

Transport Research Laboratory



Mobile Phone and Seat Belt Usage Rates in London 2008

by J Knowles, LK Walter and G Buckle

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by J Knowles, LK Walter and G Buckle (TRL)

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	Name	Date Approved
Project Manager	Paul Walton	26/06/2008
Technical Referee	Jeremy Broughton	24/06/2008

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Executive summary

The third London Seat Belt and Mobile Phone survey was carried out in March 2008 to survey the use of restraints¹ by car, taxi and van occupants, and the use of mobile phones by drivers. The survey used the same method as the London survey in 2006 and 2007 and the long running Department for Transport (DfT) Seat Belt and Mobile Phone survey. Observations were made on a weekday at 33 sites in London covering a range of different road types – one site in each Borough and one in the City of London. Ten of the sites were also surveyed at the weekend.

In total 30,850 cars and taxis and 5,314 vans were observed in 2008. Details of restraint use, age group and gender were recorded for all drivers, 14,118 car and taxi passengers and 1,394 van passengers as well as mobile phone use by the drivers. The report compares results from the 2008 survey with results from the 2006 and 2007 London surveys and the most recent DfT survey.

Overall, the survey found that a higher proportion of car drivers in London were wearing seat belts in 2008, compared with the previous two years. In 2008, 89% of car drivers in London were observed to be wearing seat belts. This wearing rate is an increase from 82% in 2006 and 87% in 2007. The survey found a less positive picture for passenger seat belt compliance. In 2008, there was a further increase in seat belt wearing for front seat passengers in cars (80% in 2006; 84% in 2007; 86% in 2008). However, the wearing rate for rear seat passengers in cars decreased slightly in 2008 after a substantial improvement in 2007 (49% in 2006; 65% in 2007; 63% in 2008).

The proportion of occupants observed wearing seat belts in London was lower than that observed in the Built-Up sites of the DfT survey, although the difference between the two surveys is smaller in 2008 than in 2006. For example, nationally the proportion of car drivers wearing a seat belt has remained fairly stable at around 92% over the last few years (DfT survey). However, in London compliance is slightly poorer, although it has risen from 82% in 2006 to 89% in 2008.

Drivers of hackney carriages are not legally required to wear a seat belt whilst on duty and private taxi drivers are not required to wear a seat belt when they are carrying a fare paying passenger. As a consequence, the proportion of taxi drivers wearing seat belts (14% in 2008) is substantially lower than the for car drivers (89% in 2008). The proportion of taxi passengers wearing seat belts has increased gradually since 2006 (17% in 2006; 19% in 2007; 21% in 2008). However, this proportion is considerably lower than the proportion of car passengers wearing seat belts. The proportion of van drivers wearing seat belts increased from 56% in 2007 to 61% in 2008, whilst the wearing rate for van passengers remains at just under 50% in 2008.

The 33 sites were grouped into five regions of London for analysis. This analysis showed that the wearing rates were lowest in Central London and the highest in South East London.

The survey records the type of child restraint used, so the effects of the new child restraint regulations could be monitored. The 2007 survey saw a significant drop in the proportion of unrestrained children (aged 0-4 and 5-9) from 2006. The 2008 survey found that the effect of the new regulations was not sustained for children aged 0-4 yrs returning to 2006 levels for those seated in the rear of the car (25% unrestrained in 2008 compared with 8% in 2007). However, the effect was sustained for children aged 5-9 and 10-13, with these age groups seeing slight drops in the proportion of unrestrained children: in the front seat the proportion of 5-9 years olds observed not wearing a restraint dropped from 21% in 2007 to 18% in 2008, and the proportion of 10-13 year olds dropped from 14% to 13% in the same period; and in the rear seat the proportion of 5-9 years olds observed not wearing a restraint dropped slightly from 27%

¹ Restraint includes seat belt and appropriate child restraint systems.

in 2007 to 26% in 2008, and the proportion of 10-13 year olds dropped from 31% to 28% in the same period.

Overall mobile phone use has increased over the last three years for all car drivers (3.8% in 2006; 3.7% in 2007; 5.0% in 2008), taxi drivers (1.9% in 2006; 3.8% in 2007; 8.1% in 2008) and van drivers (4.8% in 2006; 6.7% in 2007; 7.7% in 2008). In 2006 the majority of the mobile phones being used were hand-held, while in 2008 the reverse is true with a greater proportion of drivers using hands-free phones while driving. After the penalties for using a hand-held mobile phone while driving increased in February 2007, the proportion of car drivers using hand-held phones fell from 2.6% in 2006 to 1.4% in 2007. However, this proportion increased in 2008 to 1.9%. Over the same three year period the use of hands-free mobile phones has risen: for car drivers from 1.2% in 2006 to 3.1% in 2008, for taxi drivers from 0.8% in 2006 to 7.5% in 2008 and for van drivers from 1% in 2006 to 4.9% in 2008. While more drivers are complying with the law, its focus on hand-held mobiles may have led them to believe that hands-free mobile phones are safer than hand-held to use while driving. There is research to suggest that there may be no difference (e.g., Kircher et al., 2004²).

Previous London surveys showed that drivers' use of hand-held and hands-free mobile phones was correlated with their use of seat belts. As in previous years, belted drivers in 2008 were less likely than unbelted drivers to use hand-held mobile phones. 1.6% of car and taxi drivers wearing a seat belt were using a hand-held mobile phone, compared with 2.7% of those who did not wear a belt, and a similar disparity was found for van drivers. This suggests that driving while using a hand-held mobile phone and whilst unbelted are consequences of a driver's general willingness to disobey traffic laws.

The Police issue fixed penalty notices (FPNs) for restraint and mobile phone driving offences. Rates of seat belt FPNs issued in 2007 varied from 0.28 per million vehicle km in South East London to 0.78 per million vehicle km in Central London, with an average in London of 0.43 per million vehicle km. More FPNs were issued for mobile phone offences, although fewer drivers use hand-held mobile phones than fail to wear seat belts. Overall 0.89 FPNs per million vehicle km were issued in 2007, rates ranged from 0.58 per million vehicle km in South East London to 1.92 per million vehicle km in Central London.

In conclusion, the results of the latest survey show that overall seat belt wearing rates are improving, but mobile phone use is worsening, albeit the trends are different for hand-held and hands-free. With any increase in the level of restraint use in London and reduction in the level of mobile phone use while driving, the number of casualties would be expected to fall. Using 2007 casualty figures and the 2008 survey results, if the seat belt wearing rate in London was 100%, the resulting casualty saving has been estimated at around 160 KSI casualties and 590 total casualties per year. Similarly, if no drivers used a mobile phone, it is estimated that there would be approximately 560 fewer KSI casualties per year.

² Kircher, A, Vogel, K, Tornos, J, Bolling, A, Nilsson, L, Patten, C, Malmstrom, T and Ceci, C (2004). *Mobile telephone simulator study*. Swedish National Road and Transport Research Institute, Sweden.

1 Introduction

The use of seat belts by drivers and front seat passengers was made compulsory in cars and vans in January 1983, and for rear seat passengers in 1991 - where belts were available. A national DfT-funded seat belt survey was implemented in 1982, and superseded in 1988 by a more comprehensive TRL survey that was carried out twice a year to record the use of restraints by car, van and taxi drivers and their passengers. The survey was adapted in the year 2000 to record the use of hand-held and hands-free phone use by drivers. This provided important evidence of drivers' response to the legislation in December 2003 to prohibit the use of a hand-held mobile phone while driving.

An equivalent study in London was carried out in 2006 and 2007 for Transport for London (Broughton & Buckle, 2006 and Walter et al, 2007). The restraint and mobile phone use was observed at one site in each of the 32 London Boroughs and another in the City of London in March of each year. The survey was repeated in 2008 and the results are presented in this report. These findings are compared with the 2006 and 2007 results for London and the latest results on Built-Up³ roads in the DfT survey (October 2007).

Previous London surveys found that mobile phone use was higher than on Built-Up roads in the DfT survey, and that restraint wearing was lower. If the levels in London had matched those found in the DfT survey, it is estimated that fewer people in London would have been killed and injured in road collisions.

2 Survey methods

2.1 Data collection

In March 2006, the first seat belt and mobile phone survey for London was completed using methods that had been developed for the DfT survey. The basic method has been applied since 1988, with adaptations to the data requirements and collection procedures, and each year the results are published in a leaflet (e.g. TRL, 2008). Two extensive areas are used for the DfT survey, centred on Crowthorne and Nottingham, and other areas are surveyed each year to build up a national picture (Broughton, 2003). Restraint usage is well represented by the two areas; mobile phone usage is more varied, however, so these proportions are not as nationally representative.

For the London survey, detailed data were collected at 33 sites – one site per London Borough and one in the City of London. In order to achieve a representative London estimate, the 33 sites cover all types of road – 12 were situated on the Transport for London road network (TLRN), 11 on the Borough Principal Road Network (BPRN) and the remaining ten on Minor roads (Minor). The sites are not designed to be representative of individual Boroughs, but to give a balanced view of seat belt and drivers' mobile phone use in London. In the analysis, data are weighted to represent the distribution of traffic on these three types of road in London. In order to make direct comparisons with the 2006 and 2007 surveys, the same sites were revisited in 2008.

The survey collected information on drivers, front and rear seat passengers and people sitting on laps in cars, vans and taxis (hackney carriages and private hire vehicles). The information comprised details of restraint use for all occupants (including the different child restraint types) and mobile phone use for drivers. Age group and sex were also collected along with car registration, as cars older than E registration are not required to have rear seat belts. Age group and sex of the occupants was estimated by the survey staff and where there was doubt the variable was recorded as unknown. The sex of young children is particularly difficult to estimate and this is reflected in the numbers

³ Built-up roads have speed limits of less than 40mph.

recorded as unknown: almost 100% of under 1s, 46% of 1-4 year olds, 53% of 5-9 year olds and 41% of 10-13 year olds compared with under 1% unknown for the adult age groups. Estimating a child's age is also difficult.

The data collection procedures were as consistent as possible across the years. Each set of data was collected at a signal controlled junction in eight half hour sessions during daylight hours on a weekday. Ten sites were also surveyed at the weekend to detect any differences in restraint wearing and mobile phone use during the weekend. Two people were posted at each site: one recorded the number and type of vehicles passing in the observation session while the other recorded restraint and phone use for occupants of vehicles that stopped at the traffic signal. The detailed data on occupants in each vehicle were recorded via a digital voice recorder. The data recorded for each vehicle are detailed in Table 2.1.

Table 2.1: Variables and categories of data collected in survey

Variable	Categories
Seating position	driver, front seat passenger, rear seat passenger (left, central, right); people seated on passengers' laps
Sex	male, female, unknown.
Age (estimated)	0, 1-4, 5-9, 10-13, 14-29, 30-59, 60+, unknown.
Restraint used	seat belt, unrestrained, child seat, rear facing baby seat, booster seat with seat belt, booster cushion with seat belt, booster seat without seat belt, booster cushion without seat belt, cheated (restraint not used properly), unknown
Driver mobile phone use	Hand-held, hands-free, none
Vehicle type	car, van, hackney carriage, private hire vehicle
Vehicle prefix	L and later registrations, H-K, E-G, C-D, older, other

The survey was conducted during daylight hours, in order to observe vehicle occupants accurately. Broughton and Walter (2007) present evidence to suggest that restraint wearing rates are lower at night (defined as 8pm-7.59am) than during the day (8am-7.59pm), so wearing rates for the full day are likely to be slightly lower than the rates calculated from the survey data.

The survey collected information on the use of hand-held and hands-free mobile phones. A hand-held device is something that "is or must be held at some point during the course of making or receiving a call or performing any other interactive communication function". A hands-free device is one that can be operated without holding the mobile phone. It is an offence to use a hand-held mobile phone when driving regardless of whether the driving has been affected; this is not the case for hands-free phones. Observations of drivers using hands-free phones are only recorded if the observer is sure that a hands-free device is being used. Due to the difficulty in observing hands-free phone usage, these results are likely to be underestimates.

2.2 Changes from previous surveys

No major road traffic regulation changes occurred between the 2007 and 2008 surveys. However, two sets of changes occurred between the 2006 and 2007 surveys: the road traffic regulations changed in two significant respects and some minor adjustments were made to the survey sites and procedure (Walter, Broughton & Buckle, 2007). On 18 September 2006, a new regulation took effect that requires a driver to ensure that any

child travelling in their vehicle uses an appropriate type of restraint (DfT, 2006). The definition of 'appropriate' depends upon the child's age, weight and height, but the conventional belt designed for adults is not regarded as appropriate for children up to 135cm in height (or 12th birthday, whichever they reach first). The introduction of the new regulation was accompanied by extensive national publicity and public discussion.

The use of a hand-held mobile phone while driving was prohibited in December 2003, and new penalties were introduced on 27 February 2007. From that date, the fixed penalty included three penalty points and the basic fine was doubled to £60. Thus, it became possible for a driver to be disqualified from driving as a result of repeated mobile phone offences. Again, the new regulation was introduced to the accompaniment of extensive national publicity and public discussion.

During data quality checks for the 2008 survey, two sites were found to be missing detailed data for vans, namely Hackney and Hammersmith & Fulham. This error was due to a new member of the survey team failing to separately identify vans from cars at these two sites. The main reason of concern is that van drivers are less likely to wear their seat belts than car drivers (56% wearing rate compared to 87% wearing rate in 2007) and are more likely to use a mobile phone (6.7% compared to 3.7% in 2007). However, a detailed look at the results from these two Boroughs confirms that this error does not have a significant impact on the main results and does not affect the conclusions. However, for the remainder of the report whenever cars are referred to in the tables and figures, a small unknown number of vans will be included from these two Boroughs. A more detailed analysis of Hackney and Hammersmith & Fulham are presented in Appendix A.

2.3 Data Analysis

The 2008 data have been analysed identically to the 2007 and 2006 survey data, so the three sets of results can be compared directly.

Restraint use and mobile phone use that are classified as unknown are excluded from the analysis, and occupants classified as not using their restraint properly⁴ are included as 'unrestrained' passengers. Weights were applied to the data to give a more representative estimate of rates across London. At the Borough level, these weights were based on traffic counts in each session to ensure that the proportion of vehicles for which detailed data is collected is the same across all sites and sessions. When the data were combined to give an overall estimate for London, an additional weighting procedure allowed for traffic flows on different types of road in London. The identical process was used to analyse the data from the 2006 and 2007 London surveys and follows the methods of the long running DfT survey.

The results from 2008 were compared with the London 2006 and 2007 results and the October 2007 results from Built-Up roads in the DfT survey (using observations from sites with a speed limit of at most 40mph) where appropriate. At the time that this report was being prepared, the most recent DfT seat belt and mobile phone survey had been conducted in October 2007. Note that results quoted from that survey (labelled DfT 2007) relate to sites with speed limits up to 40mph, in order to be comparable with the sites of the London survey.

3 Survey results 2008

During March 2008, observations were made at 33 sites in London. Table 3.1 shows the numbers of vehicles observed on 43 site visits (33 sites visited on a weekday and ten sites revisited at the weekend). Detailed observations were made of the occupants of

⁴ This includes occupants wearing a seat belt that has not been fastened. Vehicle occupants who are classified as not using their restraint properly make up approximately 1.5% of all unrestrained occupants.

30,850 cars and taxis and 5,314 vans; a decrease in the number of observations of 5% and 12% respectively, compared with 2007. The average number of front and rear seat passengers per vehicle has not changed over the last three years - an average of 0.3 front seat passengers per car and 0.16 rear seat passengers per car. Details were recorded for 1,798 taxis, 70% of these were observed in Central London and 12% in North East London (these areas are defined in Appendix B).

There were fewer observations of van and taxi occupants than car occupants, so larger variation between results from the three surveys may arise by chance for van and taxi occupants than car occupants. In some cases only car driver or car occupant results are displayed as they provide the most robust results.

Once the data had been verified and validated, weights were applied to each data point dependent on the volume of traffic per road type and weekend or weekday and the proportion of vehicles that passed during the survey session for which detailed observations were made. The weights ensure that results represent London averages as well as possible. All proportions reported in this report have been weighted, and any sample size is reported as an unweighted actual representation of the number of observations.

Table 3.1: Number of vehicles and occupants observed, London surveys

Vehicles & Occupants	2006	2007	2008
Cars	27,638	30,126	29,052
Front seat passenger	8,534	8,893	8,839
Rear seat passenger	4,343	4,734	4,374
Taxis	1,497	2,027	1,798
Passenger	790	1,095	905
Vans	4,709	6,006	5,314
Passenger	1,252	1,550	1,394

The 33 sites are spread across the three types of road in London (TLRN, BPRN and Minor). Table 3.2 shows the numbers of vehicles observed on each road type during the study and the most recent estimated annual traffic flow in million vehicle kilometres travelled on these roads in London (2007 data). These numbers form the basis of the weighting system.

Table 3.2: Distribution of vehicles observed (2008) and annual traffic by road type in London (2007)

Road type	Vehicles observed		Traffic volume¹ (million vkm)	
	Car or taxi	Van	Car or taxi	Van
TLRN	12,789	2,438	7,618	1,257
BPRN	9,420	1,575	6,837	925
Minor	8,641	1,301	10,261	1,680

¹Traffic data sources: Table 4.1.2, London Travel Report 2007 (TfL, 2008), RNPR Traffic Note 1 (RNPR, 2008)

The vehicle registration was recorded to identify older cars which, if older than an E registration (registered before August 1987), are not required by law to be fitted with rear seat belts. However, as shown in Table 3.3, the vast majority (over 99% in 2007 and 2008) of cars observed were newer than this, so no adjustment for these older vehicles was deemed necessary.

Table 3.3: Distribution of car registrations in London year

Survey	L and later	H-K	E-G	C-D	Older
2006	90.4%	5.8%	2.3%	0.5%	0.9%
2007	94.4%	3.7%	1.2%	0.4%	0.4%
2008	95.3%	3.0%	1.0%	0.4%	0.3%

Distribution excludes other registrations, e.g. military and diplomatic

3.1 Use of seat belts and other restraints

The DfT survey has been running for many years, so it is possible to follow the trend in restraint wearing across time for different categories of occupants and vehicles.

Figure 3.1 shows this trend from 1995 for driver, front seat passenger and child and adult rear seat passengers in cars. The driver and front seat wearing rates have been around 92% over the last few years whilst rear restraint wearing rates for children⁵ and adults have tended to increase. The adult rear seat belt wearing rate remains considerably lower than the other rates. The results of the latest DfT survey for Built-Up roads only (October 2007) are included in this report for comparison purposes and are referred to as the national average.

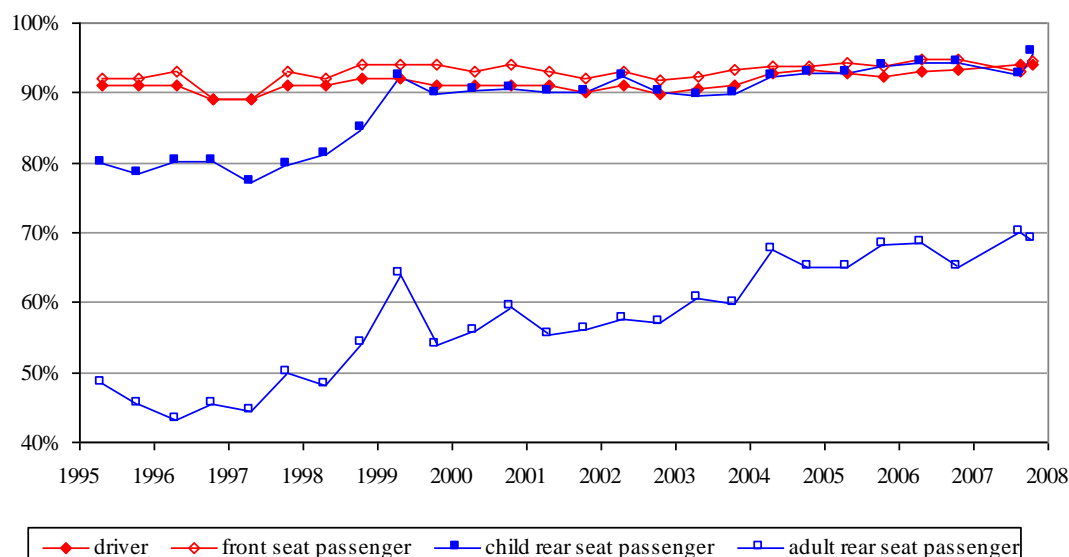


Figure 3.1: Trends in wearing rate, DfT survey

Table 3.4 shows the overall proportion of drivers and passengers (including children) using restraints for the three London surveys together with the national average (DfT 2007). In London in 2008, 89% of car drivers were observed wearing a seat belt,

⁵ Seat belt wearing rate for children includes appropriate use of child seats, booster seats and cushions.

compared with 87% in 2007. This increase brings the wearing rate in London closer to the national average of 92%. The proportion of front seat car passengers who were restrained also increased from 84% to 86% between 2007 and 2008 while the proportion of restrained rear seat car passengers fell to 63% and remains lower than the national average of 82%. The proportion of taxi drivers wearing seat belts has fluctuated between 12% and 14% over the last three surveys and 21% of passengers in taxis were observed wearing a seat belt in 2008. Drivers of hackney carriages are not legally required to wear a seat belt whilst on duty and private taxi drivers do not have to wear a seat belt when they are carrying a fare paying passenger, but taxi drivers face the same risks as car drivers when involved in a collision. Seat belt wearing rates for van drivers increased from 51% in the 2006 survey to 61% in 2008, whilst the wearing rate of passengers in vans remains at just under 50%. The rates for van drivers and passengers are still lower than the wearing rates for car occupants.

Table 3.4: Overall proportion of vehicle occupants using restraints

Survey	Drivers	Passengers			Number of vehicles
		Front seat	Rear seat	All ¹	
Cars	London, 2006	82%	80%	49%	27,638
	London, 2007	87%	84%	65%	30,126
	London, 2008	89%	86%	63%	29,052
	DfT, Oct 2007	92%	92%	82%	15,644
Taxis	London, 2006	14%		17%	1,497
	London, 2007	12%		19%	2,027
	London, 2008	14%		21%	1,798
Vans	London, 2006	51%		40%	4,709
	London, 2007	56%		49%	6,006
	London, 2008	61%		48%	5,314
	DfT, Oct 2007	69%		55%	2,419

¹Very few rear seat passengers were observed in vans and front seat passengers in taxis, so they have been combined with front seat passengers.

Overall seat belt wearing rates increased more markedly between 2006 and 2007 than between 2007 and 2008. This may be due to publicity campaigns run both on national TV and radio as well as by the Metropolitan Police in March 2007. The increased penalties for mobile phone use and the new child seat belt regulation, along with accompanying publicity and increased enforcement is also likely to have contributed to the increase between 2006 and 2007. The higher wearing rates have been sustained and slightly improved on for drivers of cars and vans in 2008 but have fallen slightly for rear seat passengers.

Table 3.5 shows the wearing rates for car occupants on the three road types (TLRN, BPRN and Minor roads). The wearing rate for front seat car occupants on TLRN roads was highest while broadly similar rates were observed for BPRN and minor roads in 2008. Rear seat passenger wearing rates were highest on Minor roads at 66% and lowest for BPRN roads at 60%.

Table 3.5: Proportion of car occupants using restraints, by road type

Road type	Year	Proportion using restraints			Sample size		
		Drivers	Passengers		Drivers	Passengers	
			Front seat	Rear seat		Front seat	Rear seat
TLRN	2006	82%	82%	50%	10,894	3,447	1,749
	2007	90%	88%	65%	11,971	3,605	1,794
	2008	90%	89%	64%	11,959	3,826	1,999
BPRN	2006	83%	77%	39%	7,726	2,264	1,111
	2007	86%	81%	52%	9,181	2,561	1,399
	2008	88%	85%	60%	9,082	2,665	1,249
Minor	2006	82%	79%	55%	9,018	2,823	1,483
	2007	85%	83%	69%	8,974	2,727	1,541
	2008	88%	82%	66%	8,011	2,348	1,126

At ten survey sites, observations were made at the weekend as well as on a weekday. Table 3.6 compares the weekday and weekend wearing rates at the sites where observations were made at the weekend. The results for 2008 showed a relatively consistent picture between weekend and weekdays for drivers and front seat passengers. Wearing rates for rear seat passengers were observed to be higher at the weekend in 2008, while the opposite was found in 2006. These results may again be affected by small numbers.

Table 3.6: Proportion of car occupants using restraints, by time of week

	Weekday			Weekend		
	2006	2007	2008	2006	2007	2008
Driver	85%	87%	89%	85%	87%	91%
Front seat passenger	82%	82%	84%	81%	84%	89%
Rear seat passenger	55%	60%	58%	49%	67%	67%
Number of cars	6,387	7,000	8,381	6,929	6,558	7,513

The variation of wearing rate by sex and age is shown in Table 3.7 and Table 3.8. The age and sex of a baby and young child is particularly difficult to estimate and a consequence of this difficulty is that the sample size for the younger age groups is reduced and the results are subject to more variation. In the majority of cases wearing rates for males were lower than for females in all surveys. For drivers and front seat passengers there is a general increase in wearing rate as age increases and for rear seated passengers children (under 14) have the highest wearing rates. The driver is responsible for children wearing a restraint up to the age of 14 and this could explain the lower restraint wearing rates of the other age groups.

In 2008, driver wearing rates increased for all ages and both sexes compared to 2007. This increase was also true for adult rear seat passengers, particularly for male rear

seated passengers (increasing from 25% to 40%). However, the seat belt wearing rate for children sitting in the back of the car fell in 2008, in particular the rate for children aged under five years old fell to the level seen in 2006 (these proportions are subject to more variation as they are based on smaller numbers of observations). The use of restraints by children in London increased between 2006 and 2007 possibly as a result of the publicity surrounding the new regulation concerning the use of child car seats introduced in September 2006. The effects however, were not sustained in 2008 for young children in the age group 0-4 shown in detail in Table 3.9.

Table 3.7: Proportion of male car occupants using restraints, by age and seating position

Age	Seat belt wearing rates				Sample Size ¹				
	2006	2007	2008	DfT 2007	2006	2007	2008	DfT 2007	
Driver	17-29	80%	80%	86%	89%	2,991	2,520	3,440	1,686
	30-59	78%	85%	86%	88%	13,097	14,218	13,573	5,470
	60+	83%	89%	89%	93%	2,365	2,576	1,627	1,851
	All	79%	85%	87%	89%	18,470	19,368	18,736	9,007
Front seat passenger	0-13	72%	85%	81%	95%	448	417	99	254
	14-29	68%	72%	80%	82%	1,047	994	1,123	432
	30-59	74%	81%	80%	89%	1,705	1,982	1,790	565
	60+	84%	91%	89%	94%	299	328	317	251
	All	73%	80%	81%	89%	3,497	3,732	3,473	1,502
Rear seat passenger	0-4	74%	91%	71%	98%	232	312	202	384
	5-13	54%	71%	68%	92%	530	613	327	367
	14-29	36%	37%	42%	58%	342	340	378	241
	30-59	31%	25%	40%	49%	447	377	272	217
	60+	40%	51%	53%	67%	83	76	58	106
	All	46%	60%	52%	82%	1,640	1,747	1,259	1,315

¹Sample sizes for all age groups may not equal the sum of the age groups due to occupants with unknown age

Table 3.8: Proportion of female car occupants using restraints, by age and seating position

Age	Seat belt wearing rates				Sample Size ¹				
	2006	2007	2008	DfT 2007	2006	2007	2008	DfT 2007	
Driver	17-29	87%	89%	92%	96%	2,265	2,210	2,885	1,994
	30-59	88%	90%	93%	96%	6,210	7,530	6,848	3,821
	60+	91%	94%	95%	96%	664	958	530	821
	All	88%	90%	93%	96%	9,158	10,725	10,296	6,636
Front seat passenger	0-13	75%	81%	88%	97%	370	304	181	214
	14-29	79%	79%	86%	92%	1,353	1,236	1,488	713
	30-59	87%	88%	90%	93%	2,549	2,575	2,515	1,065
	60+	93%	93%	94%	96%	675	871	687	729
	All	86%	86%	89%	89%	4,947	5,005	4,898	2,721
Rear seat passenger	0-4	79%	92%	65%	97%	235	304	219	384
	5-13	54%	75%	73%	90%	537	629	365	367
	14-29	35%	47%	50%	64%	591	478	462	241
	30-59	36%	43%	44%	59%	712	553	447	217
	60+	56%	55%	66%	69%	154	140	172	106
	All	42%	63%	56%	81%	2,237	2,156	1,701	1,315

¹Sample sizes for all age groups may not equal the sum of the age groups due to occupants with unknown age

Figure 3.2 presents the proportion of restrained car occupants by age group for the London 2008 survey. It is easier to see from these plots that females had higher wearing rates across almost all sub-groups and that wearing rates for rear seat passengers were particularly low for passengers aged 14 to 60 years. The biggest gap between male and female rates occurred among rear seat passengers aged 60+.

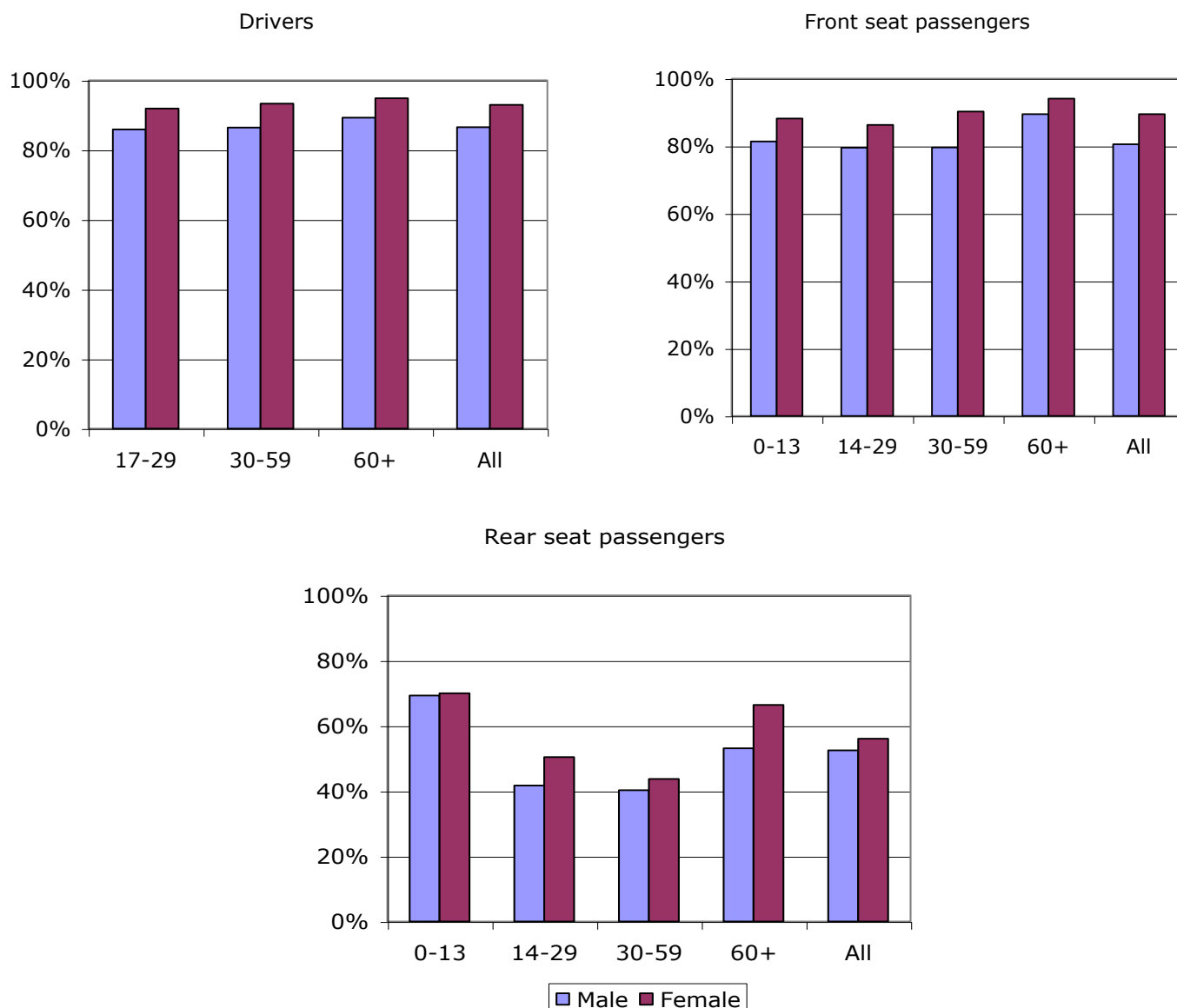


Figure 3.2: Proportion of restrained car occupants, by age in years, sex and seating position, 2008

Table 3.9 examines the use of restraints by children in greater detail, with all of the categories of restraint used in the survey. Children carried on the lap of another passenger are at as much risk in a collision as an unrestrained child and so are considered to be unrestrained.

In 2008, in the front seat, 21% of 0-4 year olds were unrestrained compared to 3% in 2007 and 5% nationally (Built-Up roads, DfT 2007). In contrast the other age groups 5-9 and 10-13 have seen improvement in the front seat wearing rate although this proportion is still well below the national rates (Built-Up roads, DfT 2007). A similar pattern is found for rear seat passengers, albeit with higher unrestrained rates.

Table 3.9: Use of child restraints in cars

Age	2006		2007			2008			DfT 2007			
	0-4	5-9	0-4	5-9	10-13	0-4	5-9	10-13	0-4	5-9	10-13	
Front seat passengers	Seat belt	17%	57%	1%	61%	85%	10%	61%	86%	8%	71%	95%
	Booster seat/cushion with seat belt	9%	8%	50%	16%	0%	22%	22%	1%	16%	26%	0%
	Child seat	20%	8%	19%	4%	0%	35%	4%	1%	33%	0%	0%
	Rear facing child seat	12%	0%	26%	0%	0%	11%	0%	0%	39%	0%	0%
	No restraint	4%	26%	1%	17%	14%	3%	10%	12%	2%	3%	5%
	Booster seat/cushion without seat belt	32%	1%	0%	1%	0%	8%	3%	1%	0%	0%	0%
	Carried on lap	6%	1%	2%	1%	0%	10%	0%	0%	3%	0%	0%
	Number observed	168	490	142	371	323	115	314	362	92	205	172
Rear seat passengers	Seat belt	32%	34%	3%	43%	65%	5%	36%	62%	4%	60%	61%
	Booster seat/cushion with seat belt	13%	12%	42%	23%	3%	10%	22%	2%	8%	24%	0%
	Child seat	25%	7%	39%	6%	0%	51%	16%	8%	73%	8%	0%
	Rear facing child seat	6%	1%	7%	0%	0%	9%	0%	0%	13%	0%	0%
	No restraint	13%	42%	4%	24%	31%	5%	19%	27%	1%	7%	39%
	Booster seat/cushion without seat belt	4%	0%	0%	2%	0%	16%	7%	1%	0%	0%	0%
	Carried on lap	7%	2%	4%	1%	0%	4%	0%	0%	1%	1%	0%
	Number observed	902	867	1,119	1,011	349	860	831	503	822	492	237

Although, in the front seat the majority of 0-4 year olds were restrained using a child seat or booster seat/cushion (68%), a fairly high proportion were restrained inappropriately using an adult seat belt (10%). This proportion of inappropriately restrained 0-4 year olds is an increase from the 1% observed in 2007, although is a similar proportion to that observed nationally (8% Built-Up roads, DfT 2007). The older age group of 5-9 year olds were mainly restrained by adult seat belts in the front seat (61%) with 26% using a child seat or booster seat/cushion. In contrast, in the rear seat the proportion of 5-9 year olds wearing an adult seat belt is around half of the front seat rate while the proportion using child seats or booster seat/cushions is doubled (36% and 38% respectively). A possible explanation may be that children travelling in the front seat are skewed towards the older end of the age group while the ones in the rear seat tend to be younger. This explanation may be a consequence of the advice that child car seats should only be used in the front seat in a car fitted with an active airbag if there is no other choice and that the seat is as far back from the dashboard as possible. Thus

children who are smaller/younger that need to use a booster seat may be more likely to sit in the rear of the car than the front.

With only one site per Borough, the rate at that site will not be representative of the Borough as a whole. Therefore, the London Boroughs have been grouped into five geographical areas and seven Police Garage areas and thus increasing the number of observations in each group (with the exception of the City of London). This grouping reduces the possible random variability in the wearing rates. The details of the Borough groupings are presented in Appendix B and for completeness, the individual wearing rates by Borough are also given.

Table 3.10 and Table 3.11 present the wearing rates for car occupants on weekdays for 2008, for the five geographical areas and seven Police Garage areas respectively. The results are compared to the overall London results and statistically significant differences are highlighted. It can be seen from Table 3.10 and Figure 3.3 that wearing rates were lowest in Central London for drivers and front seat passengers, and highest in South East London. The same pattern was observed in 2007. Table 3.11 and Figure 3.4 show that wearing rates were lowest in Central garage for drivers, and highest in South East garage.

Table 3.10: Car occupant wearing rates, weekdays, by area, 2008

Area	Driver	Front seat passenger	Rear seat passenger
South West	89%*	85%	49%*
South East	93%*	90%*	74%*
North West	88%	83%	60%
North East	88%	86%	61%
Central	78%*	71%*	54%*
London	88%	84%	61%

* Proportion significantly different from London result

Table 3.11: Car occupant wearing rates, weekdays, by Police Garage, 2008

Police Garage	Driver	Front seat passenger	Rear seat passenger
Central garage	80%*	79%	52%*
NE garage	85%*	79%*	60%
NW garage	90%*	88%*	63%
SW Hampton garage	85%*	76%*	54%*
SW Merton garage	90%*	85%	44%*
SE garage	92%*	90%*	78%*
City of London	85%
London	88%	84%	61%

* Proportion significantly different from London result

.. Rate not reported as number of observations less than 15

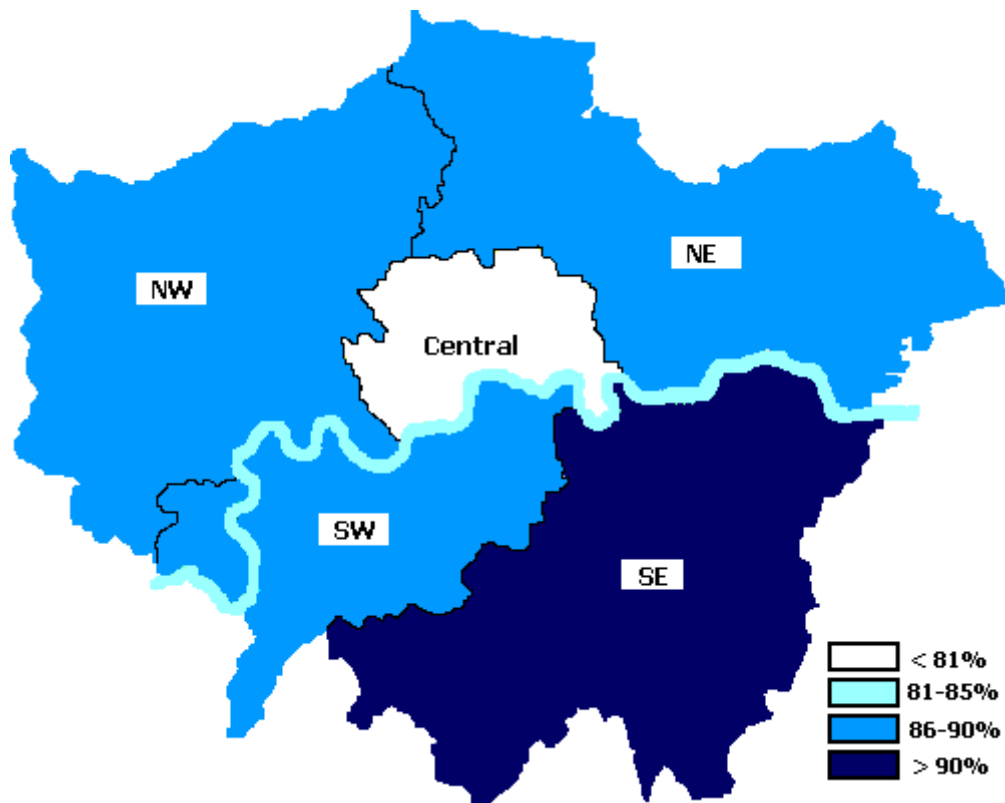


Figure 3.3: Proportion of car drivers using seat belts, weekdays, by area, 2008

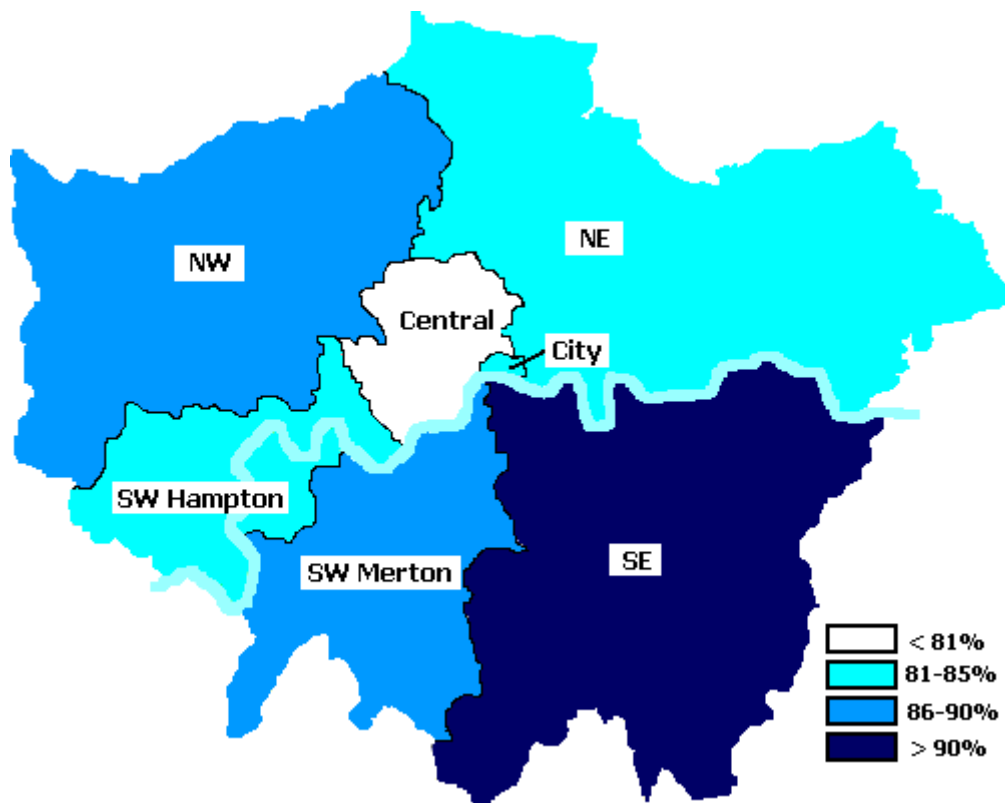


Figure 3.4: Proportion of car drivers using seat belts, weekdays, by Police garage, 2008

3.2 Use of mobile phones

Regulations prohibiting the use of hand-held mobile phones by drivers took effect in December 2003 and the penalties for using a hand-held mobile phone were increased in February 2007. The effects of these changes were seen in the results of the DfT survey and are shown in Figure 3.5. This figure shows the dip in use after the regulations took effect in 2003 and the subsequent return almost to the pre-regulation level after 2003. In the DfT survey, mobile phone use was shown to be higher in vans than in cars, and hand-held phones were more commonly used than hands-free phones. Usage of mobile phones varies more around the country than usage of restraints, so the DfT results may not be nationally representative, but should still show the trend in use across years.

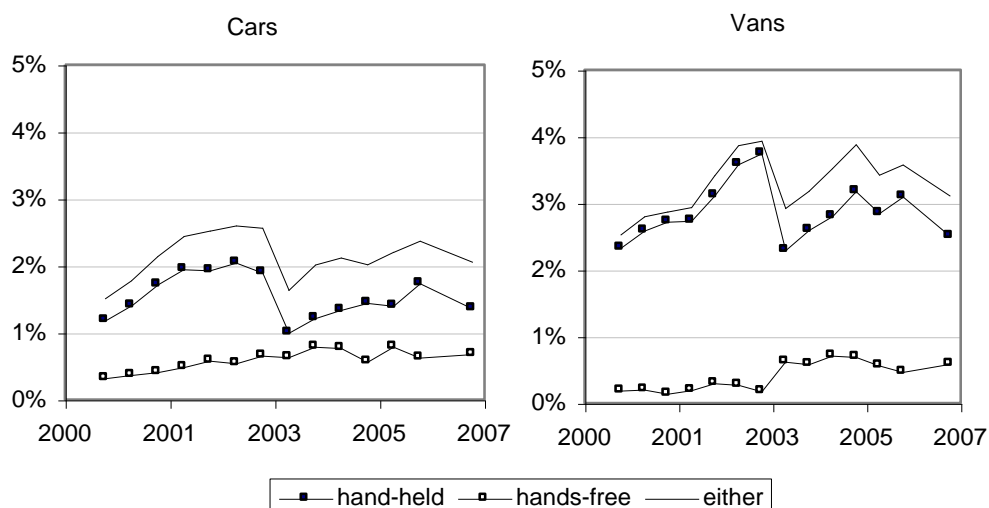


Figure 3.5: Trends in mobile phone use, DfT survey

The penalties for using a hand-held mobile phone were increased in February 2007, so a comparison of results from the 2006, 2007 and 2008 surveys may demonstrate the effects in London. Table 3.12 shows the proportion of drivers observed using mobile phones in the three London surveys. The proportion of car drivers using a hand-held mobile phone dipped substantially in 2007 (1.4%) after the change in the penalties but has risen in 2008 (1.9%) although not to the levels of 2006 (2.6%). Over the same three year period the use of hands-free mobile phones in London has risen being three times higher for car drivers in 2008 compared to 2006 (3.1% compared with 1.2%) and five and nine times higher for van and taxi drivers respectively (van drivers 4.9% compared with 1%; taxi drivers 7.5% compared with 0.8%).

The overall use of a mobile phone by drivers in London (shown in Table 3.12) increased in 2008 for car, van and taxi drivers, in particular hands-free phones. The biggest increase in mobile phone use was among taxi drivers, in particular hands-free mobiles; overall use increased from 3.8% in 2007 to 8.1% in 2008. The London mobile phone usage rate of car drivers was more than double the national rate in 2008, 5.0% compared with 2.1% in the latest DfT survey. In line with DfT results, the use of hand-held mobile phones was higher amongst van drivers than car drivers.

Table 3.12: Overall proportion of drivers using mobile phones in London

Year	Vehicle	Mobile phones			Number of vehicles
		Hand-held	Hands-free	All	
2006	Car	2.6%	1.2%	3.8%	27,640
	Taxi	1.1%	0.8%	1.9%	1,497
	Van	3.8%	1.0%	4.8%	4,709
2007	Car	1.4%	2.3%	3.7%	30,126
	Taxi	0.7%	3.1%	3.8%	2,027
	Van	1.8%	4.9%	6.7%	6,006
2008	Car	1.9%*	3.1%*	5.0%*	29,052
	Taxi	0.6%	7.5%*	8.1%*	1,798
	Van	2.7%*	4.9%	7.7%*	5,312
DfT 2007	Car	1.5%	0.6%	2.1%	13,362
	Van	2.4%	0.5%	2.9%	2,299

* 2008 result differs significantly from 2007 result

Figure 3.6 compares the use of hand-held mobile phones by car and taxi drivers in the three London surveys by age and sex. The results show a consistent pattern of phone use being lower among females than males and falling with increasing age. Figure 3.7 makes the corresponding comparison for hands-free phone use. For all groups except males aged 17-29, the use of hands-free mobile phones has tended to increase over the three years.

**Figure 3.6: Hand-held mobile phone use by car and taxi drivers in London, by age and sex**



Figure 3.7: Hands-free mobile phone use by car and taxi drivers in London, by age and sex

The level of mobile phone use across London is shown in Table 3.13, and the hand-held results are shown in Figure 3.8. The proportion of car drivers using a hand-held mobile phone was highest in the South and North West, and lowest in the North East. The results are compared to the overall London results and areas in which the observed phone use is significantly different from the overall results are highlighted. All results (apart from three) were significantly higher or lower than the overall results which imply that there is a large amount of variation in use of mobile phones across London. The biggest differences between 2007 and 2008 were the hands-free usage in the North West and Central London, which increased by 3.2% and 2.5% respectively. These increases may reflect the rise in the hands-free mobile phone usage by taxi drivers; 70% and 8% of all taxis observed were in Central London and the North East respectively.

Table 3.13: Proportion of car and taxi drivers using mobile phones, weekdays, by area, 2008

Area	Mobile phone type		
	Hand-held	Hands-free	All
South West	2.5%*	2.9%*	5.4%
South East	1.7%	1.9%*	3.6%*
North West	2.4%*	6.5%*	8.9%*
North East	1.4%*	2.3%*	3.7%*
Central	1.9%	5.7%*	7.5%*
London	2.0%	4.0%	6.0%

* Significantly different from London average

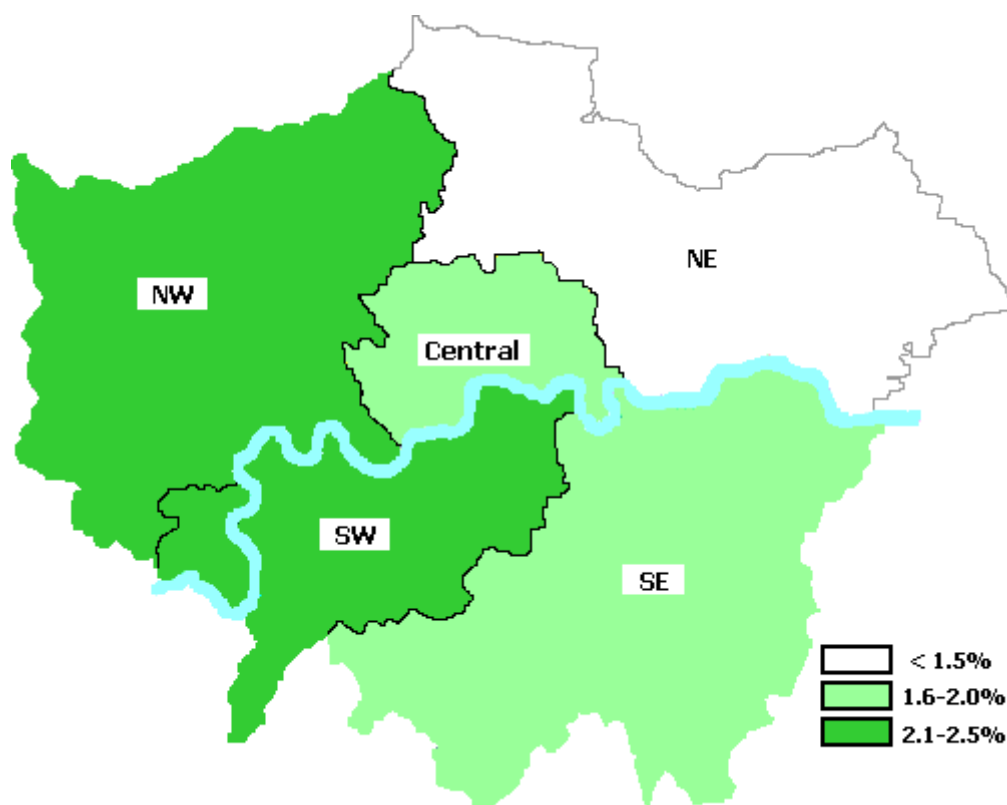


Figure 3.8: Proportion of car and taxi drivers using hand-held mobile phones, weekdays, by area, 2008

Table 3.14: Proportion of car and taxi drivers using mobile phones, weekdays, by Police garage, 2008

Police Garage	Mobile phone type		
	Hand-held	Hands-free	All
Central garage	1.6%	5.6%*	7.2%*
NE garage	1.6%	2.5%*	4.1%*
NW garage	2.5%*	5.7%*	8.2%*
SW Hampton garage	2.0%	7.2%*	9.2%*
SW Merton garage	2.7%*	2.5%*	5.2%*
SE garage	1.7%	2.1%*	3.7%*
City of London ¹	1.2%	20.2%*	21.3%*
London	2.0%	4.0%	6.0%

* Significantly different from London average

¹The results for the City of London are based on small numbers and are therefore subject to more variation than the other areas. The high use of hands-free mobile phones may be as a result of taxis accounting for 84% of the car and taxi group with a high proportion of taxi drivers using hands-free mobile phones.

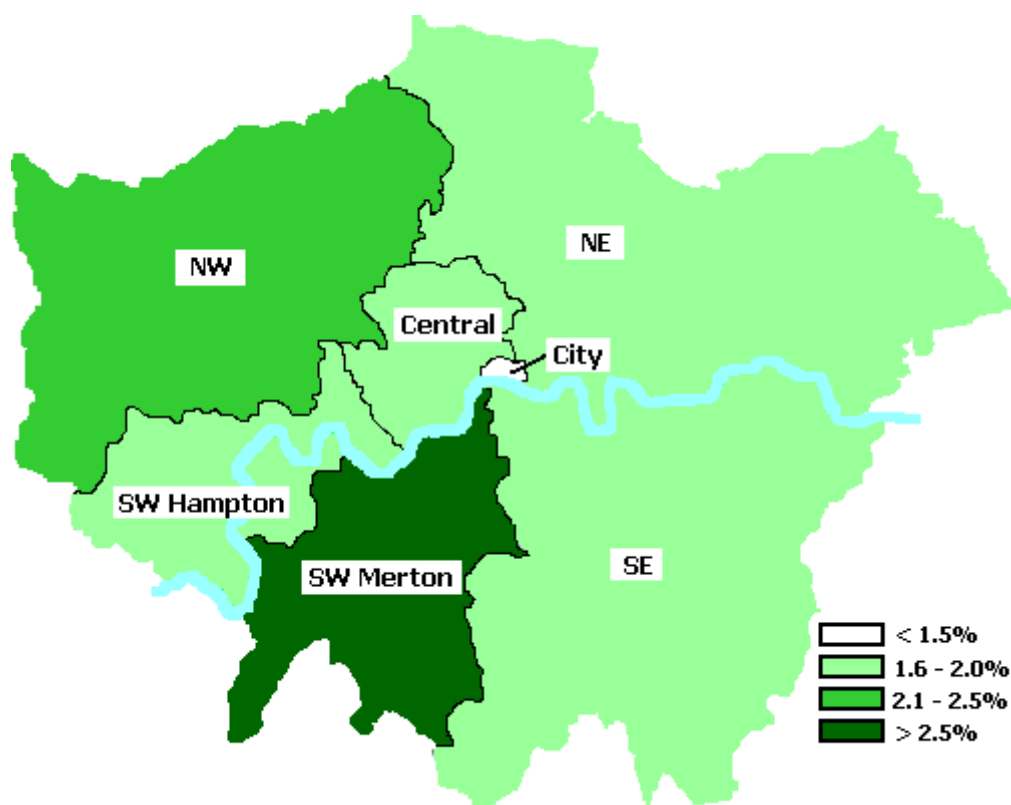


Figure 3.9: Proportion of car and taxi drivers using hand-held mobile phones, weekdays, by Police garage, 2008

Previous London surveys showed that drivers' use of mobile phones was correlated with their use of seat belts. Table 3.15 shows the proportion of drivers using mobile phones by seat belt use. Results where the proportion of seat belt wearers using mobile phone differs significantly from that of non-wearers are highlighted. Table 3.15 shows that, as in previous years, belted drivers in 2008 were less likely than unbelted drivers to use hand-held mobile phones. The difference continues to be more marked for car drivers than van drivers.

Table 3.15: Proportion of drivers using mobile phones, by restraint status

	Mobile phone type	Cars and taxis			Vans		
		2006	2007	2008	2006	2007	2008
Drivers wearing seat belts	Hand-held	2.2%*	1.1%*	1.6%*	2.3%*	1.4%*	2.1%*
	Hands-free	1.1%	2.2%*	3.0%*	1.2%*	5.5%*	4.9%*
	All	3.3%*	3.2%*	4.6%*	3.5%*	6.9%*	7.0%*
Drivers not wearing seat belts	Hand-held	3.6%	2.8%	2.7%	5.3%	2.4%	3.6%
	Hands-free	1.2%	3.3%	5.4%	0.9%	4.1%	5.1%
	All	4.8%	6.1%	8.0%	6.2%	6.5%	8.7%

* Differs significantly from drivers not wearing seat belt

4 Law Enforcement

The Police issue Fixed Penalty Notices (FPNs) for many seat belt and mobile phone driving offences. The numbers of FPNs issued in each Borough and the City of London in 2007 were provided by the Metropolitan Police and the City of London Police and have been used to compare the rates of FPNs distributed across London. Results for each Borough (displayed in Appendix B) have been combined into the London areas, and rates of FPNs per million vehicle kilometres are given in Table 4.1. Rates of seat belt FPNs issued vary from 0.28 per million vehicle km in North West London to 0.78 per million vehicle km in Central London, with an average in London of 0.43 per million vehicle km. The police issued more mobile phone FPNs than seatbelt FPNs, even though fewer drivers used hand-held mobile phones than failed to wear seat belts. Overall 0.89 FPNs per million vehicle km were issued in 2007, rates ranged from 0.58 per million vehicle km in South East London to 1.92 per million vehicle km in Central London. There is some correlation between the FPN issued and the level of illegal activity observed in the survey. Central and North East London had the lowest seatbelt wearing rates (Table 3.10) and the highest rate of FPNs while Central, South West and North West London had the highest hand-held mobile phone usage rates (Table 3.13) and also the highest rates of FPNs issued.

Table 4.1: Number and rate of Fixed Penalty Notices in London, 2007

Area	Seat belt		Mobile Phone		Traffic volume (million vkm)
	Number	Rate ¹	Number	Rate ¹	
South West	1,578	0.30	5,121	0.97	5,305
South East	2,069	0.31	3,850	0.58	6,604
North West	2,629	0.28	7,198	0.77	9,344
North East	4,687	0.64	5,264	0.72	7,359
Central	3,443	0.78	8,502	1.92	4,430
London	14,237	0.43	29,421	0.89	33,041

¹Rate is calculated as number of FPN divided by traffic volume

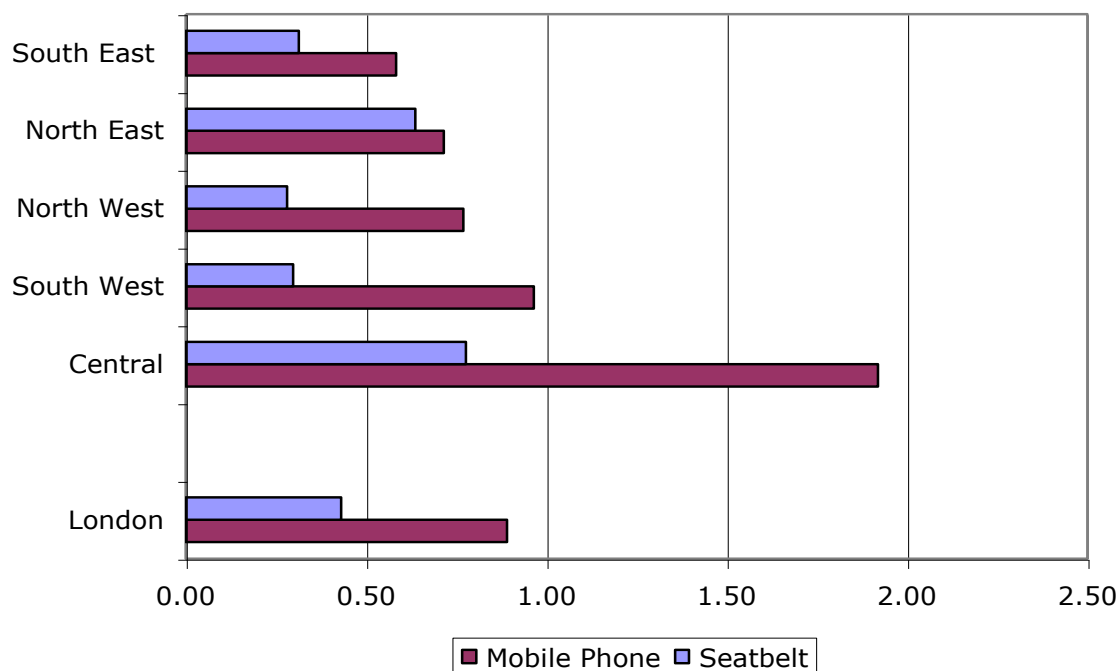


Figure 4.1: Rate of Fixed Penalty Notices per million vehicle-km in London, 2007

5 Casualty saving

A considerable amount of published research confirms the safety benefit of seat belts and correctly worn restraints, in particular the protection they provide to the occupants of a vehicle involved in a collision. Although the overall wearing rate in London has increased, it remains lower than the rate found by the DfT survey. Section 5.1 estimates the number of casualties that could be saved by raising the London rates further.

The use of mobile phones whilst driving increases the risk of being involved in a collision, and observations from the London 2008 survey show that mobile phone use is considerably higher in London than found by the DfT survey. Section 5.2 estimates the number of casualties that could be saved by reducing the number of drivers who use mobile phones.

5.1 Casualty saving of increased seat belt use

The number of car occupant casualties in London in 2007 and factors for the effectiveness of seat belts can be used to estimate the number of car occupant casualties that could be saved if the seat belt wearing rate in London was increased to the level found by the DfT survey. Estimates of the effectiveness of seat belts in fatal, serious and slight collisions have been recently reported for injured car drivers (Broughton & Walter, 2007). These show, for example, that the risk of being killed should a collision occur is reduced, on average, by 72% if a seat belt is worn.

The casualty saving estimates are subject to random variation and rely on two underlying assumptions:

1. The underlying collision-involvement rates of belted and unbelted drivers do not differ. It seems likely, in fact, that unbelted drivers tend to have a more risky driving style, and Table 3.7 shows that wearing rates were lowest among young

drivers who are more likely to be involved in collisions than older drivers. Consequently, the estimated casualty reductions are conservative.

2. The effectiveness estimates prepared for car drivers also apply to car passengers.

Using the information provided above and applying the overall car occupant seat belt wearing rates of 86% (TfL 2008) and 91% (DfT 2007), the conservative estimates of the number of car occupant casualties that could be saved by increasing the London seat belt wearing rate to DfT reported levels and eliminating non compliance (100% seat belt wearing rate) are reported in Table 5.1 and Table 5.2.

Casualty savings are indicative and do not take into account the proportion of casualties in 2007 who were wearing a seat belt (which is not known). The value of these savings were estimated using official figures for the average value of preventing a casualty (DfT, 2007c).

Table 5.1: Estimated car occupant casualty saving in London per year if restraint use increased to level found by DfT survey

Casualty	Casualties in 2007	Casualty saving	Value*
Fatal	52	5	£7.5m
Serious	900	54	£8.6m
Slight	12,224	158	£2.0m
Total	13,176	217	£18.0m

*defined using average value of preventing a casualty at June 2005 prices (DfT, 2007c)

Table 5.1 shows that 217 casualties could have been saved in a year if the proportion of car occupants wearing seat belts in London had matched the national rate. The value of preventing these casualties is estimated to be £18m at June 2005 prices.

Table 5.2: Estimated car occupant casualty saving in London per year if restraint use increased to 100%

Casualty	Casualties in 2007	Casualty saving	Value*
Fatal	52	14	£20.2m
Serious	900	145	£23.3m
Slight	12,224	428	£5.3m
Total	13,176	587	£48.7m

*defined using average value of preventing a casualty at June 2005 prices (DfT, 2007c)

Table 5.2 shows that if all car occupants in London had worn seatbelts in 2007 then there would have been 587 fewer casualties, and the estimated value of preventing these casualties is £48.7m (June 2005 prices).

The 2010 London road safety target for KSI casualties is a reduction of 50% compared to the 1994-1998 average (6,684). There were 3,783 KSI casualties in London in 2007. If all car occupants had been wearing seat belts then the estimates in Table 5.2 suggest that this total would have been 159 less, representing a 46% reduction in KSI casualties in London from the baseline.

5.2 Casualty saving of reduced mobile phone use

Using a hands-free or hand-held mobile phone whilst driving has been shown to be detrimental to driving (RoSPA, 2002) and this increases the risk of a collision occurring. Several estimates of the increase in risk have been proposed by researchers. Redelmeier & Tibshirani (1997) report a four fold increase in risk of collision involvement if a driver is using a mobile phone, and this value will be used in addition to the rates of drivers' mobile phone use shown in Table 3.12 to estimate the number of casualties that may have been saved had those drivers not been using their mobile phone.

A similar approach to that used in Section 5.1 is applied here, with the following assumptions:

- The overall levels of mobile phone use reported in Section 3.2 for drivers in London also apply to drivers of other types of vehicle (HGVs etc.), and that the same is true of the results of the DfT survey;
- The proportion of drivers who are involved in collisions is the same for drivers who do and those who do not use their mobile phones whilst driving. It seems likely in fact that the rate for phone users would tend to be higher than for non-users, for the reasons discussed in the case of unbelted drivers, so the estimated casualty reductions are conservative;
- The increased risk of being involved in a collision is the same for all injury severities;
- Results for cars and vans can be combined using the national traffic proportions of 86:14 (DfT, 2007b).

Table 5.3: Estimated casualty saving in London per year if mobile phone use decreased to level found by DfT survey

Casualty	Casualties in 2007	Casualty saving	Value*
Fatal	222	20	£28.6m
Serious	3,561	322	£51.6m
Slight	24,577	2,220	£27.5m
Total	28,360	2,562	£107.7m

*defined using average value of preventing a casualty at June 2005 prices (DfT, 2007c)

It was estimated that reducing the proportion of mobile phone users from the London level of 5.7% (combined result for car, taxi and van drivers) to the level reported in the latest DfT survey of 2.2% (combined result) would produce the casualty reductions detailed in Table 5.3.

Table 5.4: Estimated casualty saving in London per year if mobile phone use eliminated

Casualty	Casualties in 2007	Casualty saving	Value*
Fatal	222	33	£46.6m
Serious	3,561	523	£84.0m
Slight	24,577	3,610	£44.7m
Total	28,360	4,166	£175.2m

*defined using average value of preventing a casualty at June 2005 prices (DfT, 2007c)

Table 5.4 estimates the reductions of reducing the level to 0%, so in essence estimates the number of casualties that may be attributed to drivers' use of mobile phones.

Since 2005, the information collected about road collisions by the police as part of the national STATS19 reporting system includes the contributory factors to the collision (Department for Transport, 2006). These factors represent the factors which contributed to the collision in the opinion of the police reporting officer, and one factor is 'Driver using Mobile Phone'. 52 collisions were recorded with this contributory factor in London in 2007, resulting in 6 seriously and 64 slightly injured casualties. Clearly these numbers are considerably lower than the estimates in Table 5.4. It is proposed that this is due to three issues:

- Contributory Factors can be used in evidence if a driver is prosecuted. In this case, the reporting officer may need to provide evidence that the driver was using a mobile phone. As this is at best difficult to prove, this is likely to reduce considerably the reporting of the contributory factor 'Driver using Mobile Phone'; in addition,
- By the time that a police officer arrives at the scene of a collision, any evidence and indeed suggestion of the use of a mobile phone has usually been removed, i.e. the driver has finished his conversation.
- The assumptions stated above, although based on research, may not be directly applicable to London in 2008.

There were 6,684 KSI casualties in London in 2007. If mobile phone use had been eliminated then the estimates in Table 5.4 suggest that this total could have been reduced by 556, representing a 52% reduction in KSI casualties in London from the 1994-98 baseline.

6 Summary

The London seat belt and mobile phone survey was carried out in March 2008 at 33 sites in London, replicating the methods and analysis of the 2006 and 2007 survey. Results from this survey have been compared with the previous two London surveys and results on Built-Up roads from the DfT survey carried out in October 2007.

The 33 sites were chosen to cover all types of road with one site per London Borough and one in the City of London. The sites are not designed to be representative of individual Boroughs, but to give a balanced view of seatbelt wearing rates and drivers' mobile phone use in London as a whole. The survey was conducted during daylight hours in order to observe vehicle occupants accurately. Research suggests that restraint wearing rates are lower at night than during the day, so wearing rates for the full day are likely to be slightly lower than the rates calculated from the survey data (Broughton and Walter (2007)). As with all sample surveys there are limitations with the sample size when drilling down into the detail of the main results. For example, the sample size per group decreases substantially when examining seatbelt wearing rates by age group and sex and as a result the estimates are subject to increased variation.

Overall, the 2008 survey found that the driver and front seat passenger wearing rates have risen, albeit not by as much as in 2007 and that the rear seat passenger rates fell slightly. In 2008, 89% of car drivers in London were wearing a seat belt, an increase from 87% in 2007 which brought the wearing rate in London closer to the rate of 92% found by the DfT survey on Built-Up roads. The proportion of front seat car passengers who were restrained also increased from 84% to 86% between 2007 and 2008 while the proportion of restrained rear seat car passengers fell slightly to 63% - less than the DfT rate of 82%. As in previous years, the wearing rate for car drivers varied considerably across London in 2008, from 78% in Central London to 93% in South East London.

Increases in seat belt wearing since 2007 were also seen for van drivers whilst seat belt wearing rates for van passengers and taxi occupants were largely unchanged. The rates for van and taxi occupants are still considerably lower than the wearing rates for car occupants.

The use of restraints by children in London increased between 2006 and 2007 possibly as a result of the publicity surrounding the new regulation concerning the use of child car seats introduced in September 2006. The effects however, were not sustained for young children aged 0-4 (although still higher than in 2006) but were slightly improved upon for 5-9 and 10-13 year olds in 2008.

The survey collected information on the use of hand-held and hands-free mobile phones. Observations of drivers using hands-free phones are only recorded if the observer is sure that a hands-free device is being used. Due to the difficulty in observing hands-free phone usage, these results are likely to be underestimates.

The proportion of car drivers using a hand-held mobile phone fell from 2.6% in 2006 to 1.4% in 2007 after the penalties were increased, but rose in 2008 to 1.9%. The overall use of mobile phones increased in 2008 for car, van and taxi drivers, in particular use of hands-free phones. Taxi drivers saw the biggest increase, from 3.8% overall in 2007 to 8.1% in 2008. The London mobile phone usage rates of car drivers were more than double the national rates (5.0% compared with 2.1% in the DfT survey of October 2007). Hands-free mobile phones are now used more often than hand-held mobile phones. This could be the result of the increased penalties for using hand-held mobile phones, or drivers may have accepted the implied message that hands-free mobile phones are safer to use while driving than hand-held, whereas recent evidence suggests that there is little or no difference (Kircher et al, 2004).

As with the previous London surveys, the 2008 data show that males are less likely to use restraints than females and that usage generally increases with increasing age. The exception to this is rear seat passengers where children have the highest wearing rates, closely followed by those passengers aged over 60. The results for hand-held phones have maintained a pattern of being lower among women than men and falling with increasing age. For all age groups, except men aged 17-29, the use of hands-free mobile phones has increased over the last three years while the use of hand-held mobiles has tended to decrease.

There is a correlation between drivers' use of hand-held mobile phones and non-use of seat belts. As in previous years, belted drivers in 2008 were less likely than unbelted drivers to use hand-held mobile phones. For example, 1.6% of car and taxi drivers wearing a seat belt were using a hand-held mobile phone, compared with 2.7% of those who did not wear a belt. The disparity was greater for van drivers, 2.1% and 3.6% respectively.

Research has shown the safety benefit of seat belts and correctly worn restraints, and also the increased risk of being involved in a collision whilst driving and using a mobile phone (e.g. Broughton et al 2007, Kircher et al, 2004). It has been possible to estimate the number of casualties that could be saved by improving the London levels to those found in the most recent DfT survey, also to estimate the benefits of eliminating mobile phone use by drivers and ensuring that all car occupants wear seat belts. The estimates are approximate because certain simplifying assumptions are necessary, but help to illustrate the human consequences of the relatively low level of restraint use and the relatively high level of mobile phone use in London. It is estimated that if overall mobile phone use fell to the level found by DfT survey then the KSI total would fall by 342, and the casualty total would fall by 2,562. An increase in restraint wearing rates to the rates found by the DfT survey is estimated to reduce the number of car occupants KSI by 59 and the car occupant casualty total by 217.

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Appendix A: Hammersmith & Fulham and Hackney data

Data quality and validation checks are carried out in the course of processing the data. At this stage, it was noted that two sites, Hackney and Hammersmith & Fulham had no detailed data for vans. This error was queried with the survey team who confirmed that a new member of the team had failed to identify vans and cars separately at these two sites. The main reason of concern is that van drivers behave differently from car drivers. Van drivers are less likely to wear their seat belts than car drivers (56% wearing rate compared to 87% wearing rate in 2007) and are more likely to use a mobile phone (6.7% compared to 3.7% in 2007). However, a detailed look at the results from these two Boroughs confirms that this error does not have a significant impact on the results.

Table A.1 presents the overall proportion of restraint use in 2008 for car drivers with and without the two affected sites. The table shows that when the two sites are included the results are slightly lower for drivers as well as front and rear passengers. This may be due to the inclusion of a small number of vans in the results, although if this were the case then only drivers and to a lesser extent front seat passengers would be affected but the table shows that rear seat passengers are also affected. The more likely reason for the slightly lower results when the two sites are included is that Hackney and Hammersmith & Fulham have the sixth and fifth lowest seat belt wearing rate respectively for car and van drivers combined (i.e. when comparing all Boroughs on the same basis).

Table A.2 shows the overall proportion of car drivers using mobile phones with and without the two affected sites. The table shows that the results are virtually unchanged when the two sites are removed. From this, it may be concluded that the mobile phone results for London are not affected by the inclusion of vans with cars for the two sites.

Table A.1: Overall proportion of car occupants using restraints with and without the two affected sites, 2008

Occupants	Includes the two sites	Without the two sites
Drivers	88.8%	89.6%
Front seat passengers	85.8%	87.2%
Rear seat passengers	63.1%	63.5%

Table A.2: Overall proportion of car drivers using mobile phones, with and without the two affected sites, 2008

Mobile phone type	Includes the two sites	Without the two sites
Hand-held	1.9%	1.9%
Hands-free	3.1%	2.8%
All	5.0%	4.6%

The two sites are on different road types and fall into different geographical areas with the Hackney site being on a minor road in Central London and the Hammersmith & Fulham site being on the Borough principal road network in NW London. In 2007, approximately 5% of the vehicles observed were vans at the Hackney site and

approximately 25% of the observed vehicles were vans at the Hammersmith & Fulham site. This may suggest that areas including the Hammersmith & Fulham site may be slightly more affected (i.e. the North West geographical area & SW Hampton police garage). Table A.3 shows that the Central and NW area car occupant seat belt wearing rates are slightly higher when the two sites are not included.

Table A.4 shows slightly more variation in the results by police garage. However the differences can be explained by the relatively low overall seat belt wearing rate for these two Boroughs rather than the fact that some vans are included in the results. Table A.5 shows the seat belt wearing rates for car and van drivers combined with and without the Hammersmith and Fulham site for the North West and SW Hampton police garage. This table is comparing like with like as vans are included in all Borough rates. Similar differences in rates are observed with and without the Hammersmith & Fulham site as observed in Table A.3. Thus it has been assumed in the report that the inclusion of vans with cars for the two sites has not had an appreciable impact on the results. The same comparisons were made for the Central and North East areas and the same conclusion was reached.

Table A.3: Car occupant wearing rates, weekdays, by area, with and without the two affected sites, 2008

	Central		North West	
	Includes Hackney	Without Hackney	Includes Hammersmith & Fulham	Without Hammersmith & Fulham
Drivers	78%	79%	88%	90%
Front seat passengers	71%	74%	83%	88%
Rear seat passengers	54%	54%	60%	61%

Table A.4: Car occupant wearing rates, weekdays, by police garage, with and without the two affected sites, 2008

	North East		SW Hampton	
	Includes Hackney	Without Hackney	Includes Hammersmith & Fulham	Without Hammersmith & Fulham
Drivers	78%	86%	85%	93%
Front seat passengers	71%	82%	79%	90%
Rear seat passengers	54%	61%	60%	53%

Table A.5: Car and van occupant wearing rates, weekdays, with and without Hammersmith & Fulham, 2008

	North West		SW Hampton	
	Includes Hammersmith & Fulham	Includes Hammersmith & Fulham	Includes Hammersmith & Fulham	Without Hammersmith & Fulham
Drivers	85%	87%	83%	88%
Front seat passengers	80%	83%	75%	85%
Rear seat passengers	60%	60%	54%	52%

Appendix B: Borough results

Table B.1: Survey sites

Borough	Rd type	Road name	Direction	Junction	Weekend?
Barking & Dagenham	BPRN	Ripple Rd	WB	Gores Bridge Int Adj. to Asda	
Barnet	TLRN	A406 North Circular	WB	A1 Falloden Way	Yes
Bexley	MINOR	Westwood Lane	NB	A210 Blackfen Rd	
Brent	BPRN	High Rd	WB	Ealing Rd	Yes
Bromley	TLRN	A21 London Rd	SB	A21 Tweedy Rd	
Camden	MINOR	Guilford St	EB	Gray's Inn Rd	
City of London	MINOR	Ropemaker St	EB	Moorgate	
Croydon	TLRN	A232 Wickham Rd	EB	Hartland Way	Yes
Ealing	TLRN	Hanger Lane	NB	Western Ave	
Enfield	MINOR	Powys lane	SB	Bowes Rd	Yes
Greenwich	MINOR	Green Lane	SB	A20 Sidcup Rd	
Hackney	MINOR	Ponsford St	NB	Homerton High St	
Hammersmith & Fulham	BPRN	Shepherds Bush Green	NB	Uxbridge Road	
Haringey	TLRN	Seven Sisters Rd	NB	St. Ann's Rd	Yes
Harrow	BPRN	Greenford Rd	NB	Sudbury Hill	
Havering	BPRN	New Rd	SB	Marsh Way	
Hillingdon	BPRN	A437 High St	SB	A4 Bath Rd	Yes
Hounslow	TLRN	A312 Harlington Rd East	NB	A244 Hounslow Rd	
Islington	BPRN	Caledonian Rd	SB	Pentonville Rd	
Kensington & Chelsea	TLRN	Cromwell Rd	EB	Exhibition Rd	
Kingston	MINOR	B283 High St	SB	Blagdon Rd	Yes
Lambeth	TLRN	Brixton Rd	NB	A202 Camberwell New Rd	
Lewisham	TLRN	A21 Bromley Rd	NB	A2015 Beckenham Hill Rd	
Merton	BPRN	A218 Durnsford Rd	SB	Plough Lane	
Newham	BPRN	Stratford High St	EB	Abbey Lane	
Redbridge	MINOR	Clayhall Ave	SB	Woodford Ave	
Richmond-upon-Thames	BPRN	A3063 Wellington Rd South	NB	A314 Hanworth Rd	
Southwark	MINOR	Wyndham Rd	EB	Camberwell Rd	
Sutton	TLRN	A217 Reigate Ave	NB	Rose Hill RBT	Yes
Tower Hamlets	MINOR	Roman Rd	EB	Grove Rd	Yes
Waltham Forest	BPRN	Forest Rd	WB	Hoe St	Yes
Wandsworth	TLRN	A24 Tooting High St	SB	Longley Rd	
Westminster	TLRN	Knightsbridge	WB	William St	

Table B.2: Car driver wearing rates, weekday, by Borough, 2008

Borough	Wearing rate
Westminster	61%*
Hammersmith & Fullham	75%*
Hackney	76%*
Tower Hamlets	77%*
Enfield	83%*
Kensington & Chelsea	84%
Newham	84%
City of London	85%
Islington	86%
Ealing	86%
Barking & Dagenham	87%
Merton	87%
Brent	87%
Haringey	87%
Southwark	88%
Redbridge	88%
Camden	88%
Wandsworth	88%
Hillingdon	89%
Lambeth	90%
Kingston	90%*
Bromley	91%*
Sutton	91%*
Harrow	92%*
Croydon	92%*
Hounslow	92%*
Bexley	92%*
Barnet	93%*
Richmond	93%*
Havering	94%*
Lewisham	95%*
Greenwich	95%*
Waltham Forest	97%*

* denotes that wearing rate differs significantly from the London average (88%)

Table B.3: London areas by Borough

Borough	Area	Police garage
Southwark	South West	SE
Lambeth	South West	SW Merton
Wandsworth	South West	SW Merton
Merton	South West	SW Merton
Kingston	South West	SW Merton
Richmond-upon-Thames	South West	SW Hampton
Sutton	South East	SW Merton
Greenwich	South East	SE
Lewisham	South East	SE
Bexley	South East	SE
Bromley	South East	SE
Croydon	South East	SE
Hammersmith & Fulham	North West	SW Hampton
Hounslow	North West	SW Hampton
Hillingdon	North West	NW
Brent	North West	NW
Ealing	North West	NW
Harrow	North West	NW
Barnet	North West	NW
Waltham Forest	North East	NE
Redbridge	North East	NE
Havering	North East	NE
Barking & Dagenham	North East	NE
Newham	North East	NE
Haringey	North East	NE
Enfield	North East	NE
Hackney	Central	NE
Tower Hamlets	Central	NE
City of London	Central	City
Westminster	Central	Central
Camden	Central	Central
Islington	Central	Central
Kensington & Chelsea	Central	Central

Table B.4: Proportion of car and taxi drivers using mobile phones, weekdays, by Borough, 2008

Borough	Hand-held	All mobile phone use
Bromley	0.3%*	2.1%
Newham	0.4%*	3.9%
Lewisham	0.7%*	2.7%
Camden	0.7%*	5.6%
Waltham Forest	0.8%*	2.4%
Croydon	1.1%*	5.4%
Greenwich	1.2%*	2.1%
City of London	1.2%	21.3%
Kensington & Chelsea	1.2%	10.5%
Havering	1.2%	2.5%
Wandsworth	1.3%	9.9%
Redbridge	1.3%	2.3%
Harrow	1.3%	5.4%
Westminster	1.5%	5.8%
Hackney	1.6%	5.4%
Richmond	1.6%	4.6%
Haringey	1.7%	2.9%
Enfield	1.7%	5.0%
Barnet	1.8%	9.9%
Hillingdon	1.9%	8.4%
Hammersmith & Fulham	2.0%	14.5%
Southwark	2.1%	4.5%
Hounslow	2.3%	3.9%
Kingston	2.3%	3.4%
Sutton	2.3%	3.6%
Barking & Dagenham	3.2%	7.0%
Tower Hamlets	3.3%	5.5%
Merton	3.4%*	5.6%
Islington	3.5%*	5.1%
Brent	3.7%*	6.2%
Bexley	3.7%*	5.3%
Ealing	3.8%*	9.2%
Lambeth	4.2%*	6.1%

* denotes hand-held rate that differs significantly from the London average (hand-held 1.9%)

Table B.4 has two Boroughs with mobile phone usage rates substantially higher than the London average; namely City of London (21.3%) and Hammersmith & Fulham (14.5%). The high City of London rate may be due to the high proportion of taxis observed in this area (taxis accounted for 84% of the group cars + taxis) combined with a high proportion of taxi drivers using hands-free mobile phones. Hammersmith & Fulham may be higher due to the inclusion of some vans with the car group.

Table B.5: Number and rate of fixed penalty notices in London, 2007

	Seat belt		Mobile Phone		Traffic volume (million vkm) (DfT, 2007a)
	Number	Rate	Number	Rate	
Barking & Dagenham	322	0.50	677	1.05	647
Barnet	339	0.20	1,067	0.62	1,711
Bexley	261	0.26	475	0.47	1,019
Brent	616	0.61	1,376	1.36	1,015
Bromley	241	0.17	599	0.43	1,393
Camden	603	1.12	1,309	2.43	538
City of London	302	1.52	952	4.78	199
Croydon	304	0.22	619	0.45	1,363
Ealing	585	0.42	1,526	1.10	1,385
Enfield	566	0.35	726	0.45	1,621
Greenwich	522	0.44	794	0.67	1,189
Hackney	211	0.37	438	0.77	566
Hammersmith & Fulham	59	0.10	217	0.36	606
Haringey	321	0.50	366	0.57	641
Harrow	215	0.33	357	0.54	656
Havering	465	0.29	716	0.45	1,590
Hillingdon	278	0.12	798	0.35	2,276
Hounslow	537	0.32	1,857	1.10	1,695
Islington	387	0.82	708	1.49	474
Kensington & Chelsea	412	0.69	1,478	2.49	593
Kingston-upon-Thames	465	0.47	1,691	1.70	995
Lambeth	245	0.28	535	0.61	882
Lewisham	460	0.51	809	0.90	896
Merton	181	0.27	478	0.70	682
Newham	1,430	1.46	736	0.75	981
Redbridge	208	0.19	179	0.16	1,112
Richmond-upon-Thames	209	0.23	753	0.84	894
Southwark	208	0.24	597	0.68	872
Sutton	281	0.38	554	0.74	744
Tower Hamlets	427	0.42	693	0.69	1,010
Waltham Forest	1,375	1.79	1,864	2.43	767
Wandsworth	270	0.28	1,067	1.09	980
Westminster	1,101	1.05	2,924	2.78	1,050
London	14,237	0.43	29,421	0.89	33,041

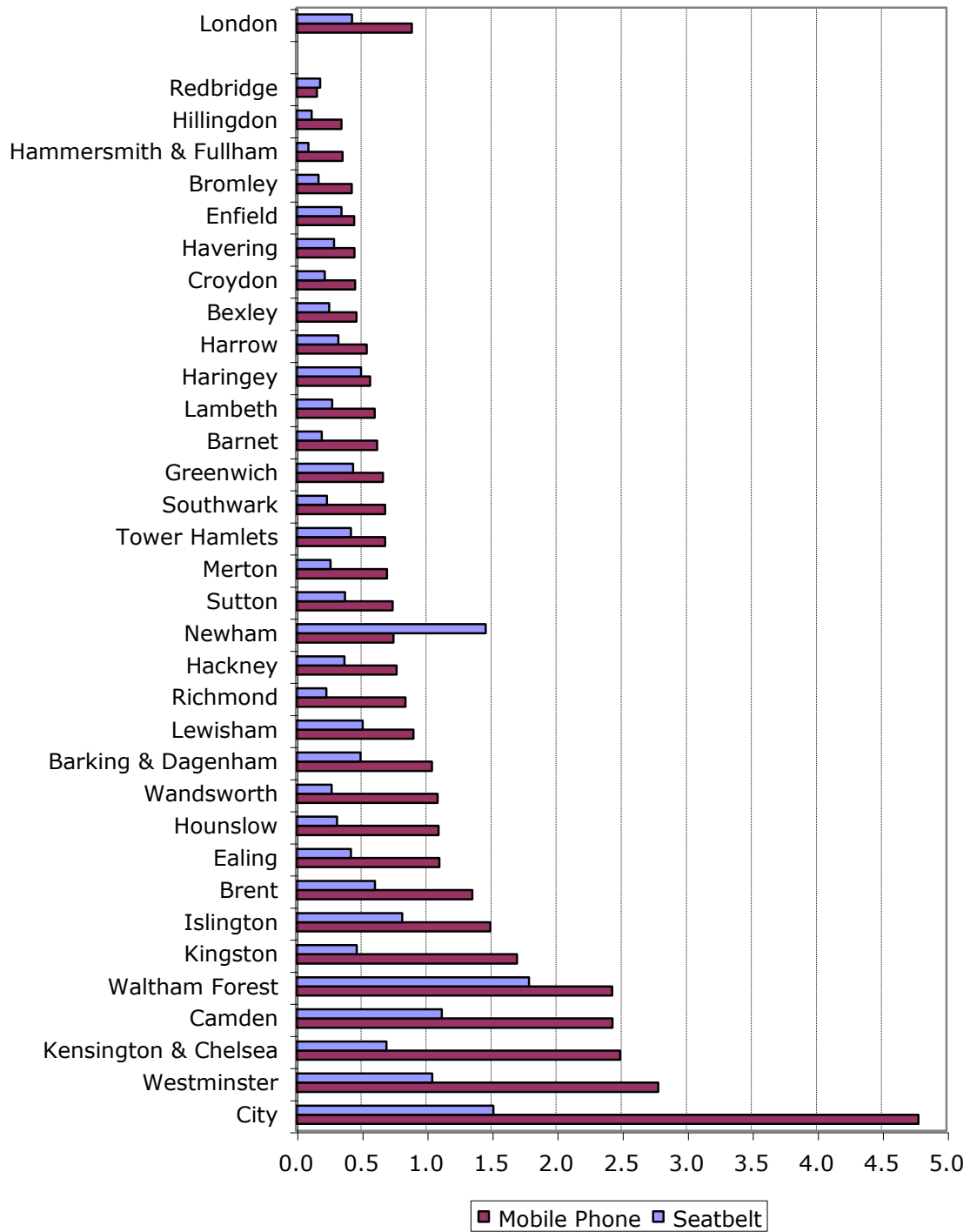


Figure B.1: Rate per million vehicle-km of fixed penalty notices in London, 2007