The number of motoring and non-motoring offences

Prepared for Road Safety Division, Department for Transport

J Broughton
This report has been produced by TRL Limited, under/as part of a contract placed by the Department for Transport. Any views expressed in it are not necessarily those of the Department.

TRL is committed to optimising energy efficiency, reducing waste and promoting recycling and re-use. In support of these environmental goals, this report has been printed on recycled paper, comprising 100% post-consumer waste, manufactured using a TCF (totally chlorine free) process.
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary</td>
<td>1</td>
</tr>
<tr>
<td>1 Introduction</td>
<td>3</td>
</tr>
<tr>
<td>2 Data sources</td>
<td>3</td>
</tr>
<tr>
<td>2.1 The TRL archive</td>
<td>3</td>
</tr>
<tr>
<td>2.2 The Offenders Index</td>
<td>4</td>
</tr>
<tr>
<td>2.2.1 Offence codes</td>
<td>4</td>
</tr>
<tr>
<td>2.2.2 Social background</td>
<td>4</td>
</tr>
<tr>
<td>2.3 Data from Scotland</td>
<td>5</td>
</tr>
<tr>
<td>3 Matching</td>
<td>6</td>
</tr>
<tr>
<td>3.1 The sample of drivers</td>
<td>6</td>
</tr>
<tr>
<td>3.2 Check of the matching</td>
<td>7</td>
</tr>
<tr>
<td>3.2.1 Initial check</td>
<td>7</td>
</tr>
<tr>
<td>3.2.2 More detailed checks</td>
<td>7</td>
</tr>
<tr>
<td>3.2.3 Possible source of errors</td>
<td>8</td>
</tr>
<tr>
<td>4 Analysis of linked data</td>
<td>8</td>
</tr>
<tr>
<td>4.1 Preliminary analyses</td>
<td>9</td>
</tr>
<tr>
<td>4.2 The number of motoring offences</td>
<td>10</td>
</tr>
<tr>
<td>4.3 Statistical models</td>
<td>11</td>
</tr>
<tr>
<td>4.3.1 Specific types of non-motoring offence</td>
<td>13</td>
</tr>
<tr>
<td>4.3.2 Specific types of motoring offence</td>
<td>15</td>
</tr>
<tr>
<td>5 Conclusions</td>
<td>16</td>
</tr>
<tr>
<td>6 Acknowledgements</td>
<td>17</td>
</tr>
<tr>
<td>7 References</td>
<td>17</td>
</tr>
<tr>
<td>Appendix A: Standard list offences</td>
<td>19</td>
</tr>
<tr>
<td>Appendix B: The consequences of mismatching</td>
<td>22</td>
</tr>
<tr>
<td>Abstract</td>
<td>23</td>
</tr>
<tr>
<td>Related publications</td>
<td>23</td>
</tr>
</tbody>
</table>
Executive Summary

It has often been suggested that a driver’s willingness to commit motoring offences tends to be associated with a willingness to commit other types of offence. This report presents the results of a study that has been carried out to test this hypothesis, based on the offences committed by over 47 thousand British drivers between 1995 and 1999. The results show clearly that drivers who committed several non-motoring offences were far more likely than non-offenders to also commit offences such as drink/driving or dangerous driving.

The data for the study have come from two sources:
- the archive of driving licence information maintained at TRL, based on licensing information supplied three times per year by the Driving and Vehicle Licensing Agency (DVLA); this contains details of all motoring offences committed since 1986 by a sample of drivers;
- the Offenders Index maintained by the Home Office which holds the criminal histories of all people convicted of a ‘standard list offence’ in England and Wales from 1963.

A sample of over 50 thousand drivers was selected from the TRL archive, stratified according to the motoring offences committed in or after 1996. Basic details of these drivers were sent to the Home Office to be matched with the Offenders Index. When a driver could be matched with an offender, details of all offences were returned to TRL where they were linked to details of any motoring offences in the archive.

The two sources have different geographical coverage: the DVLA file covers all of Great Britain while the Offenders Index excludes Scotland. It was found, however, that drivers who lived south of the border had committed very few motoring offences north of the border and vice versa. Consequently, the problems caused by the different geographical coverage were overcome by restricting the analyses to drivers living in England and Wales. The number of drivers remaining in the sample was over 47 thousand.

Since 1996, the Home Office’s standard list of offences has included three types of motoring offence, so in principle any of these offences committed by the sample of drivers sent to the Home Office should also be recorded in the Offenders Index. This provided a good opportunity for checking the reliability of the matching process. Comparison of details of standard list offences in 1996-99 found that 80 per cent of drivers were successfully matched, 12 per cent were not matched and 8 per cent were matched to the wrong offender. It has been shown mathematically that the presence of these mismatches means that analyses of the linked DVLA/Offenders Index data are certain to underestimate the strength of the relationship between the number of non-motoring offences and the number of motoring offences.

Previous research has shown that the willingness to commit offences varies by social group, but neither the driving licence file nor the Offenders Index contains information relating to social background. This type of information was added using the ACORN directory, a system that is widely employed in market research. It classifies each postcode area in Great Britain using 54 ACORN types that are grouped into 6 ACORN Categories, ranging from A (‘Thriving’) to F (‘Striving’).

The offences recorded in the linked data sets between 1995 and 1999 were analysed in conjunction with other factors likely to influence the number of offences, such as the driver’s age and sex. Preliminary analyses showed that the mean number of non-motoring offences committed by drivers increased with the number of motoring offences, ACORN Category (i.e. higher for F than for A) and varied by age. For example, drivers who committed a standard list motoring offence committed 0.72 primary non-motoring offences on average between 1995 and 1999, compared with 0.017 for drivers who had committed no motoring offence - a ratio of 42:1.

A series of statistical models was then fitted to the linked data to identify the separate influences of these factors upon the number of motoring offences, with particular interest in the influence of the number of non-motoring offences. First, motoring offences were grouped into serious (drink/driving, dangerous driving and driving while disqualified) and other offences. It was found, for example, that men who committed between 4 and 8 non-motoring offences committed on average 18 times as many serious motoring offences as men who committed no non-motoring offence, and 6½ times as many other motoring offences. The effect was even stronger for women, although relatively few women committed non-motoring offences. Drivers in ACORN Category F committed more serious motoring offences than those in Category A: 46 per cent for men and 36 per cent for women, but with other offences there was little variation by ACORN Category.

The next model investigated whether certain types of non-motoring offence might have a particular influence on the number of motoring offences. Vehicle theft was found to have the strongest influence; for example, a driver with at least 4 convictions for vehicle theft committed 25 times as many serious motoring offences as men who committed no non-motoring offence, and 6½ times as many other motoring offences. The corresponding figure for non-vehicular theft was 9.

The final model investigated whether the number of non-motoring offences might have a particular influence on certain types of motoring offence. It was found that the number of offences of dangerous driving and driving while disqualified increased dramatically with the number of non-motoring offences. For example, men with at least 4 non-motoring convictions were 40-50 times more likely to be convicted of dangerous driving than men with none; the figure was nearly 100 for women. On the other hand, there was far less variation in the number of speeding offences. Men with a single non-motoring conviction were almost twice as likely to be convicted of speeding as men with none, and there was no evidence that additional non-motoring convictions were associated with any extra speeding offences.
Overall, about one quarter of motoring offences in 1995-99 were committed by drivers who also committed non-motoring offences during this period, the proportion being much lower for women – 3 per cent. A similar pattern was found for drink/driving offences, although the female proportion is higher at about 8 per cent. The overall proportion was much higher for dangerous driving - over one half - and higher still for driving while disqualified – about three-quarters.

The linked data sets include much information that has either been condensed for these analyses or not analysed. This report certainly does not exhaust the range of issues that could profitably be studied using these data sets.
1 Introduction

It has often been suggested that a driver’s willingness to commit motoring offences tends to be associated with a willingness to commit other types of offence – what may broadly be called criminal offences. This report presents the results of a study that has been carried out to test this hypothesis, based on the offence histories of almost 50 thousand British drivers. The relationship between the number of motoring and non-motoring offences committed by these drivers has been investigated, taking account of other factors such as age, sex and social background that may influence offending behaviour.

The starting point for the study is the archive of driving licence information that has been maintained at TRL since 1986 (Broughton, 1999). The licensing information is supplied three times per year by the Driving and Vehicle Licensing Agency (DVLA) at Swansea and includes details of convictions for motoring offences. These details can be removed from the DVLA file after a relatively short period in accordance with the relevant legislation, which severely restricts the period of time over which a driver’s offence history can be studied (Broughton, 1986). The TRL archive was established to overcome this loss of information, and covers about 1 per cent of licence records. It is maintained purely for statistical and scientific purposes, and has been registered in accordance with the Data Protection Act. Further details of the Archive are presented in Section 2.1.

The TRL archive contains no information about non-motoring offences, but this is available from the Offenders Index that is maintained by the Home Office. This is one of the largest criminal databases in Europe and holds the criminal histories of all people convicted of a ‘standard list offence’ in England and Wales from 1963; the standard list is discussed in Section 2.2 and further details of the Index are provided. A criminal history is the cumulative record of court appearances of an individual offender and the Index held over 6 million criminal histories at the time when the study began in January 2001.

A stratified sample of drivers was selected from the TRL archive, and Section 3 describes how these were matched with the Offenders Index. Where a driver was matched with an offender, details of non-motoring offences were combined with any details of motoring offences from the archive. By implication, any driver who could not be matched had not been convicted of standard list offences, so the reliability of the matching process is crucial. Section 3.2 describes the checks that were possible.

Section 4 describes the analyses that were made of the linked sets of data, focusing on the extent to which the number of non-motoring offences committed by a driver is related to the number of motoring offences. Section 5 discusses the conclusions that can be drawn from these analyses.

The linked data sets include much information that has either been condensed for analysis or has not been analysed. The present report has certainly not exhausted the range of issues that could profitably be studied using these data.

The available records do not show whether an offender was riding a two-wheeler or driving a larger vehicle when a motoring offence was committed, so in this report the term driver will include any rider of a motorised two-wheeler.

Research carried out for the Home Office (Rose, 2000) has also analysed motoring offence data from the Offenders Index as part of a wider study which examined ‘the extent to which anti-social behaviour on the road is linked to other criminal activity’. Details of all offenders convicted between 1-15 March 1996 and 1-15 November 1996 were extracted from the Offenders Index, and a range of tabulations prepared to compare those convicted of the three standard list motoring offences (defined in Section 2.2) with other offenders. The present report is able to extend various aspects of the Home Office report, having access to the full history of motoring offences for each driver in the sample and being able to incorporate additional information such as their social background.

2 Data sources

The TRL archive and the Home Office Offenders Index were introduced briefly in Section 1. Fuller details will now be provided.

2.1 The TRL archive

The DVLA Driver Licence file is ordered by the driver number (which appears on any driving licence); this is based on the first five letters of the driver’s surname and a six digit code derived from the date of birth. The effect is that the file consists of a sequence of groups of records, with one group containing the records of drivers whose surnames share the first five letters. Within each group, drivers born in the same decade are brought together, with male drivers preceding female drivers.

The file naturally contains details of all drivers with licences, as its main function is to administer the driver licensing system. It also contains details of any unlicensed driver convicted of a motoring offence, in case that person were to apply subsequently for a licence. Hence, details of all people convicted of motoring offences should be held on the file.

The TRL archive contains details of all drivers with surnames in the ranges CHAME-CHEND and SWEET-TAYLL. These ranges were chosen when the archive was established in 1986 with the aim of avoiding bias due to regional surnames. Broughton (1986) found that there was some regional bias, in particular a shortage of Scottish drivers. This may have been avoided with an alternative sampling strategy, but the strategy has two important advantages:

- it is simple and cheap to implement;
- it automatically includes a sample of new drivers, i.e. those applying for their first driving licence or being convicted of a motoring offence for the first time.

The archive suffers from one inescapable problem: a small number of drivers notify DVLA each month of a
changed surname. Marriage is the main reason for surnames to change, so the effect is more pronounced for women than for men. A secondary reason is the correction of names that had been entered wrongly in the DVLA file. When both old and new names are within one of the ranges, the earlier data for the old name can be transferred to the record for the new name and there is no loss of information; otherwise there may be. To ensure that the results of this study are as accurate as possible, only complete records were included in the sample that was linked to the Offenders Index.

Each record in the TRL archive contains a selected subset of the information held in the corresponding DVLA record. The following details were used for the current study:

- personal details such as surname, initials, date of birth and postcode;
- date of issue of first licence;
- details of issue of first licence;
- details of convictions for motoring offences.

Courts supply details of motoring convictions to DVLA after the cases have been tried, so records are sometimes updated several months after the offence was committed. The date of each offence and conviction are recorded, together with a four character offence code taken from the DVLA system of ‘Endorsement offence codes’. The first two characters of an offence code indicate the general type of offence, while the remaining digits are more specific: for example, AC denotes ‘Accident offences’ while AC10 denotes ‘Failing to stop after an accident’. Offences that never involve penalty points are not endorsable and do not appear in the DVLA records, so all analyses reported below relate to endorsable motoring offences. Lesser offences such as parking and obstruction are excluded and do not contribute to a driver’s offence history.

The analysis uses the driver details that were in the TRL Archive in December 2000. In view of the delays involved in data reaching the DVLA file, details should be largely complete for convictions before September 2000.

### 2.2 The Offenders Index

The data in the Offenders Index are derived from the Court Appearance system and record details of each offender’s court appearances, offences and the sentences imposed. An offender only appears in the Index if he or she has committed at least one standard list offence. This list includes:

- all indictable offences (i.e. triable by a judge and jury at a crown court);
- all ‘triable either way’ offences (i.e. may be tried either at a crown or magistrate’s court);
- a few of the more serious summary offences (i.e. offences triable only at a magistrate’s court or where fixed penalties are given).

The list of offences is revised from time to time. Convictions for non-standard list summary offences (i.e. those normally tried at a magistrates’ court or where fixed penalties are given) appear in the Offenders Index only when they are dealt with at a court appearance for a standard list offence.

The standard list was expanded from 1 January 1996 to include three motoring offences:

- dangerous driving;
- driving or attempting to drive a motor vehicle while having a breath, blood or urine alcohol concentration in excess of the prescribed limit (but excluding several of the DVLA drink/driving offence categories);
- driving whilst disqualified from holding or obtaining a licence.

The Index should provide a complete count of these motoring offences since 1996, but previous offences only appear if they were dealt with at a court appearance for a (pre-1996) standard list offence. The three groups of offence correspond to separate DVLA offence codes, so they can be identified in the TRL archive. Offence details are never removed from the Index in the way that they are from the DVLA file.

The matching of the TRL sample and the Offenders Index was carried in April 2001, and the time taken for offence data to reach the Index means that the Index will be incomplete for several months previously. It will be necessary to examine the data to assess the month before which the data from the Index are effectively complete.

More information about the Index can be found at: www.homeoffice.gov.uk/rds/offenderIndex1.html

#### 2.2.1 Offence codes

Each offence in the Offenders Index is classified according to an elaborate coding system that has been developed over many years. The system is highly detailed, and a simplified version is generally used for research purposes. The system that has been used in this project uses the following 11 groups, which are listed in Appendix A:

1. Violence against the person.
2. Sexual offences.
4. Robbery.
5. Theft off/from a vehicle.
6. Other theft and handling.
7. Fraud and forgery.
8. Criminal damage.
10. Motoring offences.
11. Other offences.

There may be several convictions at a single court appearance, and the Offenders Index lists the most serious (in terms of the sentence imposed) first. Analyses will generally focus on this primary offence and exclude any secondary offences. Each offence is accompanied by up to 4 ‘disposal codes’ that record the sentences imposed.

#### 2.2.2 Social background

Previous research has found that the propensity to commit offences tends to vary by social group, but neither the driving licence file nor the Offenders Index contains...
information relating to social background. Davies et al. (1999) introduced this type of information using a system that is widely used for market research purposes, and this has been repeated for the current study.

The ACORN directory (CACI, 1993) is supplied by CACI Ltd. It classifies each postcode area in Great Britain using a set of 54 ACORN types; the classification is based on an extensive cluster analysis of Census data. The actual directory comprises a list of all current postcodes, with the appropriate ACORN type for each postcode. The 54 types are grouped into 17 ACORN groups, which are further grouped into 6 ACORN Categories.

A postcode area covers almost 400 people on average, and clearly some areas of this size will contain addresses of two or more of the 54 ACORN types. This will be less common with the 17 ACORN groups, and rarer still with the 6 ACORN Categories, so this study will use the ACORN Category to assess the extent to which social background influences offending behaviour. To illustrate the ACORN Categories, Table 1 lists the labels developed by CACI for the Categories and their constituent Groups, more detailed descriptions are available from the ACORN directory.

Table 1 ACORN categories and groups

<table>
<thead>
<tr>
<th>Label</th>
<th>ACORN category</th>
<th>ACORN groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Thriving</td>
<td>Wealthy achievers, suburban areas. Affluent greys, rural communities. Prosperous pensioners, retirement areas.</td>
</tr>
<tr>
<td>B</td>
<td>Expanding</td>
<td>Affluent executives, family areas. Well-off workers, family areas.</td>
</tr>
<tr>
<td>C</td>
<td>Rising</td>
<td>Affluent urbanites, town and city areas. Prosperous professionals, metropolitan areas. Better-off executives, inner city areas.</td>
</tr>
<tr>
<td>D</td>
<td>Settling</td>
<td>Comfortable middle agers, mature home-owning areas. Skilled workers, home-owning areas.</td>
</tr>
<tr>
<td>E</td>
<td>Aspiring</td>
<td>New home owners, mature communities. White collar workers, better-off multiethnic areas.</td>
</tr>
<tr>
<td>F</td>
<td>Striving</td>
<td>Older people, less prosperous areas. Council estate residents, better-off homes. Council estate residents, high unemployment. Council estate residents, greatest hardship. People in multiethnic low-income areas.</td>
</tr>
</tbody>
</table>

A driver’s ACORN Category can only be derived if the full postcode is available from the DVLA data and that postcode exists in the CACI file.

2.3 Data from Scotland

Section 1 mentioned that the Offenders Index only holds data from courts in England and Wales, so there is no information about convictions in Scottish courts. On the other hand, the DVLA data cover the whole of Great Britain, and hence include convictions in Scottish courts. This mismatch must be considered when designing the study.

The DVLA Driver Licence file contains, within each offence record, a code that specifies the court where the case was tried. This is not held in the TRL archive, so it is not feasible to remove these Scottish convictions from the driving licence information to be matched with the Offenders Index.

A practical alternative is to take account of the region where a driver lives when analysing the matched data. The region can be identified from the postcode that is held in the licence record. DVLA ensures that at least the first two characters of the postcode are recorded whenever an address is known, which is sufficient to identify the region; alternatively, there is a code for ‘not known’. The accuracy of the addresses in DVLA records depends upon drivers notifying the Agency of address changes, but changes are often relatively local so that the regional code should be rather more accurate than the actual address or postcode. The regions used are the nine Government Office Regions in England, together with Wales and Scotland.

Knowing the region where each driver lives would compensate fully for the absence of Scottish data in the Offenders Index if Scottish drivers only offended north of the border and English and Welsh drivers only offended to the south. Of course, neither condition applies in practice, so that:

- some English and Welsh drivers will have been convicted of standard list motoring offences in Scottish courts; the convictions will appear in the DVLA data but not the Offenders Index and lead to a false impression of the incompleteness of the Index;
- some English and Welsh drivers will be convicted of criminal offences in Scottish courts, so their criminal histories will be incomplete or missing.

Fortunately, there is a way of assessing the extent to which these occur. More detailed DVLA licensing data are regularly supplied to TRL for analysis as part of its programme of research into drink/driving. These include the court code that is absent from the TRL archive and the date of sentence (which may differ from the date of court appearance). The appearances in court since 1996 in this source have been analysed, using the court code to determine whether or not the court was in Scotland. Table 2 presents the proportion of motoring convictions that occurred in Scotland, by the region where the convicted driver lived.

The table shows that relatively few motoring offences are ‘cross-border’. The regions are sorted in order, and it can be seen that the proportion in a region is broadly linked to its distance from Scotland. This gives confidence in the accuracy of the allocation of drivers to regions. Drink/drive offences form the great majority of standard list motoring offences and will be used to assess the accuracy of the matching process, so it is encouraging to find that the proportion is lower for drink/drive offences than for other motoring offences.

These results apply to motoring offences, but the conclusion that the level of cross-border offending is very low is also likely to apply to non-motoring offences. Motoring offences are linked with mobility and can potentially be committed many miles from a driver’s...
home. Many types of criminal offence, however, such as violence, theft and criminal damage, tend to be committed relatively close to the offender’s home. Thus, it is likely that relatively few drivers living in England and Wales have a criminal record in Scotland.

These results suggest that restricting analyses to drivers with English or Welsh postcodes is a satisfactory solution to the difficulty caused by the fact that the Offenders Index only holds data from England and Wales while DVLA data cover the whole of Great Britain.

3 Matching

A sample of drivers was extracted from the TRL archive according to a design that is described in Section 3.1. This section also describes the process by which this sample was matched with the Offenders Index, while Section 3.2 analyses the accuracy of the matching as far as possible.

3.1 The sample of drivers

The design chosen for drawing the sample of drivers was based on the motoring offences committed by drivers in or after 1996. The reason is that the Offenders Index should contain details of all standard list motoring offences (as listed in Section 2.2) that were sentenced from 1 January 1996. Consequently, each of these offences that is recorded in the TRL archive should correspond to a unique offence record in the Offenders Index - unless it was committed in Scotland. This provides a good opportunity for testing the reliability of the matching process.

It was agreed in preliminary discussions with the Home Office that the overall sample size would be about 50,000, which should provide sufficient data for a rigorous analysis while not imposing an unreasonable burden on the Home Office computing system. The actual sample sent to the Home Office was stratified using four sampling groups based on the number of motoring offences committed in or after 1996:

1 all drivers who had committed at least 1 standard list motoring offence;
2 all drivers who had committed more than 5 motoring offences;
3 a 1:N₁ sample of drivers who had committed between 1 and 5 motoring offences;
4 a 1:N₂ sample of drivers with had committed no motoring offences.

Drivers who appeared in Groups 1 and 2 were allocated to Group 1, as were any who appeared in Groups 1 and 3. N₁ and N₂ were set to 2 and 16 respectively, so that Groups 3 and 4 would be roughly equal in size. The size of each group was:

<table>
<thead>
<tr>
<th>Group</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>4374</td>
</tr>
<tr>
<td>Group 2</td>
<td>409</td>
</tr>
<tr>
<td>Group 3</td>
<td>24591</td>
</tr>
<tr>
<td>Group 4</td>
<td>21514</td>
</tr>
<tr>
<td>Total</td>
<td>50888</td>
</tr>
</tbody>
</table>

In practice, 250 drivers had to be removed because their surnames did not satisfy the Home Office requirements, principally because they included blanks.

If both sets of files contained a common unique identifier then it would be possible to link the two directly. For example, the driver number is the unique identifier for the TRL archive, so if the Offender Index had also included the driver number then the two files could be linked directly via the driver number. However, there is no common unique identifier, so it is necessary to match the sample of drivers to the Offender Index. This consists of checking each driver in turn to see whether their details match the details of any single Offender with sufficient confidence to accept that the two are actually the same person.

The Home Office uses a standard computer program for this. The matching depends on:

- Full surname.
- First two initials.
- Date of birth.
- Sex.

A file was sent to the Home Office that contained these items for each of the 50,638 remaining drivers. The matching program then compared each driver with all, and calculated a ‘percentage match rate’ for each based on the similarity between these items of data. There were three possible outcomes for each potential match:

a a match rate of 98% or more is considered to be a true match;
b a match rate of 95% or lower is not considered to be a match;
c a match rate of 96-97 per cent is considered to be a questionable match, and can lead to an additional manual check of the proposed match; in view of the size of this sample, however, this was not carried out for this project.
The file that was returned to TRL in the spring of 2001 consisted of:

a name details followed by information from the Offenders Index if the driver had a true match and hence a criminal record;

b name details followed by a row of zeros if the driver could not be matched and so had no identifiable criminal record;

c no output for any driver with a match rate of 96-97%, so that drivers with questionable matches could be dropped from the subsequent analysis.

41 drivers were missing from the returned file, 0.08 per cent of the number sent, which means that relatively few drivers had proved to be questionable matches. The two name ranges in the TRL archive (Section 2.1) do not include the most common British surnames such as Smith or Jones. This reduces the likelihood of two people sharing personal details, so the choice of name range may well have contributed to this low level.

3.2 Check of the matching

3.2.1 Initial check

Table 3 presents the first check on the match achieved, the proportion by residential region of drivers in Group 1 of the TRL sample who could not be matched in the Offenders Index. The table also includes the distribution of the sampled drivers by region.

Table 3 Details of sample of drivers, by residential region

<table>
<thead>
<tr>
<th>Residential region</th>
<th>% of Group 1 unmatched</th>
<th>% of all drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yorkshire &amp; Humberside</td>
<td>7.0%</td>
<td>9.3%</td>
</tr>
<tr>
<td>North East</td>
<td>7.4%</td>
<td>4.7%</td>
</tr>
<tr>
<td>North West</td>
<td>8.9%</td>
<td>11.5%</td>
</tr>
<tr>
<td>East Midlands</td>
<td>10.9%</td>
<td>6.7%</td>
</tr>
<tr>
<td>South West</td>
<td>11.4%</td>
<td>9.3%</td>
</tr>
<tr>
<td>Wales</td>
<td>12.6%</td>
<td>3.5%</td>
</tr>
<tr>
<td>South East</td>
<td>13.2%</td>
<td>13.7%</td>
</tr>
<tr>
<td>West Midlands</td>
<td>14.0%</td>
<td>8.1%</td>
</tr>
<tr>
<td>East</td>
<td>17.5%</td>
<td>10.7%</td>
</tr>
<tr>
<td>London</td>
<td>18.3%</td>
<td>16.9%</td>
</tr>
<tr>
<td>Not known</td>
<td>19.6%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Scotland</td>
<td>84.8%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Great Britain</td>
<td>16.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>England and Wales*</td>
<td>12.8%</td>
<td>94.4%</td>
</tr>
</tbody>
</table>

* Includes all drivers with an address in Wales or an English region

In principal, all Group 1 drivers should have been matched, unless they had been convicted only in Scottish courts. A very high proportion of Scottish drivers has not been matched, but otherwise closeness to Scotland does not appear to explain the proportion of drivers who could not be matched: indeed, the proportion is greatest in London. Overall, about 1 in Group 1 drivers from England and Wales could not be matched in the Offenders Index.

3.2.2 More detailed checks

Over 47 thousand of the drivers in the sample lived in England and Wales, so restricting analyses to them should certainly lead to results that are statistically robust. However, Table 3 shows only whether drivers in Group 1 have been matched with offenders in the Index, not whether they have been matched correctly.

The validity of the matches can be assessed in the case of Group 1 drivers since by definition each of them has at least one standard list motoring offence in the TRL archive that should also be recorded in the Offenders Index. Hence, for each Group 1 driver living in England and Wales, the details of any standard list offence in the TRL archive have been compared with the details of all motoring offences recorded in the Offenders Index for the matching offender. Clearly, no comparison could be made when there was no match.

The following details are compared:

- TRL archive – DVLA offence code, date of court appearance and (in the great majority of cases) the date of sentence and the court code merged from the data set introduced in Section 2.3.
- Offenders Index – the ‘offence class code’, the date of sentence and the court code.

The outcome is clear-cut when the TRL archive contains the date of sentence and court code; either the details match or they do not. When only the date of court appearance is known then there may well be a gap between the date of court appearance (recorded in the TRL archive) and the date of sentence (recorded in the Offenders Index). It was clear from those cases where both dates were known in the TRL archive that any gap between court appearance and sentence is normally short. 88 per cent of drink/drive offenders were sentenced on the same day or within 1 month, while 97 per cent were sentenced within 3 months. A limit must be placed on the gap that will be accepted to avoid accepting obvious mismatches, and 3 months was chosen.

Although the offence details agreed exactly in many cases, in other cases the offence details in the TRL archive did not match those for the ‘matching’ driver in the Offenders Index. In one case, for example, a driver in the TRL archive was sentenced for drink/driving on 25/2/1997 and for dangerous driving and driving while disqualified on 9/11/1999, with no other offences recorded since 1/1/1996. The driver in the Offenders Index was sentenced for driving while disqualified on 25/3/1999 and 14/1/2000 and on the later occasion he was also sentenced for dangerous driving: none of the court codes match those in the TRL archive. It was highly likely that the Offenders Index record did not relate to the same person and that the match was false.

Table 4 analyses the convictions of Group 1 drivers from England and Wales recorded in the TRL archive for the standard list motoring offences. A check of the unmatched offences showed that the limit of 3 months was reasonable in cases where the date of the court appearance rather than sentence was known. In the great majority of the cases where the Offenders Index had no record of a sentence within 3 months of a court appearance for an offence in the TRL archive, neither was there a record of a sentence more than 3 months later. With some drivers, certain standard list offences in the TRL archive corresponded exactly to offences in the Offenders Index, so the matching program had worked satisfactorily, yet other offences had no corresponding Offenders Index offence.
### Table 4 Matching rate for standard list offences, Group 1 drivers from England and Wales

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Matched</td>
<td>730</td>
<td>958</td>
<td>877</td>
<td>912</td>
<td>415</td>
<td>3892</td>
<td>3477</td>
</tr>
<tr>
<td>No OI offender*</td>
<td>120</td>
<td>140</td>
<td>107</td>
<td>80</td>
<td>246</td>
<td>693</td>
<td>447</td>
</tr>
<tr>
<td>Not matched</td>
<td>107</td>
<td>99</td>
<td>136</td>
<td>111</td>
<td>318</td>
<td>771</td>
<td>453</td>
</tr>
<tr>
<td>Percentage matched</td>
<td>76%</td>
<td>80%</td>
<td>78%</td>
<td>83%</td>
<td>42%</td>
<td>73%</td>
<td>79%</td>
</tr>
</tbody>
</table>

* The driver could not be matched in the Offenders Index.

When the matching program was run in the spring of 2001, the Offenders Index was incomplete for 2000, and this appears to have depressed the rate of matching offences, but even in 1996-99 only four-fifths of offences could be matched. The matching rate even for the early months of 2000 was only about 60 per cent, falling below 50 per cent from July, so it was sensible to examine only matches for offences with sentences in 1996-99.

The offence details in the TRL sample and the Offenders Index are the date of sentence, so strictly the non-motoring offences included are those where the sentence occurred during this period. This minor discrepancy should not affect the results.

### Table 5 Outcome of attempt to match Group 1 drivers from England and Wales, sentences in 1996-99

<table>
<thead>
<tr>
<th>Number</th>
<th>Percentage</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>2777</td>
<td>80%</td>
<td>Were matched successfully.</td>
</tr>
<tr>
<td>427</td>
<td>12%</td>
<td>Could not be matched to an offender in the Offenders Index.</td>
</tr>
<tr>
<td>283</td>
<td>8%</td>
<td>Of proposed matches were not acceptable.</td>
</tr>
</tbody>
</table>

There is no way of checking the validity of the matches for the remainder of the TRL sample, since there is no reason to expect other motoring offences in the archive to have their equivalents in the Index. All that can be done is to use the information presented above to assess the implications for further analyses of the matched data.

#### 3.2.3 Possible source of errors

The offences detailed in the TRL sample and the Offenders Index come from a common source: the clerical staff in courts. There seem to be two main explanations for the level of unmatched drivers from Group 1. Some offenders may have used an alias, in which case the details in the Offenders Index would not match those on the driving licence file. Secondly, data are recorded and transmitted using different systems and minor errors when recording details such as date of birth may have misled the matching program. It may be significant that the initial assessment of Table 3 found the lowest matching rate in the London where – according to press reports - the court system is under particular pressure.

It appears likely that mismatching would affect the other groups to the same extent as it has been seen to affect Group 1, which has implications for the comparisons presented in the remainder of this report. This can be illustrated by a simple hypothetical example using the results of Table 5 showing that of 100 drivers who have a record, on average 80 are correctly matched, 12 are wrongly not matched and 8 are mismatched. Further, it can be inferred from the final figure that of 100 drivers who did not have a record, 8 are wrongly matched to an offender.

Suppose that two groups of 200 drivers are compared; 50 per cent of drivers in Group A actually have a record of non-motoring offences, compared with 10 per cent of Group B drivers. By assumption, drivers in Group A are five times more likely to have a record than those in Group B, but what would the matched data show?

- **a** In Group A, 100 drivers have a record: 80 of these would be correctly matched and 8 would be mismatched. Of the 100 drivers without a record, 8 would be mismatched and would appear to have a record. In total, 96 would be matched and it would appear that 48 per cent of this group had a record, close to the assumed figure.

- **b** In Group B, 20 drivers have a record: 16 would be correctly matched and 2 would be mismatched. Of the 180 drivers without a record, 14 would be mismatched and would appear to have a record. In total, 32 would be matched and it would appear that 16 per cent of this group had a record, rather higher than the assumed figure.

- **c** Comparison of (a) and (b) would suggest that drivers in Group A are 3 times more likely to have a record than drivers in Group B, little more than half the assumed ratio of 5.

Thus, this example suggests that mismatching will diminish the apparent differences between groups of drivers and lead to an underestimation of the relative offence rate. Appendix B proves this to be true irrespective of the proportion of drivers who have an offence record.

### 4 Analysis of linked data

This section will now analyse the linked data sets. The main aim is to examine the extent to which drivers’ convictions for non-motoring offences can explain variations in the number of convictions for motoring offences, based on the records of motoring and non-motoring offences between 1995 and 1999 by drivers living in England and Wales. The only date recorded in the Offenders Index is the date of sentence, so strictly the non-motoring offences included are those where the sentence occurred during these five years. The TRL archive records the date of offence and of conviction but not of sentence, so the motoring offences included are those where the conviction occurred during this period. This minor discrepancy should not affect the results.

Following preliminary analyses in Section 4.1, Section 4.2 relates the number of motoring offences to the number of non-motoring offences. Section 4.3 then uses a statistical model to examine the relationship between the two types of offence in more detail.

The conclusion of Section 3.2.3 should be borne in mind: that the mismatching which has been identified among
Group 1 drivers means that any analysis of the linked data will underestimate the strength of the relationship between the two types of offence. It affects all of the results presented below. For example, when it is shown that a driver who has committed 3 non-motoring offences has committed on average N times as many motoring offences as a driver who has committed no non-motoring offences, the true figure is in all likelihood greater than N.

4.1 Preliminary analyses

Table 6 presents the primary offences recorded in the linked Offenders Index records in 1995-99 by the 47,212 drivers in the sample who lived in England and Wales. As only primary offences are included, these figures equate to the number of court appearances. The predominance of motoring offences is exaggerated to some extent by the deliberate over-sampling of drivers who were known from the DVLA data to have committed motoring offences in 1996-99.

Table 6 Primary offences from Offenders Index, 1995-99, drivers in England and Wales

<table>
<thead>
<tr>
<th>Offence group</th>
<th>Offence type</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Violence against the person</td>
<td>884</td>
</tr>
<tr>
<td>2</td>
<td>Sexual offences</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>Burglary</td>
<td>578</td>
</tr>
<tr>
<td>4</td>
<td>Robbery</td>
<td>68</td>
</tr>
<tr>
<td>5</td>
<td>Theft off/from a vehicle</td>
<td>469</td>
</tr>
<tr>
<td>6</td>
<td>Other theft and handling</td>
<td>1389</td>
</tr>
<tr>
<td>7</td>
<td>Fraud and forgery</td>
<td>501</td>
</tr>
<tr>
<td>8</td>
<td>Criminal damage</td>
<td>142</td>
</tr>
<tr>
<td>9</td>
<td>Drug offences</td>
<td>587</td>
</tr>
<tr>
<td>10</td>
<td>Motoring offences</td>
<td>3528</td>
</tr>
<tr>
<td>11</td>
<td>Other offences</td>
<td>939</td>
</tr>
<tr>
<td>All</td>
<td></td>
<td>9135</td>
</tr>
</tbody>
</table>

Table 7 presents corresponding information for the motoring offences committed by these drivers. The DVLA records do not identify primary offences, so the table relates to all offences. The distinction is relatively unimportant since the mean number of motoring offences per court appearance is only 1.23, whereas the corresponding number for the Offenders Index is 2.37.

Table 7 DVLA motoring offences, 1995-99, drivers in England and Wales

<table>
<thead>
<tr>
<th>Offence type</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driving while disqualified</td>
<td>1362</td>
</tr>
<tr>
<td>Reckless or Dangerous Driving</td>
<td>229</td>
</tr>
<tr>
<td>Drink or drugs offences</td>
<td>3515</td>
</tr>
<tr>
<td>Careless driving</td>
<td>1284</td>
</tr>
<tr>
<td>Construction and Use offences</td>
<td>1239</td>
</tr>
<tr>
<td>Insurance offences</td>
<td>6432</td>
</tr>
<tr>
<td>Licence offences</td>
<td>2812</td>
</tr>
<tr>
<td>Speed limit offences</td>
<td>19653</td>
</tr>
<tr>
<td>Traffic direction and Signs</td>
<td>2666</td>
</tr>
<tr>
<td>Other</td>
<td>3148</td>
</tr>
<tr>
<td>All</td>
<td>42340</td>
</tr>
</tbody>
</table>

The distributions in Table 6 and 7 will guide the choice of offence types to be used in the more detailed comparisons. Section 2.2.2 pointed out that the ACORN Category could only be derived if the driver’s full postcode was available and existed in the CACI file. The percentage for which the Category could not be derived is:

Table 8 Mean number of primary non-motoring offences per driver, 1995-99

<table>
<thead>
<tr>
<th>ACORN category</th>
<th>Sample group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>A</td>
<td>0.41</td>
</tr>
<tr>
<td>B</td>
<td>0.51</td>
</tr>
<tr>
<td>C</td>
<td>0.55</td>
</tr>
<tr>
<td>D</td>
<td>0.50</td>
</tr>
<tr>
<td>E</td>
<td>0.83</td>
</tr>
<tr>
<td>F</td>
<td>1.08</td>
</tr>
<tr>
<td>Not known</td>
<td>1.30</td>
</tr>
<tr>
<td>Any</td>
<td>0.72</td>
</tr>
</tbody>
</table>

It is clear that drivers from Group 1 (at least 1 standard list motoring offence) and Group 2 (more than 5 motoring offences) were convicted of far more non-motoring offences than other drivers. Compared with the mean for all drivers, Group 1 had 21 times as many convictions and Group 2 had 56 times as many convictions. Even Group 3 (between 1 and 5 motoring offences) had 2.6 times as many convictions, while Group 4 (no motoring offences) had half as many convictions. The number of non-motoring offences
is also strongly influenced by the ACORN category, with drivers from category F (‘Striving’) having about 5 times as many convictions as drivers from category A (‘Thriving’). This shows the importance of including this variable when analysing the offence data.

These results are influenced to some extent by the ages of the various sets of drivers. For example, the mean age of drivers in Group 2 at 31/12/1999 was 28, compared with 44 for Group 4, and younger people are known to commit more offences than older ones. One way of reducing the influence of age is to focus on a single age range, and Table 9 repeats Table 8 for drivers who were aged 17-30.

Table 9 Mean number of primary non-motorling offences per driver aged 17-30

<table>
<thead>
<tr>
<th>ACORN category</th>
<th>Sample group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>0.80</td>
</tr>
<tr>
<td>B</td>
<td>0.97</td>
</tr>
<tr>
<td>C</td>
<td>1.01</td>
</tr>
<tr>
<td>D</td>
<td>0.81</td>
</tr>
<tr>
<td>E</td>
<td>1.31</td>
</tr>
<tr>
<td>F</td>
<td>1.86</td>
</tr>
<tr>
<td>Not known</td>
<td>1.12</td>
</tr>
<tr>
<td>Any</td>
<td>1.22</td>
</tr>
</tbody>
</table>

These younger drivers committed more than twice as many non-motorling offences as the full population of drivers. The results have the same general pattern, but the relative rates tend to be less. Compared with the mean for all drivers aged 17-30, Group 1 had 14 times as many convictions and Group 2 had 24 times as many; Group 3 had 2.3 times as many convictions while Group 4 had less than half as many. Drivers from category F had about 4 times as many convictions as drivers from category A.

4.2 The number of motoring offences

The results presented in the previous section compared the four sample groups and found that drivers who had committed non-motorling offences were more likely to have committed non-motorling offences. This section will now examine the number of motoring offences per driver and relate this to the number of non-motorling offences. The results take account of the stratified sampling and should be representative of the full population of drivers.

It was explained earlier that, when analysing offence data from the Offenders Index, only the most serious offence was considered per court appearance. For consistency, the DVLA data will be treated similarly. Only one motoring offence will be considered per court appearance; offences will be divided into ‘serious’ and ‘other’ for the main analyses, with other offences counted only if there was no serious offence at the same court appearance. The definition of ‘serious’ is based on the Home Office Standard List offences, but drink/driving is expanded to include all categories of drink/ and drug/driving offence. Table 7 showed that these account for over two-thirds of serious offences, while speeding accounts for over one half of other offences. Analyses in Section 4.3.2 will examine specific types of offence, rather than these two groupings.

The first step is to calculate, for drivers in the sample who had committed N non-motorling offences in 1995-99, the mean number of motorling convictions in the same period. Table 10 presents the results, including the mean and the ratio of the mean to the mean for drivers with no convictions for non-motorling offences. It is clear that drivers who had been convicted of non-motorling offences had far more motorling convictions than those with no convictions, the difference being especially marked for serious motorling offences.

Figure 1 illustrates the relative effects from the table. The data are plotted as points, and quadratic functions have been fitted to show the general trends.

In spite of the strength of the relationship demonstrated in Table 10, its implications should not be exaggerated. Table 11 is based on the linked data sets, and shows that relatively few drivers had committed non-motorling offences in 1995-99. The result is that most motorling offences were committed by drivers who had committed no non-motorling offences. Incidentally, a widely-publicised statistic derived from the Offenders Index is that over 30 per cent of young men have been convicted at some time, which is much higher than the figure of 2.6 per cent that is implied by the table. The difference arises largely because the table considers only non-motorling offences committed over five years and many of these drivers are not young.

Table 10 Mean number of motoring offences in 1995-99, by number of non-motoring offences

<table>
<thead>
<tr>
<th>Number of non-motorling offences</th>
<th>Serious motoring offences</th>
<th>Other motoring offences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Relative number</td>
</tr>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>0</td>
<td>0.015</td>
<td>0.002</td>
</tr>
<tr>
<td>1</td>
<td>0.151</td>
<td>0.030</td>
</tr>
<tr>
<td>2</td>
<td>0.340</td>
<td>0.050</td>
</tr>
<tr>
<td>3</td>
<td>0.397</td>
<td>0.051</td>
</tr>
<tr>
<td>4-8</td>
<td>0.714</td>
<td>0.171</td>
</tr>
<tr>
<td>9-</td>
<td>0.904</td>
<td>0.000</td>
</tr>
</tbody>
</table>

* Result based on only one driver
These results are likely to have been influenced by the failure identified in Section 3.2.2 to match some drivers to the corresponding offenders in the Offenders Index. Hence, some of the drivers who appear in the first row of the table should actually appear in one of the lower rows. In order to assess the likely consequences, it will be assumed that the results of Table 5 can be generalised to the full sample, i.e. that for every 88 drivers who were matched there were 12 who were wrongly not matched and so appear to have 0 non-motoring offences. If this redistribution is applied equally to all columns then the values in the first row fall to 97.05%, 99.44%, 97.97%, 63.0%, 86.0%, 64.3%, 89.1%, 97.5% and 90.4% respectively.

Thus, the redistribution does not materially affect the general conclusions to be drawn from the table. About two-thirds of men and seven-eighths of women who committed serious motoring offences in 1994-99 committed no non-motoring offences during that period, and the proportions are much higher for other motoring offences. While the propensity to commit non-motoring offences is strongly linked to the propensity to commit motoring offences, especially the more serious ones, most motoring offences were committed by drivers who were not convicted of non-motoring offences during the same period.

### 4.3 Statistical models

This section will fit statistical models to the linked data to examine the relationship between the numbers of motoring offences and of non-motoring offences in more detail. It has been pointed out that drivers’ ages and social backgrounds might influence the results, and a statistical model is needed to identify these influences separately. The data from the previous section will be modelled first, then disaggregate data will be used.

Statistical modelling allows another factor to be included in the analysis: the type of driving licence. It seems likely, for example, that the pattern of offences of drivers with provisional licences would differ from the pattern of fully licensed drivers. Some drivers will have acquired a new licence between 1995 and 1999, while others will have lost theirs as a result of disqualification. The TRL archive records the dates of any changes, but it is not feasible to include these details in the analysis. To simplify matters, drivers are allocated to one of the following licence groups:

- **Full:** Driver had passed a driving test by the end of 1999.
- **Provisional:** Driver had received a provisional licences by the end of 1999 but had not passed a driving test.
- **Unlicensed:** Driver had not received any licence by the end of 1999.

### Table 11 Distribution of drivers and motoring offences, by number of non-motoring offences

<table>
<thead>
<tr>
<th>Number of non-motoring offences</th>
<th>Distribution of drivers</th>
<th>Serious motoring offences</th>
<th>Other motoring offences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Either</td>
</tr>
<tr>
<td>0</td>
<td>97.40%</td>
<td>99.50%</td>
<td>98.22%</td>
</tr>
<tr>
<td>1</td>
<td>1.63%</td>
<td>0.32%</td>
<td>1.12%</td>
</tr>
<tr>
<td>2</td>
<td>0.47%</td>
<td>0.08%</td>
<td>0.32%</td>
</tr>
<tr>
<td>3</td>
<td>0.19%</td>
<td>0.04%</td>
<td>0.13%</td>
</tr>
<tr>
<td>4-8</td>
<td>0.27%</td>
<td>0.05%</td>
<td>0.19%</td>
</tr>
<tr>
<td>9-</td>
<td>0.04%</td>
<td>0.00%</td>
<td>0.02%</td>
</tr>
</tbody>
</table>

Figure 1 Relative effect of number of non-motoring offences on mean number of motoring offences (from Table 10)
Section 2.1 explained that DVLA records details of any unlicensed driver who is convicted of a motoring offence in case they subsequently apply for a licence. Thus, all of the unlicensed drivers in the linked data set had committed at least one motoring offence, although not necessarily between 1995 and 1999.

The following Generalised Linear Model has been fitted using the GLIM program:

\[
\text{Log}(\text{Motor}_{ijkl}) = \text{Age}_i + \text{Acorn}_j + \text{Non-motor}_k + \text{Licence}_l
\]  
(1)

where:

- \(\text{Motor}_{ijkl}\) is the number of motoring offences committed by a driver of age group \(i\) and ACORN group \(j\), the number of non-motoring offences being in the \(k\)-th range and the licence being of type \(l\).
- \(\text{Age}_i\) are factors estimated to represent the effects of age, ACORN group, non-motoring number of non-motoring offences and type of licence.

Models are fitted separately for men and women. The offence data come from the 5 years 1995-99, with separate models fitted for serious and other motoring offences. Drivers aged during this period, and Age is calculated as the age at the end of the period, 31 December 1999.

The GLIM program calculates the nominal standard error of each estimated coefficient, but in general these will not be presented. The reason is that the program’s calculations cannot take account of the main source of error in these analyses, the mismatching of some drivers to the Offenders Index. As discussed above, this mismatching is likely to mean that the models will underestimate the effect of the number of non-motoring offences, and there may well be other more subtle consequences. Consequently, some of the nominal standard errors are probably misleading.

Some of the estimated coefficients are, however, relatively imprecise because of the number of cases involved, and the standard errors calculated by GLIM should be able to identify these. In Tables 12-14, † will indicate values that do not differ significantly from the corresponding baseline value at the 95% level as indicated by the standard errors (some differences within the sets of values may not be significant).

The coefficients from the fitted models will be presented as the relative effect of these factors on the number of motoring offences. The baseline levels for calculating the relative effects are:
- age group 25-29;
- ACORN category A;
- drivers with no convictions for non-motoring offences;
- drivers with full licences.

The models fit the data well, especially for the serious offences, and Table 12 presents the resulting coefficients. For example, it shows that a male driver with 1 conviction for a non-motoring offence has, on average, committed 7
times as many serious motoring offences as a driver with no convictions, irrespective of age, ACORN category or type of licence. A man from ACORN category F committed 46 per cent more serious motoring offences on average than a man from category A, taking account of the other factors. The relative effects of the number of non-motoring offences are illustrated by Figure 2, again including fitted curves to show the general trends.

The table shows that some of the increase with the number of non-motoring offences in Table 10 is indeed associated with age and social factors, but the actual increase is still considerable. The increase is greater for serious than for other motoring offences, and is greater for women than for men (although Table 11 showed that relatively few women had committed non-motoring offences). The variations with age in the four models are broadly consistent, but the variations with ACORN category are not. Among men and serious motoring offences, there is a rising trend from category A to F, but women in category D committed most serious offences and there is a falling trend from category A to E for other offences committed by women. Unlicensed drivers commit at least 4 times as many serious motoring offences as fully licensed drivers, but fewer other offences.

The form of model (1) assumes that the groups of factor influence the number of motoring offences independently. It seems possible, however, that the influences interact so that, for example, the effect of the number of non-motoring offences differs from one age group to another. To investigate this, (1) was expanded to include a term to represent the interaction between Non-motor and either Age, Acorn or Licence. The results were examined for significant and consistent interactions.

Only two such interactions were found: for 0-19 year old men, the increase with Non-motor was more rapid than for older men, while for ACORN category F the increase was slower than for other categories. Thus, with these two exceptions, the overall effects in the first section of the table apply equally to all age groups and ACORN categories.

### 4.3.1 Specific types of non-motoring offence

So far, the analyses have grouped the various types of non-motoring offence together, but this section will examine whether the association with the number of motoring

---

**Table 14 Relative effect of the number of non-motoring offences and type of licence on the number of specific motoring offences**

<table>
<thead>
<tr>
<th>Offence type</th>
<th>Speeding Careless driving</th>
<th>Drink driving</th>
<th>Danger -ous driving</th>
<th>Driving while disqual -ified</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 offences</td>
<td>1.0*</td>
<td>1.0*</td>
<td>1.0*</td>
<td>1.0*</td>
<td>1.0*</td>
</tr>
<tr>
<td>1 offence</td>
<td>1.8</td>
<td>4.3</td>
<td>5.5</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>2 offences</td>
<td>1.2'</td>
<td>6.0</td>
<td>8.9</td>
<td>20</td>
<td>43</td>
</tr>
<tr>
<td>3 offences</td>
<td>1.5'</td>
<td>4.4</td>
<td>7.2</td>
<td>20</td>
<td>67</td>
</tr>
<tr>
<td>4-8 offences</td>
<td>1.1'</td>
<td>6.1</td>
<td>6.5</td>
<td>40</td>
<td>98</td>
</tr>
<tr>
<td>9- offences</td>
<td>1.4'</td>
<td>11</td>
<td>6.3</td>
<td>52</td>
<td>123</td>
</tr>
<tr>
<td>Full licence</td>
<td>1.00*</td>
<td>1.0*</td>
<td>1.0*</td>
<td>1.0*</td>
<td>1.0*</td>
</tr>
<tr>
<td>Provisional licence</td>
<td>0.04</td>
<td>0.2</td>
<td>0.7</td>
<td>0.8†</td>
<td>2.0</td>
</tr>
<tr>
<td>Unlicensed</td>
<td>0.35</td>
<td>0.6</td>
<td>4.9</td>
<td>3.6</td>
<td>3.9</td>
</tr>
</tbody>
</table>

| **Women**    |                          |                |                   |                            |     |
| 0 offences   | 1.0*                     | 1.0*           | 1.0*              | 1.0*                       | 1.0*|
| 1 offence    | 2.1'                     | 7.2            | 11                | 0.5†                       | 44  |
| 2 offences   | 3.6'                     | 14             | 0.3†              | 35                         | 7.7 |
| 3 offences   | 1.7'                     | 0.1'           | 0†                | 251                        | 71  |
| 4-8 offences | 0.0'                     | 15             | 21                | 95                         | 220 |
| Full licence | 1.00*                    | 1.0*           | 1.0*              | 1.0*                       | 1.00*|
| Provisional licence | 0.02 | 0.1 | 0.3 | 0.6† | 1.2 | 0.10 |
| Unlicensed   | 0.11                     | 0.5            | 5.1               | 8.3                        | 4.3 |

* Indicates the baseline level
† Indicates that coefficient does not differ significantly from 1.00 (95% level)

---

**Figure 2 Relative effect of number of non-motoring offences on number of motoring offences (from Table 12)**
offences is stronger for certain types of offence than for others. This is done by refitting model (1) with Non-motor restricted to specific offence types. Table 6 shows that the following types or groups of types are sufficiently numerous for analysis:

- violence against the person;
- theft of/from a vehicle;
- non-vehicular theft – including burglary, robbery, other theft and handling;
- drug offences.

Only results for men are reported. The results for women are much less precise because they committed relatively few of these offences, but their results are consistent with those for men. Table 13 repeats the format of Table 12 for these groups of non-motorng offences; the final column refers to non-motorng offences of all types, not the combination of the four specific offences. The relative effects of age group and ACORN category are of less interest so are not shown.

These results show that convictions for vehicle theft have the strongest association with convictions for motorng offences. Unlicensed drivers with convictions for the four types of non-motorng offence are especially likely to have committed a serious (but not other) motorng offence.

The offence of ‘Aggravated taking of a vehicle’ is recorded on the DVLA licensing file, which will account for some of the excess of other (but not serious) motorng offences. In the case of drug offences, ‘driving or attempting to drive while unfit through drugs’ is included among the serious motorng offences as defined in Section 4.2, so these offences might be expected to be associated with relatively many serious offences. However, the DVLA data include relatively few convictions for drug/driverng, and drug offences appear to have less influence than other offences on the number of motorng offences.

The relative effects of the number of non-motorng offences are illustrated by Figure 3. Quadratic curves have again been fitted to show the general trends and, although they do not fit the data exactly, they do point to an interesting conclusion for three groups of offence: as the number of non-motorng offences rises above 3 then the number of motorng offences begins to fall. The curves are fitted independently so the similarity suggests that there is an underlying cause.

It appears that periods of imprisonment might explain the declining trend for three groups of offence: perhaps offenders with multiple convictions spent lengthy periods

![Figure 3 Relative effect of number of specific non-motorng offences on number of motorng offences (from Table 13)](image-url)
in custody between 1995-99 that curtailed their opportunities for offending? The ‘disposal codes’ of the Offenders Index show the type and extent of the sentences imposed for each offence, so this possibility can be tested with these data. Figure 4 shows the mean number of sentences of imprisonment per driver in 1995-99: for example, drivers who were convicted twice of violence against the person over these 5 years received on average 0.5 prison sentences. The analysis included all sentences of actual imprisonment in the linked data, but suspended sentences were excluded. Only one (the most severe) sentence per court appearance is included, so there were no concurrent sentences.

Relatively few drivers had committed 3 or more of the specific offences, which may account for some of the variations by offence type in the figure. It appears, however, that drivers convicted of vehicle theft received at least as many prison sentences as those convicted of violence against the person, yet Figure 3 shows an almost linear trend for these offenders. This suggests that imprisonment does not account for the pattern of results in that figure.

The mean period of imprisonment was also examined. The results follow the general pattern of Figure 4 but with more variability, so they are not presented.

4.3.2 Specific types of motoring offence

The modelling approach of Section 4.3 is now applied with specific types of motoring offence, rather than the two groups of serious and other offences. Table 14 shows how the number of non-motoring offences is related on average to the number of motoring offences (the final column refers to motoring offences of all types, not the combination of the five specific offences). The relative effects of the number of non-motoring offences are illustrated by Figure 5, in two parts to accommodate the different scales of effect. Quadratic curves have been fitted to show the general trends, although there is little curvature in most cases. It is interesting to see, however, that the drink/driving trend is similar to those in Figure 3.

The number of non-motoring offences bears little relation to the number of speeding offences, except for a small but significant elevation among men with a single non-motoring offence; there is a larger but insignificant elevation among women. Men who committed 1-8 non-motoring offences committed 4-6 times as many careless driving offences as men who committed no non-motoring offences. The rate of increase is slightly greater for drink/driving offences, and the increases for dangerous driving and driving while disqualified are dramatic. The rate of increase for ‘all offences’ is rather greater for women than for men, but the female patterns for specific offences are relatively unclear because the women drivers had committed relatively few non-motoring offences.

The relation between the type of licence and the number of motoring offences varies with the type of offence. Drivers with full licences commit many more speeding offences than do other drivers, and rather more careless driving offences. Unlicensed drivers commit more offences of drink/driving, dangerous driving and driving while disqualified. Overall, drivers with provisional licences commit fewer motoring offences than do drivers with full licences; unlicensed men commit slightly more but unlicensed women probably commit fewer.

Section 4.2 showed that only a relatively small minority of motoring offences between 1995 and 1999 were committed by drivers who had also committed non-motoring offences during that period. The results in Table 14 for dangerous driving and driving while disqualified suggest that this might not be true of these offences. Table 15 is a simplified version of Table 11 and presents the proportion of motoring offences that were committed by drivers who also committed non-motoring offences. The ‘actual’ proportion is calculated directly from the linked data, the ‘adjusted’ proportion applies the adjustment from Section 4.2 to take account of those drivers who were not matched to the Offenders Index but should have been. The table shows that drivers who committed non-motoring offences committed a clear majority of the dangerous driving and driving while disqualified offences, perhaps as many as three quarters of the latter.

![Number of non-motor offences](image.png)

**Figure 4** Mean number of prison sentences per driver in 1995-99
Table 15 Proportion of motoring offences committed by drivers who also committed non-motoring offences

<table>
<thead>
<tr>
<th>Type of motoring offence</th>
<th>Men</th>
<th>Women</th>
<th>Either</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Actual</td>
<td>24%</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td>Adjusted</td>
<td>28%</td>
<td>3%</td>
</tr>
<tr>
<td>Drink/driving</td>
<td>Actual</td>
<td>22%</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>Adjusted</td>
<td>25%</td>
<td>9%</td>
</tr>
<tr>
<td>Dangerous driving</td>
<td>Actual</td>
<td>52%</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>Adjusted</td>
<td>59%</td>
<td>32%</td>
</tr>
<tr>
<td>Driving while disqualified</td>
<td>Actual</td>
<td>68%</td>
<td>54%</td>
</tr>
<tr>
<td></td>
<td>Adjusted</td>
<td>77%</td>
<td>61%</td>
</tr>
</tbody>
</table>

5 Conclusions

This report has presented the results of a study examining the extent to which the number of motoring offences committed by a driver is linked to the number of non-motoring offences committed. The data for the study have come from two sources:

- the archive of driving licence information maintained at TRL, based on licensing information supplied three times per year by the DVLA: this contains details of all motoring offences committed since 1986 by a sample of drivers;
- the Offenders Index maintained by the Home Office which holds the criminal histories of all people convicted of a ‘standard list offence’ in England and Wales from 1963.
A sample of over 50,000 drivers was selected from the TRL archive, stratified according to the motoring offences committed in or after 1996. Details of these drivers were sent to the Home Office, where they were matched with the Offenders Index using a standard computer program. When a driver could be matched with an offender, details of the offence history were returned to TRL where they were linked to details of any motoring offences in the archive.

The two sources have different geographical coverage: the DVLA file covers all of Great Britain while the Offenders Index excludes Scotland. It was found, however, that drivers who lived south of the border committed very few motoring offences north of the border and vice versa. Consequently, the problems caused by the different geographical coverage could be overcome by restricting the analyses to drivers living in England and Wales. Over 47,000 drivers remained in the sample.

Since 1996, the Home Office’s standard list of offences has included three types of motoring offence, so in principle any of these offences committed by the sample of drivers sent to the Home Office should also be recorded in the Offenders Index. This has provided a good opportunity for checking the reliability of the matching process. Comparison of details of standard list offences in 1996-99 found that 80 per cent of drivers had been successfully matched, 12 per cent had not been matched and 8 per cent had been matched to the wrong offender. It has been shown mathematically that the presence of these mismatches means that analyses of the linked DVLA/Offenders Index data will underestimate the strength of the relationship between the number of non-motoring offences and the number of motoring offences.

Previous research has shown that the propensity to commit offences varies by social group, but neither the driving licence file nor the Offenders Index contains information relating to social background. This type of information was added using the ACORN directory, a system that is widely employed in market research. It classifies each postcode area in Great Britain using 54 ACORN types that are grouped into 6 ACORN Categories ranging from A (‘Thriving’) to F (‘Striving’).

The offences recorded in the linked data set between 1995 and 1999 were analysed in conjunction with other factors likely to influence the number of offences, such as age and sex. Preliminary analyses showed that the mean number of non-motoring offences committed by drivers increased with the number of motoring offences, ACORN Category (i.e. higher for F than for A) and varied by age.

A series of statistical models was then fitted to the linked data set to identify the separate influences of these factors upon the number of motoring offences, with particular interest in the influence of the number of non-motoring offences. First, motoring offences were grouped into serious (drink/driving, dangerous driving and driving while disqualified) and other offences. It was found, for example, that men who had committed between 4 and 8 non-motoring offences had committed on average 18 times as many serious motoring offences as men who had committed no non-motoring offences, but only 6.5 times as many other motoring offences. The effect was even stronger for women. Drivers in ACORN Category F committed more serious motoring offences than those in Category A: 46 per cent for men and 36 per cent for women, but with other offences there was less variation by ACORN Category.

The next model investigated whether certain types of non-motoring offence might have a particular influence on the number of motoring offence. Vehicle theft was found to have the strongest influence; for example, a driver with at least 4 convictions for vehicle theft had on average committed about 25 times as many serious motoring offences as one with no vehicle theft convictions. The corresponding figure for non-vehicular theft was 9.

The final model investigated whether the number of non-motoring offences might have a particular influence on certain types of motoring offence. It was found that the number of offences of dangerous driving and driving while disqualified increased dramatically with the number of non-motoring offences. For example, men with at least 4 non-motoring convictions were 40-50 times more likely to be convicted of dangerous driving than men with none; the figure was nearly 100 for women. On the other hand, the number of speeding offences was almost unaffected by the number of non-motoring offences. Men with 1 non-motoring conviction were almost twice as likely to be convicted of speeding as men with none, a very small effect compared with the others that have been found. There was no evidence that additional non-motoring convictions were associated with any extra speeding offences.

Overall, about one quarter of motoring offences in 1995-99 were committed by drivers who also committed non-motoring offences during this period, the proportion being much lower for women – 3 per cent. A similar pattern was found for drink/driving offences, although the female proportion was higher at about 8 per cent. The overall proportion was much higher for dangerous driving - over one half - and higher still for driving while disqualified – about three-quarters.

The linked data sets include much information that has either been condensed for these analyses or has not been analysed. The present report has certainly not exhausted the range of issues that could profitably be studied using these data.

6 Acknowledgements

The work described in this report was carried out in the Safety Group of TRL. The assistance of Mr Andrew Kalinsky of the Home Office in extracting data from the Offenders Index is gratefully acknowledged, also the assistance of Mrs Jackie Knowles of TRL in setting up this study.

7 References


Appendix A: Standard list offences

This Appendix lists the standard list offence groupings and main codes used in the Offenders Index. A full list of codes and sub-codes is contained in the Offenders Index code book. The data on the Index relates only to offences classified as 'standard list' offences. These are all indictable (i.e. triable by a judge and jury at a crown court) or triable either way offences (i.e. may be tried either at a crown or magistrates court) plus a few of the more serious summary offences (i.e. triable only at a magistrates court or where fixed penalties are given). A few summary offences have been declassified or reclassified as standard list offences during the period covered by the Index. Note that the definition and numbering of the offence groups has been modified slightly for this project.

Until January 1996 the indictable motoring offence of dangerous driving (802) was standard list only when tried on indictment in a crown court, it is now a standard list offence. The other indictable motoring offence of fraud or forgery associated with vehicle or driver records (814) is still only standard list when tried on indictment as are the motoring offences 926, 958, 960, 962, 964, 966 and 970. The summary motoring offences 803 subclass 2 (the main drink/drive offence) and 807 subclass 1 (driving whilst disqualified) were also added to the standard list from January 1996. These two summary offences significantly broaden the coverage of the motoring standard list offences.

1 Violence against the person

Indictable
1 Murder
2 Attempted murder
3 Threat or conspiracy to murder
4 Manslaughter, etc
5 Wounding or other act endangering life
6 Endangering railway passenger
7 Endangering life at sea
8 Other wounding, etc
9 Assault (until 1988)
10 Intimidation and molestation (until 1979)
36 Kidnapping
37/1 (1992 onwards) Aggravated vehicle taking
104 Assault
105 Common assault
920 Death or injury to person by dangerous driving (1.7.64-31.12.86)
921 Aiding, abetting, causing or permitting death or injury to person by dangerous driving (1.7.64-31.12.86)

Summary
103 Aggravated assault
104 Assault on a constable
105 Common assault
109 Cruelty to or neglect of children

2 Sexual offences

Indictable
16 Buggery
17 Indecent assault on a male
18 Indecency between males
19 Rape
20 Indecent assault on a female
21 Unlawful sexual intercourse with girl under 13
22 Unlawful sexual intercourse with girl under 16
23 Incest
24 Procuration
25 Abduction
26 Bigamy
27 Soliciting by a man (1978 onwards)
74 Gross indecency with a child
86 Possession of obscene material, etc (1982 onwards)
Summary
107 Keeping a brothel
139 Indecent exposure
166 Offences by prostitutes
187 Living on prostitutes earnings etc (1963-78)
192 Gross indecency with children (1963-78)

3 Burglary
Indictable
27 Sacrilege
28 Burglary in a dwelling
29 Housebreaking
30 Burglary in a building other than a dwelling
31 Attempting to break into houses shops warehouses etc.
32 Entering with intent to commit felony
33 Going equipped for stealing, etc

4 Robbery
Indictable
34 Robbery and assault with intent to rob
35 Theft of/from a vehicle

Indictable
37/2 Aggravated vehicle taking
45 Theft from a vehicle
48 Theft of motor vehicle
918 Unauthorised taking of a motor vehicle

Summary
126 Interference with a motor vehicle
130 Stealing and unauthorised taking
131 Aggravated vehicle taking (£2000)
138 Taking motor vehicle without consent of owner
6 Other theft and handling stolen goods

Indictable
37 Embezzlement (up to 1968)
38 Larceny of horses, cattle and sheep
39 Theft from the person of another
40 Theft in a dwelling other than from automatic machine or meter
41 Theft by an employee
42 Theft or unauthorised taking from mail
43 Abstracting electricity (note: also includes aggravated larceny from 1963 to 1968)
44 Theft of pedal cycle
46 Theft from shops
47 Theft from automatic machine or meter
49 Other theft or unauthorised taking
54 Handling stolen goods

Summary
174 Stealing animals (1963-68)
176 Stealing or cutting, rooting up etc with intent to steal any tree, shrub etc to the value of 1 shilling (1963-1968)
177 Stealing or destroying or damaging with intent to steal plants etc (1963-68)
181 Unlawful possession
7 Fraud and forgery

**Indictable**

50 Obtaining goods, &c, by false pretences (1963-68)
51 Frauds by company directors, etc
52 False accounting
53 Other fraud
55 Bankruptcy offences
58 Forgery and uttering (up to 1971)
59 Forgery (misdemeanour) (up to 1971)
60 Forgery, or use of false prescription (1972 onwards) Coining (up to 1971 - rare)
61 Other forgery, etc (including coinage and hall marking offences)

8 Criminal damage

**Indictable**

56 Arson
57 Criminal damage endangering life (excluding arson) (note: other malicious injuries 1963-71 - appears to be more common)
58 Other offences of criminal damage (1972 onwards, note that criminal damage <£2,000 coded to 149 from 1989)
59 Threat or possession with intent to commit criminal damage (1972 onwards)

**Summary**

149 Criminal damage (1963-74, 1979 onwards); various changes in thresholds eg <£400 before 1989, <£2,000 from 1989 onwards

9 Drug offences

**Indictable**

92 Misuse of drugs (1993 onwards)
93 Misuse of drugs (1993 onwards)

**Summary**

37 Possession of soft drugs (1968-1971)
168 Offences in relation to Public Health
193 Misuse of Drugs
195 Subclass 5, Dangerous Drugs Acts 1965 and 1967 (up to 1971)

10 Motoring offences

**Indictable**

70 Reckless or dangerous driving (1963-64)
71 Driving under the influence of drink of drugs (1963-64)
72 Other motoring offences (1963-64)
802 Dangerous driving (standard list when tried summarily from 1 January 1996; prior to this standard list when tried on indictment)
814 Fraud forgery, etc associated with vehicle or driver records (standard list on indictment only)
926 Dangerous driving (64-86) (standard list on indictment only)
958 Driving licence offences (standard list on indictment only)
960 Operator’s licence offences (standard list on indictment only)
961 Aiding abetting causing or permitting operator’s licence offences (standard list on indictment only)
962 Vehicle insurance offences (standard list on indictment only)
964 Vehicle registration and (excise) offences (standard list on indictment only)
966 Drivers work record and employment offences (standard list on indictment only)
970 Vehicle testing offences and prescribed goods vehicles testing and plating offences (standard list on indictment only)

**Summary**

803 Driving after consuming alcohol or taking drugs (803/2 standard list from 01/01/96)
807 Driving licence related offences (807/1 standard list from 01/01/96)

11 Other offences Any other code
Appendix B: The consequences of mismatching

Section 3.2.3 presented a numerical example which suggested that the fact that some drivers had been wrongly matched to offenders in the Offenders Index would lead to an underestimation of the differences between groups of driver of the proportion who had an offence record. This Appendix will prove that this is true.

Table 5 found that 80 per cent of Group 1 drivers were successfully matched in the Offenders Index, 12 per cent could not be matched and 8 per cent were matched to the wrong offender. It appears likely that the same percentages would apply to the other groups. Suppose that, of a sample of $N$ drivers, $\alpha N$ actually had been convicted of offences while the remaining $(1-\alpha)N$ had not:

- 88 per cent of the first group would be matched (correctly or wrongly) to offenders in the Offenders Index.
- 8 per cent of the second group would be wrongly matched to offenders.

Hence, the number of drivers who appear to have criminal histories would be

$$0.88\alpha N + 0.08(1-\alpha)N = (0.8\alpha + 0.08)N$$

Now compare this sample with a second where the actual proportion of drivers who had been convicted is $\beta$, with $\alpha > \beta$.

The ratio of the apparent proportions is

$$\frac{0.8\alpha + 0.08}{0.8\beta + 0.08} = \frac{\alpha + 0.1}{\beta + 0.1} < \frac{\alpha}{\beta}$$

Thus the apparent ratio underestimates the actual ratio, to an extent that depends upon the actual proportions.

To see that this also applies to results such as those presented in Table 10, suppose that the number of motoring offences per driver committed by the $\alpha N$ convicted drivers was $\sigma S$ ($\sigma > 1$) while the mean number for the $(1-\alpha)N$ drivers without convictions was $S$ per driver.

a. The $(0.8\alpha + 0.08)N$ drivers matched (correctly or wrongly) to the Offenders Index would have committed on average $0.88\alpha N\sigma S + 0.08(1-\alpha)NS$ motoring offences, so the mean number of offences per driver would be $S/(11\alpha\sigma +1-\alpha)/(10\alpha+1)<\sigma S$.

b. The $(0.92-0.8\alpha)N$ drivers not matched to the Offenders Index would have committed on average $0.12\alpha N\sigma S + 0.92(1-\alpha)NS$ motoring offences, so the mean number per driver would be $S(3(\alpha\sigma+23(1-\alpha))/(23-20\alpha)>S$.

Consequently, comparison of the matched and unmatched drivers would underestimate the relative offence rate $\sigma$.

Observe that the difficulty arises in both cases because of the cases that are mismatched, not the cases that could not be matched. This can be demonstrated mathematically by reworking the equations with 0.08 replaced by 0.00.
Abstract

The TRL Archive of driving licence data holds details of the motoring convictions committed by a sample of British drivers since 1986. The Home Office Offenders Index holds the criminal histories of all people convicted of 'standard list' offences in England and Wales from 1963. A sample of over 50 thousand drivers from the TRL Archive has been matched with the Offenders Index in order to compare their histories of motoring and non-motoring offences between 1995 and 1999.

The report shows that the number of non-motoring offences is strongly related to the number of certain types of motoring offence, in particular dangerous driving and driving while disqualified. On the other hand, the relationship is weak for speeding offences. Of the various types of non-motoring offence, vehicle theft has the strongest relationship with the number of non-motoring offences. The relationship tends to be stronger for women than for men, although they commit relatively few non-motoring offences.

Related publications

TRL551  *Criminal and motoring offences of drink/drivers who are High Risk Offenders* by G P Davies and J Broughton. 2002 (price £25, code AX)

TRL511  The *relationship between speed and accidents on rural single-carriageway* by M C Taylor, A Baruya and J V Kennedy. 2002 (price £25, code AX)

TRL403  *Analyses of driver licence records from DVLA* by J Broughton. 1999 (price £25, code E)

TRL322  *Road layout design standards and driver behaviour* by G Maycock, P J Brocklebank and R D Hall. 1998 (price £35, code H)

TRL326  *Drivers’ speed choice. An in-depth study* by A Quimby, G Maycock, C Palmer and G B Grayson. 1999 (price £25, code E)

TRL325  *The factors that influence a driver’s choice of speed - a questionnaire study* by A Quimby, G Maycock, C Palmer and S Buttress. 1999 (price £35, code H)

CT80.2  *Driver behaviour update (2001-2002)* Current Topics in Transport: selected abstracts from TRL Library’s database (price £20)

CTX01  *Traffic calming (1991-2001)* Current Topics Xtra: selected abstracts from TRL Library’s database (price £55)

Prices current at February 2003

For further details of these and all other TRL publications, telephone Publication Sales on 01344 770783, or visit TRL on the Internet at www.trl.co.uk.