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Paper 66

The Nature and Extent of Heavy Goods Vehicle Theft

Rick Brown

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Police Research Group: Crime Detection and Prevention Series

The Home Office Police Research Group (PRG) was formed in 1992 to carry out and manage research relevant to the work of the police service. The terms of reference for the Group include the requirement to identify and disseminate good policing practice.

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Foreword

This paper presents the findings of a study on the theft of Heavy Goods Vehicles. The work was commissioned during 1994 by the Metropolitan Police Joint Action Group on Organised Lorry Theft in order to provide the necessary information for the development of initiatives to combat the problem of lorry theft.

The study revealed that, in 1994, 3,047 HGVs were stolen in England, Scotland and Wales, although England accounted for by far the largest proportion of thefts. Most of these stolen vehicles have never been recovered. The research demonstrates that the majority of HGV theft tends to be focused on a fairly small group of vehicle types and on HGVs produced by just a few manufacturers.

Those who are victims of HGV theft incur considerable costs. In terms of the insured value of the vehicle (usually much lower than the market, or replacement value), the study found that HGV theft cost over £30 million in 1994. This figure ignores many of the other, associated costs, such as the cost of replacing the vehicle, increased insurance premiums and loss of business.

HGV theft is an issue which will need to be tackled by a variety of groups if the extent of the problem is to be reduced. The conclusions therefore provide action points for vehicle manufacturers, security device manufacturers, HGV owners and HGV drivers.

S W BOYS SMITH
Deputy Under Secretary of State
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Most of all, however, I wish to thank all those individuals who were victims of HGV theft in 1994 and who took the time and trouble to complete and return a questionnaire for this research.

The Authors

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Executive summary

Until recently, the extent of Heavy Goods Vehicle (HGV) theft was unknown. Information on the total number of motor vehicles stolen each year has been published for many years, but it is not possible to discern from this the types of vehicles which were stolen. This research set out to estimate the number of HGVs stolen in 1994 and to identify the circumstances in which they were taken. This work was undertaken to support the work of the Metropolitan Police Joint Action Group on Organised Lorry Theft. Established in March 1994, this group is a multi-agency body whose aim is to reduce lorry theft nationally.

Methodology

The required information was collected in two stages. First of all, existing records of stolen HGVs stored on the Police National Computer were analysed in order to estimate the number stolen in 1994. As this source only contains records of vehicles yet to be recovered, further work was undertaken to provide an estimate of the recovery rate for HGVs. This work indicated that 3,047 HGVs were stolen in 1994, of which 360 were recovered.

The second phase of the study involved a postal survey of HGV theft victims. Questionnaires were sent to 1,350 individuals, of whom 700 (52%) responded to the survey. The information collected from this stage of the research provided further details of the theft - such as the time of theft, location of the vehicle and vehicle security. The following paragraphs summarise the main findings of the research.

Types of vehicle stolen

A considerable array of HGVs were stolen in 1994, ranging from goods lorries and drop-side lorries to cesspool emptiers and a snow plough. Tipper lorries were the most frequently stolen type of HGV, accounting for 30% of thefts. Four types of HGV (tipper, drop-side, flat-bed and goods) accounted for almost 80% of all thefts. These figures were, to some extent, a reflection of their relative abundance on the road. To gain an indication of the risk of theft for each type of vehicle, the theft rate per 1,000 vehicles registered was calculated. This showed that livestock carriers had the highest risk of being stolen, relative to their numbers on the road; these were followed by drop-side lorries and tippers.

The make of lorry was also analysed, showing that 80% of thefts were concentrated on four manufacturers (Iveco Ford, Bedford, Leyland DAF and Mercedes). In terms of the relative risk of theft, Bedfords were most likely to be stolen.

When the age of stolen vehicles was considered, an interesting trend became apparent. Although the age of vehicles stolen spanned a thirty six year time span (from 1958 to 1994), almost three quarters were registered in the 1980s. The number stolen in each year of registration peaked in 1989, followed by a sharp decline for subsequent years. In terms of the risk of theft per 1,000 HGVs registered,

the theft rate declined from 7 per 1,000 vehicles registered in 1985 to 1 per 1,000 registered in 1991.

Location of theft

From a regional point of view, the South East had the highest number of thefts, followed by Yorkshire and Humberside and the North West. (These three regions also had the highest risk of theft per 1,000 HGVs registered.) By contrast, Scotland and Wales had the lowest incidence of HGV theft, together accounting for just 4.4% of those stolen in 1994.

The findings suggest that the type of area used for parking may effect the level of HGV theft. Those parked on industrial estates accounted for over half of the HGVs stolen, whilst rural locations and residential areas each accounted for about a fifth of all thefts. The actual parking location may also influence HGV theft. Over half of all HGVs were stolen from a company's own depot, whilst a further 11% were taken from factory / warehouse parking areas. By contrast, less than 1% were stolen from supervised lorry parks. However, no information was available on the usage of various parking locations, so it was not possible to calculate relative risk of theft associated with such places.

Time of theft

HGVs were most likely to be found stolen on a Monday. This reflects the fact that many weekend thefts will not be discovered until the Monday morning. Indeed, almost a third of all HGVs appear to be stolen over the weekend. Over three quarters of all stolen HGVs were found to have been stolen in the morning. This suggests that many were stolen during the hours of darkness, with the vehicle disappearing at some point between the driver parking up in the evening and returning the following morning.

Victims of theft

The majority of victims of HGV theft were smaller sized companies. Organisations employing ten staff or less accounted for half of all thefts. Furthermore, companies with just one HGV accounted for almost a third of thefts. Where the industrial sector was concerned, the construction industry was most affected (with 31% of thefts), followed by distribution / haulage (23%).

The cost of theft to the victim may be far beyond that which could be quantified in this research. However, in terms of the insured value of the vehicle (usually considerably less than the actual / replacement value), the average loss suffered was £11,238. Multiplied across the 2,687 unrecovered vehicles, this gives a total insured value of over £30.14 million. This calculation ignores many of the other costs

associated with HGV theft, such as the high cost of replacing the vehicle, the cost of hiring a replacement vehicle, increased insurance premiums and loss of business.

Vehicle Security

The research also explored the security of the vehicle at the time of theft. Over three quarters of the stolen vehicles had steering column locks, suggesting that in the cicumstances of these incidents, steering column locks may be ineffective at preventing theft of HGVs. Generally speaking, stolen HGVs had minimal security protection.

Security is not only about the devices fitted to vehicles - the security of the parking location is also important. Almost a third of vehicles had been parked in a location with no security present. In half of the thefts, security was present in the form of locked gates and / or fencing. However, the quality of these physical defences remains unclear.

Once HGV owners have been the victim of a theft they generally take measures to prevent being a victim again. Indeed, over 80% adopted further crime prevention measures following the theft. This most frequently involved installing additional security devices to the remaining vehicles, although many also improved the existing perimeter security of their premises.

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1. Introduction

Background

In recent times, considerable concern has been expressed about the number of lorries which are stolen each year. National statistics on vehicle crime do not provide discrete information on lorry theft and the precision of the records held on such crime by individual police forces varies considerably. Hence, it has not been possible to produce any reliable estimate of either the number of lorries stolen per annum or to identify any related trends. However, representatives of the haulage industry have suggested that lorries are disappearing with increasing frequency and that such crime is now creating major problems amongst operators. One such representative body, the Freight Transport Association (FTA), surveyed a sample of its members and estimated that, in total, 4,000 had been victims of either theft of a vehicle or theft from a vehicle in 1993 (FTA, 1994). This study did not consider lorry owners who were not FTA members and the total figure includes vehicles other than lorries. It does, however, help to reinforce the view that lorry theft may now constitute a significant problem.

Existing police intelligence suggests that, in some instances, lorries are stolen purely for the load and these are often abandoned to be recovered (minus load) after a short time. However, intelligence sources also suggest that a number of lorries are stolen for re-sale, often by highly organised, 'professional' gangs, and are never seen again. In the latter case, the stolen lorry can be expected to be disposed of in one of two ways:

(i) ***Lorry re-sold intact:*** Where the lorry is re-sold as an entire unit, its identity will often be changed, with false registration number plates and replacement vehicle identification plates, to give it the appearance of being legitimate. It appears that such vehicles are subsequently disposed of on the used vehicle market and are bought by unsuspecting purchasers.

(ii) ***Lorry re-sold in parts:*** An alternative motive for stealing a lorry is to realise the value of the individual components. In this case, thieves dismantle the vehicle, retain the marketable parts (engine, gear box and axles) and sell the remainder as scrap metal. The components may then be sold on to lorry operators requiring replacement parts. Intelligence suggests that vehicle parts are usually disposed of through a third party, who may often deal in legitimate vehicle parts and use illegitimate components to create a lucrative sideline. Recent police experience indicates a growing trend in this trade.

A number of police forces have mounted operations to combat lorry theft in recent years and have displayed success both in detaining suspects and securing their conviction. As a result of these operations, lorry theft has been reduced in the particular police force areas concerned. However, these operations also confirm that

lorry theft does not confine itself to force boundaries, but is often organised on a national basis, with thieves travelling the length and breadth of the country. In view of this, a national approach to combatting the issue was deemed necessary. Accordingly, in March 1994, the Metropolitan Police established the 'Joint Action Group on Organised Lorry Theft' to provide a co-ordinated approach to reducing this type of crime.

The Joint Action Group on Organised Lorry Theft

The Joint Action Group on Organised Lorry Theft was set up as a sub-group of the Joint Action Group. This latter committee was established in November 1992 by the Metropolitan Police and brings together a range of Government and other public agencies with a view to targeting the activities of organised criminals. The Joint Action Group on Organised Lorry Theft is a multi-agency body whose members include not only personnel from a number of police forces, but also representatives of motor manufacturers, the haulage industry, the vehicle security industry, insurers, Customs and Excise and the Home Office. Appendix A provides a full list of the organisations participating in the group.

The purpose of the Joint Action Group on Organised Lorry Theft is to reduce lorry theft and it is mandated to:

- identify, determine and monitor the extent and scale of lorry theft (i.e. theft of large goods vehicles and associated theft of loads) in England, Scotland and Wales;
- identify and propose initiatives through which lorry theft can be addressed;
- instigate action in respect of lorry theft initiatives;
- promote discussion and increase awareness of the problem, including the economic effects on hauliers;
- interact with the Home Office Vehicle Crime Prevention Group of the National Board for Crime Prevention (and other appropriate agencies) in respect of lorry theft and theft of loads.

In the early stages of its existence, this group formed the view that available information on lorry theft was inadequate to support its remit. A request was then made to the Home Office Police Research Group (PRG) for supportive research to be undertaken into the extent and nature of lorry theft. This work commenced within PRG in September 1994.

Research objectives

The term "lorry" is regularly used in conversation to describe some form of large goods vehicle. Defining precisely which vehicles are covered by the term does, however, create considerable difficulties and it was decided that the research should instead focus on a more readily defined vehicle category - Heavy Goods Vehicles (HGVs). A HGV is conventionally deemed to be one with a gross vehicle weight of over 3.5 tonnes. For this weight of vehicle, owners require an operator's license and, for this reason, manufacturers will clearly indicate which of their commercial models fall into the HGV category and which are Light Commercial Vehicles (LCVs). (The latter group are designed to have a gross vehicle weight of up to, but not exceeding 3.5 tonnes, thereby not requiring an operator's license.)

The HGV category includes various types of lorry (drop-sided, flat-bed etc), but also other large vehicles considered to be of interest to the research such as breakdown trucks, concrete mixers and car transporters. Accordingly, the term HGV, rather than lorry, will be used to describe the subject of the research throughout this report unless a point applies only to vehicles which are purely lorries (ie drop-side lorry, flat-bed lorry).

The research looked at all HGVs stolen in England, Scotland and Wales between 1 January and 31 December 1994. It set out to:

1. Provide an estimate of the number of HGVs stolen;

2. Describe the physical characteristics of the HGVs stolen;

3. Describe the circumstances in which HGVs were commonly stolen.

Format of the report

This report is structured as follows:

- Section 2 outlines the methodology employed to obtain the data in this study and provides the details of the number of HGVs stolen in 1994;

- Section 3 provides an analysis of the types of HGV stolen, including the make, age, body type and axle configuration;

- Section 4 deals with the location of the thefts, starting with a regional analysis and working down to the actual place where the HGV was parked. This section also explores the times at which thefts occur.

- Section 5 explores the victims of HGV theft and the financial cost to the victim.

- Section 6 provides an analysis of vehicle security, both for the vehicle itself and for the place where the vehicle was parked.
- Section 7 sets out the conclusions of the report and provides possible action points for vehicle manufacturers, security device manufacturers, HGV owners and HGV drivers.

2. Methodology and Preliminary Findings

Use of Police National Computer data

The Police National Computer (PNC) Stolen Vehicle File is a national database which holds records of every vehicle which has been reported to the police as stolen and which has not yet been recovered. (The stolen record details are deleted from the system after the vehicle's recovery.) Extensive use was made of the 1994 Stolen Vehicle Files to assist in establishing:

(i) the number of HGVs stolen in England, Scotland and Wales between 1 January and 31 December 1994;

(ii) an appropriate sample of victims of HGV theft within England, Scotland and Wales between 1 January and 31 December 1994.

Number of HGVs stolen

Some initial difficulties were experienced in identifying which of the vehicles recorded in the Stolen Vehicle File could properly be defined as HGVs. No direct indication was given as to whether a vehicle was a HGV and no information was recorded on the gross vehicle weight (i.e. whether or not it was over 3.5 tonnes). To overcome this problem, motor manufacturers were consulted and, on the basis of information supplied, vehicles were selected according to the body type shown within the PNC record. This approach ensured that all HGVs contained in the Stolen Vehicle File would be identified, but meant that some other vehicle types (particularly LCVs) might also be wrongly included. Records in the initial HGV database were, therefore, individually inspected and deleted if information supplied by manufacturers indicated that the vehicle was not a HGV.

Particular problems were experienced with two body types - Box Body Vans and Luton Vans, which can take the form of HGVs or LCVs. As there was no way of determining from the PNC record whether a particular Box Body or Luton Van constituted a HGV or a LCV, a decision was taken to exclude these body types entirely from the HGV database. Unfortunately, the most recently available DVLA records show that there were 106,800 of such vehicles registered in 1993 and that these accounted for 26% of all HGVs. The exclusion of these body types will inevitably mean that the subsequent research is based on an under estimate of the number of HGVs stolen in 1994. No viable solution to this problem could, however, be identified.

Analysis of the PNC data revealed that 2,687 HGVs were stolen and not recovered during 1994. Further analysis was undertaken and this suggested that a further 360 HGVs were stolen and recovered during that year. (Appendix B provides an explanation of how the recovery rate was calculated.) This indicates that, in total, 3,047 HGVs were stolen in 1994. A theft rate was also calculated for HGVs which

found that at least 6 vehicles in every 1,000 registered were stolen in 1994. This was considerably lower than the theft rate for all registered motor vehicles (approximately 24 per 1,000 registered).

Selection of sample

The PNC database is primarily an operational tool and, although it can provide a certain amount of information about the theft of vehicles, greater detail was required for the purposes of this research. A postal survey was therefore conducted to gain additional data on the actual circumstances in which HGVs were taken. The HGV database, developed from PNC records for 1994, was again employed to select the sample of victims for this latter exercise. A fifty percent sample was randomly selected from the HGV database and this was stratified by county to ensure a representative coverage of all parts of England, Scotland and Wales.

In all, 1,350 questionnaires[1] were sent to those who had been victims of HGV theft during 1994 and 700 forms were subsequently returned covering 678 vehicles. The response rate achieved (52%) was slightly lower than had been anticipated, although every effort was made to maximise this with a number of follow up reminders being sent to non respondents. The response could be the result of a number of factors, including businesses which have closed down since reporting the HGV stolen; people moving address since reporting a stolen vehicle; or some reports may have been the result of fraudulent insurance claims, in which case the respondent would be unlikely to return the questionnaire.

The possibility, of course, exists that the level of response may have reduced the degree to which the findings can be said to be representative. However, it should not be forgotten that the research still received responses from around a quarter of all those reporting a HGV theft during the twelve month period of interest. This was considered to provide a satisfactory basis for the analysis of the circumstances of theft detailed in subsequent sections.

1 A copy of the questionnaire can be obtained from the author on request.

3. Types of HGV Stolen

In the following analysis, the types of HGV stolen are presented in both numeric and percentage terms, allowing the reader to identify the most common types of vehicle stolen. However, it is also important to gain an insight into the risk of theft associated with certain types of vehicle. Further data is, therefore, presented showing the ratio of vehicles stolen to each thousand registered.

Rigid versus articulated vehicles

HGVs can be categorised according to two generic body types:

> **articulated:** with a pivotal point between the driver's cab and the actual body of the vehicle;
>
> **rigid:** with the cab and body built onto the same chassis unit and unable to pivot.

Figures 1 and 2 provide examples of each of these types.

Figure 1: Example of a rigid HGV

Figure 2: Example of an articulated HGV

The analysis showed that, on the whole, rigid vehicles were stolen more often than articulated ones with the former category accounting for 2,730 of the thefts recorded (89.6%). (Articulated vehicles accounted for the remaining 317 thefts i.e. 10.4%.)[2] The predominance of rigid lorries could be expected given that the majority of lorries registered are also rigid. In 1993 (the latest year for which statistics are available), 410,100 HGVs were registered and 76.2% of these were rigid. Assuming the distribution of rigid/articulated vehicles was constant for 1994, this suggests theft rates of nine rigid vehicles per 1,000 registered and three articulated vehicles per 1,000 registered. Rigid vehicles were, therefore, three times more likely to be stolen than articulated ones.

Where articulated lorries are concerned, a tractor unit can usually be detached from the trailer it pulls and may be stolen separately. The research indicated that this was a common phenomenon as, in 70% of cases, the tractor unit was found to be stolen on its own. (In 23% of cases a tractor unit, trailer and load were taken and, in the remaining 7% of thefts, a tractor and trailer were taken without a load.) The fact that the tractor units are stolen on their own suggests that HGV thefts are frequently motivated by the value of the vehicle rather than that of the load. This proposition is supported by the figures for rigid HGVs where 84% were stolen without loads.

It was noted that rigid HGVs were likely to have "day" cabs (93.8%), whilst articulated ones most commonly had "sleeper" cabs (86.8%). (Day cabs are fitted where short journeys are the norm; larger sleeper cabs, with beds, are used where long distance journeys and over night stays are expected.) Analysis was undertaken to determine whether the type of cab attached influenced the rate of theft. This showed that the majority of HGVs stolen in 1994 had day cabs (85.7%), whilst sleeper cabs accounted for only 14.3% of vehicles stolen. These findings are broadly

2 These figures are based on finding the proportion of rigid/articulated lorries stolen from the sample survey and multiplying the figures by the total number of lorries stolen (3047)

in line with what might be expected given the distribution of cab types between rigid and articulated vehicles.

Body type

A range of vehicle body types were covered by the research and, as Table 1 indicates, thieves appeared not just to target conventional goods vehicles. A variety of other HGVs were also stolen, including two cesspool emptiers and a snowplough. The single most frequently stolen class of vehicle was the tipper, which accounted for almost a third of the total. (These vehicles are most commonly used in the construction trade and later analysis suggests that this industrial sector was hardest hit by HGV theft - see Section 5.) The majority of HGV thefts did, in fact, focus on a very small number of body types. Tipper and drop-side vehicles jointly accounted for almost half of the HGVs stolen and, together with flat-bed and goods lorries, accounted for almost 80% of thefts.

With most thefts being concentrated on such a small range of HGV types, it might be assumed that the number of vehicles stolen could be reduced by improving security on these body types. In the short term, this might be an effective measure. There is, however, evidence that such a targeted approach to crime prevention might simply displace the crime to other types of HGV. Police intelligence suggests that vehicles are often stolen purely for their parts rather than to be used intact for a specific purpose. Thus, parts of interest might instead be obtained from vehicles with alternative body types, particularly as manufacturers often produce a standard range of chassis, gear box and engine upon which a wide variety of bodies can be placed. Insulated vans could, therefore, have the same type of chassis as tippers and improved security on one could merely result in the other being targeted more often. The long term success of vehicle security as a crime prevention measure may therefore lie in increasing the level of security on all types of HGVs.

To gain an indication of the relative risk of theft associated with various body types, the number of vehicles stolen per 1,000 registered was calculated. The rate of theft for all types of motor vehicles on the road (including cars) is approximately 24 in every 1,000 registered. As Table 2 shows, for HGVs this figure was considerably lower and stands at a more moderate 6 per 1,000 registered, although this will be an underestimate due to excluding box bodies and Luton vans. Livestock carriers had the greatest risk of being stolen with a theft rate over nine times that calculated for HGVs as a whole. An estimated 156 livestock carriers were stolen nationally in 1994, although there were only 2,800 of these vehicles registered. Questionnaire returns suggested that many of these vehicles may have been privately owned horse boxes. Furthermore seventy five percent of the livestock carriers stolen were produced by Bedford.

Drop-side lorries also exhibited a high rate of theft (27 per 1,000 registered). This rate was slightly higher than the rate noted for all vehicle categories (including cars) and suggests that drop-side lorries were over four times more likely to be stolen than the average HGV. Despite tipper lorries being more frequently stolen than any other

Table 1: HGVs stolen by body type[3]

	Unrecovered Number	National Estimate[4]	Percent
Tipper	811	920	30.2
Drop-side lorry	513	582	19.1
Flat-bed lorry	498	565	18.5
Goods lorry	308	350	11.5
Livestock carrier	138	156	5.1
Insulated van	78	88	2.9
Skip loader	76	85	2.8
Breakdown truck	69	79	2.6
Tanker	26	30	1.0
Car transporter	19	21	0.7
Bottle Float	11	12	0.4
Concrete mixer	9	10	0.3
Refuse disposal	9	10	0.3
Street cleansing	9	10	0.3
Skeletal goods	9	10	0.3
Low loader	8	9	0.3
Pantechnicon	6	7	0.2
Glass carrier	5	6	0.2
Tower wagon	5	6	0.2
Solid bulk carrier	2	2	0.1
Road surfacer	2	2	0.1
Gritter vehicle	2	2	0.1
Cesspool emptier	2	2	0.1
Tar sprayer	1	1	0.0
Line painter	1	1	0.0
Snow plough	1	1	0.0
Other lorry/truck	69	80	2.6
Total	2687	3047	100.0

3 Appendix C provides illustrations of the most frequently stolen body types.

4 The national estimate is based on a calculation including both recovered and unrecovered vehicles. This provides an indication of the actual number of HGVs stolen in 1994.

HGV type, they had only the third highest risk of theft (16 out of every 1,000 registered), although this was still over twice the average for all HGVs and twice that which might be expected given the number of tippers on the road.

Given the nature of the research, it was not possible to explore the reasons why some types were more frequently stolen than others. For example, it is unclear whether certain body types are more likely to be re-sold intact, whilst others are broken up for their components.

Table 2: HGVs stolen per 1,000 registered by body type

	Unrecovered Number	National Estimate	Theft rate per 1000 registered
Livestock carrier	138	156	56
Drop-side lorry	513	582	27
Tipper	811	920	16
Flat-bed lorry	498	565	14
Skip loader	76	86	13
Goods lorry	308	349	9
Insulated van	78	88	7
Bottle float	11	12	3
Tanker	26	29	2
Refuse disposal	9	10	1
Other	219	248	1
Total	2687	3047	6

Make of HGV

Table 3 indicates that a range of makes were stolen in 1994, but thefts were concentrated on just a few manufacturers with four companies (Iveco Ford, Bedford, Leyland DAF and Mercedes) accounting for 80% of these. The most frequently stolen make of HGV was Iveco Ford with tippers and drop-side lorries (previously identified as the two most commonly stolen body types) accounting for over 60% of the Iveco Ford HGVs stolen.

Bedford vehicles were also frequent targets for theft with 721 believed to have been stolen in 1994. The type of Bedford vehicles most commonly stolen were flat-bed lorries (25.2%), tippers (24.2%) and livestock carriers (16.2%). Tippers and flat-bed lorries also accounted respectively for 31.9% and 22.3% of thefts of Leyland DAF HGVs. For Mercedes HGVs a different picture emerged with goods lorries accounting for 21.9% of thefts and drop-side lorries accounting for a further 20.1%.

The relative risk of theft for the various makes was also determined and Table 4 shows that each had experienced a fairly similar likelihood of being stolen. Six of the thirteen makes were within the range 4 to 8 HGVs per 1,000 registered (with the overall average standing at 6 per 1,000). This suggests that differences between manufacturers in terms of the number of HGVs stolen can be accounted for to some degree by the number of their vehicles registered. For example, although Iveco Ford accounted for the highest proportion of HGVs stolen, its vehicles had only the fourth highest likelihood of theft with a rate just slightly higher than the overall average. An exception to this was Bedford, whose HGVs were found to be much more likely to be stolen (17 per 1,000 registered) when compared to other makes. For all makes of HGV, the rate of theft per 1,000 registered was well below the overall average for all types of motor vehicles registered (24 per 1,000).

Table 3: HGVs stolen by make

	Unrecovered Number	National Estimate	Percent
Iveco Ford	780	885	29.0
Bedford	636	721	23.7
Leyland DAF	404	458	15.0
Mercedes	333	378	12.4
Volvo	146	166	5.4
MAN/VW	75	85	2.8
Renault VI	73	83	2.7
Scania	62	70	2.3
Foden	35	40	1.3
ERF	34	39	1.3
All Wheel Drive	31	35	1.2
Seddon Atkinson	16	18	0.6
Hino	5	6	0.2
Other	57	65	2.1
Total	2687	3047	100

Table 4: HGVs stolen per 1,000 registered by make

	Unrecovered Number	National Estimate	Theft rate per 1000 registered
Bedford	636	721	17
All Wheel Drive	31	35	10
Hino	5	6	8
Iveco Ford	780	885	7
Mercedes	333	378	6
MAN/VW	75	85	5
Foden	35	40	4
Leyland DAF	404	458	4
Volvo	146	166	3
Scania	62	70	3
Renault VI	73	83	2
ERF	34	39	1
Seddon Atkinson	16	18	1
Other	57	65	7
Total	2687	3047	6

Age of HGV

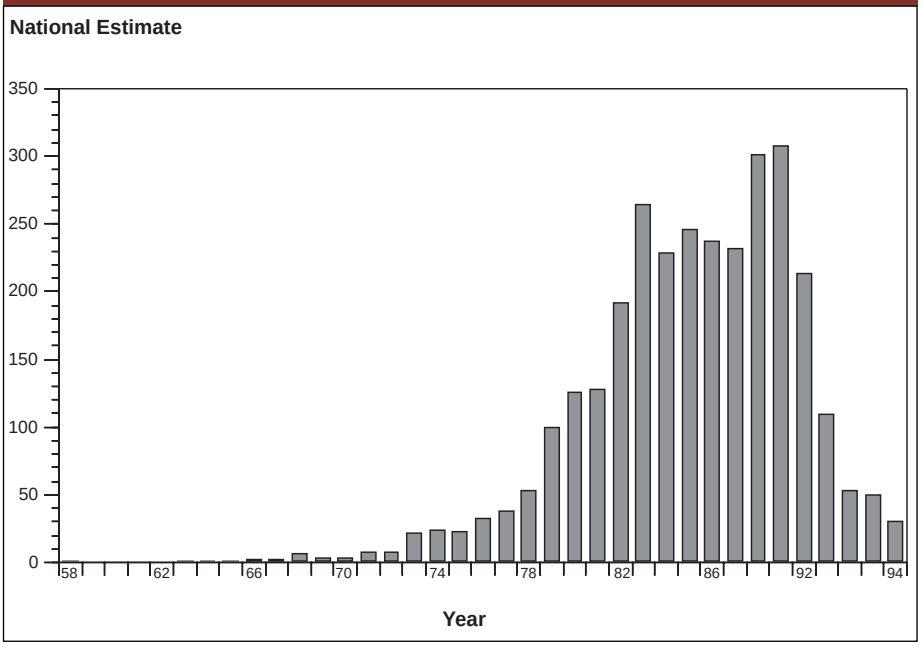
In age terms, HGVs stolen in 1994 spanned a thirty six year time period with the oldest one dating back to 1958. However, Figure 3 shows that almost three quarters (74%) of the HGVs stolen during this year were registered in the 1980s. The number of HGVs stolen in each year of registration peaked with 1989 models and was followed by a sharp decline for subsequent models. Research on car theft undertaken by Houghton (1992) indicated that cars aged over 10 years were more prone to theft than newer models. The current study suggests that, as far as HGVs are concerned, those aged between five and eleven years were stolen most frequently.

The rate of theft per 1,000 vehicles was also examined for various ages of vehicle. Vehicles registered in 1985 had a theft rate of 7 vehicles per 1,000 compared to 5 per 1,000 for 1988 models, 4 per 1,000 for 1991 models and 1 per 1,000 for 1993 models. HGVs registered between 1991 and 1993 accounted for just 7% of thefts, but constituted 21.1% of HGVs on the road. One possible explanation of this apparent discrepancy may relate to the fact that, in the early 1990s, some of the major HGV manufacturers made significant changes to the design of their models. These changes meant that key components, such as the engine and gear box, could no longer be re-fitted in vehicles built earlier. Iveco Ford, for example, replaced its 'Cargo' range at this time with models using a new design of engine and gear box. From 1987

onwards, Bedford made increasing use of components supplied by other manufacturers and, in 1992, ceased to provide HGVs for the commercial market. Thus, newer Iveco Ford and, where they exist, Bedford models may be less prone to theft simply because they are less likely to have components compatible with earlier models.

It would follow then that 1980s models might be expected to be the most popular targets of theft as their parts will be the newest available for re-fitting on pre-1990 vehicles. Further, engines and gear boxes built in the mid 1980s may be reaching the end of their lifespan and 1980s components fitted on other HGVs would appear to be the most natural replacement. This theory is, of course, based on the assumption that vehicles are stolen for their parts. Whilst police intelligence suggests this is the case, it was beyond the remit of this research to identify the purpose of theft. If, however, this theory is correct, it follows that in future years, vehicles which are new now will be the targets of theft. This suggests that attempts should be made to secure new HGVs from theft in order to prevent crime in the long term.

Figure 3: HGVs stolen by year of first registration



Axle configuration

Most of the HGVs stolen during 1994 (84.1%) had just two axles. Of the remaining stolen HGVs, 7.6% had three axles and 8.3% had four. The majority of the two axle HGVs (92.0%) had rigid bodies, whilst 54.9% of three axle vehicles were of the rigid type.

The likelihood of a two axle HGV being stolen was calculated as 8 per 1,000 registered. The theft rate for three axle vehicles was somewhat lower with 4 per 1,000 registered being stolen. By contrast, four axle HGVs had a much higher likelihood of theft with a rate of 14 stolen for every 1,000 registered. (The vast majority (85.7%) of four axle HGVs are, in fact, tipper lorries.)

The axle configuration for the trailers stolen during 1994 appears to have consisted entirely of two and three axle types. Two axle configurations were associated with 34.8% of trailer thefts and three axle configurations with a further 65.2%. The risk of theft rate appears to have been higher for trailers with two axles (8 trailers stolen per 1,000 registered) than for three axle trailers (1 per 1,000 registered), although no explanation could be found to explain this phenomenon.

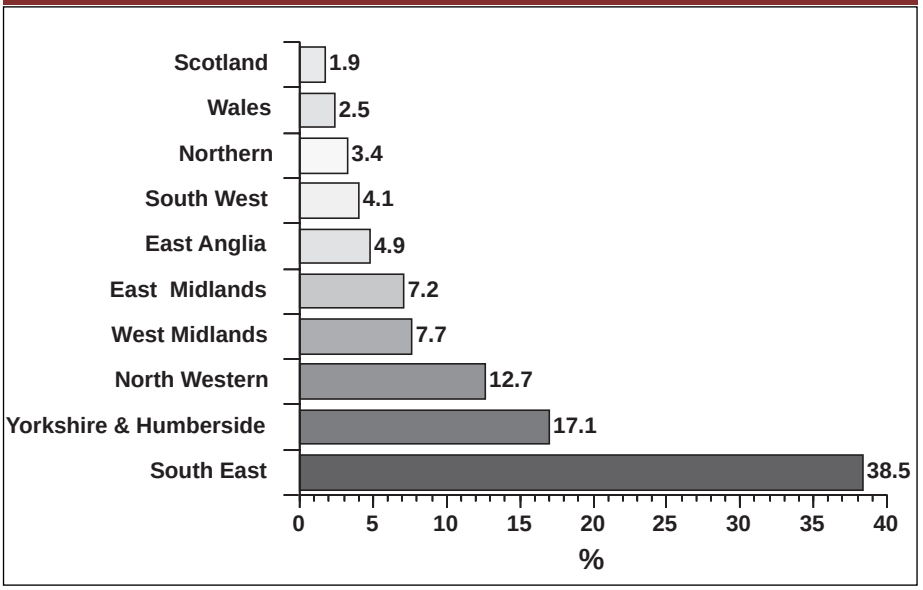
4. Location and Time of Theft

The following section provides an analysis of the location of thefts to an increasingly specific level of detail, working from the regional level down to the environment in which the stolen HGV was parked. Information on the time (of day and week) at which the theft occurred is also presented.

Regional picture

The study indicated that there were significant regional differences in the number of HGVs stolen. Figure 4 suggests that HGV theft was predominantly an English problem with Scotland and Wales together accounting for just 4.4% of the vehicles stolen in 1994. The South East had a greater number of HGVs stolen than any other region and accounted for 38.5% of thefts. (Appendix D provides the details of the counties included in each region.) Two other broad geographic areas also appeared to have particular problems with HGV theft: the North East / North West of England (the North West, and Yorkshire and Humberside regions) accounted for almost a third (29.8%) of the HGVs taken; the Midlands (West and East regions) accounted for 14.9%. Taken together, the three broad geographical regions mentioned above accounted for 83.2% of thefts.

Figure 4: Regional breakdown of HGV thefts



Extrapolation from the survey results presented above suggests the South East region alone may have accounted for at least 1,173 HGV thefts (38.5% of the national total of 3,047) in 1994. Estimates of the total number of HGVs stolen were calculated for all regions and used, with data on the number of HGV registrations in each region, to assess the risk of having a vehicle stolen in each case. The theft rates per 1,000 vehicles on the road for each region are presented in Table 5. Generally speaking, the pattern of theft rates was similar to that for the raw figures of numbers stolen (Figure 4). Wales and Scotland had a low risk of HGV theft, while the South East of England, and Yorkshire and Humberside, had theft rates around twice the national average. The exception to this was the West Midlands which, whilst having the fourth highest number of HGVs stolen, had a theft rate below the national average.

Table 5: HGVs stolen per 1,000 registered by region

	Sample Number	National Estimate	Theft rate per 1000 registered
South East	261	1173	12
Yorkshire and Humberside	116	521	11
North Western	86	387	8
East Anglia	33	149	8
East Midlands	49	219	7
Northern	23	104	6
West Midlands	52	235	5
Wales	17	76	4
South West	28	125	4
Scotland	13	58	2
Total	678	3047	6

It should, however, be borne in mind that the above rates may not provide an entirely accurate indication of the risk of HGV theft in each region. HGVs do not necessarily remain in the location in which they were registered and many must move about the country to fulfil their function. The number of HGVs registered in a region may not, therefore, reflect the number generally present in that region and is likely to provide an under estimate of the usual population for some, but an over estimate for others. It should also be noted that some areas may be subject to a particularly high concentration of HGVs from other parts of the country. For example, trading centres like Dover, Folkstone, Hull and Hartlepool are likely to have a greater concentration of HGVs from all over Britain than registration statistics would suggest.

Nevertheless, when comparison was made of where the HGV was reported stolen and where the victim resided, it was found that in approximately half of all cases the vehicle was stolen in the force area in which the victim was based. This suggests that registration information should be an adequate indicator of regional HGV population for the purposes of calculating a theft rate, although it may be subject to a certain degree of error.

County situation

The fact that the South East of England had the highest rate of HGV theft was reflected in the analysis results for individual counties. Indeed, the three highest county rates were all in this geographical region. HGV theft was most prevalent in Essex and 9.6% of the vehicles stolen in 1994 were taken in this county. Certain areas within Essex appeared to be especially susceptible to theft. Chelmsford, for example, accounted for 15% of thefts within Essex, whilst Basildon accounted for a further 10.8% of vehicles stolen in that county.

Greater London also had a high frequency of HGV theft, accounting for 7.5% of all HGVs stolen, whilst Kent accounted for 6.2% of all thefts. Within Kent, Maidstone and Sittingbourne appeared particularly susceptible to HGV theft, accounting for 16.6% and 11.9% of thefts in the county respectively. The prevalence of HGV theft within certain towns may well reflect the nature of local industry. For example, both Chelmsford and Maidstone have a high level of commercial activity and, therefore, higher usage of HGVs.

A full breakdown of HGV theft for each county can be found in Appendix E.

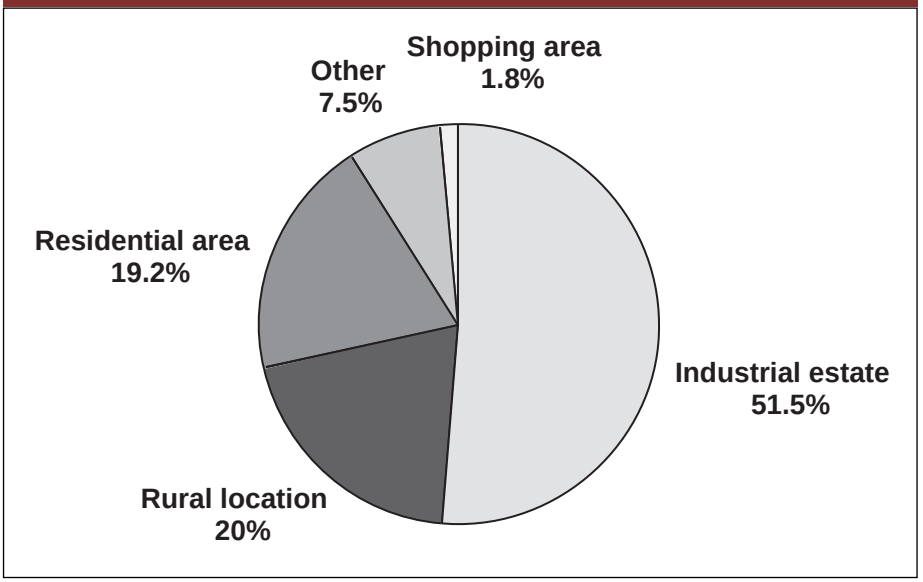
Type of area

The above findings suggest that variations in the level of HGV theft may, to some degree, reflect the type of commerce and industry prevalent there. Subsequent analysis indicated that certain types of environment were more prone to HGV theft and also that the risk was greatest in areas with higher levels of industrial / commercial activity. Figure 5 shows that over half of the HGVs considered by the study were stolen from industrial estates. This result is not entirely surprising given the findings of previous research. Johnstone et al (1994) found that such estates were often targets of crime and, indeed, generally have a higher risk of victimisation than residential areas. Their study showed that vehicle crime accounted for 33% of all offences on industrial estates, with theft of vehicles accounting for 21% of crimes.

The current study suggested that the places where HGVs were stolen from tended to vary considerably between regions. In Yorkshire and Humberside, 59.1% of the HGVs stolen were taken from industrial locations, but in Wales the figure was only 29.2%. In the latter case, HGVs were more likely to be stolen from rural locations,

which were, in fact, the second most common type of area vehicles were stolen from. Nationally, whilst Wales had the highest proportion of thefts in rural districts (41.2%), East Anglia (33.3%), Scotland (30.8%) and the East Midlands (30.6%) also had a high proportion of thefts in such areas.

Figure 5: Type of area HGV theft occurs from



Parking location

Previous studies have suggested that the vulnerability of a particular vehicle to theft may be influenced by how and where it is parked within a given area. The 1992 British Crime Survey (Mayhew et al, 1993) found, for example, that cars parked on the street at night had a higher risk of theft than did those parked in garages. Table 6 shows that certain parking locations were more commonly targets of HGV theft than others. Vehicles were most frequently taken from a company's own depot.

Factory and warehouse parking areas, and roadside parking, also left the HGV relatively vulnerable to theft. By contrast, supervised lorry parks had the lowest frequency of theft amongst those places listed in Table 6. Whilst it is tempting to suggest this could be a result of the extra security acting as a deterrent, it may merely reflect limited usage of such establishments, or indeed, the scarce supply of places. (The security of the parking location is considered further in Section 6.)

The frequency of theft in various parking locations varied according to the region. Company depots were the most frequent targets in all regions, although the extent varied from 65.3% in the East Midlands to 39.1% in the Northern region. Whilst accounting for 10.5% of thefts nationally, HGVs stolen from the roadside accounted for 15.4% and 17.6% of thefts in Scotland and Wales respectively and for 17.9%, the highest proportion, in the South West.

The actual location of the parked vehicle at the time of theft also varied according to the general type of area. On industrial estates, 84.3% of thefts occurred from either the company's own depot or from a factory / warehouse parking area. In rural areas, this figure fell to 43.3% and drivers' own homes and farm yards assumed increased importance (each accounting for 9.6% of thefts). Nonetheless, a company's own depot still accounted for the largest proportion of thefts in both rural areas and residential areas (29.0%) In the latter case, these were, however, closely followed by thefts from the drivers' own homes (26.7%) and from the roadside (26%).

Table 6: Parking location of vehicle at time of theft

	Sample Number	National Estimate	Percent
In company's own depot	360	1585	52.0
In factory/warehuse parking area	76	335	11.0
On the roadside	73	321	10.5
At the drivers home	72	317	7.2
At unsupervised lorry park	50	220	4.6
In warehouse/garage	32	141	2.3
In a public car park	16	70	1.0
In supervised lorry park	7	31	0.9
Other	6	26	10.4
Total	692	3047	100

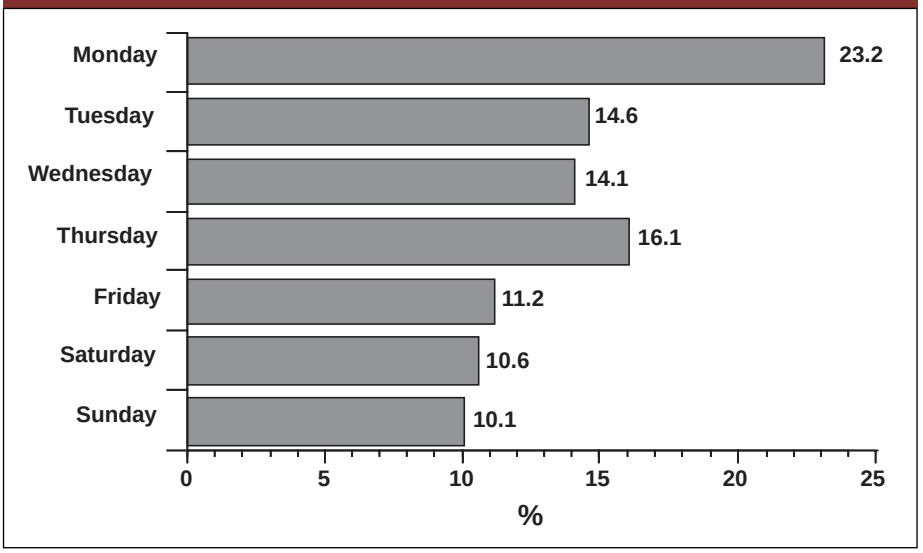
Time of HGV theft

The research also investigated the time of day and day of week thefts tended to occur on. As victims are rarely present when a HGV is stolen, it was considered futile to ask respondents to indicate the time of day when the vehicle was stolen. They were instead asked to report the time at which the vehicle was found to have been stolen, along with the day of week. They were also asked to indicate how long the vehicle had been left prior to having been found stolen. In this way, it was possible to gain a broad indication of the times at which vehicles were commonly stolen.

Day of week

As Figure 6 shows, vehicles were most likely to be found stolen on a Monday and least likely on Saturday and Sunday. The Monday figure may, however, be artificially high and reflect the fact that Saturday and Sunday thefts would be less likely to be discovered immediately because staff were not working. Information provided on the length of time vehicles had been left before being found to be stolen suggested that 29.3% of vehicles were stolen over the weekend. Of the other week days, Thursday had a higher frequency of theft discoveries than Tuesday, Wednesday or Friday.

Figure 6: Day of week HGV discovered stolen



Time of day

Table 7 demonstrates that over half the HGVs considered by the study were discovered stolen between 4am and 7:59am. Indeed, over three quarters of stolen HGVs were found to have been stolen in the morning, whilst only 6.6% were found stolen between 8pm and midnight.

Table 7: Time of day HGV discovered stolen

	Sample Number	National Estimate	Percent
00:00 - 03:59	27	121	4.0
04:00 - 07:59	366	1635	53.7
08:00 - 11:59	143	639	21.0
12:00 - 15:59	33	147	4.8
16:00 - 19:59	39	174	5.7
20:00 - 23:59	45	201	6.6
Don't know	29	130	4.3
Total	682	3047	100

The high number of morning discoveries suggested that a large proportion of HGVs were stolen at night. This view was supported by further analysis which indicated that 44.3% of the stolen vehicles had been left in the evening and were found to have been taken by the following morning. The figure is likely to be a minimum estimate of the percentage of night time thefts, as 23.6% of the remaining vehicles had been left for 19 hours or more and at least some may have been stolen during the hours of darkness.

During the mid-week Wednesday evenings appeared to be the overall worst time for HGV theft with 9.7% of the stolen vehicles considered being parked up on a Wednesday night and found to have been stolen by Thursday morning. Tuesday night thefts were also high accounting for 8.1% of the HGVs taken.

5. Victims of HGV Theft

Company and fleet size

The study suggested that the majority of victims of HGV theft during 1994 were smaller sized companies. Organisations employing ten staff or less accounted for half of all HGV thefts with owner operators alone suffering 12.8% of the thefts. At the other end of the scale, companies employing between 51 and 100 staff accounted for 4.8% of thefts, whilst 16.6% of thefts occurred from companies with more than 100 employees. The concentration of thefts within smaller organisations was even more apparent when the HGV fleet size was examined. Companies with just one vehicle accounted for 31.9% of HGVs stolen, whilst those with less than five accounted for 62.7% of the stolen vehicles. By contrast, companies with more than one hundred vehicles made up 10.5% of the HGV thefts.

Further analysis did not, however, suggest that small companies were more likely to be victims of HGV theft. According to Inland Revenue figures (1990), approximately half of all 'professional' haulage firms operate with just one HGV, whilst a further one third operate with between two and five. In view of this, it might be suggested that smaller companies may - if anything - be less vulnerable. It should, however, be borne in mind that the Inland Revenue figures used dealt solely with 'professional' hauliers. This meant that these were not directly comparable with study data which were drawn from all owner groups, including 'own account'[5] operators who may well be more likely to have larger fleets of vehicles. As no more suitable figures were available it was not possible to determine precisely how vulnerability varied with company and fleet size.

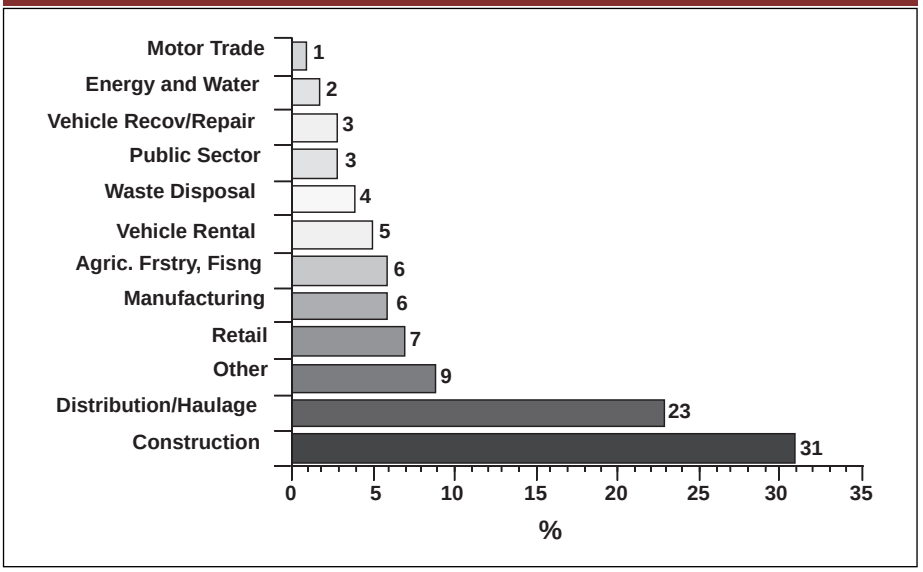
Industrial Sector

Figure 7 suggests that the construction industry was affected more by HGV theft than any other sector and accounted for 31% of the vehicles stolen in 1994. A further 23% of thefts occurred within the haulage industry. Apart from these particularly hard hit industries, thefts were fairly equally and widely distributed amongst a range of sectors - from manufacturing to waste disposal and from retail to vehicle recovery.

It should also be noted that a small number of those responding to the survey used their HGVs for non work purposes. In Figure 7, these have been classified under the 'Other' category. Nineteen respondents indicated they used their vehicle for private or leisure use; twelve of these vehicles were horseboxes.

5 'Own account' operators are those who use their own vehicles to transport their own products, whilst professional hauliers are those who use their own vehicles to transport other peoples products.

Figure 7: HGVs stolen by industrial sector



Financial cost to victims

Study respondents were asked to quote the insured value of the vehicle stolen and this indicated that the actual loss experienced varied significantly according to the type of vehicle taken. For example, rigid lorries were, on average, insured for £10,411, whilst a tractor unit and trailer were insured for £26,777. (The average insured value for tractor units alone was £16,902.) Table 8 provides a breakdown of the costs for a range of body types and shows that refuse disposal lorries were the most expensive type of vehicle stolen, whilst tankers and street cleansing vehicles also had a high value. Livestock carriers, drop-side lorries and flat-bed lorries, whilst among the most likely HGVs to be stolen, were all placed at the least expensive end of the range. Indeed, there did not appear to be any relationship between the relative risk associated with the theft of a vehicle and its insured value.

Table 8: Mean average insured value of vehicle by body type

	Sample Number	Mean Average Vaue (£)
Refuse Disposal	2	27,250
Tanker	10	18,856
Street Cleansing	1	18,000
Concrete Mixer	2	14,000
Low Loader	2	14,000
Skip Loader	28	13,854
Breakdown Truck	14	13,839
Tipper	206	13,260
Goods Lorry	86	12,895
Insulated Van	16	12,593
Flat-bed Lorry	135	9,705
Car Transporter	5	9,200
Drop-side Lorry	122	7,934
Glass Carrier	2	7,600
Skeletal Goods	2	6,600
Livestock Carrier	25	6,332
Total	664	11,238

The study indicated that, on average, the theft of a HGV involved a loss of £11,238. Multiplied across the 2,687 vehicles stolen and not recovered in 1994, this gives a total cost of over £30.14 million for that year alone[6]. This is inevitably a minimum estimate of the cost of HGV theft, as some further costs would be associated with the 360 vehicles stolen and recovered during that year.

Many of the costs noted above will be borne by insurance companies rather than individual owners and companies. However, the study suggested that the direct victims of HGV theft may nonetheless experience a very real, additional financial cost which will inevitably have some impact on the viability of the business.

When asked about the effect that vehicle theft had on business, 17% of respondents identified the high cost of purchasing a replacement lorry. In many of these instances, this was because the new vehicle cost more than the sum paid out by the insurance company. The administrative time taken to deal with the theft and the possibility of increased insurance premiums provided other examples of the costs

6 It should be noted that these figures are based on insured value, rather than on the actual market value of the vehicle.

borne by victims of theft. As far as the latter issue was concerned, 14.7% of respondents stated that premiums had risen as a result of claiming on their policy and some also noted that insurers were no longer willing to accept the risk of insuring them.

The greatest cost associated with HGV theft did, however, appear to result from the subsequent loss of business and revenue. HGVs are, in essence, capital equipment used to generate income and the loss of such a machine can have a devastating effect on a company's operation. Of those surveyed, over a quarter (25.7%) spontaneously mentioned the loss of business resulting from the theft. Until a replacement vehicle can be brought into service, a theft means that no income is generated and this can result in hardship, particularly for smaller operators and owner drivers. Replacement vehicles were hired by 19.3% of respondents, allowing them to continue providing a service to their customers. Considerable costs were sometimes accrued as a result and these were not always met by the insurer.

Despite the wide ranging effect on business, only twelve of the companies surveyed (1.7%) are known to have gone out of business as a result. (The possibility exists that business failures may have been more common among non respondents and this result should be treated with caution.) Ten of these twelve companies employed less than ten staff. One of these closed down after trading for 35 years as a result of having eight vehicles stolen in a thirty month period. A further nine companies (1.3%) indicated that they had made staff redundant as a result of the theft. These were usually the stolen vehicles' drivers although, in one case, the company laid-off six of its workers.

Theft of loads

Of those responding to the survey, 16.1% indicated that they had a load stolen as well as a vehicle. This suggests that a total of 490 loads were stolen from HGVs which were not recovered during 1994. The study did not address recovered vehicles and it can be assumed that at least some of the stolen HGVs which were recovered would not have had the load intact. Reports of stolen loads are collated on a national basis by the Essex Police National Lorry Load Desk. This unit collects information on stolen loads and circulates details to police forces to help in recovery and identification of loads. Figures for 1994 indicate that, in total, some 600 loads were reported stolen to the National Lorry Load Desk, with an estimated value of £30 million.

According to the current study, building and construction materials were the most common items taken accounting for 29% of missing loads. Plant machinery and work tools were also frequent targets accounting for 19% of load thefts, although a range of food products were also stolen constituting 12% of the loads stolen. A

number of high value loads were also reported stolen including £80,000 worth of electrical steam irons and £30,000 worth of stainless steel meal trolleys. Losses of £10,000 or more accounted for 18.4% of loads stolen. Loads worth less than this were more common, with 42.5% of stolen loads worth less than £1,000 and 36.2% worth less than £500.

The average value of the loads stolen in 1994 was £6,807. This provides an estimate of the total value of loads stolen at £3.3 million, which accounts for only about a tenth of the value reported to the National Lorry Load Desk, even though the number of loads reported stolen was fairly similar. This discrepancy was largely a result of different methods of measuring the value of goods stolen. Whilst this research used the insured value, the National Lorry Load Desk uses the estimated value of the goods at point of sale. Regardless, the loss of loads represent a heavy financial burden, particularly given that the study suggested that only 3.5% of stolen loads would be recovered. One recovered load consisted of rotten beef kidneys which, presumably, had limited value.

6. Vehicle Security

Security devices installed

Despite the costs associated with the loss of a vehicle, the study suggested that there had been only a limited effort to install security devices to HGVs. As Table 9 shows, most of those stolen had minimal security protection with infrequent use made of alarms and immobilisers. This finding has, of course, a positive interpretation. Stolen HGVs may seldom have immobilisers because such devices are successful in preventing theft in the first place, whilst their presence would merely suggest they were ineffectual at stopping a thief.

Over three quarters of the stolen HGVs did, however, have steering column locks fitted. This finding should not be trivialised because there is no statutory obligation for manufacturers to fit these devices to HGVs before sale. As vehicles are usually built to meet customers' specifications, the finding suggests that they are requiring at least a minimal level of security. Unfortunately, the presence of steering column locks in so many of the stolen vehicles suggests that, on their own, it is difficult to see these as an effective means of preventing HGV theft. This confirms Mayhew et al's (1992) prediction that thieves might develop techniques to overcome these locks.

Table 9: Type of security applied to stolen HGVs

	Sample Number	National Estimate	Percent
Steering column lock	537	2389	78.4
Mortise deadlock on cab door	97	424	13.9
Electrical system immobiliser	70	305	10.0
Air brake immobiliser	46	201	6.6
Fuel valve immobiliser	43	186	6.1
Manually set alarm	33	143	4.7
Automatically set alarm	14	61	2.0
Tracking system	9	40	1.3
Other	29	125	4.1

Most of the security devices fitted to HGVs had been installed at the time of manufacture. For example, steering column locks were usually fitted at the production stage (97.8%), as were mortise deadlocks (88.7%) and fuel valve immobilisers (74.4%). Some of the other types of security system were most frequently fitted after purchase. The retrofit market accounted for 44.4% of the tracking devices fitted and 50% of the air brake immobilisers and automatically set alarms installed.

Use of security devices

One of the main problems with vehicle security devices is that these generally have to be set manually on exit. If drivers forget to take this action or deem it unnecessary during a brief absence, the security device is just as ineffective in combatting HGV theft as none at all. The research sought to explore whether the drivers of HGVs which had immobilisers and alarms fitted had armed/turned on the security device prior to the theft. The vast majority of immobilisers attached to the electrical system were said to have been armed before the theft (96.4% of cases), although many of these devices are anyway set automatically when the ignition is turned off. Air brake immobilisers were also generally said to be armed (92.1% of cases) with fuel valve immobilisers and manually set alarms turned on only slightly less often (81.8% and 85.2% of cases respectively). Generally speaking, security devices were said to have been operational at the time the vehicle was taken.

A word of caution needs to accompany the above findings, as there may well have been a tendency for those responding to provide "socially acceptable" answers. The questionnaire provided copious reassurances that all responses would be treated as strictly confidential. However, some respondents may still have preferred not to provide an honest answer to questions on the use of security devices eg. to avoid providing information which conflicts with that given to insurers. Alternatively, if the questionnaire was completed by fleet managers, they may not know whether the security devices were used or not and drivers may be unwilling to admit to their supervisors that they failed to use the security. It was noted that, when asked about the arming of alarms and immobilisers, approximately 20% of respondents missed the question out, possibly to avoid providing an embarrassing answer. It is, therefore, suggested that findings about the level of use of security devices should be treated as over estimates of the actual rate.

The above caution may also apply to other findings in this section on cab security and "hidden keys".

Cab security

The majority of respondents (90.8%) indicated that the cab was locked at the time of the theft, while 2.9% stated that they didn't know whether it was or not. The remaining 6.3% of unlocked vehicles were predominantly rigid type lorries (95.3%) and frequently used in the construction industry (32.6%) or in the distribution/haulage business (18.6%). These unlocked vehicles were most commonly stolen from rural areas (34.9%), although industrial estates also accounted for 32.6% of those stolen. Just over 58% were parked in either the company's own depot or in a factory/warehouse parking area at the time of the theft. A further 18.6% were parked on the road side when the theft occurred.

The general trends for unlocked vehicles appear similar to those identified for HGV theft as a whole, although rural areas were somewhat over represented as were thefts from the roadside. The fact that many vehicles were left open in a company's own depot and in rural locations may suggest that these places were felt to be of lower risk. This perception was certainly not borne out by the study findings. It is, perhaps, more difficult to explain why a significant proportion of HGVs were left unlocked on the open road, as such locations might be expected to have a higher risk associated with them. This phenomenon may be explained by the fact that most of the road side thefts of unlocked lorries occurred in rural areas (37.5%) or residential areas (50%) and these may have been perceived as safe. It should also be noted that such thefts could have occurred during the normal course of business – eg. during deliveries, or unloading – rather than while parked.

Hidden keys

Before the study commenced, the researchers were told that it was "normal practice" for drivers to leave the vehicle with the keys hidden somewhere within it, especially if it was to be used by another driver. Only 4.6% of survey respondents admitted to leaving the keys in or on the stolen vehicle; one quarter of these had left the keys in the ignition. HGVs which had keys left on them were generally of the rigid type (90.3%); 19.4% were used in agricultural work, 16.1% in distribution/haulage and 16.1% in construction. Common vehicle types were drop-side lorries (29%), flat-bed lorries (22.6%) and tippers (19.4%). They were predominantly stolen from industrial areas (45.2%) or rural locations (25.8%) and two thirds were stolen from the owner's depot.

Security of parking location

The study also considered the level of security afforded by the parking location used for the HGV. Table 10 shows that almost a third of survey respondents stated that the vehicle stolen had been parked in a location with no security. In 30.7% of these cases the vehicle had been parked on the road side and, in a further 14.6%, at the driver's own home. There was, however, a significant proportion of cases (17.6%) in which the vehicle was stolen from a company depot which had no form of security.

Even where security was present, the results suggest that physical barriers failed to prevent theft. Table 10 indicates that over half of all locations which succumbed to HGV theft had locked gates and/or perimeter fencing. A considerable proportion of sites also has security lighting, which may suggest the possibility of being seen is not a major factor in the thief's choice of targets. Surveillance may be a more effective measure against HGV theft, as few vehicles seem to have been stolen from locations employing either a security guard on the premises or closed circuit television. However, this latter finding may simply reflect the limited use or availability of parking locations with surveillance. Evidence from research in car parks (Webb et al,

1992; Tilley, 1993) has suggested that the presence of staff and the use of CCTV can reduce the extent of car theft. There would seem to be no particular reason why such methods should not be successful if applied to HGV parking.

The company's own depot should be expected to provide the safest environment for HGVs as this is one of the few places where the owner can actually control measures taken to prevent theft. However, more HGVs were taken from the victims' own premises than they were from any other location (see Section 4). More than 70% of the depots from which vehicles had been stolen already had locked gates and/or perimeter fencing. Alarmed premises were much less the norm with 15.8% of companies using such devices, whilst only 4.7% employed security guards and 2.8% CCTV. (Only very slightly more use was made of these latter approaches by large companies with more than 50 employees, although they were statistically more likely to have perimeter fencing[7].) However, it is again impossible to determine whether alarms and surveillance were infrequently represented in responses because they were most effective or because they were rarely available/used.

Table 10: Type of security on parking location

	Sample Number	National Estimate	Percent
Locked gate	371	1615	53.0
Perimeter fence	366	1594	52.3
No security	205	893	29.3
Security lighting	202	881	28.9
Alarmed premises	68	296	9.7
Security guard on premises	31	134	4.4
Closed circuit TV	23	101	3.3
Other	50	216	7.1

Preventing future thefts

Owners who had been the victims of HGV theft had generally taken measures to avoid "repeat victimisation" and, in all, 83.7% had adopted further prevention measures since the theft. Measures introduced most usually involved the installation of security devices within remaining vehicles. Immobilisers were the most frequently

7 The security measures installed on company sites which were victims of lorry theft were compared to three sizes of company – those with 20 staff or less, 21-50 staff and those with 51 staff or more. A significant relationship was found between company size and two types of security – perimeter security (Chi Square=8.79, p=0.012, 2 d.f.) and security lighting (Chi Square=11.04, p=0.004, 2 d.f.). In the latter case, medium sized firms (21-50 staff) were more likely to have lighting (53.6%), whilst firms with over 50 employees were least likely to have this feature (27%).

installed device, with 31.3% of respondents fitting such equipment. The means of immobilising the vehicles ranged from cutting the fuel supply to disabling the electrical system or the brake system. Tracking devices were also popular with victims and 12.9% had installed them on the remaining or replacement vehicles. Alarms had been installed by 10.1% of victims and 9.9% had chosen other forms of vehicle security, ranging from steering wheel locks and pedal locks to gear locks and wheel clamps.

A number of victims had also made attempts to improve the security of the premises where the HGVs were parked. Security lights on premises had been installed by 5.1% of victims, whilst closed circuit cameras had been introduced by just 1%. The most popular route to preventing theft from premises (in 21.1% of cases) was improving the perimeter security. This often involved upgrading the quality of the gate locks and strengthening the gates themselves. Anti ramming devices, such as crash barriers and concrete bollards had also been installed on a number of premises, whilst other victims had taken a more 'DIY' approach to security – by obstructing compound gates at night with heavy loads, or with an immobilised vehicle.

One option which might prove more effective in preventing future thefts is the practice of locking a vehicle inside a building when not in use. Of those introducing new measures to prevent theft, 5% stated that they had adopted this practice with vehicles parked most usually in warehouses or in garages. This method was normally reserved for periods when the vehicle was left unsupervised, such as overnight and at weekends, and was expected to increase vehicle security as follows:

(i) ***by deterring the random, opportunist theft:*** here the thief may know the type of vehicle required but has no specific target. Being unable to view the vehicle from outside the locked building, the thief may be deterred from breaking into the building on the basis of there being a strong chance that it may not house the desired vehicle;

(ii) ***by increasing amount of security to be overcome:*** even if the vehicle is targeted, the thief will then need to overcome up to three forms of security – compound security, building security and vehicle security.

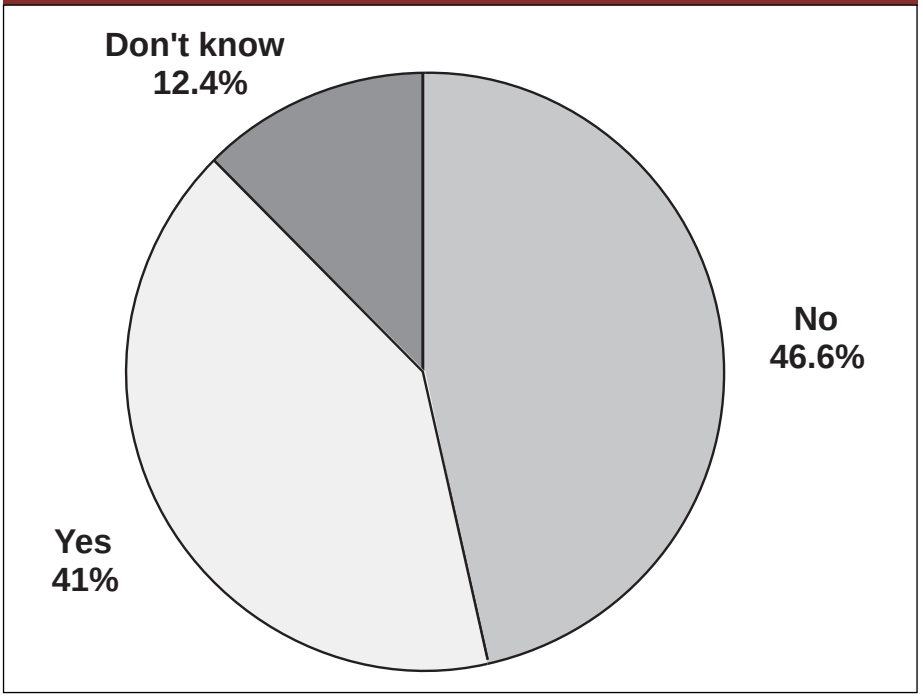
Evidence of the possible success of parking a HGV inside a secured building can be found in Table 6 (Section 4), which shows that only 2.3% of vehicles were stolen from garages or warehouses. Although this could merely reflect low level usage of this method of security, Clarke and Mayhew (1994) provide additional support for the garaging of vehicles. By re-analysing British Crime Survey data they found that, where cars were concerned, those parked in a domestic garage were fifty times safer than those parked on a street near the owner's home.

Satisfaction with vehicle security and security advice

Survey respondents were asked about their satisfaction with available security systems. When asked whether manufacturer fitted security was adequate, over two thirds (67.7%) indicated that it was not. Even when security was fitted, it was not always thought to be effective. Over half of respondents (51.4%) felt that the standard HGV security systems fitted by manufacturers were inefficient. This latter finding may not be surprising considering that over three quarters of lorries stolen in 1994 had steering column locks fitted by the manufacturer.

Although there is no single mechanism for advising hauliers on security, advice is available on a nationwide basis via crime prevention officers present in each police force. These specialists can provide expert advice on security both vehicles and the premises in which they are kept. As Figure 8 shows, a considerable proportion of theft victims were dissatisfied with the information made available on effective security systems for HGVs. Conversely, it can also be noted that over 40% of such victims felt that sufficient information was available.

Figure 8: Response to: Are theft victims satisfied that the information about effective security systems for HGVs is readily available to them?



7. Conclusions

On the basis of the current research, it is possible to make a range of suggestions which could help the manufacturers, owners and drivers of HGVs to take action and reduce the extent of this problem.

Action points for vehicle manufacturers

- ***Improving security:*** HGV theft appears to be focused on a small number of makes, with Iveco Ford, Bedford, Leyland DAF and Mercedes accounting for 80% of the vehicles stolen. Efforts made by these manufacturers to improve security could have a considerable effect on the total number stolen in the long term. However, thieves target vehicles to meet known demand and as demand changes other makes may be targeted.

  It therefore follows that for the long term benefit of the industry, **all** manufacturers should consider installing effective security on **all new HGVs** as standard. Approximately 8% of the HGV stock is replaced each year and, hence, the benefits of this approach will necessarily be long term.

- ***Influencing the components market:*** Although not conclusive from this research, a significant proportion of HGVs may be stolen for the value of their individual components. Those buying stolen parts are likely to do so because they are cheaper than buying new components. Manufacturers should therefore address the pricing of their parts in order to reduce the attractiveness of black market components. It is recognised, however, that manufacturers will be unlikely to under-cut the price of illegitimate components because lorry thieves will have very few overheads, with most of the sale of parts being pure profit.

- ***Marking of components:*** Permanently marking components with serial numbers, which can be cross reference with the HGV's vehicle identification number, should be developed. This will allow stolen parts to be identified and returned once they have been recovered by the police and might also contribute in some way to theft prevention.

Action points for security device manufacturers

- ***Targeting older vehicles:*** The majority of HGVs stolen in 1994 were produced between five years and ten years ago. This suggests that suppliers of retrofit security devices (fitted after manufacture) need to focus their marketing effort on older vehicles, particularly those produced by the four main manufacturers.

- ***Type of security device:*** Some security devices, such as steering column locks, would appear to be relatively ineffective in deterring HGV theft. Effective barriers to theft need to be identified, developed and promoted. Careful

evaluation will be required if vehicle owners are to be convinced that security equipment warrants the expenditure required.

Action points for HGV owners

The following points are relevant to those who own HGVs, as well as those who lease them or act as fleet managers for company vehicles.

- ***Buying legitimate components:*** The market for illegitimate parts is purely demand led; HGV theft would be reduced if thieves were unable to sell the components they steal. HGV owners should therefore ensure that they buy used components from legitimate dealers.

- ***Installing security devices:*** Steering locks, ignition locks and standard door locks appear no longer to provide adequate protection against the bulk of HGV theft. Unfortunately, additional security can cost upward to £500, but this may be an insignificant amount compared to the potential losses (increased insurance premiums, loss of business etc) ensuing from a vehicle being stolen. No security device can ever be considered 100% effective, but they can be expected to reduce the risk.

  Where possible, self arming security devices should be used. These devices, which engage automatically when the ignition is turned off, do not rely on the driver setting the equipment each time the vehicle is left.

- ***Improving the security of company depots:*** Over half of all lorries appear to be stolen from company's own depot and owners could do much to improve the security of parking provided. The research suggests that whilst gates and fences alone do not necessarily provide adequate security cover, consideration should still be paid to robust perimeter security. (Some of the perimeter security noted in the study may have been substandard and easily breached). Wherever possible, the HGV should be kept in a locked building when not in use.

  Measures which increase the level of surveillance should also be considered. Security lighting can be effective if there is someone present to see a potential thief, such as a security guard, or if it is used in conjunction with security cameras. The latter could be an expensive option for the small operator, but should be considered by larger firms.

- ***Targeting vehicles for increased security:*** The study has shown that certain HGVs may be more prone to theft than others. Those working in the construction industry, and in the distribution and haulage business, should give particular attention to vehicle security. Within the construction industry, tipper lorries and drop-side lorries should particularly be targeted for improved security.

Overall, greatest concern should be shown by those operating livestock carriers which have a theft rate nine times the average of HGVs. Owners of other types of HGVs cannot, however, afford to be complacent.

Action points for HGV drivers

- ***Using vehicle security:*** Drivers should always make full use of any available vehicle security. Keys should always be removed from the ignition, security devices should be armed and cab doors locked – even if the vehicle is being left for only a very short time. This security procedure will usually only take a matter of seconds and could prevent a vehicle from being stolen. It should be followed whether the vehicle is to be left on the open road or in the company depot. Indeed, the latter should never be considered a safe place to leave an unlocked vehicle.
- ***Handling keys:*** Keys should always be taken with the driver when the vehicle is left and should not be hidden anywhere on the vehicle – no matter how good the hiding place is thought to be. When the vehicle is left in the company's own depot, keys should not be left hanging in the haulier's office.
- ***Choosing parking locations:*** Parking places should be chosen carefully. Drivers should be particularly vigilant when leaving a vehicle on an industrial estate, as these places are prone to high levels of HGV theft. A significant proportion of thefts occur in rural locations too and vehicles should always be made secure.

Conclusion

HGV theft has been shown to be a widespread and expensive problem. Despite this, only limited attention appears to have been paid to vehicle and parking location security. By making fairly modest efforts to improve security, the extent of the problem could be reduced. Further work may be required to provide additional information on, for example, the purposes of HGV theft and the mode of disposal for such vehicles.

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Appendix A: Members of the Joint Action Group on Organised Lorry Theft

Association of British Insurers
British Vehicle Rental and Leasing Association
BRS-Excel Logistics
ERF Limited
Foden Trucks
Freight Transport Association
H M Customs and Excise
Home Office
Iveco-Ford Trucks Ltd
Leyland DAF Trucks Ltd
MAN Truck and Bus UK Ltd
Mercedes Benz (UK) Ltd
Metropolitan Police Service
National Criminal Intelligence Service
Norwich Union
Retail Motor Industry Federation
Road Haulage Association
Scania (GB) Ltd
Simba Vehicle Security
Society of Motor Manufacturers and Traders
Vehicle Crime Prevention Group of the National Board for Crime Prevention
Volvo Truck and Bus Ltd

Appendix B: Calculating a recovery rate

To supplement the data on the number of unrecovered vehicles, work was conducted to provide an estimate of the number of lorries stolen, but subsequently recovered. This involved taking four 'snapshots' of the PNC database. These data-sets contained the number of unrecovered lorries stolen in 1994 on:

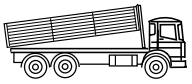
31st October 1994
30th November 1994,
31st December 1994,
31st January 1995.

By comparing one month with the following one, vehicles which were recorded stolen on the first month but not on the second were identified. These constituted vehicles which had been recovered and subsequently deleted from the PNC database. For example, the November database was compared to the October one and x vehicles on the October database were found to be absent on the November database. This provided the figure for the number of vehicles recovered in November 1994.

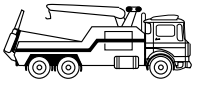
This exercise was repeated by comparing November with December and December with January, producing estimates of the recovery rate of y and z for December and January respectively. These three calculations were then used to produce the mean average recovery rate per month. Based on this calculation, on average, 30 HGVs appear to be recovered per month. The number of lorries stolen and recovered in 1994 was therefore 360 (30×12), suggesting an annual recovery rate of approximately 12%. This is significantly below the recovery rate for all types of motor vehicle, which in 1993 stood at 59%.

The recovery rate for lorries is likely to be an underestimate of the actual number stolen. As the recovery rate was calculated on a monthly basis it would fail to pick up vehicles which were stolen and subsequently recovered within the same month. For example, a lorry stolen on 2nd October 1994 and recovered on 30th October 1994 would not have been included in the recovery figures. This research will particularly underestimate lorry thefts where the vehicle is stolen for the load, as these will often be recovered within a matter of days.

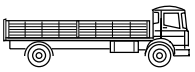
Appendix C: Examples of the most frequently stolen body types



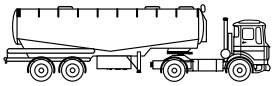
TIPPER



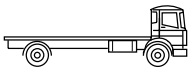
BREAKDOWN TRUCK



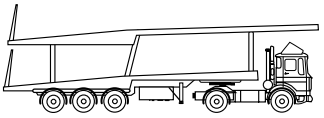
DROP-SIDE LORRY



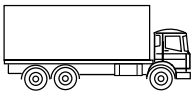
TANKER



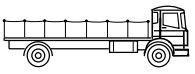
FLAT-BED LORRY



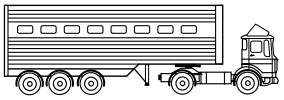
CAR TRANSPORTER



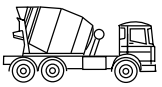
GOODS LORRY



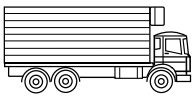
BOTTLE FLOAT



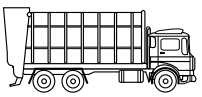
LIVESTOCK CARRIER



CONCRETE MIXER

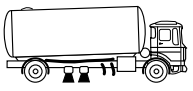


INSULATED VAN



REFUSE DISPOSAL

SKIP LOADER



STREET CLEANER

Appendix D: Counties in each region

Region	County
Northern	Cleveland
	Cumbria
	Durham
	Northumbria
	Tyne and Wear
Yorkshire and Humberside	Humberside
	North Yorkshire
	South Yorkshire
	West Yorkshire
East Midlands	Derbyshire
	Leicestershire
	Lincolnshire
	Northamptonshire
	Nottinghamshire
East Anglia	Cambridgeshire
	Norfolk
	Suffolk
South East	Bedfordshire
	Berkshire
	Buckinghamshire
	East Sussex
	Essex
	Greater London
	Hampshire
	Hertfordshire
	Isle of Wight
	Kent
	Oxfordshire
	Surrey
	West Sussex
South West	Avon
	Cornwall
	Devonshire
	Dorset
	Gloucesterhire
	Somerset
	Wiltshire

Region	County
West Midlands	Hereford and Worcester
	Shropshire
	Staffordshire
	Warwickshire
	West Midlands
North Western	Cheshire
	Greater Manchester
	Lancashire
	Merseyside
Scotland	Borders
	Central Scotland
	Dumfries and Galloway
	Fife
	Grampian
	Highland
	Lothian
	Orkney
	Shetland
	Strathclyde
	Tayside
	Western Isles
Wales	Clwyd
	Dyfed
	Gwent
	Gwynedd
	Mid Glamorgan
	Powys
	South Glamorgan
	West Glamorgan

Appendix E: Frequency of thefts in each county

County breakdown of lorry theft

	Sample Number	National Estimate	Percent
Essex	65	292	9.6
Greater London	50	225	7.4
Kent	42	189	6.2
Lancashire	39	175	5.8
West Yorkshire	33	148	4.9
South Yorkshire	33	148	4.9
Hertfordshire	29	130	4.3
North Yorkshire	27	121	4.0
Humberside	23	103	3.4
Greater Manchester	23	103	3.4
Buckinghamshire and Berkshire	22	99	3.2
Cheshire	16	72	2.4
West Midlands	16	72	2.4
Suffolk	15	67	2.2
Staffordshire	15	67	2.2
Sussex	14	63	2.1
Nottinghamshire	13	58	1.9
Hampshire	12	54	1.8
Cambridgeshire	12	54	1.8
Surrey	11	49	1.6
South/West/Mid Glamorgan	11	49	1.6
Lincolnshire	10	45	1.5
Derbyshire	10	45	1.5
Avon and Wilshire	9	40	1.3
Berkshire	8	36	1.2
Oxfordshire	8	36	1.2
Northamptonshire	8	36	1.2
Leicestershire	8	36	1.2
Merseyside	8	36	1.2
Hereford and Worcester	8	36	1.2
Dorset	7	32	1.0
Gloucestershire	7	32	1.0
Shropshire	7	32	1.0
Norfolk	6	27	0.9
Tyne and Wear	6	27	0.9
Cumbria	6	27	0.9
Cleveland	6	27	0.9
Warwickshire	6	27	0.9

County breakdown of lorry theft *(continued)*

	Sample Number	National Estimate	Percent
Strathclyde and Western Isles	6	27	0.9
Durham	4	18	0.6
Lothian	4	18	0.6
Devon and Cornwall	3	14	0.4
Gwynedd and Clwyd	3	14	0.4
Somerset	2	9	0.3
Dyfed/Powys	2	9	0.3
Dumfries and Galloway	2	9	0.3
Gwent	1	5	0.1
Northumbria	1	5	0.1
Tayside	1	5	0.1
Total	678	3047	100

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