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ESTIMATING THE SIZE OF THE 'VEHICLE UNDERCLASS'

Update

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EXECUTIVE SUMMARY

1. The current report is an update of the Jill Dando Institute's (JDI) original report "Estimating the size of the vehicle underclass", produced in March 2004. In November 2004, the Department for Transport released the results of the 2004 VED Roadside survey. This latest survey showed that VED evasion had decreased since the 2002 roadside survey from 2.8% to 1.9%. The original report was revised with these new 2004 figures to determine the corresponding change in the size of the vehicle underclass.

2. The term 'vehicle underclass' is used by many organisations in reference to vehicles that do not comply with motor vehicle licensing laws. This study uses the following *working* definition:

Vehicles that are used on the road with one or more of the following characteristics:

- *Untaxed (or SORNed) for at least 3 months*
- *Between keeper for at least 3 months*
- *Keeper with an unallocated post-code (as a rough indicator of vehicles registered to a false name or address)*
- *VRM that does not appear on the DVLA record (an indicator of vehicles with false or tampered number plates)*
- *VRM registered to a different vehicle type or model (an indicator of vehicles with false or tampered number plates, or vehicles that have been 'imperfectly' rung or cloned)*
- *Declared scrapped*

3. Using data from the full VSS database held by the DVLA, the DfT roadside survey and a subset of the roadside survey sample in 2002 (figures for this subset of the 2004 survey were not available), the size of the vehicle underclass was estimated to be **804,835** or **2.5%** of the total vehicle population. This includes vehicles that have been untaxed for three months or more. The earlier report estimated the size of the vehicle underclass to be 970,800 vehicles or 3% of the total vehicle population. The smaller estimate produced in the current report reflects the lower level of VED evasion found in the 2004 roadside survey.

4. The table below compares the figures if the line when tax evaders are defined into the underclass is drawn at 6 and 12 months or more of tax evasion in 2002 and 2004.

Length of tax evasion	Size of vehicle underclass			
	No. vehicles		% of vehicle population	
	2002	2004	2002	2004
3 months or more	970,800	804,835	3.0%	2.5%
6 months or more	844,480	654,458	2.6%	2.0%
12 months or more	611,400	480,339	1.9%	1.5%

INTRODUCTION

5. The term 'vehicle underclass' refers to vehicles used on the road in contravention of motor vehicle licensing laws and regulations. The vehicle underclass is thus a broad category including for example, untaxed, unregistered, or uninsured vehicles as well as those that have had their identity disguised. The costs stemming from the vehicle underclass are considerable - from the loss of tax revenue to the increased premiums for motor insurance and wasting of police time.

6. This study was commissioned by the Department for Transport (DfT) to provide an estimate of the current size of the vehicle underclass in Britain using available data sources. It builds upon a similar report that the Jill Dando Institute of Crime Science (JDI) carried out last year (2004). If these reports become part of a regular review, this will determine whether the vehicle underclass is increasing, decreasing or remaining static.

7. This report is divided in two main sections. The first recapitulates the definition of "vehicle underclass" that was established in JDI's initial report. The second section provides an estimation of the size of the underclass, using data from a combination of sources and integrating the findings from *Transport Statistics Bulletin: Vehicle Excise Duty Evasion 2004*.

8. In JDI's original report there were two additional sections. One set out a range of potential data sources for use in estimating the size of the vehicle underclass. The other contained a series of recommendations for monitoring the size of the vehicle underclass in future. These have been excised from the current report, which merely seeks to update the findings of the initial report in line with the latest survey results. Nevertheless, these sections remain a useful resource for those seeking a more in-depth examination of the vehicle underclass and how it might be better monitored.

SECTION I: DEFINITIONS OF THE VEHICLE UNDERCLASS

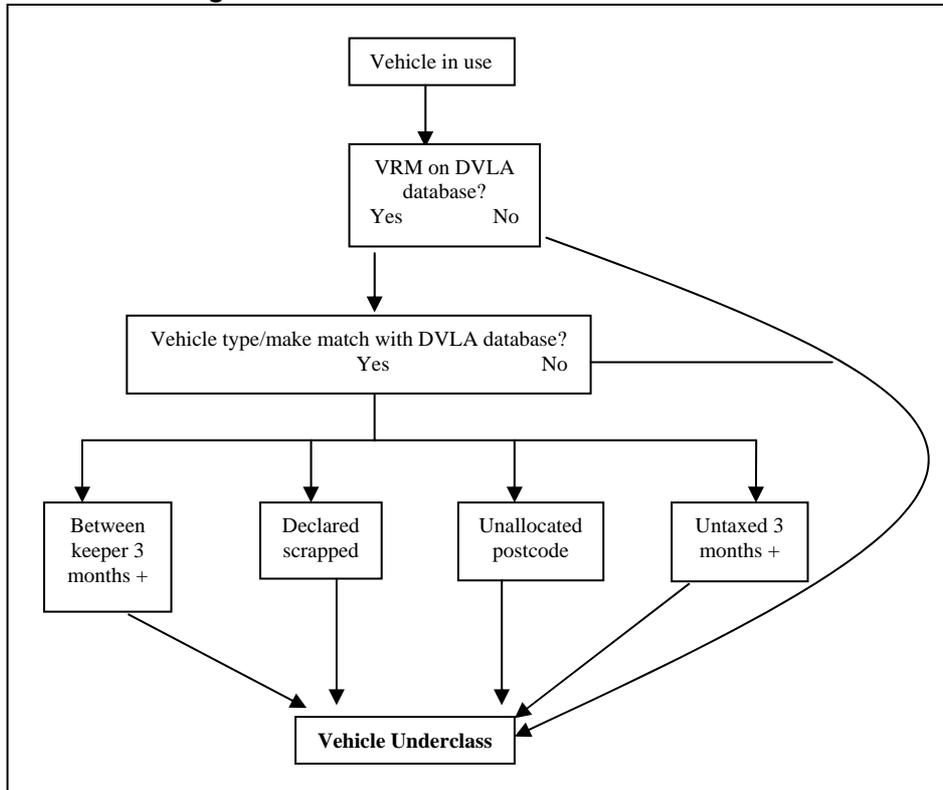
9. The term 'vehicle underclass' is used by many organisations – including the Driver and Vehicle Licensing Authority (DVLA), DfT, insurance companies, the police and others – to refer to those vehicles that do not comply with motor vehicle licensing laws. However, there is little consensus over the exact meaning of the term. As part of JDI's initial report, taking into consideration the limitations of available data and in consultation with the DfT and the DVLA, the following definition was agreed:

Vehicles that are used on the road with one or more of the following characteristics:

- *Untaxed (or SORNed) for at least 3 months¹*
- *Between keeper for at least 3 months*
- *Keeper with an unallocated post-code (as a rough indicator of vehicles registered to a false name or address)*
- *VRM that does not appear on the DVLA record (an indicator of vehicles with false or tampered number plates)*
- *VRM registered to a different vehicle type or model (an indicator of vehicles with false or tampered number plates, or vehicles that have been 'imperfectly' rung or cloned)*
- *Declared scrapped*

10. The working definition of the vehicle underclass applied in this study is shown graphically in Figure 1.

Figure 1: Working definition of the underclass



11. Several categories of “underclass” vehicles have been omitted from this definition. These include uninsured vehicles and vehicles without MOT. Although such vehicles undoubtedly are ‘underclass’ vehicles, there is

¹ In our initial report we demonstrated that the three-month cut off point was fair as the longer people evaded payment, the greater the likelihood that they would continue to evade. The policy question was at which point had the rate of decay slowed sufficiently that all those evading VED from then onwards should be considered part of the underclass. Drawing the line at 3 months was justified on the grounds that more than 50% of people at this stage in their evading ‘careers’ will go on to evade for 12 months or more.

currently very little data available to measure these problems. However, there is likely to be substantial overlap between these categories and tax evasion, so the number of underclass vehicles may be little affected by this exclusion. Foreign-registered vehicles that have been in the UK for more than six months are also excluded. Finally, it has not been possible to estimate 'perfectly' cloned or rung vehicles, that is vehicles that have been disguised as others of the same make and model so well that this cannot be detected by the current methodology.

12. No data sources were found that could provide a measure of all the underclass categories listed above. The best sources of data available for this study were the DfT Roadside Survey, analysed in combination with the DVLA full vehicle record.

SECTION II: ESTIMATING THE CURRENT SIZE OF THE VEHICLE UNDERCLASS

13. The following were used as the main sources of data for this report:

- Analysis of the full DVLA vehicle record (the VSS), containing details of all vehicles that have ever been registered in Britain (of which there were approximately 77.9 million as of September 2004). There are **32,400,000** vehicles currently registered in the UK.
- Reanalysis of data from the most recent DfT roadside survey, which was conducted in June 2004 for the purposes of providing an estimation of numbers of untaxed vehicles on the road. The sample size was **1,143,254** vehicles.
- Transcription and analysis of VRMs and vehicle makes/types from a sub-set of roadside survey vehicles from June 2002 (numbering **4,462**) which had been recorded on video and could therefore be re-examined. These were then compared against the DVLA vehicle record.²

14. To avoid double-counting of underclass vehicles (eg. to avoid counting a vehicle which is untaxed *and* between keepers once for each infraction), categories were defined to be mutually exclusive. For example, the 'between keeper' category in the table below excludes those that are untaxed, as these will be captured in the 'untaxed vehicle' category.

15. There were two stages to the process of estimating the size of the vehicle underclass. The first stage involved an estimation of the total number of 'problem vehicles', which includes *all* untaxed and between keeper vehicles whatever the period of time of such evasion. The second stage of analysis

² In the absence of new data, we have used information from a sub-set of the roadside survey 2002, which formed part of JDI's initial report.

built on the first, in producing the estimated size of the vehicle underclass and applying the time criterion of three months.

Problem vehicles

16. Table 1 shows the underclass problem categories, constructed to eliminate overlap, and the number of vehicles found to fall in each.

Table 1: Basic data on underclass categories

Problem vehicle category	Data source	Number (%)
Untaxed vehicles	VSS details of full Roadside Survey sample, 2004	21,722 (1.9% <i>in traffic</i>)
Between keepers (bk) & taxed	Analysis of vehicles on the VSS, 2004	713,021 (2.2%)
Declared scrapped & not bk & taxed	Analysis of vehicles on the VSS, 2004	83,529 (0.3%)
Unallocated postcodes & not dec. scrapped & not bk & taxed	Analysis of vehicles on the VSS, 2004	46,526 (0.1%)
Non-existent VRMs	Sub-set of roadside survey compared against the VSS (data from 2002)	1 (0.02%)
Vehicle type/make mismatch & not dec scrapped & not bk & taxed	Sub-set of roadside survey compared against the VSS (data from 2002)	1 (0.02%)

The figures taken from the VSS database are based on the 32,400,000 vehicles currently registered in the UK.

17. To produce the total number of problem vehicles, the estimation of 'untaxed vehicles' category shown in Table 1 had to be grossed up to the total vehicle population, as did the number of vehicles in the 'non-existent VRMs' and 'vehicle type/make mismatch and not declared scrapped and not between keeper and taxed' categories. The 'between keepers and taxed', 'declared scrapped and not between keeper and taxed' and 'unallocated postcodes and not declared scrapped and not between keeper and taxed' categories, were all derived from the VSS and hence already provided numbers for the total population. The calculations are shown in Box 1, and produced a total of **2,119,636** problem vehicles, or **6.54%** of the total vehicle population.

Box 1: The total 'problem vehicle' population

Untaxed vehicles
DfT has calculated that the roadside survey figure of 1.9% 'in traffic' equates to a figure of 3.9% 'in stock' or a total of 1,263,600 vehicles.

Between keepers (bk) & taxed
Figure from the DVLA VSS database is 713,021 (2.2%).
Because they are taxed, all these vehicles are assumed to be in use.

Declared scrapped & not bk & taxed
Figure from the DVLA VSS database is 83,529 (0.3%).

Unallocated postcodes & not dec. scrapped & not bk & taxed
Figure from the DVLA VSS database is 46,526 (0.1%).

Non-existent VRMs

Figure from roadside survey sub-set is 0.02%. Equating this to 0.02% 'in stock', this suggests total number of these vehicles in use = 6,480

Mismatches of vehicle type or make & taxed & not bk & not dec. scrapped

Figure from roadside survey subset is 0.02%. Equating this to 0.02% 'in stock', this suggests total number of these vehicles in use = 6,480

Total number of vehicles on the road =
31,136,400 taxed vehicles + 1,263,600 untaxed vehicles = 32,400,000

Total number of **problem vehicles** =
1,263,600 + 713,021 + 83,529 + 46,526 + 6,480 + 6,480 = 2,119,636

Problem vehicles as a % of all vehicles on the road = 6.54%

18. JDI's earlier report (based on VED evasion from the 2002 roadside survey) estimated the number of problem vehicles at 7.34%. The smaller estimate in this report reflects a lower level of VED evasion found in the 2004 roadside survey.

19. Although the number of problem vehicles appears to have decreased, there have been some increases within particular subsets of the vehicle underclass. Specifically, the numbers of vehicles taxed but between keepers have increased from 1.5% (491,000) in 2002 to 2.2% (713,021) of the vehicle population in 2004. Although these vehicles are taxed, determining the correct keeper of the vehicles can make chasing of fines (speeding, parking, congestion charges etc) difficult. Furthermore, when the current tax on the vehicle expires, the between keeper status of these vehicles makes it difficult to determine who the DVLA should contact for renewal. This in turn increases the possibility that these vehicles can then slip out of the system. However, closer analysis of the length of time that these vehicles have been between keeper should better indicate whether the increase of vehicles in this category is likely to be due to either more people taxing their vehicles, or more vehicles being at risk of falling out of the system (see the following subsection).

20. The numbers of vehicles declared scrapped and not between keeper and taxed has also increased from 0.1% in 2002 to 0.3% of vehicles in use in 2004. However, this increase may be due to differences in the way that these raw figures were determined across the two surveys. In 2002, the problem vehicle category "Declared scrapped and not between keepers and taxed" was calculated by obtaining vehicle details from the roadside survey sample, which was then grossed up to the total vehicle population in use. In 2004, DfT did not have the scrapped marker on the Evasion Survey database and due to staff shortages they did not have the resources to produce it. Instead, DfT produced the figures straight from the full VSS record rather than grossing up from the roadside survey.

20. Interrogation of the roadside survey data also provides some insight into the size of the overlap between 'untaxed' and 'between keeper' vehicles. 28,227 of the vehicles in the roadside survey sample were between keeper. Of these, 3,924, or 14%, were also unlicensed.

The vehicle underclass

21. An estimate of the size of the vehicle underclass, excluding vehicles that had been untaxed or between keeper for less than 3 months, was produced on the basis of the 'problem vehicles' estimate and the following additional data:

- Of the untaxed vehicles in the 2002 roadside survey subset (of which there were 137, or 3.1% of the total), 45% had been untaxed for more than three months. Because we do not have a subset of the 2004 roadside survey for video analysis, we have used the 2002 figure in our following calculation.
- 13.9% of between keeper vehicles in the full 2004 roadside survey were also untaxed;
- DVLA data on the vehicles on its 'no current keeper' database (which only includes vehicles that had been taxed at some point within the past two years) show that 12% of these vehicles had been between keeper for more than three months³.

22. The size of the vehicle underclass, taking into account the three months' criterion, was estimated to be **804,835**, or **2.5%** of the total vehicle population, as shown below in Table 2. As in Table 1, above, the underclass categories are defined in such a way as to avoid double-counting of vehicles.

Table 2: Estimated size of vehicle underclass

Underclass category	No. of vehicles*	% of total vehicle population (32,400,000)
Untaxed ≥ 3 months	568,620	1.8%
Bk ≥ 3 months & taxed + Bk ≥ 3 months & untaxed < 3 mths [#]	93,200	0.3%
Declared scrapped & not bk & taxed	83,529	0.3%
Unallocated postcodes & not dec. Scrapped & not bk & taxed	46,526	0.1%
Non-existent VRMs	6,480	0.02%
Vehicle type/make mismatch & not dec scrapped & not bk & taxed	6,480	0.02%
TOTAL UNDERCLASS	804,835	2.5%

*grossed up to total vehicle population

[#]see appendix for details of how this figure was calculated

23. The size of the vehicle underclass in JDI's earlier report was estimated to be 970,800 or 3% of the total vehicle population (based on information from

³ In the absence of new data, we have used the information taken from DVLA's records at the time of the 2002 VED roadside survey.

the 2002 VED roadside survey evasion). The current rate shows a decrease in the estimated size of the underclass. As mentioned previously, this appears to be due to a lower level of VED evasion found in 2004 roadside survey.

The three-month cut off point

24. The previous report discussed the point at which an untaxed vehicle can be considered to have fallen into the underclass. It showed that the longer people evade for, the greater the likelihood that they will continue to evade. JDI have drawn the line at 3 months of evasion based on the 2002 results which showed that more than 50% of people evading at this point will go on to evade for a further year or more. However, we have also produced estimates of the size of the underclass, based on periods of 6 months or more of evasion and one year or more. These are shown below with the findings from the original report, in Table 3.

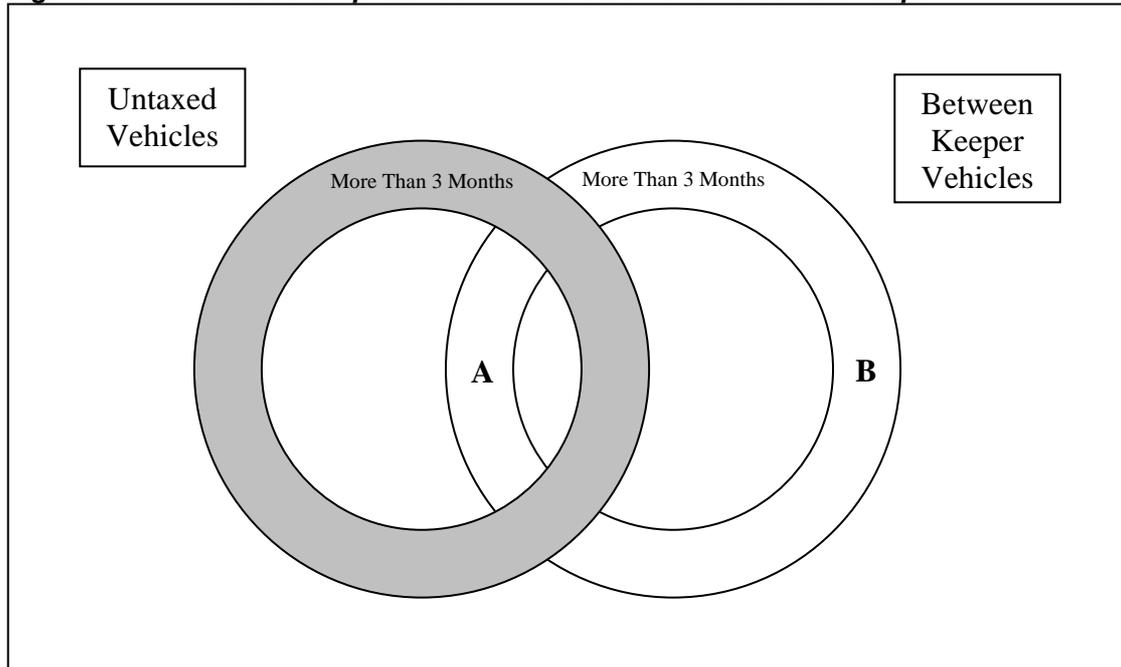
Table 3: Effect of VED evasion on the size of the underclass

Length of tax evasion	Size of vehicle underclass			
	No. vehicles		% of vehicle population	
	2002 data	2004 data	2002 data	2004 data
3 months or more	970,800	804,835	3.0%	2.5%
6 months or more	844,480	654,458	2.6%	2.0%
12 months or more	611,400	480,339	1.9%	1.5%

APPENDIX: ESTIMATING VEHICLES THAT ARE BETWEEN KEEPERS

25. Figure 2 displays the relationship between vehicles that have no current keeper and vehicles that are untaxed. Our estimate of the number of vehicles that have been evading VED for more than three months (the dark outer ring in figure 2) includes some vehicles that are also 'between keepers', as the overlap between the two outer rings in figure 2 demonstrates.

Figure 2: Relationship between VED evasion and no current keeper



26. The task here is to estimate the number of vehicles that have been between keepers for more than three months (and therefore fall into the underclass category) but which have not been counted in our VED evasion figure. Figure 2 shows that there are two such groups:

- Vehicles that have been between keepers for more than three months but evading tax for less than three months ("A" in figure 2 above) and,
- Vehicles that have been between keepers for more than three months but are taxed ("B" in figure 2 above).

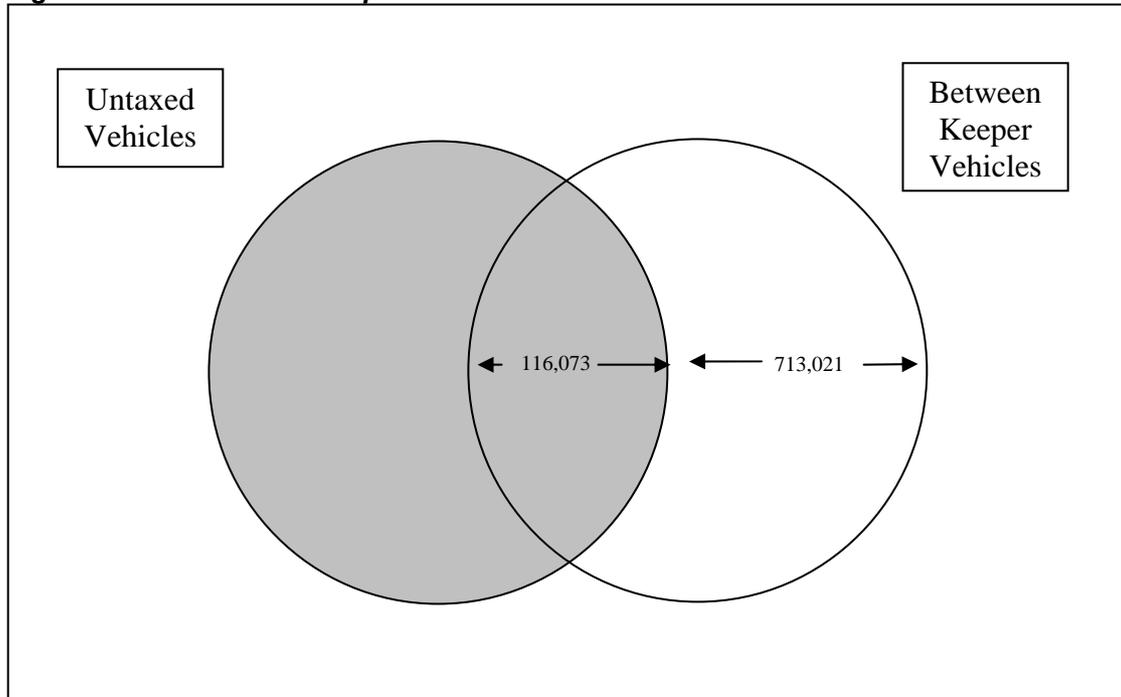
The following explains how we estimated the size of A and B.

Step 1 – Distinguishing 'between keeper' vehicles that are taxed and untaxed

27. We know from our scan of the VSS that there are 713,021 vehicles that are between keepers and taxed. We also know from our analysis of the sub-sample of the roadside survey that this figure represents 86% of all between keeper vehicles (ie 14% of all between keeper vehicles are untaxed). This means that the total number of vehicles between keepers is 829,094. Of

these, there are 116,073 vehicles nationally that are between keepers but untaxed (see figure 3).

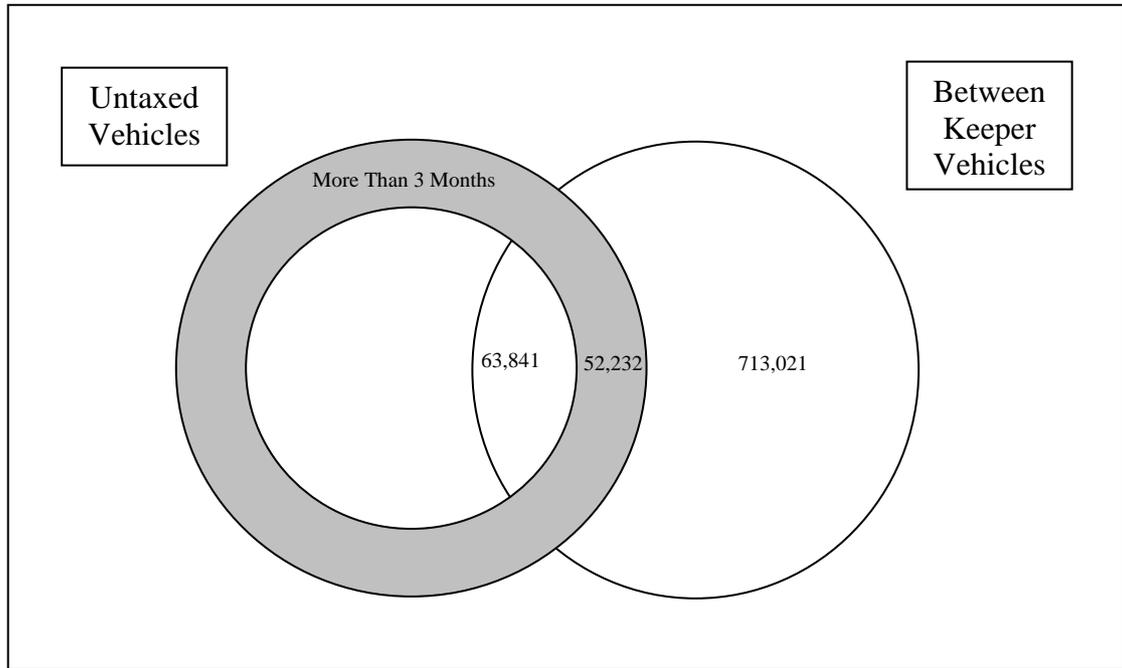
Figure 3: *Between keepers: taxed vs untaxed*



Step 2 – Identifying between keeper vehicles that have been untaxed for less than three months

28. We know that 55% of untaxed vehicles have been untaxed for less than three months. Applying this rule to the 116,073 figure above produces a figure of 63,841 vehicles that are between keepers and untaxed for less than three months (see figure 4).

Figure 4: Between keeper vehicles untaxed for less/more than three months



Step 3 – Identifying which of these vehicles have been between keepers for more than three months

29. According to DVLA figures, approximately 12% of vehicles that are between keepers have been between keepers for more than three months. Applying this figure to the 63,841 vehicles that are between keepers and untaxed for less than three months and 713,021 vehicles that are between keepers and taxed produces 7,661 and 85,563 vehicles respectively (see figure 5 below).

30. The number of vehicles that are between keepers for more than three months and either untaxed for less than three months (7,661) or taxed (85,563) therefore equals 93,224. For simplicity, we have rounded this to 93,200 in the text of this report.

Figure 5: Estimate of different categories of 'between keeper' vehicles

