivers that did not accept an offer should be more suitable than one formed from a group of drivers from the general population as they would at least share some characteristics in terms of the reasons for being offered a course. Similar methods to those described in the report above and in Annex A could be used to control for observed differences in the characteristics of drivers across these two groups.

2. Comparing drivers either side of a boundary produced by guidance for extending course offers[56]: However, more robust approaches based on comparisons between drivers detected just above and below threshold speeds will only be appropriate for NSAC, the National Motorway Awareness Course (NMAC) and NSAC20 as such thresholds do not exist for most other driver retraining courses.

3. Geography: As an improvement on option 1 and comparable to option 2, an instrumental variables approach would allow for a more robust assessment of impact than comparisons between drivers accepting a course offer and those declining. Such an approach would remove the influence unobserved characteristics might have on the outcome; however, this relies on the identification of one or more variables that affect the outcomes of interest through their influence on a driver's decision to accept or decline a course offer only[57]. Course price and/or other variables that do not have a direct influence on the outcome but do have an effect on a driver's decision to participate could be used as instruments. In this study, such an approach was tried but the variables were not found to be valid instruments.

4. Voluntary courses: For the outcomes to be explored for voluntary courses, comparisons could be made between individuals participating earlier with those participating later where individuals participating later form the counterfactual (as both groups should in principle share similar characteristics). At present, none of the courses

[55] https://ndors.org.uk/courses/

[56] Refer to section 3.2.2 of the report for more detail or Annex A.

[57] This refers to an instrumental variables approach as described in Annex A

offered through NDORS are voluntary but an approach of this kind could be used for future courses or non-NDORS administered courses.

Understanding the impacts of other courses through the application of the methods described above, however is likely to be complicated by the relatively smaller numbers of drivers currently participating in other NDORS courses compared to the NSAC. In 2017, NSAC participations accounted for 85 percent of all participations in NDORS courses. As such, detailed consideration is required of how far volumes of course participants and subsequent offences are sufficiently frequent to merit a statistical approach to evaluation.

In addition, it would be desirable to assess the effects of many of these courses on driver attitudes and attitudinal change if a sample of drivers could be attained.

Annex A: Statistical Analysis

This Annex provides a detailed account of the statistical analyses carried out using data from the PentiP database of speeding offences, DVLA held Drivers90 data on driving licence records and DfT STATS19 data on injury collisions. The primary aim of these analyses was to explore the causal effects of participation in the National Speed Awareness Course on future offending and the likelihood of being involved in injury collisions.

The data used in this study were obtained through extensive engagement with thirteen police forces, the DVLA, DfT and Northgate Public Services. Thirteen Police Forces in England agreed to provide us with non-personal data on observed offending with the DVLA agreeing to act as the data processor to link the Police force data to their records of driver licence details and DfT provided data on injury collisions.

1.1A Logic model

This section sets out the causal process by which participation in the NSAC is anticipated to lead to its intended outcomes and impacts (summarised in the logic model below). These anticipated outcomes and impacts of the NSAC are:

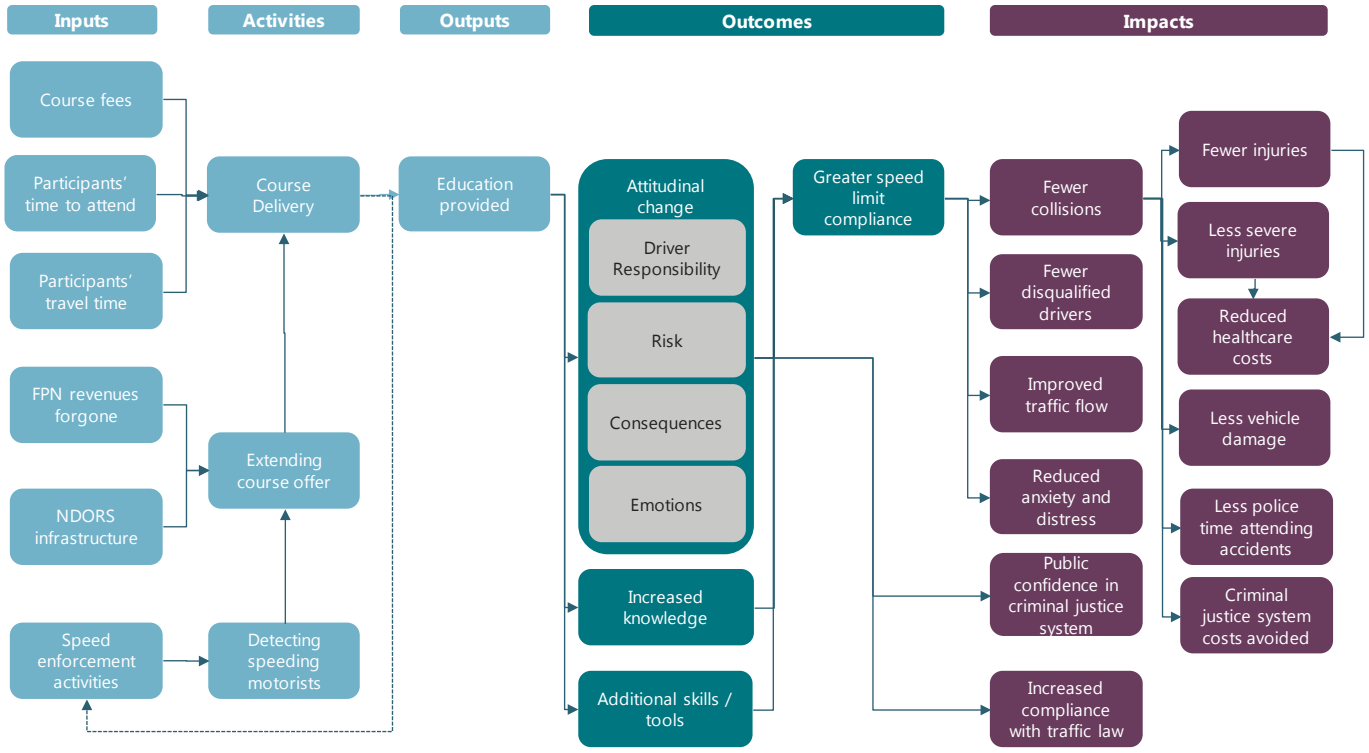
- Attitudinal change: the course was developed to target a range of attitudinal changes associated with the driver's perception of risk to him/herself, to any passengers and to other road users by:
  - directly challenging attitudes towards speeding.
  - offering motorists' insight and understanding about how they drive.
  - equipping participants to make a change in their driving styles.
- Improved driving knowledge: The course can also be expected to achieve a direct educational effect, boosting motorists' understanding and awareness of speed limit compliance elements of the Highway Code. This effect may be most noticeable amongst motorists who obtained their driving licence further in the past or for motorists who obtained their licence in another country as knowledge may have decayed over time or not be suitable for unfamiliar driving conditions.
- Behavioural outcomes: Attitudinal change and increased knowledge could be expected to lead to reductions in low level speeding behaviour amongst participants (for some period of time). This reflects the core objective of the course to encourage compliance with speed limits. This may implicitly lead to a reduction in the number of individuals who drive in excess of the speed limit. Such an effect should be visible in reduced reoffending and reconviction rates amongst course participants compared to what could have been expected otherwise.
- Road safety outcomes: Although the NSAC does not directly target an improvement in road safety, safer driving behaviour is a potential indirect benefit of greater compliance with speed limits amongst motorists. This could indirectly manifest itself in a reduction in the probability and/or severity of collisions which has implications for the costs of treating injuries in addition to costs associated with other damage/activity such as vehicle damage, police time, and criminal justice system costs. There is, however, the potential for the NSAC to induce a moral hazard problem in which drivers, aware that they may be offered a course if caught driving over the speed limit, perceive the expected cost of doing so to be lower than it was previously and subsequently drive faster. This would have the opposite effect on road safety to the above.

- Disqualification: Participation in NSAC may also reduce the risk of disqualification both through the avoidance of an immediate endorsement and a longer-term effect from changes in behaviour as a result of participation. Reduced risk of disqualification will lead to a reduction in associated social costs such as lost output should an individual's employment status be affected by disqualification or court costs that have been avoided.

- Improved network efficiency/traffic flows: Greater compliance with speed limits may boost the overall efficiency or throughput of UK roads. This effect is most likely to be felt on motorways which are congested. It was not possible to explore any effects here within the scope of this study.

- Reduced anxiety and distress for other drivers: Increased speed limit compliance among a larger number of motorists may reduce anxiety or distress that excessive speeding can cause to other motorists. However, there is very little evidence to assess the likelihood of such outcomes arising as a consequence of the NSAC. Additionally, any effects of this nature are likely to be modest as the course focuses on low-level speeding behaviour.

Figure 1.1A: NSAC Logic Model



1.2A Data

The statistical analysis makes use of data collected from a variety of sources on drivers detected driving at speeds in excess of the statutory limit in the thirteen participating police force areas. These are described in more detail below:

- PentiP (Police force): is a system used by 43 Police Forces and courts to process Fixed Penalty Notices (FPNs) and Conditional Offer Fixed Penalty Notices (COFPNs)[58] issued to drivers as well as other types of disorder or antisocial

[58] Used in Scotland.

behaviour. The data contained within is owned by the police forces themselves. It forms the basis of the analysis presented below providing data on each speed offence captured. The following variables were provided for this research:

(1) Course date, reason why offer was withdrawn/cancelled: Course related details;

(2) Offence date and time, DVLA code, Speed, Location: Offence related details; and

(3) Driving License Number, Name, Gender, Postcode, Date of Birth: To identify drivers across individual datasets.

- Drivers90 (DVLA): is owned by the Driver Vehicle Licencing Agency (DVLA) and includes all details of licencing information for all drivers resident in Great Britain including name, address, date of birth, entitlement, and endorsements (records of previous motoring offences). Data on endorsements is held in DVLA records for four or 11 years from the date of conviction or offence, depending on the offence. The following variables were used for this research:

  (1) Offence, conviction and disqualification details: To track past motoring convictions and to identify reconviction rates. These offending rates can be used as a proxy for reoffending;

  (2) Length of time the individual has held a licence and points on licence at time of offence: Potential control variables to allow the evaluation to control for driver experience and past offending behaviour; and

  (3) Driver licence number, date of birth, gender, full postcode: To identify the individuals for the purpose of data linking.

- STATS19 (DfT): contains records of collisions that involved injuries and were attended by the police as reported by police officers. This data was used to explore the road safety impacts of the national speed awareness course. STATS19 is recorded at the vehicle level and not at the driver level and the following variables were used for this research:

  (1) Collision circumstances: severity, number of vehicles, number of casualties, speed limit, casualty class, casualty severity, casualty type;

  (2) Vehicle registration number: for linking; and

  (3) Age, gender and postcode of driver: To identify the individuals, where possible, of relevance in other datasets and for identifying casualties.

- Course location and price data (compiled by Ipsos MORI): Information was provided by NDORS on the Police Forces offering the NSAC, the price, course provider and the broad locations of where the courses were held for just over half of the 60 months between June 2011 and May 2016, with the remainder interpolated from what was available. This data was processed into a database of course locations and prices by month and matched to the full dataset by the DVLA with the following variables calculated:

  (1) Distance to nearest course location: distance in km of the nearest course location in the month the NSAC was offered.

Table 1.1 outlines the details included in the combined dataset.

Table 1.1A: Combined dataset variables and source[59]

Variable	Description	Source
Unique ID	Unique identifying variable generated from personal data for each driver	-
Offence details:		
Issuing police force	Name of force where offence was processed	PentiP
Offence type	Offence code for that detection	PentiP
Location	Partial postcode for location where offence was recorded	PentiP
Offence date	Date of detection	PentiP
Eligibility check date	Date eligibility for course was checked	PentiP
Eligibility check result	Result of eligibility check (eligible/ineligible)	PentiP
Course offer made date	Date offer was extended if eligible	PentiP
Course acceptance date	Date offer was accepted (NULL if not accepted)	PentiP
Course withdrawn reason	Reason offer was withdrawn (did not respond/declined/paid fine)	PentiP
Course attendance date	Date of course attendance if accepted	PentiP
Speed of offence	Speed at which driver observed driving at time of detection	PentiP
Licence details:		
Endorsable offence code*	Offence code for all past endorsable offences	Drivers90
Penalty points at time of the offence	Number of penalty points on licence at the time of relevant offence	Drivers90
Offence date*	Date of past endorsable offences	Drivers90
Disqualification date*	Date of disqualification (if disqualified)	Drivers90
Conviction date*	Conviction dates for all past convictions	Drivers90
Conviction code*	Conviction codes for all past convictions	Drivers90
Length of time licence held	Number of years' individual had held a valid licence	Drivers90
Collisions data:		
Date of collision	Date of the collision	STATS19
Total casualties	Total number of casualties attributed to collision	STATS19
Number of casualties	Separate variables for number of casualties by severity	STATS19
Speed limit at location	Speed limit of road on which collision occurred	STATS19
Contributory factor	Police recorded standardised contributory factor (cf306 for speeding, blank otherwise)	STATS19
Course provision data:		
Nearest course	Name of the nearest course location (taken from NDORS data)	NDORS data
Distance to nearest course	Distance in km to nearest course location (based on distance between home and course site postcodes)	NDORS data

[59] * Note that multiple variables are present for these variables to include all past offending details. **In addition, Vehicle registration, driver license number, age, date of birth, gender and postcode were dropped from the dataset prior to transfer to Ipsos MORI.

The table below outlines the police forces providing data for the study.

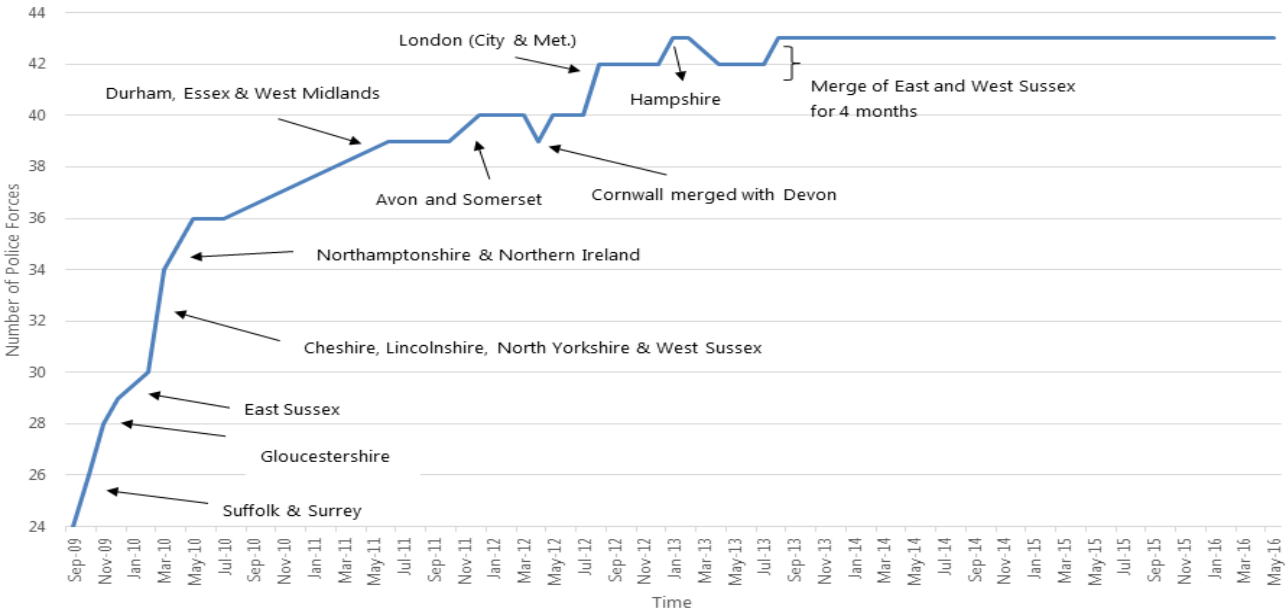
Table 1.2A: Participating Police Forces

Police Force
Bedfordshire Police
Cambridgeshire Constabulary
Gloucestershire Constabulary
Greater Manchester Police
Hampshire Constabulary
Hertfordshire Constabulary
Merseyside Police
Northamptonshire Police
South Yorkshire Police
Staffordshire Police
Thames Valley Police
Warwickshire Police
West Mercia Constabulary

Of the 13 police forces participating in this research, 10 were early adopters of the national course with Gloucestershire Constabulary, Hampshire Constabulary and Northamptonshire Police adopting the course later than September 2009. These police forces cover a wide geographical range including both metropolitan and rural areas.

As shown in the following figure, 24 police forces were delivering the National Speed Awareness Course by September 2009 (information prior to this date was not available). This has expanded to include 41 of the 43 forces in England and Wales.

Figure 1.2A: Number of Police Forces Offering the National Speed Awareness Course



Source: NDORS course provider data[60]

1.2.1A Data processing and matching

The DVLA compiled the full dataset for analysis in accordance with a data processing contract between the NPPC on behalf of the Chief Constables of each of the participating police forces and the Department for Transport (of which the DVLA is an executive agency) with the purpose of carrying out research for an impact evaluation of the National Speed Awareness Course.

Initially, an extract of the PentiP data was prepared on behalf of the thirteen Police Forces containing the variables outlined earlier, for drivers detected driving at speeds in excess of statutory limits within the participating Police Force areas before transferring this securely to the DVLA. These data covered just over 2.7 million observed offences between 2012 and 2017. As the data contained in the PentiP extract only contained data for that particular offence, the individual offence records were then matched to the Drivers90 data using driver licence number to obtain a complete offending record for each driver identified in PentiP.

Ipsos MORI then provided the DVLA data on the speed awareness course locations and price data by month as outlined above. This was matched to the full dataset on the basis of postcode with the distance to the nearest course location calculated using the offender's home postcode and the nearest course site postcode in that month. It should be noted that this approach has its weaknesses in that an individual may not have been offered the opportunity to participate in a course at the nearest location, and the 'as the crow flies' measure of distance is less appropriate in 'topographically challenged' areas.

The final step in the data linking process was the matching in of the DfT held STATS19 data. The DfT created an extract of STATS19 with the relevant variables which was sent to the DVLA for matching using vehicle registration mark, age, gender

[60] The chart above identifies 43 police forces. This is because East and West Sussex are separated in the NDORS data provided and Northern Ireland is included.

and postcode. There is a risk that this process does not capture all relevant collisions as the STATS19 data does not allow direct identification of the driver, instead only providing a broad estimate of their age and gender with postcode sometimes incomplete. It is also possible that drivers could have moved house or changed cars between offending and involvement in a collision. They may also drive more than one car in which collisions would not be identified.

All items of data marked as personal (age, gender and home postcode) were then removed from the dataset before transfer to Ipsos MORI via the DfT. The final dataset was compliant with the data processing agreement defined by the parties involved in the transfer of data.

1.2.2A Data limitations

The data available for the study are evident:

- Taking a baseline for reoffending: In order to analyse the data, an appropriate baseline is required from which to measure reoffending. The dataset covers the period between April 2012 and April 2017 and therefore is highly likely to exclude the very first speeding offence for the majority of drivers in our data. As a result, the first recorded offence for each driver within our data and consequently between April 2012 and April 2017 has been taken as the baseline for the purpose of analysis. The main limitation with this is that this does not capture any prior attendance on a speed awareness course if this was completed before April 2012. NDORS figures show around 770,000 people taking the course in 2011 and 448,000 in 2010 suggesting that a sizeable proportion of our sample could have potentially taken the course before inclusion in our sample. It is likely that as a result of this, estimates understate the effect of the course as our control group contains some drivers who have previously attended a course and may therefore be less likely to reoffend.

- Unobserved characteristics: The data available did not include any information on drivers' attitudes to speeding. Attitude is thought to have a material effect on the likelihood that someone is detected driving in excess of the statutory speed limit and likely relates to how acceptable this behaviour is. Such information is not measurable from administrative data and a large primary data collection exercise (which was deemed infeasible at the planning stage of the evaluation) would be required to gather this information. Further constraints from a data protection perspective also limited the data provided in relation to participant age, gender and postcode. These items of personal data were removed from the data prior to the final dataset being transferred to the DfT. This limits the extent to which differential impacts on different types of drivers can be explored in the analysis as well as how far it is possible to control for differences in participant characteristics. Some of the evaluation approaches adopted seek to mitigate these limitations.

- Measure of observed offending: The use of administrative data limits the analysis to observed offending. Drivers may exceed the limit but not be detected doing so and subsequently not be recorded as having offended. Importantly for the analysis, detection may alter speeding behaviour of drivers in unexpected ways such as making drivers more aware of where speed cameras and patrol cars are or are likely to be where they subsequently reduce their speed before continuing to speed outside of these areas. This is not assumed to have a large impact on the analysis as this effect could be expected for both groups of drivers, those attending a course and those declining the offer.

1.2.3A Sample sizes and driver groups

The assembled dataset contained a total of 2,712,057 speed limit offences between April 2012 and April 2017 in the participating Police Force areas covering a total of 2.288,456 individual drivers. Upon review of the PentiP data for each driver, four key groups were identified based on records at the time of their first offence within the dataset:[61]

1. The first of these groups consists of drivers who were eligible for a course and subsequently attended one on their first recorded offence between April 2012 and April 2017.

2. The second is made up of drivers that were eligible for a course but did not attend a course, for which it is implicitly assumed that they were offered a course but either declined, failed to complete it or failed to respond to the course offer receiving an FPN instead.

3. The third group consists of drivers who did not receive an eligibility check according to the PentiP records and were therefore assumed to have been caught speeding in excess of the maximum guidance threshold relevant for that road. An eligibility check is carried out when a driver is detected at eligible speeds and checks for recent course participation that may preclude a course offer being made e.g. if a driver had attended a course within the last 3 years.

4. Finally, the fourth group is made up of drivers that were deemed ineligible on their first recorded offence between 2012 and 2017. This may have been because they had attended a similar course in the previous three years or had been deemed ineligible based on specific circumstances of the offence (e.g. caught by a handheld device and an officer had deemed the situation as dangerous).

Table 1.3 outlines the sample size of each sub-group of drivers.

Table 1.3A: Sample sizes based on status at first recorded offence between April 2012 and April 2017

Group	Number of drivers	Percentage of total drivers
Attended course	1,464,221	64%
Declined/failed to attend	192,193	8%
No eligibility check	428,692	19%
Ineligible	202,231	9%
Total	2,287,337	100%

Source: Ipsos MORI analysis

1.2.4A Outcomes of interest

This evaluation explores two key outcomes of interest - the degree to which participation in the courses reduces the likelihood of subsequent speed related reoffending and involvement in injury collisions. The data provided to the study team offers a small number of variations on these outcomes to explore including binary outcomes describing likelihood of reoffending and/or being involved in a collision in addition to counts of the number of subsequent offences/collisions. However, for the purpose of this analysis, a couple of issues have been addressed:

[61] This is not necessarily the drivers first driving offence but the first speeding offence recorded between April 2012 and April 2017.

1. Definition of reoffending: For the purposes of this evaluation 'reoffending' refers only to further detected/observed instances of exceeding a statutory speed limit subsequent to the initial offence for which an NSAC course offer had been made to eligible drivers. Further offences may have been dealt with through a course offer, if eligible, or through a FPN alongside penalty points.

2. Defining a baseline from which to assess reoffending: A baseline is required for each driver from which we can construct a reoffending timeline, as it is defined above. As the data provided runs from April 2012 to April 2017, we do not have complete records of any earlier speed related offending for drivers, particularly if they were offered a course before April 2012. Consequently, the first record of an offence/course offer within the period covered has been taken as the baseline start point from which reoffending is measured. In simple terms, the baseline is the first time the driver was detected at speeds in excess of the statutory limit between 2012 and 2017.

1.2.5A Differences between groups

Table 1.4 presents the overall reoffending rate and collision rate per 10,000 people for each group identified in 1.3.1. This illustrates differences in the rate of reoffending and involvement in injury collisions with NSAC participants reoffending at the lowest rate and involved in relatively fewer collisions, taking into account the much larger number of NSAC participants in our data.

Table 1.4A: Reoffending and injury collision rate by status at baseline offence between 2012 and 2017

Group	Reoffending rate	Involved in a collision (rate per 10,000 people)
Attended course	13.4%	216 (1.48)
Declined/failed to attend	15.5%	33 (1.72)
No eligibility check	17.4%	77 (1.80)
Ineligible	24.0%	55 (2.72)
Total	15.3%	381 (1.67)

Source: Ipsos MORI analysis

It is likely that the characteristics of drivers within each sub group differ in meaningful ways, such as the proportion of drivers caught on different road types, the mean vehicle speed at the time of offence, years' driving experience and proportion previously convicted of a driving related offence.[62]

Comparisons of the means across the four groups, however, suggest little difference in the observed characteristics at the time of the baseline offence across most variables including average speed of offence, points on licence at time of offence and number of years' experience at time of the offence. However, drivers amongst the group who declined the offer of the course at their baseline offence are twice as likely to have a prior motoring conviction. In addition, drivers declining a course offer have an extra half a kilometre to travel on average to attend a course (this difference is exploited in the instrumental variable analyses set out later). Table 1.5 presents comparisons of the variables available for analysis.

[62] This includes any conviction recorded by the DVLA and is not limited to just speed related convictions. Note that a Fixed Penalty Notice does not constitute a conviction for the purpose of this variable. This analysis therefore considers only the more serious motoring convictions recorded by the DVLA.

Table 1.5A: Sub-group comparisons

		Course attendees	Course decliners	No eligibility check	Ineligible
Road type where detected/ offence type	Motorway	11.2%	12.2%	20.3%	16.9%
	Public road (not including motorway)	88.4%	87.5%	78.3%	82.6%
	Other[63]	0.4%	0.3%	1.4%	0.5%
Mean vehicle speed at time of first offence		44.6	44.4	55.1	46.9
Total points on licence at time of first offence		0.2	0.2	0.3	0.4
No of years' licence held at the time of first offence		24.6	25.6	23.8	25.7
Proportion convicted of a driving offence before baseline offence		1.6%	2.7%	2.2%	1.9%
Average price of course in £ at nearest location		86.75	86.45	-	86.86
Average distance in miles to nearest course location		6.01	6.54	-	6.07

Source: Ipsos MORI analysis[64]

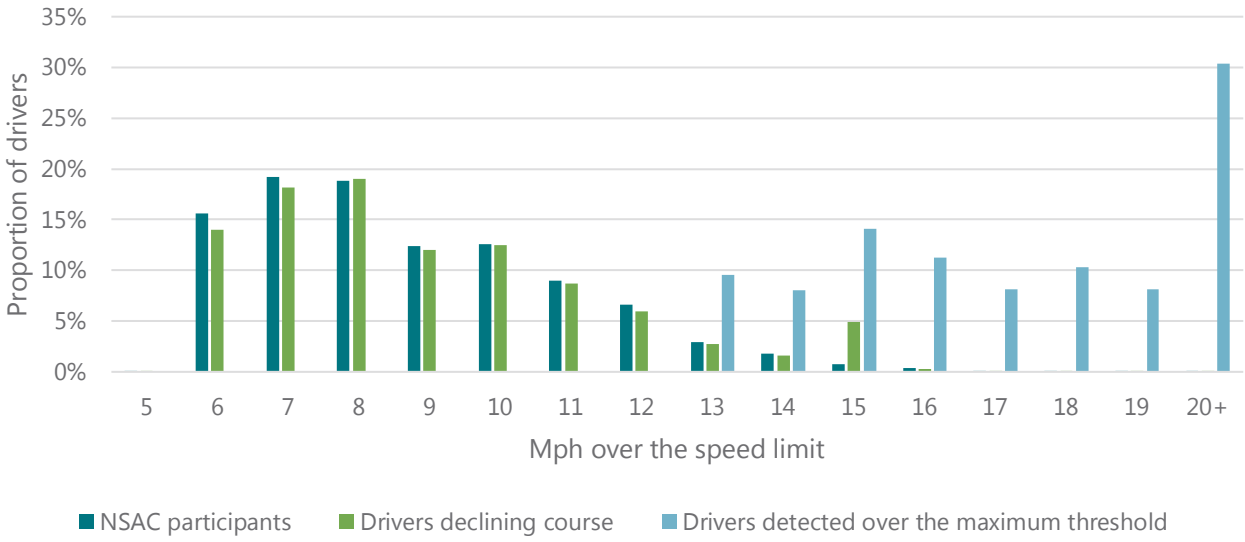
The lack of personal data including age and gender limits the extent to which we can discern differences between the groups and as such it is possible that unobserved characteristics vary systematically between groups.

Analysis of the distributions for a number of key variables is presented below. Firstly, the speed in excess of the speed limit is similarly distributed for drivers accepting and declining a course offer which is unsurprising given that these groups were both deemed eligible for a course offer. The distribution is different for the group of drivers that were detected above the maximum threshold speed, quite obviously because they must be travelling at speeds of 11-12mph in excess at least to be included in this group.

[63] Includes DVLA codes SP10, SP20 and SP40. These are exceeding goods vehicle speed limits, exceeding speed limit for type of vehicle (excluding goods or passenger vehicles) and exceeding passenger vehicle speed limit respectively.

[64] Data on price and nearest course location not available for drivers not in receipt of an eligibility check.

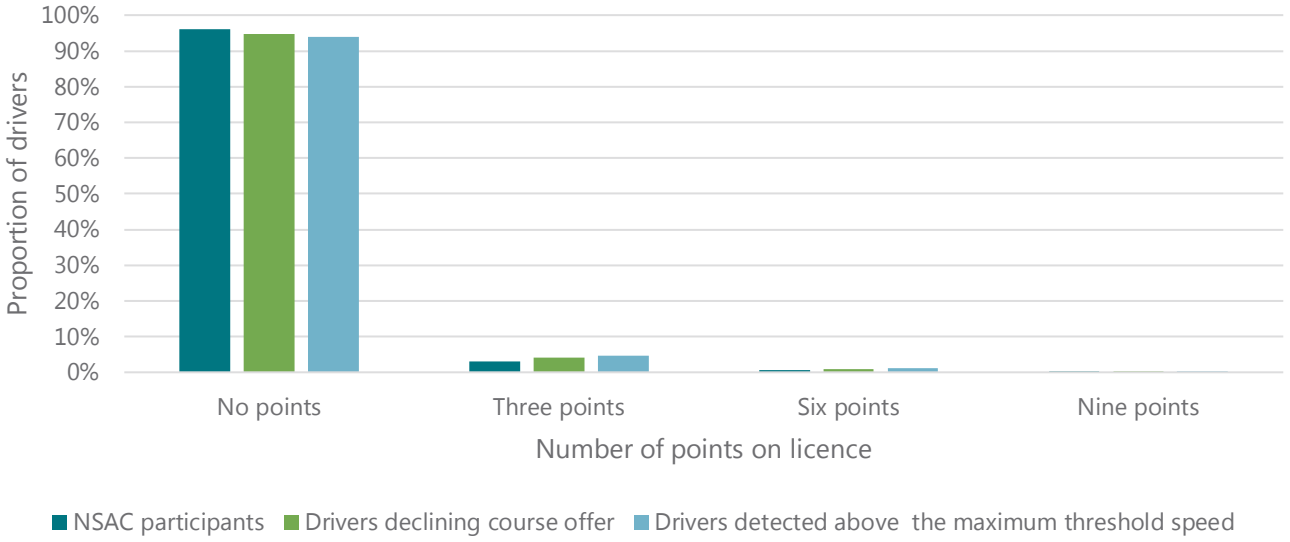
Figure 1.3A Distribution of vehicle speed in excess of speed limit by group



Source: Ipsos MORI analysis

Only minor differences are evident in the proportion of drivers with points on their licence at the time of being offered the course. Across each group, the vast majority of drivers had no points on their licence.

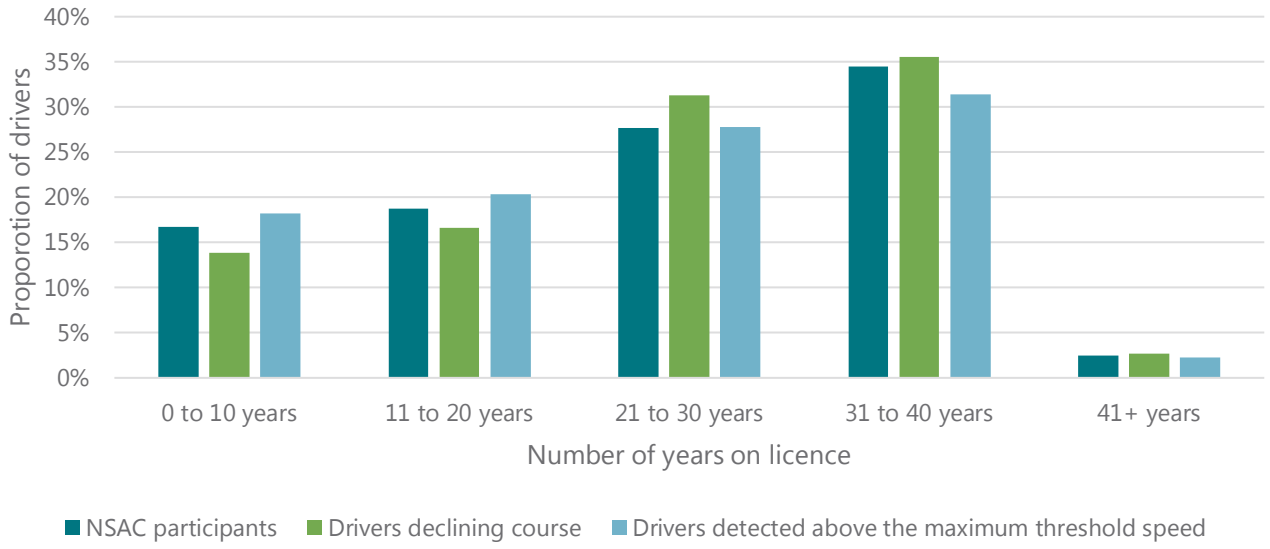
Figure 1.4A Distribution of points on licence at time of being offered the course by group



Source: Ipsos MORI analysis

On average, course participants had held a licence for a shorter amount of time when compared to drivers declining the offer as shown in the figure below. Drivers observed offending at speeds above the maximum recommended speeds are also most likely to have held a licence for less than time than the other two groups.

Figure 1.5A Number of years with a licence at time of being offered the course/at offence



Source: Ipsos MORI analysis

More formally analysing the means of the two primary groups (accepters and non-accepters), the table below presents the output of a simple t-test exercise to examine the statistical significance of differences shown above. Despite differences appearing to be extremely small in table 1.5, significance testing finds differences over each variable to be statistically significant. This is thought to be primarily a consequence of the high degree of precision afforded by the large number of observations.

Table 1.6A: Differences between drivers accepting a course offer and those declining

Variable	Group	N	Mean	Std. Dev.		F	Sig.	t	Sig. (2-tailed)	Mean Diff.	95% Conf. Interval	
											Lower	Upper
Speed of vehicle at earliest offence	Accepted	1464139	44.642	12.658	Equal variances assumed	727.682	0.000	8.764	0.000	0.267	0.208	0.327
	Declined	192193	44.375	11.962	Equal variances not assumed			9.153	0.000	0.267	0.210	0.325
Points on licence at the time of the earliest offence	Accepted	1464084	0.160	0.816	Equal variances assumed	3435.080	0.000	-30.021	0.000	-0.061	-0.065	-0.057
	Declined	192137	0.220	0.978	Equal variances not assumed			-26.128	0.000	-0.061	-0.065	-0.056
Number of years' licence held at time of earliest offence	Accepted	1463039	24.640	11.738	Equal variances assumed	1558.297	0.000	-32.151	0.000	-0.914	-0.970	-0.858
	Declined	191799	25.550	11.445	Equal variances not assumed			-32.781	0.000	-0.914	-0.968	-0.859
Proportion previously convicted of a driving offence	Accepted	1464139	0.0155	0.123	Equal variances assumed	5669.824	0.000	-37.944	0.000	-0.012	-0.0125	-0.011
	Declined	192193	0.027	0.163	Equal variances not assumed			-30.729	0.000	-0.012	-0.013	-0.011
Average price of course in £ at nearest location	Accepted	997827	86.750	6.380	Equal variances assumed	28.334	0.000	-16.494	0.000	-0.302	-0.338	-0.266
	Declined	138127	86.450	6.360	Equal variances not assumed			-16.528	0.000	-0.302	-0.338	-0.266
Average distance in miles to nearest course location	Accepted	1016484	6.010	5.690	Equal variances assumed	1625.810	0.000	30.462	0.000	0.532	0.498	0.566
	Declined	139811	6.540	8.680	Equal variances not assumed			22.283	0.000	0.532	0.485	0.579

Source: Ipsos MORI analysis

1.3A Counterfactual selection

A credible assessment of the causal effects of participating in NSAC requires the selection of an appropriate group of individuals who did not participate to assess what might have occurred in its absence (i.e. a comparison group). This group of individuals should ideally be equivalent to those individuals who have taken part in the NSAC in terms of the characteristics that will influence or determine their future driving behaviour – including aspects that are easier to observe (such as level of driving experience) and those aspects that may be more difficult to observe (such as levels of impulsivity). However, as participants of the course are not selected at random, there are some challenges involved in identifying an appropriate comparison group:

- Differences to the general driver population: Drawing comparisons between drivers participating in the NSAC and those in the general driver population may lead to a biased estimate of impact as it is possible that drivers not participating from the general population differ systematically from NSAC participants across characteristics that are linked to reoffending. For example, there is a possibility that some individuals that have not been observed by the police authorities at speeds in excess of statutory limits may have greater knowledge of or different attitudes to speed limits, translating into greater compliance with those limits and a lower likelihood of offending at any given point in the future. If this is the case, then comparisons made on this basis would very likely understate the impacts of the course.

- Selection on the basis of speed: ACPO guidance recommends that drivers caught driving in excess of the statutory limit by more than 10% + between 2mph and 9mph should be eligible for the NSAC provided they have not completed an NSAC in the previous 3 years.[65] These thresholds were in part set owing to a view that those detected at speeds far in excess of the speed limit are more likely to hold different attitudes to those detected at speeds just in excess of the statutory limits and are more likely to be persistent offenders, for whom the NSAC has not been developed. The data analysed in this study support this view and finds that drivers detected driving far in excess of the statutory speed limit are much more likely to be observed reoffending than NSAC participants or drivers detected just in excess of the limit but not participating in a course. As a result, comparisons with drivers detected at speeds far in excess of the speed limit are likely to overstate the impact of the course.

- Drivers declining a course offer: This group consists of drivers who were caught in excess of the speed limit, received an eligibility check for the speed awareness course and were deemed eligible but subsequently did not attend a course. This includes drivers declining the course offer in addition to drivers who did not respond to the offer before the deadline set in the offer letter. These drivers instead received a Fixed Penalty Notice and as such would be similar to drivers attending the course having also been caught within the threshold for eligibility and disposed of in the same way attendees would have been in lieu of the course. However, there may be systematic differences between individuals accepting the course offer and those declining. It is not implausible that variables such as age and attitude towards speed in particular may influence someone's decision to attend the course as well as affect the likelihood they are caught breaking the speed limit again in the future.

Taking into account the various options presented above, the group of drivers who were detected driving at similar speeds to NSAC participants but who did not attend a course constitute the best available counterfactual for the analysis that follows. However, there is an additional element of selectivity introduced by drivers themselves when choosing whether or not to accept the offer of a course. Once an offer has been extended, drivers are free to accept this offer and participate in

[65] ACPO Speed Enforcement Policy Guidelines: Available from http://library.college.police.uk/docs/appref/ACPO-Speed-Enforcement-Guidance.pdf (Accessed: March 2018)

a session or decline the offer and instead receive a Fixed Penalty Notice and three penalty points on their licence. It may be the case that drivers declining the course could exhibit characteristics that mean they are more or less likely to reoffend anyway than those that accept. In particular, drivers declining the course may be more impatient and/or exhibit a more tolerant attitude towards speeding than those accepting the offer causing problems for analysis comparing these two groups. This cannot be addressed through sample selection but is instead approached through the application of appropriate statistical methods.

1.3.1A Controlling for observed and unobserved differences

The figures presented in tables 1.5 and 1.6 suggest that although there are statistically significant differences between groups, these are not very large in the context of the variables explored. For example, the difference in the number of years with a licence is less than 1 year. Nevertheless, it is important that any observed differences between groups are controlled for to mitigate against the risk that these differences may be responsible for differences in offending patterns. Two approaches have been taken to account for these differences:

- Propensity Score Matching – A propensity score matching exercise was carried out in which course participants were matched to course decliners on the basis of the variables in table 1.6. Several variations on the matching procedure were explored including nearest neighbour, kernel and coarsened exact matching. In the first stage of the matching procedure, the dependent variable takes the form of a dummy variable describing course attendance (i.e. 1 = attended, and 0 = decline/failed to attend), while the pre-treatment characteristics set out in table 1.5 & 1.6 overleaf were used as independent variables. The second stage differs depending on which matching process was used and each are described in further detail in section 1.4. Note that it is likely that the absence of characteristics such as age and gender limits the potential for PSM to improve the comparability of our samples.

- Control variables - Each of the following variables were used as controls in the regression analysis to reduce the amount of bias in estimates of impact:

  - Vehicle speed: Inclusion of a variable describing the speed at the time of the earliest offence recorded in the dataset allows us to control for the degree of speeding at that point in time. It is likely that drivers caught travelling at higher speeds were caught in different circumstances and they may also exhibit a different attitude towards excess speed showing a willingness to speed to a higher degree.

  - Points on licence: The number of points on a driver's licence at the time of the earliest offence in the data can be used as a proxy for recent driving offending and provide some indication of past behaviour. Analysis also makes use of a variation of this variable in which the values are squared to accommodate changes in the estimate effect of this on reoffending/collisions as more points are acquired. Lastly, another refinement to the analysis uses a dummy variable in addition to the standard variant taking the value of 1 if the driver had nine points on their licence at the time of the earliest offence recorded between April 2012 and April 2017 and zero otherwise. This is motivated by the desire to control for the impact attributable to the threat of disqualification on the prevention of reoffending as, in most cases, a driver with 12 points will be disqualified.

  - Number of years with a licence: A proxy for both years' experience driving and age, the number of years with a licence has been included as a control variable wherever possible. Re-offending and involvement in collisions may well be linked in part to both age and driving experience making this an important variable for inclusion.

- Prior driving convictions: A dummy variable that takes the value of 1 if the driver has previously received a driving conviction and zero otherwise, allows us to control for past offending and driving behaviour in another way. Unlike points on a driver's licence that disappear after a set period of time, prior convictions remain and are included in the Drivers90 data. There is the potential that drivers previously convicted of a driving offence may be more likely to reoffend regardless particularly if past convictions are correlated with more tolerant attitudes toward speeding.

- Distance to nearest course location: As the distance a driver must travel to attend a course is thought to impact their decision to attend, this has also been controlled for in the analysis. It is anticipated that drivers that must travel further to attend a course, and therefore have a higher relative cost of attendance, are less likely to participate.

- Later NSAC participation: Drivers that decline a course offer on their first detection between April 2012 and April 2017 may still attend a course on a subsequent offence and therefore may benefit from course participation at a later stage. A variable that takes this into account has been included in the modelling of the effects of the course on the frequency of reoffending.

1.4A Regression models comparing NSAC participants and drivers not accepting the course offer

For the core models used in the analysis of reoffending data and initially for modelling the impact of the NSAC on collisions, binary logistic regression models and count based Poisson models were specified. Outcomes for these regressions were explored at a range of timeframes from earliest recorded offence in the data, namely 6 months, 1 year, 2 years and 3 years.

1.4.1A Logistic regression

Logistic regression is a discrete choice model applicable when the outcome variable of interest takes the form of a categorical variable. For the purpose of this analysis the variable of interest identifies drivers who have offended within specified time periods since course attendance or declining an offer. The standard regression equation used is presented below:

$$logit\big(p(x)\big) = \ln\left(\frac{p(x)}{1-p(x)}\right) = \alpha + X_i\beta + \partial NSAC_i + \varepsilon_{it}$$

And:

$$p = \frac{e^{(\alpha + X_i\beta + \partial NSAC_i + \varepsilon_{it})}}{1+e^{(\alpha + X_i\beta + \partial NSAC_i + \varepsilon_{it})}}$$

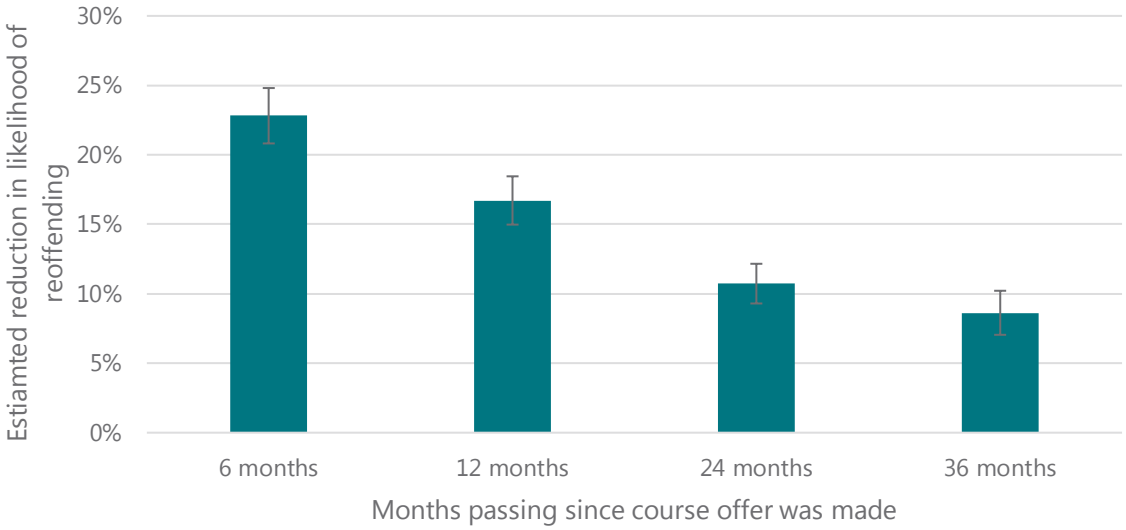
Here, y_i is a binary variable taking the value of one if a driver is observed reoffending, or being involved in a collision for collision analysis, within x months of their earliest offence recorded in the dataset and zero otherwise. The vector X_i contains the control variables set out in tables 1.5 and 1.6 in addition to the number of points on licence squared and a dummy for drivers with nine points thus controlling for the impacts these have on reoffending and collisions. A dummy variable for NSAC participation ($NSAC_i$) identifies treatment for the purpose of the analysis with the parameter ∂ capturing its estimated impact on the outcome.

Findings

Reoffending: The regression results shown in table 1.7 show the estimated effects of the course on the likelihood that a driver is observed reoffending within 6, 12, 24 and 36 months for NSAC participants compared to drivers declining the

course. These are demonstrated more clearly in figure 1.6 below which shows a large reduction in the likelihood of reoffending of 26 percent after 6 months with the magnitude of the effect declining over three years. However, it remains significant at 11 percent 3 years' post participation implying that the course has a persistent impact on reoffending.

Figure 1.6A: Estimated reduction in the likelihood of reoffending of NSAC participants relative to drivers that did not accept the course offer



Source: Ipsos MORI analysis; 95 percent confidence intervals shown

Using the estimations results from the logistic regressions on reoffending, the probability of a driver from our sample being observed reoffending is shown in the chart below. Course participants are consistently less likely to be caught reoffending than those drivers that declined the course offer. The absolute difference between probabilities remains constant at just under 2 percentage points which corresponds to the declining proportional effect sizes shown in figure 1.7.

Figure 1.7A: Estimated impact on the likelihood of reoffending of NSAC participants relative to drivers that did not accept the course offer

Source: Ipsos MORI analysis; 95 percent confidence intervals shown

Table 1.7A: Logistic regression models – Reoffending analysis

Variable	Model 1		Model 2		Model 3		Model 4	
Estimated method	Logistic		Logistic		Logistic		Logistic	
Dependent variable	Reoffended in 6 months		Reoffended in 12 months		Reoffended in 24 months		Reoffended in 36 months	
Observations	1536807		1325248		890635		467864	
R squared	0.002		0.002		0.001		0.002	
	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
NSAC (dummy variable = 1 if driver attending an NSAC and zero otherwise)	-0.228	0.000	-0.167	0.000	-0.116	0.000	-0.101	0.000
Vehicle speed at baseline	0.006	0.000	0.005	0.000	0.005	0.000	0.006	0.000
Points on licence at baseline	0.054	0.000	0.086	0.000	0.103	0.000	0.140	0.000
Number of years with a valid licence at baseline	-0.005	0.000	-0.003	0.000	0.000	0.468	0.002	0.000
SP10	0.278	0.000	0.119	0.014	0.003	0.953	0.204	0.000
SP20	-0.606	0.011	-0.280	0.110	-0.420	0.09	0.835	0.495
SP30	0.292	0.000	0.260	0.000	0.275	0.000	0.391	0.000
SP40	0.652	0.025	0.405	0.154	0.419	0.212	0.749	0.129
Prior convictions (dummy variable =1 if driver has prior driving convictions)	0.205	0.000	0.216	0.000	0.203	0.000	0.198	0.000
Dummy variable for nine points on licence at baseline	-0.146	0.399	-0.169	0.356	-0.271	0.345	-0.465	0.549
Number of points on licence at baseline squared	-0.007	0.001	-0.012	0.000	-0.014	0.000	-0.022	0.000
Number of months since NSAC participation at number of months specified in dependent variable	-0.062	0.984	-0.130	0.897	-0.083	0.711	-0.072	0.687
Constant	-3.037	0.000	-2.545	0.000	-2.084	0.000	-1.875	0.000
	Chi	Sig.	Chi	Sig.	Chi	Sig.	Chi	Sig.
LR test	1396.540	0.000	1231.030	0.000	1035.120	0.000	1050.870	0.000

1.4.2A Poisson/Negative Binomial

Poisson and Negative Binomial are both regression techniques designed for outcome variables that take the form of count variables such as the number of events occurring. For the purpose of this research, the variable of interest identifies the number of offences/collisions a driver has committed/been involved in over specified time periods since course attendance or declining an offer. The standard specification used is presented below:

$$y_i^x = e^{\alpha + X_i\beta + \partial NSAC_i + \gamma LP + \varepsilon_{it}} = e^{\alpha} * e^{X_i\beta} * e^{\partial NSAC_i} * e^{\gamma LP} * e^{\varepsilon_{it}}$$

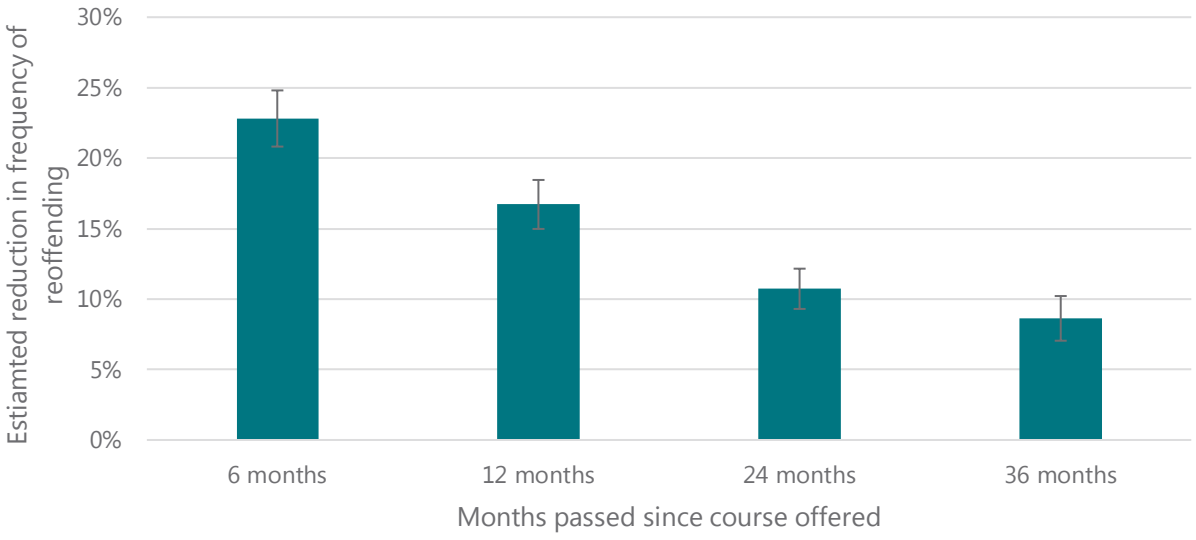
$$\log(y_i^x) = \alpha + X_i\beta + \partial NSAC_i + \gamma LP + \varepsilon_{it}$$

In contrast to the standard logistic regression model presented earlier, here y_i is a count variable taking the value of the number of offences/collisions for driver i after the earliest offence for which we have data. As above, this is estimated over the same timeframes, within x months of their earliest offence recorded in the dataset. The vector X_i contains the control variables set out in tables 1.5 and 1.6 in addition to the number of points on licence squared and a dummy for drivers with nine points thus controlling for the impacts these have on reoffending and collisions. A dummy variable for NSAC participation ($NSAC_i$) identifies treatment for the purpose of the analysis with the parameter ∂ capturing its estimated impact on the outcome. In contrast to the logistic specification, in these models an extra variable has been included that takes the value of the number of months since NSAC participation for drivers that take part on a course after the baseline offence.

Findings

Reoffending: Similar to those findings from the logistic regression analysis, these regressions find a persistent but declining effect on the incidence of reoffending post NSAC participation compared to drivers who declined a course offer. Figure 1.8 sets out the estimated reduction in the incidence of reoffending showing similar magnitudes to the effect sizes illustrated in figure 1.6.

Figure 1.8A: Estimated reduction in the frequency of reoffending compared to drivers that did not accept the course offer



Source: Ipsos MORI analysis

Table 1.8A: Poisson regression models – Reoffending analysis

Variable	Model 1		Model 2		Model 3		Model 4	
Estimated method	Poisson		Poisson		Poisson		Poisson	
Dependent variable	Offences in 6 month		Offences in 12 month		Offences in 24 month		Offences in 36 month	
Observations	1536807		1325248		890635		467864	
R squared	0.002		0.002		0.001		0.002	
	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
NSAC (dummy variable = 1 if driver attending an NSAC and zero otherwise)	-0.234	0.000	-0.169	0.000	-0.107	0.000	-0.086	0.000
Vehicle speed at baseline	0.005	0.000	0.004	0.000	0.005	0.000	0.005	0.000
Points on licence at baseline	0.047	0.000	0.076	0.000	0.089	0.000	0.115	0.000
Number of years with a valid licence at baseline	-0.005	0.000	-0.003	0.000	0.000	0.054	0.002	0.000
SP10	0.228	0.000	0.075	0.093	-0.051	0.189	0.090	0.040
SP20	-0.600	0.009	-0.248	0.122	-0.424	0.058	0.421	0.674
SP30	0.271	0.000	0.232	0.000	0.225	0.000	0.311	0.000
SP40	0.539	0.052	0.340	0.189	0.359	0.195	0.649	0.066
Prior convictions (dummy variable =1 if driver has prior driving convictions)	0.206	0.000	0.216	0.000	0.198	0.000	0.180	0.000
Dummy variable for nine points on licence at baseline	-0.100	0.534	-0.084	0.608	-0.231	0.366	-0.501	0.494
Number of points on licence at baseline squared	-0.006	0.001	-0.010	0.000	-0.013	0.000	-0.020	0.000
Number of months since NSAC participation at number of months specified in dependent variable	-0.070	0.950	-0.100	0.864	-0.090	0.631	-0.086	0.624
Constant	-2.992	0.000	-2.508	0.000	-2.048	0.000	-1.824	0.000
	Chi	Sig.	Chi	Sig.	Chi	Sig.	Chi	Sig.
LR test	1578.640	0.000	1363.54	0.000	1097.69	0.000	1131.73	0.000

1.5A Propensity score matching

As described in section 1.3, a score matching approach was applied to create a matched sample of drivers that did not participate in the course that could be considered more similar to course participants across a range of observed characteristics. A propensity score matching approach was utilised, in which statistical models were developed to compare the characteristics of drivers that participated in the course at the time of their baseline offence with those that did not. The first stage of this specifies a probit model predicting the likelihood someone takes up a course offer based on the aforementioned characteristics. Drivers that declined a course offer – but shared a similar predicted probability of being included on a course as a driver that was - were considered to be 'matched' and formed part of the comparison group. Drivers that declined an offer of a course and did not share a similar likelihood of those accepting such an offer were dropped from the sample and did not form part of the comparison group.

This approach can offer an unbiased estimate of the impact of the NSAC if it is possible to control for all factors that may influence the choice for a driver to accept or decline a course offer.

1.5.1A Matching variables

Nearest neighbour matching was applied to the samples of NSAC participants and the group of drivers that declined the course offer at the time of their baseline offence. The following variables were utilised in the matching:

- Vehicle speed at time of baseline offence: In order to match drivers with circumstances at the time of the baseline offence. It may be reasonable to think that drivers detected driving far in excess of the statutory limit may exhibit different attitudes to speeding;
- Points on licence at time of baseline offence: ensures comparison of drivers with similar recent endorsements. Drivers with more points are likely to exhibit different attitudes and behaviours than those with none or few which may also be tied to reoffending such as impulsiveness;
- Number of years' licence held at time of baseline offence: to match drivers with a similar amount of experience. The number of years with a valid licence is used as a proxy for experience which is likely linked to reoffending and may or may not influence the likelihood that someone accepts a course offer;
- Distance to nearest course location: for matching drivers in relation to the ease with which they can access a course. Drivers that are further from a course location may be less willing to take the time out to travel there and/or be unwilling to incur the extra cost thus declining a course offer;
- Price of course at nearest course location: as with distance above. The price of a course in the local area is likely to influence a driver's decision to attend or not attend a course. Those drivers facing a higher cost are less hypothesised as being less likely to accept an offer and therefore this should be used in the matching;
- Prior driving convictions: Previous convictions for driving offences is likely linked to reoffending and could be thought of as an indication of a driver's attitude. More impulsive drivers may have one or more prior convictions and also be more likely to be observed reoffending; and
- Offence type at time of baseline offence: to match participants as closely as possible in terms of the baseline offence for which they were included in the sample.

The outputs from the first stage probit models are presented in table 1.9 below. This shows that:

- Drivers with more experience, as measured by the number of years for which they have held a valid licence, are less likely to accept a course offer than those less experienced. This is intuitive especially given the incentive younger drivers face to attend a course instead of to receive the points, of which they need fewer in their first years of driving to be disqualified.

- Drivers detected at higher speeds at their baseline offence are less likely to accept a course offer potentially reflecting some underlying attitudinal differences between drivers detected near to the limit and those further above it. Similarly, with the number of points on a driver's licence prior to the baseline offence, more points mean a driver is less likely to accept a course offer.

- Surprisingly, however, facing a higher course price is associated with an increased likelihood of accepting an offer. It should be noted that the magnitude of this effect is just 0.4 percent for every extra pound.

Comparing the balance of the models after matching, table 1.10 illustrates the results of the matching process and the remaining bias. The matching procedure is shown to have performed relatively well.

Table 1.9A: Probit model

Variable	Model 1		Model 2		Model 3		Model 4	
Treatment group	NSAC participants		NSAC participants		NSAC participants		NSAC participants	
Control group	Drivers declining offer		Drivers declining offer		Drivers declining offer		Drivers declining offer	
Length of time in data	At least 6 months		At least 12 months		At least 24 months		At least 36 months	
Observations in treatment group	997761		997761		669157		347638	
Observations in control group	138062		138062		96571		54949	
R-squared	0.004		0.004		0.004		0.004	
	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
Vehicle speed	0.002	0.000	0.002	0.000	0.002	0.000	0.003	0.000
Points on licence	-0.037	0.000	-0.037	0.000	-0.032	0.000	-0.024	0.000
Number of years with a valid licence	-0.003	0.000	-0.003	0.000	-0.003	0.000	-0.003	0.000
Distance to nearest course location	-0.006	0.000	-0.006	0.000	-0.007	0.000	-0.005	0.000
Prior convictions	-0.313	0.000	-0.313	0.000	-0.308	0.000	-0.306	0.000
SP10	0.155	0.000	0.155	0.000	0.171	0.000	0.153	0.000
SP20	0.857	0.000	0.857	0.000	-	-	-	-
SP30	0.080	0.000	0.080	0.000	0.103	0.000	0.118	0.000
SP40	0.305	0.093	0.305	0.093	0.318	0.219	-	-
Price of nearest course	0.004	0.000	0.004	0.000	0.004	0.000	0.006	0.000
Constant	0.766	0.000	0.766	0.000	0.723	0.000	0.461	0.000

Table 1.10A: Overview of matched samples

Variable	Model 1		Model 2		Model 3		Model 4	
Treatment group	NSAC participants		NSAC participants		NSAC participants		NSAC participants	
Control group	Drivers declining offer		Drivers declining offer		Drivers declining offer		Drivers declining offer	
Length of time in data	At least 6 months		At least 12 months		At least 24 months		At least 36 months	
Mean standardized bias	2.2		2.2		1.5		2.1	
	Treated	Control	Treated	Control	Treated	Control	Treated	Control
Vehicle speed	44.545	43.692	44.545	43.692	44.340	43.713	44.348	43.622
Points on licence	0.122	0.123	0.122	0.123	0.081	0.084	0.034	0.032
Number of years with a valid licence	24.950	25.270	24.950	25.270	25.231	25.404	25.562	25.779
Distance to nearest course location	6.021	5.836	6.021	5.836	6.017	5.876	6.069	5.952
Prior convictions	0.016	0.015	0.016	0.015	0.016	0.015	0.015	0.014
SP10	0.004	0.004	0.004	0.004	0.005	0.005	0.005	0.004
SP20	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000
SP30	0.882	0.898	0.882	0.898	0.884	0.891	0.890	0.900
SP40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SP50	0.113	0.010	0.113	0.010	0.110	0.104	0.105	0.100
Price of nearest course	86.754	86.813	86.754	86.813	86.469	86.528	86.373	86.461

1.5.2A Average treatment effect on recorded reoffending

Findings from the comparison of the proportion of drivers detected driving in excess of the statutory speed limit after their baseline offence across the group of drivers accepting the course offer at the baseline and those declining are set out below. These clearly illustrate a lower proportion of drivers amongst the participant group having been observed reoffending over all timeframes with the difference remaining steady at between 1.2 and 1.7 percentage points for the sample of drivers for which at least 3 years' worth of data post baseline offence are available.

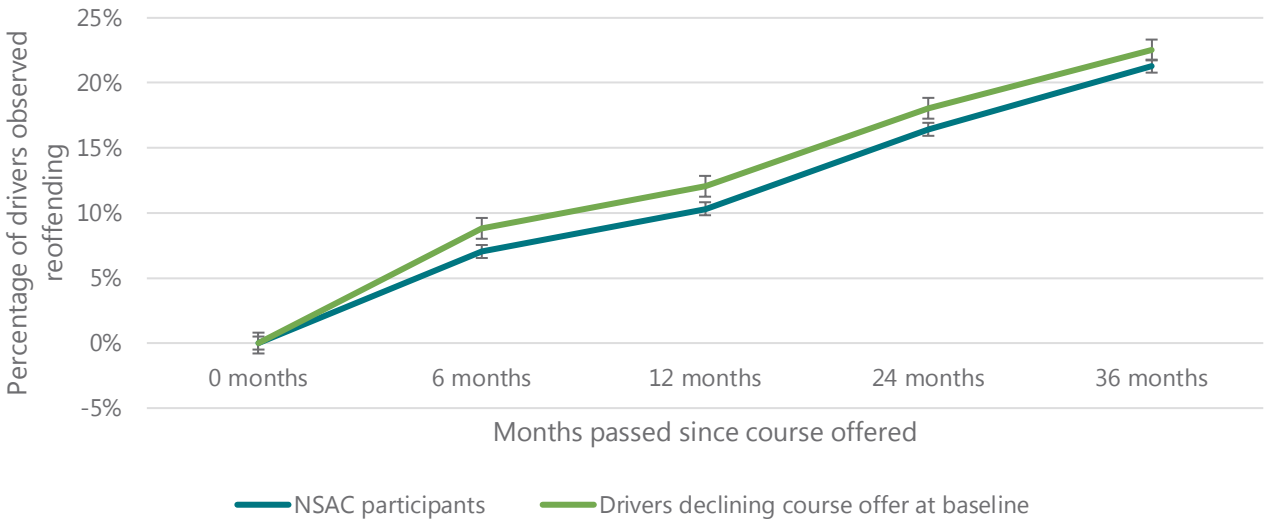
Table 1.11 sets out the differences in the means of the control and treatment group alongside the sample of drivers included in the relevant matching procedure. A negative value here indicates a lower proportion of drivers within the treatment group recorded as having reoffended. All differences are statistically significant at the 99 percent confidence level.

Table 1.11A: Differences in proportion of NSAC participants and comparison group drivers not accepting the course offer who were detected reoffending over number of months since baseline offence

Drivers in data for...	After 6 months	After 12 months	After 24 months	After 36 months
At least 6 months	-0.0100796	-	-	-
At least 12 months	-0.0100796	-0.0078626	-	-
At least 24 months	-0.0112485	-0.0093177	-0.0067936	-
At least 36 months	-0.0177944	-0.0172565	-0.0161806	-0.012421

Figure 1.9 illustrates these differences graphically and support the findings from the regression models presented earlier.

Figure 1.9A: Likelihood of drivers being detected reoffending (NSAC participants vs drivers declining course offer)



Source: Ipsos MORI analysis; *95 percent confidence intervals shown*

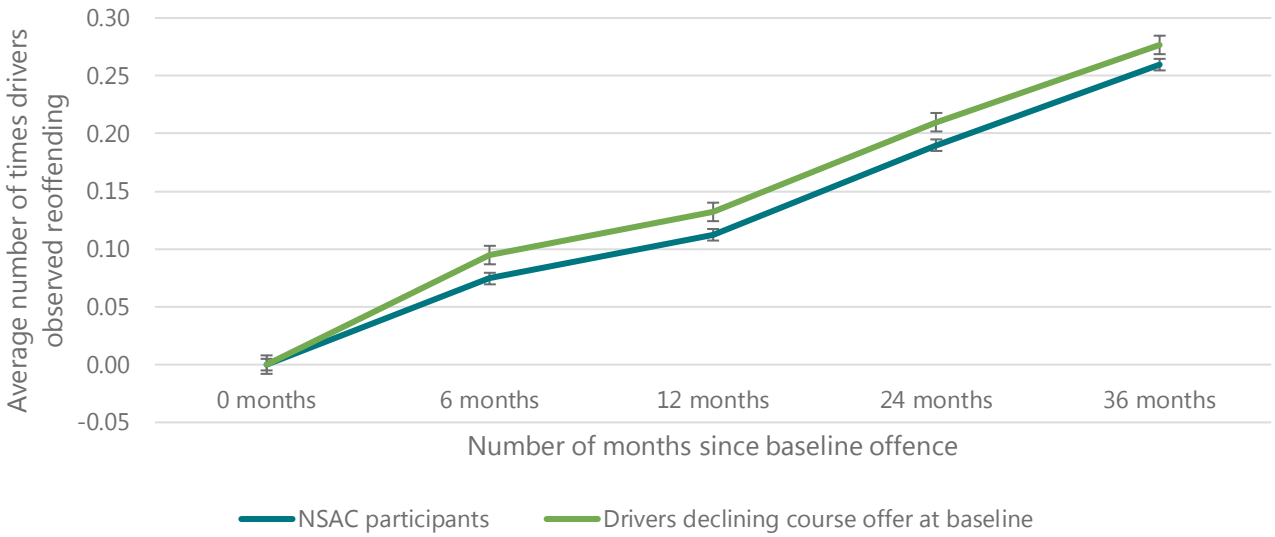
Similarly, table 1.12 presents the differences in the mean number of reoffences between the control and treatment groups with negative values indicating a smaller number of reoffences in the treatment group on average. Once again, all differences are statistically significant.

Table 1.12A: Differences in the average number of subsequent offences per driver across NSAC participants and comparison group drivers not accepting the course offer by number of months since baseline offence

Drivers in data for...	After 6 months	After 12 months	After 24 months	After 36 months
At least 6 months	-0.011957773	-	-	-
At least 12 months	-0.011957773	-0.010501513	-	-
At least 24 months	-0.012992467	-0.011686346	-0.009450697	-
At least 36 months	-0.020345877	-0.019799331	-0.019876998	-0.017063727

Figure 1.10 also confirms earlier findings and shows that participation in the NSAC is associated with a lower number of subsequent offences overall when compared to the matched sample. The proportional effect declines over time as in all the prior analyses but consistently remains within 1.7 and 2 percentage points in magnitude for the sample of drivers for whom we have at least 36 months of data.

Figure 1.10A: Frequency of reoffending (NSAC participants vs drivers declining course offer)



Source: Ipsos MORI analysis; *95 percent confidence intervals shown*

Summary of findings from comparisons with drivers declining a course offer

- Impact on the likelihood of re-offending: The findings suggest that NSAC participants are 23 percent less likely to be detected reoffending after six months compared to drivers who declined the course offer when controlling for a limited number of characteristics. The size of this effect decreases over time yet despite this decrease, course participants are still nine percent less likely to be observed reoffending after 3 years. Estimates from score matching exercises suggest that course participants are 1.2 to 1.7 percentage points less likely to be observed reoffending. This implies a slightly smaller effect size of 20 percent over 6 months and 5.5 percent over 3 years when compared to estimates obtained in the regression models.

- Impacts on the frequency of re-offending: Taking into account the fact that drivers may be observed reoffending on more than one occasion, further analysis comparing the frequency of reoffending of course participants to those who

did not accept the offer provides broadly similar findings – suggesting that, at 6 months, course participants are detected on 23 percent fewer occasions and 10 percent fewer occasions after 3 years.

Impacts of the course by years a licence had been held: The results suggested the course had a larger effect on those drivers who were more experienced, with an extra year on a participant's licence associated with an additional 0.1% reduction in the likelihood of reoffending. This would seem to suggest that more experienced drivers have most to gain from participation.

- Wider findings from the models:
  - Drivers with past motoring convictions are shown to be 23 percent more likely to be observed reoffending after 6 months with this effect remaining stable over time. At 36 months, a driver with a past motoring conviction is still 22 percent more likely to be detected reoffending.
  - Drivers with more points on their licence at the time of their baseline offence are also more likely to be observed reoffending over all timeframes. This would seem to suggest that the number of points on a driver's licence could represent a reasonable proxy of a driver's attitude towards driving. However, this research shows that the deterrent effect of penalty points on reoffending increases as points accumulate, with the probability of a driver reoffending falling as points approach the 12-point threshold needed for licence disqualification. This finding was consistent with past research[66].

1.6A Regression Discontinuity Design (RDD)

The models set out above address selection issues through the inclusion of control variables within a standard regression framework. If these controls did not fully capture the influence of unobserved differences, then the results set out above are likely to be subject to bias. A third set of analyses, based on exploiting the architecture of the NPCC guidance for course offers, was employed to try and validate these findings for reoffending.

The thresholds set out in the national guidance create a formal discontinuity between drivers offered a place on a speed awareness course and those not at the maximum guidance threshold (10%+9 over the speed limit). Given this feature of the programme, a plausible approach to the analysis would be a Regression Discontinuity Design (RDD). These methods are based on the assumption that, although drivers offered and accepting a course offer and drivers not in receipt of an offer will differ systematically on an overall basis, randomness in the observed offence speed in the immediate vicinity of the maximum guidance threshold will mean that the observed and unobserved characteristics of the two groups will be close to identical at this point (i.e. comparisons between those that were caught just in the guidance thresholds, to those that were caught just above). Provided that a set of key assumptions hold (discussed below), an RDD has an interpretation close to that of an RCT (and will be more robust than the logistic and Poisson/negative binomial results set out above). However, these findings are considerably less generalisable, as they only capture the effect of the course on the marginal driver (i.e. those 'just within' the guidance speeds).

[66] Corbett, C., Delmonte, E., Quimby, A. and Grayson, G. (2008). The deterrent effect of penalty points on speeding drivers. *Proceedings of the Behavioural Research in Road Safety, Eighteenth Seminar*, p. 175

1.6.1A RDD counterfactual sample of drivers

The sample of drivers constituting the counterfactual in this analysis was formed of drivers caught speeding in excess of the maximum threshold speed and not offered the NSAC:

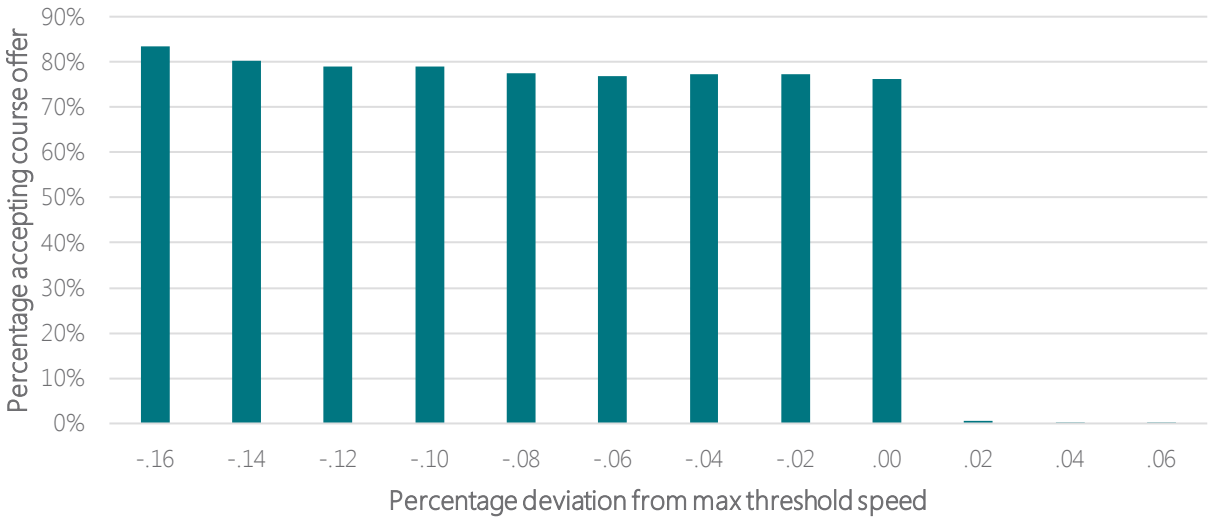
- Drivers caught just in excess of the maximum threshold: This counterfactual exploits police forces' use of national guidance thresholds for offering courses and attempts to address the potential for unobserved differences between individuals accepting or declining a course offer. This group is comprised of drivers caught just above the maximum threshold speed outlined in the national guidance i.e. more than 10%+9mph over the limit and were therefore not recommended for a course in the national guidance. As police forces are allowed their own discretion when offering courses however, some drivers in excess of this limit will also have been offered a course, an issue described in more detail in section 1.6.2. Differences in the unobserved characteristics of the drivers caught just under and those just over this maximum speed could be considered to be random in the vicinity of the threshold with the observed and unobserved characteristics of the two groups close to identical at this point.

For this analysis, it has also been necessary to estimate the speed limit of the road to which the offence relates. This has been done using the speed recorded and the categories of groups defined by eligibility check status and accepted status. As this is an estimation, the speed categories may not be wholly accurate and in particular it may understate the difference from the threshold for offenders not in receipt of an eligibility check as a result of their speed. This is because it has been assumed that where an offender did not receive an eligibility check, they were speeding in a zone with a limit equal to the next lowest speed limit for which they were not eligible for a course e.g. if someone not given an eligibility check is caught doing 57 it has been assumed that they were speeding in a 40mph zone as if this was 50 they would receive an eligibility check; however, it is impossible to rule out that this was in fact a 30mph zone. Note that all speeds have been rounded to the nearest whole number as over 95 percent of the speeds recorded were provided with zero decimal places.

1.6.2A Validity of Approach

Drivers are offered places on the course through the application of national guidance by police forces based on the speed at which they were caught and the speed limit of the road on which they were travelling. In order for an RDD type of analysis to be valid, there should be a discontinuous drop in the proportion of people accepting a course offer at the maximum threshold for the course.

Figure 1.11A: Distribution of speeds and course acceptance



Source: Ipsos MORI analysis

The figure above illustrates the probability of a driver being offered a place on a course given the percentage difference between the speed at which they were travelling and the speed limit of the road they were caught on. There is a distinct 'drop' in the probability of being offered a course at the maximum threshold, however the discretion afforded to Police Forces means that a relatively small number of drivers below this threshold were not offered a course and similarly some over it were.

In these circumstances, application of RDD methods will yield the 'Intention to Treat' estimator (i.e. an estimate of the impact of the course on those at the threshold speed for assignment into treatment, regardless of whether they ultimately attended a session). Fuzzy RDD (FRD) methods are required to estimate the average treatment effect on the treated and involves an additional step of estimating the discontinuous increase in the probability of assignment into treatment at the minimum scoring threshold, and introduce an additional source of uncertainty in the estimated treatment effects.

The RDD approach should be more robust than the previous approaches but its validity does rely on two further assumptions. The first of these is that the unobserved characteristics of the drivers just either side of the maximum threshold speed set out in the guidance are similar. It is assumed that this holds as it is unlikely that gender or age are very different for drivers around the cut-off. The second assumption is that there was no manipulation of treatment status (i.e. drivers are not able to influence assignment to treatment before or after the fact). This is also considered unlikely as the system used to catch and process speed offenders is automated with little opportunity for drivers to alter whether they receive a course offer or not.

1.6.3A RDD model specification

The RDD was implemented using a non-parametric form in which the sample was restricted to observations within a defined bandwidth of the recommended maximum threshold speed recommended for course participation. These observations were used to estimate the relationship between the running variable and outcome (and the discontinuous jump in the outcome variable at threshold).

The non-parametric RDD was implemented using a flexible functional form, as follows:

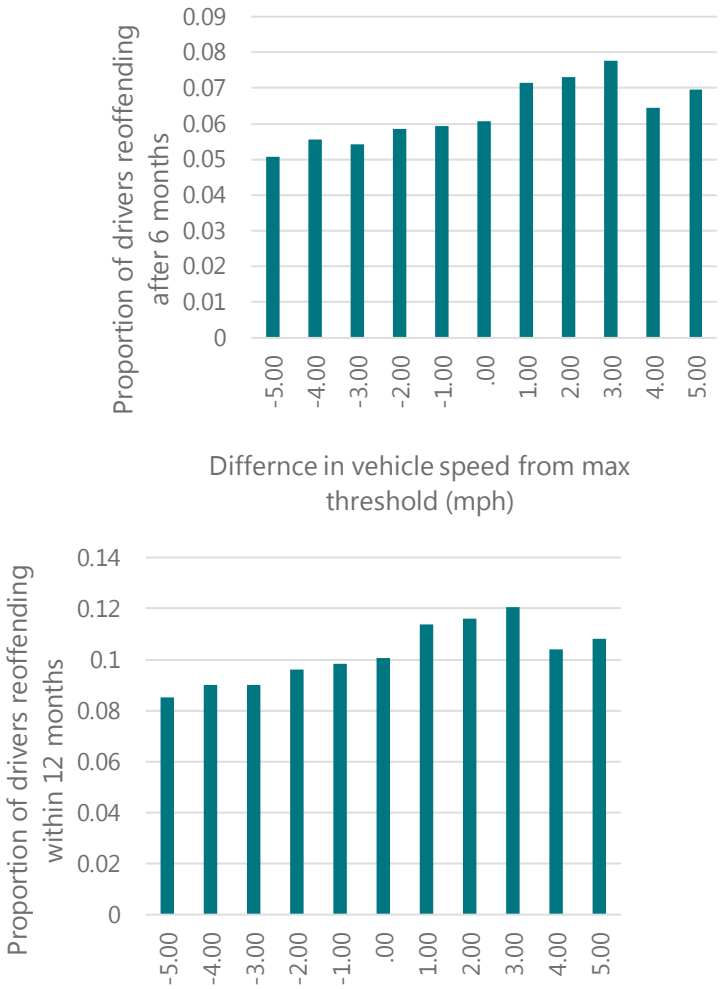
$\pi_i = \alpha + \beta T + (1 - T) \cdot (\gamma RV_i) + T \cdot (\rho RV_i) + \varepsilon_i$ (if -h<= RV<=h)

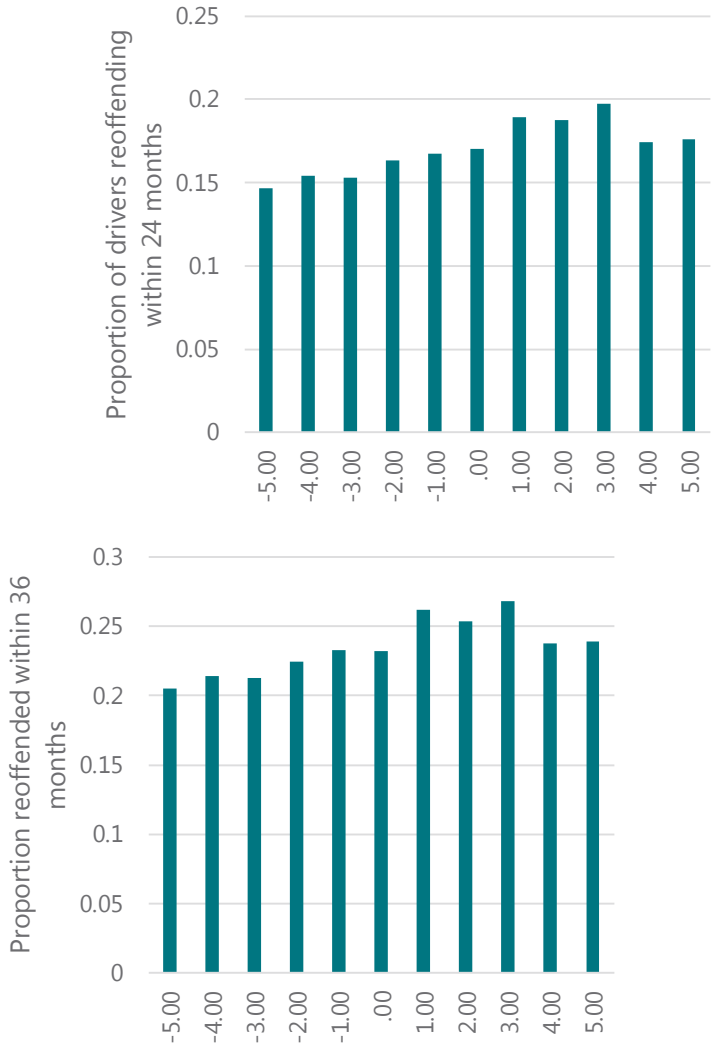
In this model, T is a dummy variable taking the value of zero if the running variable (RV) is greater than zero and one otherwise. The co-efficient β captures the impact of treatment at the threshold. The parameter h, is the bandwidth and determines which observations either side of the threshold are to be included in the linear regression. This specification was estimated using local linear regression and using the triangular kernel with the optimal bandwidth of 3 selected.

1.6.4A RDD Findings

Graphical analysis in figure 1.12 compares the reoffending rates of NSAC participants and drivers detected driving in excess of the statutory speed limit marginally above the maximum threshold speed outlined in the NPCC guidance. There is a discontinuous increase in the proportion of drivers reoffending when comparing drivers detected at speeds 1 mph faster above the maximum threshold for the course to those detected at speeds 1mph slower (as set out in the guidance for each of the four panels displayed).

Figure 1.12A: Likelihood of reoffending by difference in speed relative to maximum threshold

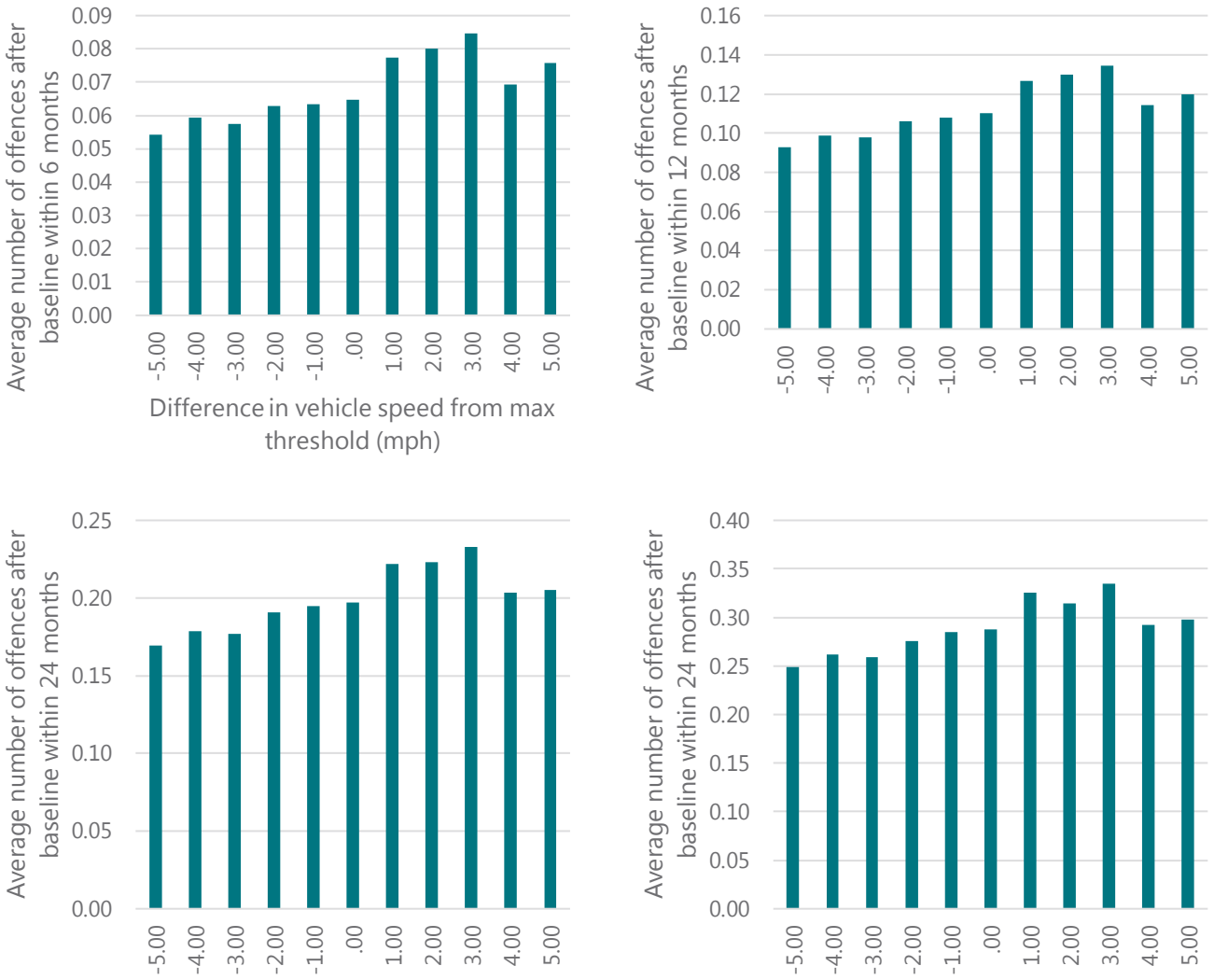




Source: Ipsos MORI analysis

Similar distributions to those above are observed when analysing the number of subsequent offences. Figure 1.13 below illustrates.

Figure 1.13A: Frequency of reoffending by difference in speed relative to maximum threshold



Source: Ipsos MORI analysis

These models were also first run utilising a sharp design which would provide the 'intention to treat' estimator of impact. Results from the 'fuzzy' design models are presented alongside these and in general show larger impacts whilst taking into account the flexibility in application of the guidelines and the fact that drivers above the threshold may have been offered a course whilst some below may not. Full results are presented in tables 1.14 and 1.15:

- These models suggest that participation in the NSAC leads to a reduction in the likelihood that the driver reoffends relative to a Fixed Penalty Notice and that this effect is persistent over time. These more robust findings suggest that the short-term effect of the course for this group of drivers is smaller - reducing the likelihood of reoffending by around 12 percent in over six months, compared to 20 to 25 percent suggested by the previous analyses. However, the findings also suggest that the impact of the course is more stable (and may even increase) over time. It should also be noted that the level of uncertainty regarding the size of the impacts of the course is higher with these results in comparison to the logistic, Poisson and propensity score matching estimates described earlier.

1.6.5A Summary

- The results of the RDD exercise support early findings from the logistic/Poisson regressions and propensity score matching exercise, however they do imply a smaller short term effect that remains more persistent as time passes.

Table 1.14A: RDD regression tables (binary outcomes)

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
Dependent variable	Reoffended within 6 months		Reoffended within 12 months		Reoffended within 24 months		Reoffended within 36 months		Reoffended within 6 months		Reoffended within 12 months		Reoffended within 24 months		Reoffended within 36 months	
Parametric/non-parametric	Non-Parametric/local linear		Non-Parametric/local linear		Non-Parametric/local linear		Non-Parametric/local linear		Non-Parametric/local linear		Non-Parametric/local linear		Non-Parametric/local linear		Non-Parametric/local linear	
Fuzzy/Sharp	Sharp		Sharp		Sharp		Sharp		Fuzzy		Fuzzy		Fuzzy		Fuzzy	
Speed bandwidth	3mph		3mph		3mph		3mph		3mph		3mph		3mph		3mph	
Effective observations	349322		303672		207609		108761		349322		303672		207609		108761	
Right of cut-off	147900		129092		89001		47342		147900		129092		89001		47342	
Left of cut-off	201422		174580		118608		61419		201422		174580		118608		61419	
	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
First stage	-	-	-	-	-	-	-	-	-0.978	0.000	-0.978	0.000	-0.978	0.000	-0.978	0.000
	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
NSAC treatment effect	-0.009	0.002	-0.010	0.006	-0.019	0.000	-0.034	0.000	-0.009	0.002	-0.011	0.006	-0.020	0.000	-0.035	0.000

Source: Ipsos MORI analysis

Table 1.15A: RDD regression tables (frequency outcomes)

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
Dependent variable	Offences at 6 months		Offences at 12 months		Offences at 24 months		Offences at 36 months		Offences at 6 months		Offences at 12 months		Offences at 24 months		Offences at 36 months	
Parametric/non-parametric	Non-Parametric/local linear		Non-Parametric/local linear		Non-Parametric/local linear		Non-Parametric/local linear		Non-Parametric/local linear		Non-Parametric/local linear		Non-Parametric/local linear		Non-Parametric/local linear	
Fuzzy/Sharp	Sharp		Sharp		Sharp		Sharp		Fuzzy		Fuzzy		Fuzzy		Fuzzy	
Speeds	3mph		3mph		3mph		3mph		3mph		3mph		3mph		3mph	
Effective observations	349322		303672		207609		108761		349322		303672		207609		108761	
Right of cut-off	147900		129092		89001		47342		147900		129092		89001		47342	
Left of cut-off	201422		174580		118608		61419		201422		174580		118608		61419	
	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
First stage	-	-	-	-	-	-	-	-	-0.978	0.000	-0.978	0.000	-0.978	0.000	-0.978	0.000
	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
NSAC treatment effect	-0.009	0.005	-0.012	0.005	-0.021	0.003	-0.046	0.000	-0.009	0.005	-0.013	0.005	-0.022	0.003	-0.047	0.000

Source: Ipsos MORI analysis

1.7A Instrumental Variables (IV)

The analysis above illustrates that, as participation in the NSAC is based on a choice of the individuals concerned after a course offer has been made, it is challenging to identify the causal effects of course participation as this decision will be determined by characteristics of those individuals that might also be thought to influence the outcomes of interest (i.e. attitudes, knowledge of speed limits, and compliance with speed limits). However, if it is possible to identify a variable (an instrument) that influences participation in the course, but is not directly correlated with the outcomes of interest (i.e. it is 'exogenous'), then it is feasible to develop unbiased estimates of the impacts involved. This evaluation approach is known as an instrumental variable strategy and produces highly robust (Level 4 on the Maryland Scale) estimates of causal effects (provided it is feasible to identify a valid instrument)[67].

The main challenge involved in implementing an instrumental variable approach is identifying a variable that meets these requirements. However, there are two aspects of the delivery of the course that may influence participation in the course, but are determined independently of the course participants. Firstly, the price of the course is set by course providers, and to the extent that price of the course is influential in the choice to accept the course or the FPN and penalty points, this will influence a drivers decision to participate or not but is not directly related to reoffending behaviour. Secondly, the opportunity cost of participating in the course will also be determined by the distance that individuals need to travel (which in turn will be determined by the physical locations for delivery selected by the course provider).

This analysis makes use of course provision data to build an estimate of the costs associated with participating in the NSAC covering the distance to the nearest available course from a driver's home address and the price charged there at that time. Additional variables thought to be in part linked to the ability for someone to pay (such as wages, employment etc.) at the Police Force area level were also included in an attempt to improve the power of the instruments, however these instruments were not found to be valid in any of the models specified and are therefore not reported here. The comparison group for this analysis is the group of drivers who declined a course offer upon their first detection between April 2012 and April 2017.

1.7.1A IV validity

The instruments, price, distance to the nearest course location and total cost, were all found to be correlated with treatment assignment. This means that these variables were likely linked to a driver's decision to accept or decline a course offer. However, the directions of these correlations were not entirely as expected. The price charged by the course provider in a driver's local area was positively correlated with offer acceptance meaning that areas with higher course prices were associated with higher NSAC participation. This is counter-intuitive and may reflect other underlying factors such as a driver's ability to pay for a course. The distance to the nearest course location and total cost were, however, negatively correlated meaning that having further to travel to a course location was associated with drivers declining an offer, as was facing a higher cost in terms of price and time. These correlations do not imply causality.

Tests for under and weak identification do not suggest that using total cost and distance to the nearest course results in a weak model and those presented in Table 1.17 are always identified. However, statistical testing to confirm the validity of the instruments suggests that they are not. In light of this, findings from the instrumental variable analysis are likely to be biased and inconsistent.

[67] See: National Audit Office. (2013). *Evaluation in Government*. NAO. pp22. Available at: https://www.nao.org.uk/wp-content/uploads/2013/12/10331-001-Evaluation-in-government_NEW.pdf

1.7.2A Model specification

The standard approach for such analyses would be to apply a two-stage least squares specification such as the one below:

$$\hat{D}_i = \boldsymbol{\lambda}_i{}'\gamma + \rho z_i + \epsilon_i$$

$$y_i = \mathbf{x}_i{}'\beta + \alpha \hat{D}_i + u_i$$

In the second equation, y_i is the outcome variable for driver i (i.e. likelihood of reoffending or being involved in a collision), $\mathbf{x'}_i\beta$ is the matrix of observable covariates and corresponding parameter estimates that would include, amongst other things, points on licence at time of offence and length of time they have held a licence and D_i is a dummy variable, set at 1 if the driver has participated in an NSAC with α is the effect of the treatment on the outcome variable. In the first equation, NSAC participation, D_i, is estimated as a function of the matrix z_i, the instruments. In both equations, u_i and ϵ_i are both error terms.

In the case of a binary outcome variables, such as the likelihood someone is detected reoffending, this model would be equivalent to estimating a linear probability model and is therefore likely to be considered less theoretically robust.

1.7.3A Findings

Tables 1.16 to 1.17 present the results of the IV analysis including first stage regressions and test statistics:

- Likelihood of reoffending: These results suggest that the likelihood of course participants observed reoffending is 2.4 percentage points lower than for drivers that decline a course offer after 6 months. The effect increases to 4 percentage points at 12 months from where it remains similar up until 36 months where it estimated to be a 3.6 percentage point difference.

- Frequency of reoffending: Looking at the frequency of reoffending, the results suggest that the course participants reoffending rate is 2.7 percentage points lower after 6 months than for drivers who decline a course offer. The effect increases to 4.5 percentage points at 12 months from where it remains similar up until 36 months where it estimated to be a 4-percentage point difference.

Table 1.16A: First stage IV regressions

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
Dependent variable	Likelihood of reoffending within 6 months		Likelihood of reoffending within 12 months		Likelihood of reoffending within 24 months		Likelihood of reoffending within 36 months		Frequency of reoffending within 6 months		Frequency of reoffending within 12 months		Frequency of reoffending within 24 months		Frequency of reoffending within 36 months	
Instruments	Distance; Total cost		Distance; Total cost		Distance; Total cost		Distance; Total cost		Distance; Total cost		Distance; Total cost		Distance; Total cost		Distance; Total cost	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
Distance to nearest course location	-0.002	0.000	-0.002	0.000	-0.002	0.000	-0.002	0.000	-0.002	0.000	-0.002	0.000	-0.002	0.000	-0.001	0.000
Total cost (includes price, time and travel costs)	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.000
Vehicle speed	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
Points on licence	-0.009	0.000	-0.009	0.000	-0.005	0.000	-0.005	0.187	-0.009	0.000	-0.009	0.000	-0.005	0.000	-0.004	0.187
Number of years with a valid licence	-0.001	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.000	-0.001	0.000
Prior convictions	-0.074	0.000	-0.074	0.000	-0.074	0.000	-0.077	0.000	-0.074	0.000	-0.074	0.000	-0.074	0.000	-0.077	0.000
SP10	0.031	0.000	0.031	0.000	0.035	0.000	0.033	0.000	0.031	0.000	0.031	0.000	0.035	0.000	0.033	0.000
SP20	0.108	0.000	0.108	0.000	0.142	0.000	0.158	0.426	0.108	0.000	0.108	0.000	0.142	0.000	0.158	0.426
SP30	0.016	0.000	0.016	0.000	0.022	0.000	0.026	0.000	0.016	0.000	0.016	0.000	0.022	0.000	0.026	0.000
SP40	0.055	0.087	0.055	0.087	0.060	0.203	0.147	0.110	0.055	0.087	0.055	0.087	0.060	0.203	0.147	0.110
Nine points on licence at baseline (1 = yes)	0.000	0.583	0.000	0.583	-0.000	0.202	-0.000	0.845	0.000	0.583	0.000	0.583	-0.000	0.202	-0.000	0.845
Number of points on licence at baseline squared	0.048	0.002	0.048	0.002	-0.002	0.951	-0.112	0.207	0.048	0.002	0.048	0.002	-0.002	0.951	-0.112	0.207
Constant	0.733	0.000	0.733	0.000	0.724	0.000	0.625	0.000	0.733	0.000	0.733	0.000	0.724	0.000	0.625	0.000

	F stat.	sig.	F stat.	sig.	F stat.	sig.	F stat.	sig.	F stat.	sig.	F stat.	sig.	F stat.	sig.	F stat.	sig.
First stage F test	606.950	0.000	606.955	0.000	436.829	0.00	248.110	0.00	606.955	0.000	606.955	0.100	436.829	0.000	248.11	0.000

Table 1.17A: Second stage IV regressions with test statistics

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
Dependent variable	Likelihood of reoffending within 6 months		Likelihood of reoffending within 12 months		Likelihood of reoffending within 24 months		Likelihood of reoffending within 36 months		Frequency of reoffending within 6 months		Frequency of reoffending within 12 months		Frequency of reoffending within 24 months		Frequency of reoffending within 36 months	
Instruments	Distance; Total cost		Distance; Total cost		Distance; Total cost		Distance; Total cost		Distance; Total cost		Distance; Total cost		Distance; Total cost		Distance; Total cost	
Observations	1135823		1135823		765914		402604		1135823		1135823		765914		402604	
	F stat.	sig.	F stat.	sig.	F stat.	sig.	F stat.	sig.	F stat.	sig.	F stat.	sig.	F stat.	sig.	F stat.	sig.
F stat	70.180	0.000	70.040	0.000	64.580	0.000	59.560	0.000	70.060	0.000	68.050	0.000	59.780	0.000	54.800	0.000
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
NSAC (dummy variable = 1 if driver attending an NSAC and zero otherwise)	-0.012	0.000	-0.010	0.000	-0.012	0.000	-0.016	0.000	-0.017	0.000	-0.015	0.000	-0.016	0.000	-0.020	0.000
Vehicle speed	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000
Points on licence at baseline	0.004	0.000	0.009	0.000	0.014	0.000	0.025	0.000	0.004	0.000	0.010	0.000	0.017	0.000	0.034	0.000
Number of years with a valid licence at baseline	-0.000	0.000	-0.000	0.184	0.000	0.000	0.001	0.000	-0.000	0.000	-0.000	0.097	0.001	0.000	0.002	0.000
Prior convictions (dummy variable =1 if driver has prior driving convictions)	0.025	0.000	0.043	0.000	0.066	0.000	0.106	0.000	0.030	0.000	0.052	0.000	0.0900	0.000	0.157	0.000
SP10	0.013	0.000	0.005	0.331	-0.012	0.076	0.007	0.549	0.011	0.006	0.001	0.863	-0.026	0.002	-0.019	0.269
SP20	-0.040	0.000	-0.053	0.000	-0.116	0.000	0.016	0.957	-0.045	0.000	-0.060	0.000	-0.153	0.000	-0.088	0.833
SP30	0.014	0.000	0.015	0.000	0.024	0.000	0.038	0.000	0.014	0.000	0.016	0.000	0.0248	0.000	0.041	0.000
SP40	-0.008	0.722	0.002	0.949	0.057	0.321	0.114	0.414	-0.014	0.606	-0.008	0.795	0.063	0.375	0.154	0.429

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
Dependent variable	Likelihood of reoffending within 6 months		Likelihood of reoffending within 12 months		Likelihood of reoffending within 24 months		Likelihood of reoffending within 36 months		Frequency of reoffending within 6 months		Frequency of reoffending within 12 months		Frequency of reoffending within 24 months		Frequency of reoffending within 36 months	
Dummy variable for nine points on licence at baseline	-0.000	0.004	-0.001	0.000	-0.001	0.000	-0.003	0.013	-0.000	0.019	-0.001	0.000	-0.001	0.001	-0.004	0.009
Number of points on licence at baseline squared	-0.018	0.133	-0.0343	0.022	-0.038	0.297	0.048	0.721	-0.019	0.157	-0.032	0.068	-0.042	0.356	0.089	0.637
Constant	-0.108	0.000	-0.194	0.000	-0.331	0.000	-0.661	0.000	-0.131	0.000	-0.233	0.000	-0.455	0.000	-0.996	0.000
	Chi	P-value	Chi	P-value	Chi	P-value	Chi	P-value	Chi	P-value	Chi	P-value	Chi	P-value	Chi	P-value
Under identification test	1212.630	0.000	1212.670	0.000	872.678	0.000	495.621	0.000	1212.627	0.000	1212.627	0.000	872.678	0.000	495.621	0.000
	F	IV size	F	IV size	F	IV size	F	IV size	F	IV size	F	IV size	F	IV size	F	IV size
Weak identification test	606.950	10%	606.955	10%	436.829	10%	248.108	10%	606.955	10%	606.955	10%	436.829	10%	248.108	10%
	Chi	P-value	Chi	P-value	Chi	P-value	Chi	P-value	Chi	P-value	Chi	P-value	Chi	P-value	Chi	P-value
Sargan statistic	36.244	0.000	7.581	0.0059	31.486	0.000	38.303	0.000	31.694	0.000	6.669	0.000	31.166	0.000	33.159	0.000

1.8A Collisions

The set of analyses applied to the reoffending data described throughout this annex were also applied to the collision data. However, there are several limitations with the data and methods that should be taken into account when interpreting these results:

- Rarity of collision occurrence: Only 401 collisions are recorded in the dataset between April 2012 and April 2017. These involved 381 unique drivers representing less than 0.001 percent of the total sample. Under such circumstances, regression analysis is limited in its extent to identify statistically significant differences across covariates.

- Lack of contextual details: STATS19 data does not record blame and contextual detail is absent meaning that it is not possible to ascertain in exactly what capacity an individual was involved in a collision. However, the absence of these details should apply equally to collisions involving NSAC participants and those involving non-participants.

- Probable underreporting of injury collisions and no data on non-injury collisions: the data only covers injury collisions reported by the police and is known to understate both the number of injury collisions and includes no information on higher frequency but lower cost minor collisions. Prior research using the National Travel Survey suggests there are an estimated 2.6 unreported injury collisions[68] per reported injury collision. Further analysis of the 2016 NTS data also suggests that there were approximately 2.6 non-injury accidents for every injury accident in 2016, as reported by NTS respondents[69].

In order to address the first of these points, the analysis comparing drivers who accepted a course offer on their first detection between April 2012 and April 2017 with those that declined one has been undertaken as in the reoffending analysis but has also been supplemented with additional models which aim to improve confidence in findings.

1.8.1A Penalized logit/firth

This approach modifies the standard logistic regression model approach to reduce small sample bias in small sample data. This is clearly applicable for the analysis of collision data, where the occurrence of an event (collision) is extremely rare. In these scenarios, the standard logistic model, estimated via maximum likelihood is prone to bias, with maximum likelihood consistent only if the number of observations is sufficient. Where collisions are concerned, the sample size for drivers that are known to have been involved in a collision is very small in absolute terms and even smaller in relative terms to those drivers not observed reoffending. To compound matters, the sample size falls further when looking at the sample of drivers observed as having been involved in a collision across the two core comparison groups with only 33 drivers involved in a collision after declining a course offer.

This approach applies a penalty to model coefficients removing the first order bias of the Maximum Likelihood estimates and is a technique readily available in most statistics packages. For a more complete discussion of this approach and its limitations, see Firth 1993.[70]

[68] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/648081/rrcgb2016-01.pdf

[69] The data table used for this is nts0623 and shows the proportion of respondents who have been involved in a road accident in the last 12 months. Data available to download here: https://www.gov.uk/government/statistics/national-travel-survey-2016

[70] Firth, D. (1993) *Bias reduction of maximum likelihood estimates.* Biometrika, Volume 80, Issue 1, 1 March 1993, Pages 27–38. Available at: https://doi.org/10.1093/biomet/80.1.27

1.8.2A Zero-inflated Poisson

Zero inflated Poisson models make use of the zero-inflated distribution and can account for an excess number of observations with an outcome of zero. These models consist of two distinct parts:

- Binary distribution that determines structural zeros: A logistic model to estimate the likelihood of excess zeros.
- Poisson distribution generating counts: A Poisson distribution to estimate the expected number of counts of the outcome (which can also include zeros).

More detailed descriptions of this method are readily available in the literature (or see Ridout et al.1998).[71]

1.8.3A Logistic and Poisson findings

- Impact on the likelihood of re-offending: Both the standard and penalized logistic models give similar results though the p value for the treatment variable in the penalized model is slightly smaller. However, no statistically significant effects are found on the likelihood of a driver being involved in a collision after participating on the course. This is not conclusive evidence that the course does not have an impact as this finding may arise as a product of the very rare nature of the outcome. Future analysis could make use of larger sample sizes to elicit an effect. In addition, non-recorded collisions are unobserved and therefore these models will always show an incomplete picture of the impact on collisions.
- Impacts on the frequency of re-offending: Similarly, no effect is found on the number of collisions in either the standard Poisson or the zero-inflated Poisson models.

1.8.4A RDD findings

Implementation of the RDD was carried out as described in section 1.6 of this Annex with the reoffending outcomes replaced with the binary and count variations of the collision outcomes. No statistically significant effects were visible in any of the models. Table 1.19 contains a full set of results

1.8.5A Summary

- It has not been possible to demonstrate a statistically significant effect of participation in the NSAC on the likelihood of involvement in injury collisions. Injury collisions are a highly infrequent event and it is considered likely that the failure to find these effects was due to the small number of observations available for analysis. However, it is important to point that that the NSAC has not been designed directly to target and reduce collision involvement but to encourage and facilitate compliance with speed limits. There may be benefits in completing further analysis using larger samples of drivers than were available for this study to help understand the impact (or otherwise) of the course on road safety.

[71] Ridout, M.S., Demetrio, C.G.B. and Hinde, J.P. (1998) Models for counts data with many zeros. Proceedings of the XIXth International Biometric Conference, Cape Town, Invited Papers, pp. 179-192.

Table 1.18A: Logistic and Poisson regression models – collision analysis

Variable	Model 5		Model 6		Model 5		Model 6	
Estimated method	Logistic		Penalized Logistic		Poisson		Zero-inflated Poisson	
Dependent variable	Involved in a collision		Involved in a collision		Number of collisions		Number of collisions	
Observations	1652843		1652843		1652843		1652843	
R squared	0.007		-		0.007		-	
	Chi	Sig.	Chi	Sig.	Chi	Sig.	Chi	Sig.
LR test	32.890	0.000	35.690	0.000	33.680	0.000	32.570	0.000
	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
NSAC (dummy variable = 1 if driver attending an NSAC and zero otherwise)	-0.157	0.125	-0.155	0.102	-0.147	0.181	-0.157	0.154
Vehicle speed at baseline	-0.006	0.312	-0.006	0.303	-0.005	0.422	-0.004	0.542
Points on licence at baseline	-0.093	0.696	-0.085	0.640	-0.113	0.624	0.038	0.882
Number of years with a valid licence at baseline	-0.022	0.000	-0.021	0.000	-0.021	0.000	-0.024	0.000
SP10	0.973	0.105	1.070	0.116	0.892	0.136	0.721	0.271
SP20	-	-	-	-	-11.009	0.986	-11.722	0.992
SP30	-0.399	0.062	-0.387	0.060	-0.418	0.043	-0.400	0.068
SP40	-	-	-	-	-11.015	0.994	-11.669	0.996
Prior convictions (dummy variable =1 if driver has prior driving convictions)	0.960	0.002	0.932	0.002	0.918	0.003	0.899	0.007
Dummy variable for nine points on licence at baseline	-	-	-	-	-9.816	0.984	-10.991	0.991
Number of points on licence at baseline squared	-0.002	0.965	-0.002	0.936	0.000	0.998	-0.011	0.824
Number of months since NSAC participation at number of months specified in dependent variable	-0.009	0.937	-0.012	0.985	-0.023	0.928	-0.086	0.850
Constant	-7.560	0.000	-8.316	0.000	-7.589	0.000	-1.591	0.005

Table 1.19A: RDD regressions table – collision analysis

	Model 1		Model 2		Model 3		Model 4	
Dependent variable	Likelihood of collision involvement		Likelihood of collision involvement		Frequency of collision involvement		Frequency of collision involvement	
Parametric/non-parametric	Non-Parametric/local linear		Non-Parametric/local linear		Non-Parametric/local linear		Non-Parametric/local linear	
Fuzzy/Sharp	Sharp		Fuzzy		Sharp		Fuzzy	
Speeds	3mph		3mph		3mph		3mph	
Effective observations	288145		288145		207609		108761	
Right of cut-off	132658		132658		89001		47342	
Left of cut-off	155487		155487		118608		61419	
	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
First stage	-	-	-0.954	0	-	-	-0.954	0
Treatment effect	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
NSAC treatment effect	-0.000	0.368	-0.000	0.368	-0.000	0.568	-0.000	0.568

Annex B: Qualitative Research

Ipsos MORI was commissioned to deliver an independent evaluation of the National Speed Awareness Course (NSAC). As part of the study, qualitative research was carried out with stakeholders as well as course participants to gather views on the course's overall effectiveness and its possible effects on driver behaviours, attitudes and offending behaviour. This strand of research provides further detail for the rationale of the NSAC and an understanding of how, in what respects and why the course may have been effective in meeting its objectives. It should be noted that this element constituted a relatively small part of the overall programme of research, and consultees were selected to capture a mixture of perspectives rather than seeking a nationally representative sample. This annex provides a detailed description of the qualitative work carried out as part of the impact evaluation of the NSAC and the associated findings.

1.1B Stakeholder consultation

1.1.1B Objectives

The primary purpose of the stakeholder consultations was to gather views on the effects of the course. However, they were also used to validate the approach taken to the data analysis described in Annex A. In full, the objectives were to:

- Explore the expected effects of the course on offending behaviour of participants;
- Explore the broader context in which the NSAC is administered; and
- Collect evidence to validate the statistical approach described in Annex A.

1.1.2B Methodology

A total of 15 stakeholder consultations were carried out face to face and by telephone in May and July 2017 with representatives from the National Driver Offender Retraining Scheme (NDORS), police forces, course providers and other relevant parties. Stakeholders participating in these consultations were asked questions on the following topics:

- History of the course and rationale for implementation;
- Administration of the course;
- Motivations for offer acceptance;
- Expected effects of participation;
- Public perceptions of the NSAC; and
- Broader context.

Each interview was tailored to the interviewee, based upon their area of expertise; some topics were covered in more/less detail with some individuals than with others.

The 15 stakeholder interviewees were categorised into three groups: policy stakeholders, police force representatives and course provider representatives. Policy stakeholders came from organisations heavily involved in road safety policy, including

representatives from the DfT, NDORS, Highways England and Road Safety GB. Police force representatives were sampled from those forces which had agreed to participate in the wider research and were selected to achieve a mix of areas, taking into account urban/rural spilt, geographical size and population density, killed & seriously injured casualties statistics, and course provider type (local authority, private company or police force). Course providers were then sampled on the basis of police force areas selected.

1.1.3B Findings

The findings from consultations with stakeholders are presented by theme below:

What is the rationale and context behind the NSAC?

All stakeholders consulted as part of this research gave a view on the rationale of the NSAC. The effectiveness of education over prosecution was thought to be the main factor underpinning the rationale for the course:

- Effectiveness of education over prosecution: Several policy stakeholders made reference to the 1988 Road Traffic Law Review Report[72] and the idea that education was a valid alternative to prosecution. With the public interest in mind, this would address the behaviour of the offender and not just punish the offence. By addressing the attitudes and behaviours of drivers observed driving in excess of the speed limit, the course was considered by policy stakeholders to have more potential to alter future driving behaviour and reoffending than the traditional FPN and three penalty points as it addresses the root cause of the offence (whereas a Fixed Penalty Notice was thought to have little link to the behaviour at the root of the incident).

However, a further two factors were highlighted in the consultations as important in motivating the introduction of the national course:

- Standardise delivery of course: At the time of the introduction of NSAC, several police forces already provided local courses which varied in content and quality. There was a perception that it was a 'local lottery' as to whether the course offered in a driver's local area was one of the better or worse in terms of quality, length or price. The national rollout was designed to address these inconsistencies in the treatment of speed offenders between areas and the quality between providers.

- Increasing legitimacy of road safety enforcement: Another reason given for the introduction of the course concerns the increasing use of static speed cameras which resulted in more detections that would not have been pursued otherwise by police officers. In such cases, some drivers thought this was unfair and that, as a result, issuing a FPN was not in the public interest. It was suggested that the course would represent a 'policing by consent' intervention in this context as it was considered to be a more acceptable means of policing by the drivers being enforced than the FPN.

It was also highlighted by some policy stakeholders that some drivers may be particularly hostile towards the course or anxious about its intentions. Such hostility was thought to derive from the perceived unfairness following the spread of fixed speed cameras described in the bullet point above.

Stakeholders stressed the importance of the course delivery matching the specification to ensure that any expected behavioural changes were realised. This was because the course had been designed based upon behavioural change models

[72] Department for Transport/Home Office. 1988. *Road traffic law review report*. London: HMSO

that stipulate the activities necessary to change behaviour. Should these not be followed, the causal chain from attendance to changes in behaviour may not arise. The view was expressed that trainers need to be aware of the mechanisms through which behavioural change is realised, or the course would risk failing to stimulate the changes desired.

It was suggested that the course is targeted at three key groups of drivers which are identified in the latest course specification:

1. Drivers who were not aware they were speeding either because they did not notice their speed or were not aware of the speed limit;

2. Drivers who were aware they were speeding but believed it to be so minor that it did not make much of a difference; and

3. Drivers who were more likely to take risks and to speed more often but who were of the belief that they were a safe driver.

These three target groups align nicely with the two key groups of drivers identified in the 2005 evaluation of the National Driver Improvement Course[73] for Section 3 offences such as driving without due care and attention. This identified that there were two types of drivers who were being referred to the scheme. The first lacked some of the key skills required for driving whist the other group had these skills but were not willing to apply them:

- Skills deficient – For some drivers, for whom a significant amount of time had passed since their test, it was suggested that the key skills/knowledge required for safe driving had deteriorated and led to the potential for accidental lapses (i.e. non-deliberate mistakes). Drivers in the first group above would best fit into this category.

- Attitude deficient – Another group of drivers were identified who may or may not possess the skills required to drive safely within the limit but who did not see their behaviour as a problem, and 'needed to be educated' (violations based on deliberate high-risk behaviour). Drivers in the second and third group above would fit into this category of driver.

For the first of these groups, the re-learning of driving skills and techniques to maintain control of their speed was considered to be the mechanism through which changes in driving behaviour would occur. In contrast, for the second group it was suggested that the weighing up of the benefits and costs of speeding, as well as education about the consequences, would prompt attitudinal change that would lead to changes in future behaviour.

Following on from this, one policy stakeholder suggested that the course was unlikely to have any effect on drivers who consciously weight up the costs and benefits of speeding before course participation and who still take a conscious decision to drive with excessive speed. Such a driver does not fit neatly into either of the two categories outlined above but shares characteristics with the attitude deficient group.. As these are the main mechanisms through which the course aims to have an effect, it would be reasonable to think that the course would have less of an effect on these drivers. Another stakeholder suggested that drivers who reoffend are likely to be defined, at least in part, by their prior attitudes and behaviours; and in particular, drivers breaking speed limits by a greater margin or more often are less likely to benefit from participation as they are already taking a calculated risk driving in this manner.

[73] Conner, Mark & Lai, Frank. (2005). Evaluation of the effectiveness of the National Driver Improvement Scheme. Available at: https://www.researchgate.net/publication/237482506_Evaluation_of_the_effectiveness_of_the_National_Driver_Improvement_Scheme

Police force stakeholders and course providers discussed the rationale in less depth but generally agreed with the views described by policy stakeholders above. Police force representatives highlighted the importance of policing with consent and the provision of a national scheme to formalise the array of courses provided before 2009, whilst course providers focussed on the expected implications for road safety and the potential for education to have a greater effect on behavioural and attitudinal change than a FPN as a key reason for the introduction of the course.

How is the course administered?

All five police forces relied primarily on the use of stationary speed cameras to detect speed offences. The sites chosen for these cameras were selected in a similar manner across each police force, with sites undergoing assessment based upon past evidence of collisions and collision related injuries. The police force representatives indicated that sites were chosen in places where reduced speed would potentially reduce the number of injuries. They described hand-held cameras as predominantly being used in response to complaints from individuals about stretches of road where no speed cameras were in place or that had an elevated risk of injury to children or other vulnerable people, such as outside schools.

Representatives of police forces commented on the approach used in their local area for the detection and processing of offenders. They were unanimous in their emphasis on the use of national guidance as the framework of local speeding policy enforcement. However, almost all police forces also made use of the flexibility afforded to them in extreme circumstances. This flexibility gives Chief Constables discretion to refuse to offer a course to a driver detected within the threshold speeds, or to extend a course offer to a driver detected outside of the range in some circumstances. One example might be when a driver was detected speeding but could prove that were mitigating circumstances such as visiting a seriously ill family member in hospital. Another example of the police using this flexibility was provided by one force that did not offer a course to a driver detected, by handheld camera, within the speeds set out in the guidance because they were considered to pose a risk to oncoming traffic. On this occasion, an FPN was issued to the driver in place of a course offer.

Both course providers and police forces stated that the time frames offered to course participants to accept and complete a course were broadly equivalent across police force areas primarily because the same PentiP system is used to process course offers in all police forces. Representatives from course providers also expressed a view that the course price was set based on the cost to deliver in each police force area and the costs associated with each individual provider.

What do stakeholders think the motivations of drivers are for accepting a course offer?

All stakeholders were asked about a driver's motivations for accepting a course offer over taking a FPN (in part to inform the statistical analyses[74]). There was consensus that the main motivation to accept a course offer was the avoidance of penalty points and a fixed fine. Accepting a course offer was associated with less significant indirect financial penalties such as increases in insurance premiums which are associated with the penalty points. However, the avoidance of points was highlighted as most important given the similarity in price of the course to the FPN (at least in recent years). It was suggested by several stakeholders that the relationship between penalty points and acceptance of a course offer was also not linear: the more points a driver had accumulated (and the closer they were to disqualification) the more likely they would be to accept a course offer. This was not possible to test with our group of participants as they had all accepted a course offer and at most had three points on their licence at the time of the offence nor was it possible to test thorough the statistical analysis. Other factors discussed included:

[74] See Annex A for further detail

- Convenience was also highlighted by a large proportion of stakeholders as a key factor. Most stakeholders expressed the opinion that where courses are available on weekends or at evenings, more drivers would be willing to accept an offer. There may be drivers for whom taking time off work is difficult or who consider the opportunity cost of their time to be higher. Such drivers were thought to be less likely to accept a course offer, but it was not clear whether these drivers would differ in a systematic way from drivers accepting a course offer.

- Employment: It was also suggested that drivers who relied on a clean licence or maintaining a licence for their employment would be much more likely to accept a course offer. For this group of drivers, it was thought that the financial consequences of a FPN and 3 penalty points for the individual would be far greater than the price of the course, with the potential loss of employment and income.

- Driver attitudes: The existing attitude of a driver towards speeding was thought by some stakeholders to be a significant factor affecting a driver's decision. Drivers who did not intend to offend were thought to be potentially more likely to accept an offer than a driver who is aware of their behaviour. This follows from the reasoning that drivers making a conscious decision to speed may be more willing to take risks and accept a higher penalty for their action than drivers detected because of a lack of attention to their speed.

- Price: The price of the course offer was not considered to be a major motivating factor by most stakeholders as the price was similar to the cost of a FPN. While there are variations in the price of the course across providers, differences were considered not to be significant and not large enough to influence participants' decision making.

The responses from the stakeholder interviews imply that course participants would primarily accept a course offer to avoid perceivably heavier sanctions, rather than choosing to go onto the course to learn new skills/techniques. Stakeholders considered that this was not detrimental to the case of the course as this now 'captive' audience would receive education that they otherwise would not have.

How is participation in NSAC expected to affect driver behaviour?

In terms of how the course is expected to have effects on reoffending, the most important factor cited by stakeholders was participants' increased knowledge. Stakeholders suggested that drivers were made more aware of the consequences of speeding, as well as gaining more knowledge of speed limits and speed limit recognition. These elements are outlined in the course specification and are grounded in behavioural change theory.

In terms of the likely length of time any effects of the course last, just under half of all stakeholders considered that effects on reoffending would be short term in nature. One thought that the effects would decline from 6 months onwards whilst another suggested the possibility that the effects would have worn off by around 12 months. It should be noted that these estimates differ substantially from the persistence of effects identified in the statistical analysis for this evaluation, suggesting that stakeholders hold unduly conservative views on persistence. These views were based on the belief that the knowledge gained from course participation would dissipate over time just as it was hypothesised that knowledge gained before completion of the driving test is also thought to dissipate. In the long term it was suggested that bad habits once again creep in, whilst in the very short term drivers would become more aware of their speed and make a concerted effort to obey the limit. It was not possible to gain views from participants on this as those interviewed had completed a course only 1 to 2 months earlier.

What might be the effect on collision from participation?

Around two thirds of interviewees commented on the potential for the NSAC to have an impact on the likelihood, frequency and severity of collisions. Policy stakeholders stressed that the aim of the course was to influence drivers' speeding behaviour and not to directly reduce road collisions. However, stakeholders were aware of the evidence base which suggests that speed does play a role in some collisions so it was recognised that course participation may have an indirect effect on collision occurrence. One policy stakeholder identified the teaching of techniques to identify hazards as one way in which the course might influence collision occurrence. Another stakeholder suggested that better awareness of speed limits and possession of techniques to control the vehicle would lead to more time to react to hazards, though it was likely that any effect would only be noticeable in situations where the driver was at fault. Representatives of course providers stressed that the course was not designed with collision reduction in mind.

What might be the effect on public perceptions of educational approaches to speed enforcement and perceptions of speed enforcement more generally?

Stakeholder interviewees thought the course increased the acceptability of educational approaches to speed enforcement because of the number of drivers having had a positive experience of the course which is then passed on by word of mouth. Combined with stakeholders' perceptions that drivers would rather be on the course than receive 3 points, the course is thought to have improved the acceptability of education as an alternative to prosecution in respect to speed enforcement, within the bounds defined by the guidance. There is no suggestion that the course might improve the acceptability of education as an alternative for higher level speeding behaviour.

Looking at speed enforcement more generally, drivers were said to appreciate that the course content legitimised the reasons for speed limit enforcement by highlighting the potential consequences of speeding. However, one stakeholder expressed the opinion that there was still a lot of progress to be made if the general public's perception of speeding was to be similar to that of drink/drug driving.

1.2B Participant research

1.2.1B Objectives

Course participants were interviewed to gain an understanding of the potential effects of the NSAC on participant attitude and behaviour. These interviews also played a small part in validating the approach taken in the statistical data analysis. The full list of objectives from these consultations were:

- To understand the attitudinal and behavioural changes expressed by participants that could be attributed to the course;
- To explore the factors participants considered before accepting a course offer; and
- To gather views on participant experience of the course.

1.2.2B Methodology

Overall, 15 telephone interviews were conducted with NSAC participants in October and November 2017. These semi-structured interviews covered the following topics:

- Decision to attend the course;
- Experience of the course;
- Driver attitudes towards speeding; and
- Driver behaviour.

All participants were asked the same questions and covered each of the above topics.

Ipsos MORI generated a sample of participants for interview by giving five course providers introduction and consent forms, which course trainers handed out to participants in September and October 2017. The consent forms introduced the study and asked for participants' permission to be contacted as part of this research. Participants were then invited to opt in to the study by completing the form provided and returning it in a sealed envelope to the course trainer. The trainer then forwarded these on to the study team once a certain number had been received. It was not possible to collect any demographic information upon which to sample drivers given concerns that requests for such details may deter participants from opting in. It was also not possible to sample drivers on the basis of their attitude towards speeding. As a result, it is possible that the final sample exhibits selection bias where drivers with more extreme positive or negative views may have been interviewed.

The approach resulted in 122 participants consenting to be contacted for the research. From this group, three participants from each course provider were then selected for interview. No firm criteria were placed on specific course location within the areas covered by these course providers but a spread was sought wherever possible. A total of 15 interviews were carried out.

During the interview, the participant was asked their age: the average age of the fifteen was 45. This compares to an average age of 47 from prior research into the NSAC[75], and an estimated range of 42 to 50 in the data used for this evaluation. Most participants interviewed had not attended a course in the past and for the four who had, this was their second time. Another four participants had received a FPN in the past and in each case the course had not been offered, either because they were not available at the time or because they were ineligible. All drivers interviewed were aware of the course prior to their participation (predominantly through word of mouth).

1.2.3B Findings

The findings from the participant consultations are presented below. Note that, although many are similar, not all of the headings below follow the same structure as those in the stakeholder consultation section as different questions were asked to this group and emphasis was placed on different aspects.

What motivations do drivers have for accepting a course offer?

Participants were asked about their motivations for accepting the course offer extended to them. The vast majority indicated that the main reason was the avoidance of the penalty points associated with a FPN and a desire to not incur any financial implications through effects on insurance premiums.

A small number of drivers also elaborated on the importance of not getting penalty points as this had implications for their employment.

What are participants' experiences of the NSAC?

The view offered by some policy stakeholders, that some participants may be anxious or hostile towards the course before attendance, was in part validated by some course participants spoken to. These feelings were thought to arise from a sense of unfairness at being detected or through anticipation that the course was there to punish drivers. Participants reported a common view before participation that the course was there to shame them. A number of course participants thought this would be the case but were all surprised after participation when they did not think they had been shamed at all.

> ***"I thought the course was essentially going to name and shame me, really I did"*** *– course participant, aged 56*

In terms of their expectations of the course content and application to them, before going on the course many participants believed it would focus very specifically on speed and use graphic images of accidents to scare participants. A number of those interviewed did not think they would benefit much from participation, apart from avoiding penalty points or higher insurance premiums. They expected that the course would have the intent of shaming them in some manner and would be quite dry in its content. Having participated, their views changed.

Following participation, those interviewed highlighted the knowledge they had gained relating to other aspects of driving, and not just speed, as a pleasantly surprising element which appeared to make the course more relevant for them. These included techniques to account for other drivers' potentially erratic behaviour by staying further behind drivers. In addition,

[75] Brainbox research for ACPO, (2011). Evaluation of the National Speed Awareness Course. London: Brainbox Research. Available at: http://www.roadsafe.com/pool/files/SpeedAwarenessResearch%5B1%5D.pdf

the interactive nature of the training was mentioned by several participants as a good way to engage attendees and avoid the lecture/classroom-like feeling it could have had.

Course participants are accompanied by drivers in the same position. This avoided the risk of alienating them by normalising the idea that drivers on the course had only made a mistake. It was thought that being around drivers caught in similar circumstances put participants at ease meaning that they would be more open to engaging than otherwise would be.

Many participants reported that the course served as a good refresher and covered areas perhaps forgotten since passing the driving test. Three participants identified the recalling of speed zones as something that they had not considered in detail since their driving test. Emphasis was also placed on the role of the trainer by almost all participants. The trainers were reported to have come across as very knowledgeable and personable. Several drivers praised the chemistry and interaction of the trainers who created a relaxed environment, whilst one driver who had participated in a previous course with just one trainer noted a big improvement by having two because the interaction made the session feel less like a lecture.

"It was their [the instructors'] knowledge that worked really well. They didn't teach in a way to try and frighten us" *– course participant, aged 54*

When prompted to describe some elements of the course that didn't work as well, just three participants offered examples. One driver thought that the imagery in some of the videos played was not hard hitting enough, though another driver was grateful that it was not more hard hitting. Another driver thought that the inclusion of some small elements was unnecessary and pointed to the discussion of Scottish lorries, in a session carried out in England with no lorry drivers present, as an example.

Three drivers recommended that the course be made available more widely, because of the benefits from drivers' knowledge being refreshed.

Overall, the evidence from the stakeholder and participant consultations supports the view that the course is largely delivered as per the specification. The interactive components were key from both the design perspective and the participant's perspective whilst those interviewed reported increased knowledge in each of the 5 areas targeted in the 2015 course specification: facts about speeding, speed limits, causes and consequences, hazard perception and what stops you? In the few instances described by participants in which some attendees were disruptive, the trainers gave warning before removing participants as necessary in line with the specification.

To what extent does the course impart knowledge on speeding to course participants?

In line with the course specification, participants acquired knowledge on a number of aspects of speeding. Drivers recalled gaining knowledge and awareness of the overall picture of speeding and collision statistics in the UK whilst also learning about the causes and consequences of speeding.

In particular, drivers reported learning a great deal about speed limits. One often-cited example was how to determine a 30mph zone on the basis of lampposts either side of the road. This was considered particularly useful to drivers when required to join a new road without a speed limit sign in sight.

Exploration of the consequences of speeding was focussed largely on the potential for excess speed to cause harm in the event of an incident. Participants were shown comparisons of the outcome of a collision at the speed limit compared with one just over the speed limit, alongside illustration of the relationship between accident speed and the chance of a fatality

occurring. There was also a focus on the consequences for the participant of being caught again in the future. These included potential ramifications for employment, higher insurance premiums and a potential loss of their licence.

Participants were also encouraged to consider the causes of speeding. Participants reported a much greater understanding of the cause for their own speeding behaviour following participation and in particular after the exercise assessing the causes of speeding.

Overall, the knowledge acquired by participants and described in the interviews aligns with the modules outlined in the course specification. All drivers interviewed reported having gained some knowledge from participation, some being a refresher of what they had known previously (for example, speed limits) and some new knowledge.

What were the potential attitudinal changes that could be attributed to the course?

All participants believed that speeding on UK roads was not uncommon, and offered a variety of reasons why this might be the case. The most common theme concerned particular aspects of modern life in which people feel pressure to get places faster.

All participants agreed, if asked, with the importance of enforcing speed limits, and acknowledged that the speed limits existed for a reason. Many participants highlighted the potential for speed to lead to collisions/fatalities that could otherwise have been avoidable. But some considered that enforcement was more suitable in certain situations than in others: for example, three believed that enforcement was less important when roads were clear, for example at night and when no other traffic was about. Another participant felt that enforcement was more appropriate near schools and in urban areas.

"Particularly in urban areas where there are schools and things it's crucial that there's a speed limit that's enforced." *– course participant, aged 59*

One participant considered that static speed cameras might encourage accidents before or after on that stretch of road as many drivers would be likely to slow down just before and speed up again just after (accordion effect). Another participant spoke of their experience of having a speed camera installed near their home following several accidents on that piece of road and perceived there to be fewer near schools and hospitals, which may have contributed to more negative views of speed cameras in the general public. Participation in the course, however, informed drivers as to how camera locations are selected and what their purpose is, thus contributing towards legitimising their use and dispelling some misplaced opinions.

It is important to acknowledge that the course participants consulted were interviewed after their participation in the course and so their views on the enforcement of speed limits are likely to have been influenced by the immediacy of experience. For example, all of the drivers interviewed as part of this research said that they had always held the view that speed limits should be enforced. But there was a clear impression from the interviews that the course had reinforced such beliefs in the need for speed enforcement. This might partly have been from an improved understanding of why speed cameras are placed where they are, learned from the course, but there may be an element of post-hoc rationalisation.

When asked about how the course might have changed their attitude to driving, participants suggested that the main change was that they would be more likely to weigh up the potential costs as well as the benefits of speeding. One who had considered that speeding on empty motorways could be acceptable said that the course had made them consider the consequences if they were to lose control at a higher speed. Participants also often noted that little time was actually saved by speeding so a key benefit was much lower than expected.

"I think that's what the course has done is make you realise that, you won't get there any quicker by speeding" *– course participant, aged 46*

A number of course participants stressed the importance of the skills they learnt in helping them to control their future driving behaviour and considered that the skills and knowledge gained could result in increased driving confidence.

However, there is some evidence to suggest that a few individuals' prior attitudes to speed remained unchanged by the course. One participant said that it was his first time being caught in 10 years, that it was a mistake that had led to his detection, and that his view on speed remain unchanged. Another said that the course had not changed their opinion that speeding on clear motorways was allowable and that they could not guarantee that they would not do so in the future.

Participants were also asked about the extent to which they thought other course participants in their cohort had left with a different view of speeding. There was a clear perception that most of the other people had changed their attitude as a result of the course, though a few seemed not to have done, based on their behaviour during the session. For example, one interviewee mentioned several participants on their third or fourth course expressing a desire to 'just get through this'. This would support the view that the course was not able to change everyone's attitude towards speed; one participant suggested that changes in attitude depended very much on how open that individual was to learning.

One participant had considered before the course that the placement of speed cameras was also a revenue generating exercise, but had changed their view after the reasons for the cameras' placement was explained. However, some interviewees said that others on their courses had retained their negative view of speed cameras. Once again, the perceived lack of cameras around urban centres, schools and hospitals was noted.

Course participants consulted generally held the view that education was an appropriate and effective alternative to prosecution for low-level speeding offences. One participant directly compared the course to receipt of an FPN and shared a view (also held by policy stakeholders) that the FPN does not address the root cause of the offence. Another participant suggested that penalty points and fines have a place for higher level speeding offences as these are likely to be a conscious decision on the part of the driver to speed and indicative of an attitude towards speeding that is unlikely to be affected by course participation. It is, however, difficult to attribute these attitudes to the effect of the course since the interviews had been carried out with those who qualified for attendance. However, for many, this was their first driving-related course since passing their driving test, in which case their views on the use of education for speed enforcement would be informed solely by the course they participated in.

Overall, the evidence suggests that the course was effective at reinforcing some participants' pre-held beliefs that speed enforcement was desirable. The evidence also suggests that learning about the rationale for the location of speed cameras was an effective way to change attitudes for drivers who had previously had a more negative view of enforcement. But from the anecdotes of the participants it seemed that the course might not be successful in changing the attitude of a small minority. Lastly, the research finds support for the use of education for speed enforcement, particularly as it provides an opportunity to learn from mistakes.

How is participation in NSAC expected to affect driver behaviour?

The 15 participants were first asked to think about some of the things that affect the speed at which they drive, and identified a number of factors:

- Pressure from drivers behind (tail-gating) – A total of 7 NSAC participants interviewed said that being tailgated was a major factor affecting the speed that they drive at. They could feel pressure to increase their speed, something some drivers may not be comfortable with.

"It's not nice getting tailgated when you're trying to stay within the speed limit and you can feel a car right behind you." *– course participant, aged 22*

- Traffic conditions – Several drivers said that they may consider the traffic conditions when determining the speed they drive at. Many felt more comfortable driving quickly when there was limited traffic, in particular on empty motorways.

- Pressure to get places quickly – A small number of respondents reported that pressure to get to places quickly might lead to drivers increasing their speed: emergencies, or being late for work or for an important meeting were cited.

- Tiredness – Three participants highlighted tiredness as a factor that could result in a driver increasing their speed, either so they could reach their destination more quickly or because tiredness could lead to a lack of concentration so drivers might speed without realising it.

- Distractions – Two participants mentioned distractions such as conversations with passengers or using hands-free phones as a key factor which could lead to a driver exceeding the speed limit by mistake.

- Vehicle power - One participant mentioned driving a powerful motorbike and believed that this encouraged them to drive quicker than they perhaps should do, and that other drivers with powerful vehicles would do the same.

Interviewees were then asked if and how they believed that the course had changed their driving behaviours. The main themes were:

- More regularly checking speedometer: Of all the behaviour changes described by participants, this one was most common. Drivers reported paying more attention in general to their speed, largely by regular glances at the speedometer.

- Identifying speed limits on unfamiliar roads: A small number of drivers reported paying more attention when joining new roads with which they were unfamiliar. New behaviours included looking out for speed limit signs after joining a new road and one driver reported the use of a satnav to identify the correct speed limit. A small number of drivers had also learned on the course to identify 30mph limits by the presence of streetlamps.

- Holding back from other drivers: Participants reported leaving more space between them and the car in front than they would have done before the course because of the information they had learned about stopping distances.

- Resisting pressure from cars behind: One driver had altered their behaviour to resist increasing their own speed in response to drivers behind driving close to them. Before participating in the course, they suggested that they would have also increased their own speed rather than to stay within the speed limit or allow the other driver to pass

- Removing distractions: Some course participants had removed distractions. One, for instance, has since stopped using their Bluetooth device to take calls whilst driving in an attempt to avoid distraction.

In a couple of cases the course was successful in encouraging drivers to be more aware of their own speed.

"When I drive, for example on a dual carriage way, I think about all the things around me that can affect how I drive and what speed I go. So things like other cars, people on the side of the road, animals that can run into the road." – *course participant, aged 54*

The general nature of the course content meant that participants felt that the learning was applicable for a wide range of different driving situations.

However, it is important to note that a key motivation for these changes, as reported by participants, was also the threat of penalty points should they be detected again within 3 years of participation. This is not to suggest that the course did not have an effect on behaviour but while the course has equipped drivers with the necessary skills to drive within the limit it may be the threat of penalty points that encourages the use of the skills.

These interviews do not allow us to robustly assess changes in driver behaviour as a result of the course but it can be considered unlikely that the behaviours described above would have occurred without the course. Participants directly link these behaviours with the course and were positive about the effects of the course. The interviews do, however, leave open the possibility that the effects are temporary in nature as those interviewed had completed a course only 1 to 2 months earlier. The statistical analysis carried out for this evaluation suggests that the effects last for at least 3 years.

1.3B Conclusions

Overall, the findings from the stakeholder and participant interviews are largely consistent:

- Motivations for accepting a course offer: The views put forward by stakeholders and those from course participants are very similar in that the overwhelming majority held the view that the avoidance of penalty points and probable increases in insurance premiums are the main reasons drivers choose to accept a course offer. In addition, there was agreement that the avoidance of points was more important for some drivers who rely on a clean licence for their employment.

- Course delivery: Stakeholders stressed the importance of the behavioural mechanisms underpinning the design of the course and the importance of adhering to the specification to achieve the desired results. The findings from the participant interviews suggest that the course is being delivered in line with the specification.

- Effects of participation on attitude and behaviour: Stakeholders held the view that the course has the potential to result in attitudinal and behavioural changes in participants which may in turn manifest themselves in the form of reduced reoffending, more so than a FPN. The participant interview evidence largely corroborates these perspectives with many examples of changes in behaviour reported by drivers.

- Public perceptions to speed enforcement: From the stakeholder consultations, it was thought that the course would improve public perception of education as an approach to speed enforcement through the positive experiences course participants share with other drivers. Although course participants did not indicate whether or not they had shared their view of the course with other drivers, they did hold overwhelmingly positive views of the course, supporting the stakeholders' belief. In addition, course participants and stakeholders agreed that the course was successful in dispelling some pre-conceived beliefs about speed enforcement, such as speed camera placement, and that it improved/reinforced public acceptability of speed enforcement.

The main point of divergence is between the views of stakeholders and the statistical evidence described in Annex A on the persistence of effects on driving behaviour:

- Persistence of effects: The statistical analysis suggest that the course has an impact on driver behaviour for at least three years following course participation. This contrasts with the views offered by multiple stakeholders that the effect of the course wears off after 6 to 12 months. It seems likely that stakeholders are relatively conservative when discussing the effects of the course.

Annex C: Cost/Benefit Analysis

The Theory of Change outlined in section 2.3 of this report sets out the outcomes and impacts which are intended to be achieved through the implementation of the speed awareness course. Greater compliance with speed limits is expected to lead to fewer collisions, amongst other things, which in turn will lead to reduced costs in dealing with the aftermath, including healthcare and human costs where injuries are involved and reduced costs relating to property damage. Reduced reoffending is also expected to reduce criminal justice system costs that would otherwise have been incurred in the detection and processing of offenders. These benefits can potentially form the basis of at least a partial cost benefit analysis of the NSAC.

This section provides an assessment of the costs and benefits of the National Speed Awareness Course that considers the costs incurred in its delivery as well as the value of the benefits associated with reduced reoffending and fewer collisions. Aggregate level information on the costs associated with the delivery of the NSAC was not available for this evaluation, so the analysis focuses on costs and benefits at an individual course participant level. The analysis is driven primarily by the estimated effects of the NSAC on reoffending and collisions while drawing on other sources of secondary information as available and appropriate.

This annex proceeds by first providing an estimate of the net costs involved in the provision of the course, before giving an assessment of the potential benefits using findings from the main evaluation and probing the sensitivity of these results to the key areas of uncertainties. The analysis concludes with some tentative conclusions in relation to value for money.

1.1C What are the costs of NSAC provision?

There are two key types of cost associated with NSAC provision:

- Resource costs incurred in the delivery of the course: These include the costs incurred by course providers and the police in the administration and delivery of the course, compared to the cost of issuing fixed penalties. Information on the aggregate cost of delivering the NSAC was not available, but using NDORS data on the price charged by providers within each police force area between January 2017 and June 2017, the average price of the course has been estimated at £87.44.[76]. It is assumed that this price provides a reasonable approximation of the cost associated with delivering the course. However, the price also includes a police levy of £35 per participant to cover the cost of detection and processing of offenders. There was also at the time of conducting this analysis a £5 central cost recovery element[77] to cover the costs of the NDORS infrastructure such as administration of the national regime, maintaining the national database, and a contribution towards course development, evaluation, monitoring and research[78]. On the assumption that the £35 cost incurred in the detection and processing of an offender would have been incurred anyway in the absence of the course, this has been subtracted from the total cost to leave a cost of £52.44 per participant.

- Time and travel costs: Drivers participating in the NSAC incur further costs in terms of the time and resources needed in order to attend. However, as drivers have chosen to accept the course offer, it is assumed that they expect to derive a

[76] As the price of the NSAC varies across the country, and detail regarding the number of course participants paying which prices is unavailable, the total cost has been estimated using an unweighted average of the price charged by all course providers up to July 2017.

[77] The cost recovery amount to cover the NDORS infrastructure fell to £4 in September 2017 whilst the proportion going to police forces rose to £45.

[78] Note that this may overstate the resource costs involved in the delivery of the course if the levies also contribute towards other activities not directly related to delivery of the course.

benefit that is at least equal to these costs relative to the alternative of accepting a Fixed Penalty Notice currently set at £100 for speeding and 3 penalty points. It is not possible to quantify any benefits accruing to participants over and above the cost of participation (beyond those associated with improved road safety, and the results below will understate the overall benefits of the course.

1.2C What are the benefits from NSAC participation?

The following sections provide estimates of the benefits of NSAC, including cost savings for the criminal justice system from reduced reoffending and cost savings in terms of lost output, vehicle or property damage, administrative costs and emergency services responses arising from fewer collisions.

The overall benefits of NSAC will be linked to the persistence of its effects over time. The evaluation could only observe changes in driver behaviour over a period of three years, and found that the effects of the course were persistent over that period. The estimated effects were also comparatively stable over time, and it appears reasonable to assume that the effects of the course may endure for more than three years. To address this, the results are subject to sensitivity analysis describing the potential effects of the programme assuming they persist for 3, 5 and 10 years. Projections of the effects of the course over a 5 and 10-year period have been prepared on the basis that trends observed over the first three years will continue into the future. The level of uncertainty increases over longer time periods, and results over a 10 year period are considered more speculative than those for the 5 year period.

1.2.1C Cost savings to the criminal justice system

There are costs incurred by the criminal justice system associated with processing of drivers observed driving in excess of the speed limit. There is therefore potential for the NSAC to lead to cost savings being realised where reoffending is reduced following course participation. Where the course leads to fewer speeding offences being committed, the costs associated with the detection and processing of offending drivers could be reduced.

Effects of the course on the likelihood of reoffending

The results of the evaluation suggested that participation in an NSAC led to a persistent reduction in the likelihood of and frequency of reoffending that endures for at least 3 years in comparison to a FPN. As described above, it appears reasonable to assume that these impacts may continue beyond 3 years – though there was some uncertainty regarding the size of these effects and the extent to which they decayed over time (see section 3 in the main evaluation report). Comparing the reoffending of NSAC participants with drivers detected at speeds slightly higher than the threshold for a course offer pointed to a reduction in reoffending of just over 10 percent that was broadly stable over time, whilst comparisons with drivers that did not accept a course offer suggested a larger initial effect (up to 23 percent over 6 months) but with the effect declining with time in this case.

To enable a projection of the potential benefits of the course over 5 and 10 year periods, two approaches have been taken based upon the patterns of these results over time:

- Results based on comparisons with drivers not accepting a course offer: A trend was fitted to the estimated effects of the programme over three years to give a projection of the future effects of participation in the course on reoffending over 10 years[79] (displayed in the blue line in the following figure) used in the five and 10 year sensitivities.

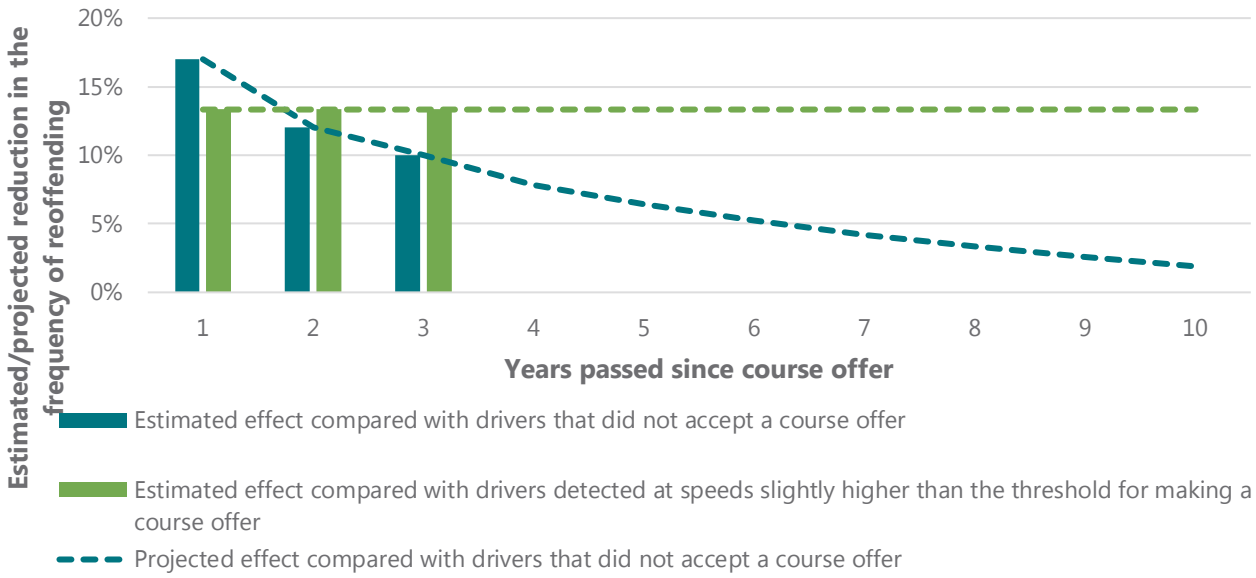
[79] A logarithmic trend was considered to fit the data best in which the effect on reoffending declines over time.

- Results based on comparisons with drivers detected at speeds slightly above the threshold for a course offer: These findings suggested that the effect of an NSAC on speed reoffending was relatively stable over three years. A projection of the future effects of the course was developed by assuming the effect of participation in the course on reoffending continues to remain stable (displayed in the green line in the following Figure 1.1).

Figure 1.1 illustrates the projected effects of participation in an NSAC on the frequency of reoffending over 10 years based on the assumptions above. The projection forms the basis for estimating the potential benefits of the course under the scenarios that they endure for 3, 5 and 10 years. Both drivers that did not accept a course offer and those just over the threshold are very likely to have received a FPN and 3 penalty points in place of the course.

These should be viewed with caution as we are unable to observe actual effects beyond three years.

Figure 1.1C: Projected effect of participation in NSAC on the frequency of reoffending over 10 years



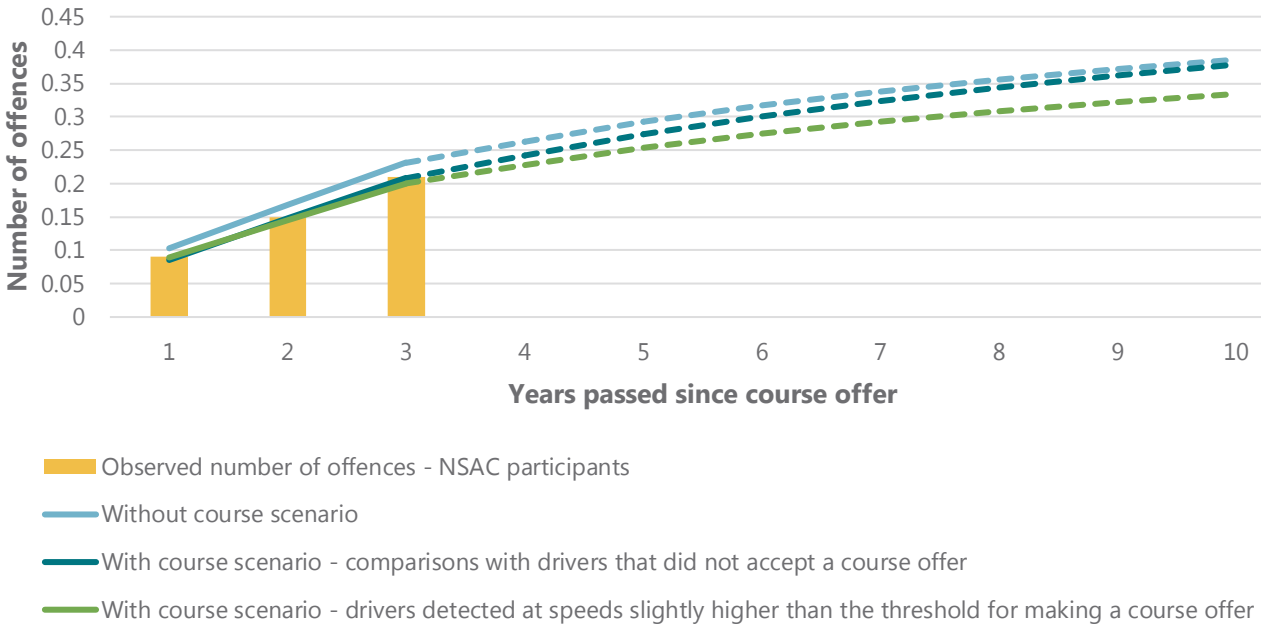
Source: Ipsos MORI analysis

Effects on total reoffending

The number of offences that participants will commit over 10 years was projected into the future by applying a time trend to the estimated number of offences over 3 years implied by the findings above. Applying the projected effect of the course on the frequency of offences then results in a projection of the number of offences that would have been committed had the course not been available.

This gave an estimated reduction in the expected number of speed offences avoided as a result of NSAC of between 231 and 298 per 10,000 participants over 3 years. After 10 years, the variation in the estimates is more substantial indicating either a reduction of around 73 offences per 10,000 drivers or a reduction of 504 offences per 10,000 drivers depending upon the projection used. Figure 1.2 illustrates these differences in the expected number of offences on a per participant basis.

Figure 1.2C: Projected number of offences per participant over 10 years



Source: Ipsos MORI analysis

Value of cost savings

There has been limited research into the costs involved in the processing of out of court disposals. However, research completed by the Office for Criminal Justice Reform did identify a range of values for a selection of disposals.[80] These did not include the costs involved in the processing of FPNs and speed offences.

In lieu of direct estimates of the cost of administering FPNs, it has been assumed that the police levy of £35 provides a reasonable approximation of those costs (which is broadly equivalent to the upper estimated cost associated with a street disposal – such as a Penalty Notice for Disorder in which an offender is offered a fixed penalty to discharge liability for an offence)[81]. This was applied to the projected reduction in offending derived above to estimate the associated cost savings to the public sector.

The results are illustrated in Table 1.1 which sets out the expected costs of processing FPNs for drivers that did not take the course (column labelled 'without NSAC'), and the expected costs of processing FPNs for drivers that did take the course (based on the two scenarios developed above). These results explore the possible cost savings under the assumptions that the effects of the course endure for 3, 5 and 10 years[82].

Table 1.1C: Estimated present value of benefit per course participant from the processing of fewer FPNs

Persistence of effects	Without NSAC	With NSAC	Cost Savings per Participant
		Costs of processing FPNs	

[80] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/217353/out-of-court-disposals-june2011.pdf

[81] ibid

[82] There are also potential spill over effects from NSAC participation on the number of offences committed by non-participants if driving within the speed limit forces drivers behind to lower their speed. These are not captured here.

	Costs of processing FPNs	Low	High	Low	High
3 years	£8.09	£6.86	£7.28	£0.80	£1.01
5 years	£10.24	£8.51	£9.59	£0.66	£1.26
10 years	£13.50	£10.76	£13.25	£0.35	£1.61

Source: Ipsos MORI analysis

1.2.2C Reduction in costs associated with avoidance of collisions

The primary potential economic benefits associated with the NSAC are likely to relate to the avoidance of, and reduction in the severity of speed-related collisions as a result of greater compliance with speed limits.

The private costs and externalities associated with such collisions include:

- Property (vehicle) damage
- Injuries and the costs of hospitalisation
- Policing activities related to collisions
- Journey quality impacts for other road users
- Criminal justice system costs

The data used in this study did not find that participation in an NSAC had a statistically significant effect on the number of reported injury collisions. However, it is possible that insufficiently large numbers of observations of injury collisions were available to enable any effects of the course to be identified[83]. The literature does also suggest that speed is an important factor in collision occurrence and this evaluation has found an impact on speed compliance[84]. Therefore, the analysis that follows is predicated on the assumption that the number of collisions observed in the data was too small to observe effects [85], meaning the estimates presented should be treated with a great deal of caution. Further uncertainty arises because there is no information available on either unreported injury collisions or higher frequency but lower cost minor collisions that primarily involve property damage.

Reduction in likelihood of collision involvement

The results of the evaluation suggested the possibility that participation in the course reduces the likelihood that a driver would become involved in a reported injury collision (this finding would be accepted at the 89 percent level of confidence, but not at the 95 percent confidence level typically applied in statistical studies). This should be interpreted with caution as highlighted above but the findings also suggested that such an effect may be stable over time. It was therefore assumed

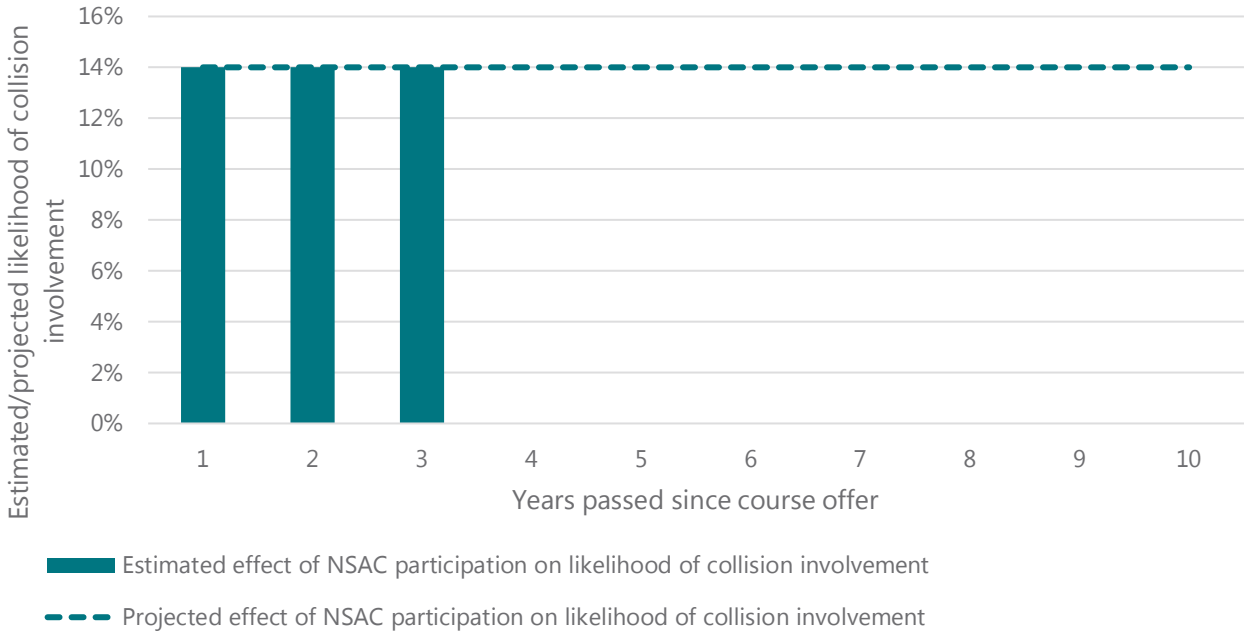
[83] The estimated reduction in the likelihood of a collision of 14 percent was significant at the 89 but not the 90 or 95 percent confidence levels typical for statistical significance.

[84] See for example: Taylor, M., Lynam, D., Baruya, A. (2000). The effects of drivers' speed on the frequency of road accidents. Department of the Environment, Transport and the Regions. Available at: https://trl.co.uk/sites/default/files/TRL421.pdf;

[85] I.e. a Type II error has been made. In this case, a type II error relates to a situation in which the statistical test fails to find an effect that is in fact present. This is typically a consequence of having small sample sizes.

that the effect would remain stable into the future under the three scenarios that the effects of NSAC endure for 3, 5 or 10 years if present at all. Section 1.3 looks at the implications of the effect lasting various lengths of time.

Figure 1.3C: Projected reduction in collision occurrence over 10 years



Source: Ipsos MORI analysis

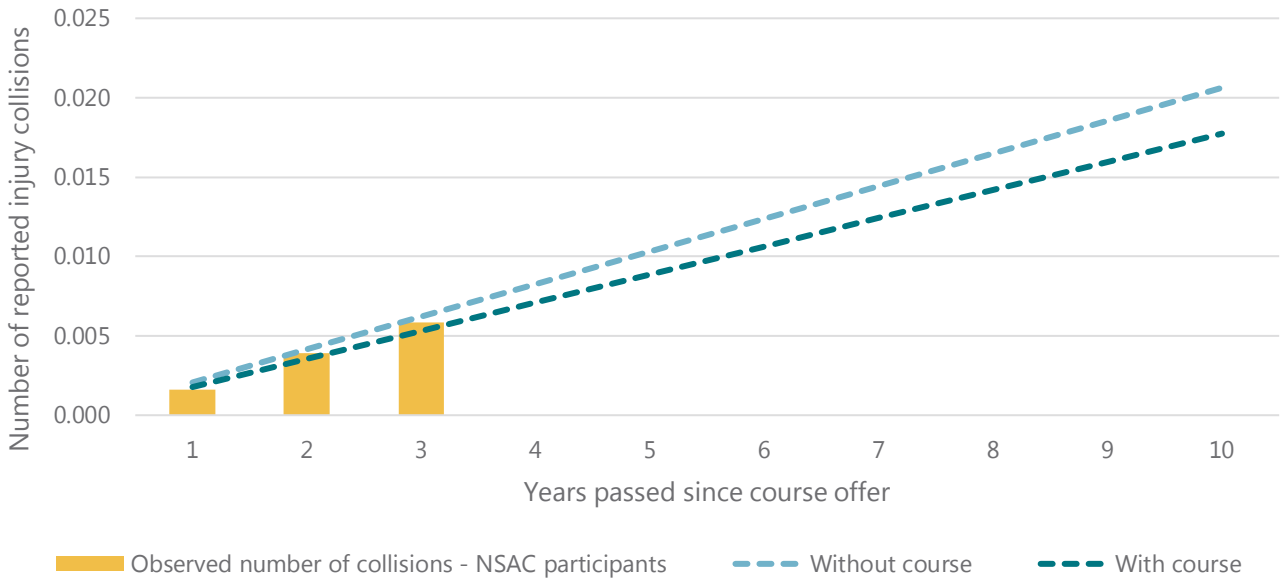
Reduction in the number of injury collisions

The data made available for this evaluation suggested that 0.002 percent of drivers completing an NSAC are involved in an injury collision that is reported to the police[86] every year. It has been assumed that this incident rate would remain stable over time – therefore participants in an NSAC could each expect to be involved in 0.02 collisions over 10 years. Applying the potential effect of the course on reducing the likelihood of collisions (i.e. projected to be 14 percent per annum), it is estimated that 2 fewer injury collisions will be reported to the police per 10,000 participants if the effects of the programme endure for 3 years, 4 if they endure for 5 years and 8 if they endure for 10 years.

Figure 1.4 outlines the projected number of injury collisions per driver over 10 years with course participation and without course participation

[86] This is the incidence rate observed in the sample of data used in this study. It is likely that this understates the true incidence rate of these collisions as the matching process would not have captured all the relevant collision records. This is because the sample of STATS19 data captures a relatively smaller period of time and the matching of data is limited by the lack of a direct linking variable between two datasets.

Figure 1.4C: Projected number of reported injury collisions per driver over 10 years, course participants and non-participants



Source: Ipsos MORI analysis

These projections only cover collisions involving injury that are reported to the police and this study did not find that participation in an NSAC had a statistically significant effect on the number of reported injury collisions . Therefore, the projections should be viewed with caution as should the size of the effect observed.

A further two types of collision are considered below:

- Unreported injury collisions: STATS19 only collects data pertaining to collisions which involve injury and which are also reported to the police; however, research carried out by the DfT using the National Travel Survey (NTS) suggests that for every casualty that is reported in the STATS19 data there are approximately 2.6 that are not.[87] Due to the nature of unreported injury collisions, data was not available in the evaluation to estimate a direct effect from course participation and therefore it has been assumed that the effect is the same as that implied for reported collisions – described in Figure 1.3.

- Minor collisions not involving an injury: Further research undertaken by the DfT using the NTS suggests that there may be around 3 collisions which do not involve an injury for every 1 that does. Again, it is necessary to assume the same effect on such collisions as observed for reported collisions in figure 1.3[88].

Multiplying the incidence rate of 0.02 by the estimated 2.6 unreported injury collisions per every one reported and 3 non-injury collisions per injury collision gives the estimated incidence rates for these unobserved collisions (non-injury collisions are therefore assumed to be equal to 7.8x the number of reported injury collisions observed in STATS19). Figure 1.5 illustrates the projected number of each type of collision over 10 years per participant. After 3 years, this would imply an additional 0.001 injury collisions avoided per participant that would not be reported to the police and 0.002 avoided minor

[87] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/648081/rrcgb2016-01.pdf

[88] Note that these assumptions could overstate the impact of the course if one of its effects is to reduce the severity of collisions, which would result in reduced reported injury collisions but an increase in unreported injury collisions or minor collisions that did not involve an injury.

collisions that would not have involved an injury. After 5 years, this would suggest just over 0.001 avoided injury collisions per participant not reported to police and 0.003 avoided non-injury collisions whilst after 10 years these rise to 0.002 and 0.006 respectively. There is significant uncertainty surrounding these figures as we do not collect data on either of the above types of collisions. In addition, they are still subject to the same limitation as with the reported injury collision projections, that our sample contained too few collisions to obtain a conclusive result.

Figure 1.5C: Projected number of non-reported injury collisions and non-injury collisions per driver over 10 years, course participants and non-participants

Source: Ipsos MORI analysis

Value of cost savings

The costs of collisions vary depending on the severity of the incident and the number of casualties involved. Table 1.2 outlines the average cost per collision for each of the three types of collisions discussed above. It is assumed that injury collisions that go unreported do not include fatalities but otherwise have the same number of serious and slight casualties as reported injury collisions.[89] The costs per casualty come directly from the DfT's WebTAG[90] guidance. The number of casualties per collision were obtained by dividing the number of casualties of each type by the number of collisions. This approach should be considered an upper bound for the estimate of casualty costs, as it would be reasonable to assume that unreported accidents are likely to be less severe than those reported in STATS19.

Table 1.2C: Average value of prevention of road casualty by severity, £ (2016 prices & 2016 values)

Casualty		Reported injury collision	Unreported injury collision	Non-injury collision

[89] This may overstate the savings from unreported injury collision involvement if unreported injury collisions involve fewer serious casualties or the costs involved with the types of serious/slight injuries arising from these collisions are lower.

[90] WebTAG provides guidance on the analysis, modelling and appraisal of transport interventions. Further guidance can be found online: https://www.gov.uk/guidance/transport-analysis-guidance-webtag

		Number of casualties per collision	Average cost per collision	Number of casualties per collision	Average cost per collision	Average cost per collision
Fatal[92]	£1,888,675	0.013	£24,553	-	-	-
Serious	£212,234	0.176	£37,353	0.176	£37,353	-
Slight	£16,361	1.138	£18,619	1.138	£18,619	-
Damage only	-	-	-	-	-	£2,268

Source: WebTAG & Ipsos MORI analysis

The present value of the benefits associated with reduced collisions resulting from NSAC are reported in Table 1.3 below, assuming that the effect is present. As in Table 1.1, the cost savings have been estimated over 3, 5 and 10 years to reflect uncertainty regarding the long-term persistence of the effects of the course.

Table 1.3C: Present value of costs avoided from reduction in number of collisions per participant

Number of years	Injury collision (reported)	Injury collision (unreported)	Non-injury collision
3 years	£18.72	£33.83	£4.11
5 years	£30.17	£54.53	£6.63
10 years	£55.57	£100.44	£12.21

Source: Ipsos MORI analysis

1.2.3C Other impacts

There are a number of other potential impacts of NSAC participation that we have not been quantified. These include:

- Social costs associated with driver disqualification: The study team have been unable to identify any benchmarks for the valuation of these costs. However, it seems likely that the most significant costs come from the criminal justice system and relate to the prosecution of individuals detected as driving while disqualified rather than social costs associated with disqualification itself. The data available also exclude any disqualified drivers, precluding an assessment of any impact arising from course provision.

- Private costs associated with reduced driving speeds: There is potentially a negative social welfare effect associated with greater compliance with speed limits. By driving with greater compliance to speed limits an individual (and any passengers) will often be increasing their journey times. However, consideration of this effect can be excluded from the evaluation as WebTAG guidelines specifically state private costs associated with desisting from lawbreaking activity should not be counted. Wider benefits such as potential fuel savings and reduced wear on vehicles may also be present, however it has not been possible to quantify these as part of this study.

[91] WebTAG table A 4.1.1

[92] The methodologies used in the valuing of fatalities are subject to much debate in the literature. For this reason, these figures should be interpreted with caution.

- Efficiency of the road network: Greater compliance with speed limits has the potential to increase the efficiency of the road network as illustrated in the logic model but there is no readily available evidence from which we can measure this effect.

- Anxiety and Distress: Another outcome described in the logic model, increased compliance with speed limits, may lead to reduced anxiety and distress amongst other drivers. However, there are no readily available benchmarks from which to measure this impact.

1.3C Value for money

This section compares the estimated costs and benefits associated with NSAC under the assumptions above (using the more conservative estimates of the cost savings associated with reduced processing of FPNs):

- The estimated benefits of participation in NSAC (per participant) are estimated at £57.50[93] after three years while the costs of the programme are estimated at £52.40. This gives an overall benefit to cost ratio of £1.10 per £1 of costs under the more conservative set of assumptions. This would invite the conclusion that that the benefits of the course outweigh the costs for the three years over which it has been possible to demonstrate effectiveness of the course suggesting an improvement in overall social welfare from the course.

- If the effects of NSAC endure for 5 years then the estimated benefits of the programme rise to £92.00, giving a benefit to cost ratio of £1.75 per £1 of costs. This does not seem implausible given the stability of the estimated effects of the course over time. Greater value for money would be attained if the effects of the course endure for 10 years, with a speculative benefit to cost ratio of £3.21 per £1 of costs. Though this would clearly be highly speculative.

- These results are conditional on the assumption that the NSAC has a similar effect on the rate of unreported injury and minor collisions as it does on injury collisions reported to the police. Additionally, the severity of casualties associated with unreported collisions could plausibly involve less severe costs than those that are reported to the police. To reflect this uncertainty, a further set of results were produced assuming that the costs saving associated with unreported injury collisions were halved relative to the scenario set out above.

- Under these assumptions, the estimated benefits of participation in the programme (per participant) after 3 years is £40.60. Under these more conservative assumptions, the estimated benefits of the programme exceed the costs involved in the fourth year, with the total benefits rising to £64.70 in 5 years' post participation (a benefit to cost ratio of £1.23). The findings indicate that at minimum, the NSAC will deliver an improvement in social welfare (under these scenarios) provided that the effects of the course endure for more than four years. The stability of the estimated effects of the course over three years suggests that this is plausible.

As highlighted above, the sample sizes available for analysis were insufficiently large to conclusively establish whether the NSAC has an effect in terms of reducing injury collisions. As such, the results above should be treated as indicative and speculative. While a larger study (of national scale) could provide a definitive answer in relation to the effects of the course on injury collisions, substantial uncertainties would still remain owing to not having data on higher frequency but less severe unreported injury collisions and minor collisions that do not involve injury.

[93] Figures are rounded to the neared £0.10.

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