

## DRIVING AS PART OF YOUR WORK MAY DAMAGE YOUR HEALTH

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### INTRODUCTION

#### Company Car Drivers Are A Subset Of Those Who Drive As Part Of Their Work

We have recently completed a study for DETR looking at the factors that affect car use choices (Stradling et al, 1999). What functions do cars serve? Table 1 shows one formulation from our research (Stradling, 2000), suggesting seven main journey types for which people use their cars.

**TABLE 1**  
**Types of car trips**

1. Driving as part of work
2. Driving to and from work
3. Ferrying kids around - both to school and to other places.
4. Life and network maintenance tasks such as shopping, visiting friends and relations, and evenings out.
5. Car as load carrier.
6. Driving for holidays and weekends away.
7. Life enhancement activities such as voluntary work, hobby support or just driving for pleasure.

These are arranged in typical decreasing degree of time pressure. Time pressure likely derives from the degree of obligation to others implicit in the trip type.

In this sample of 791 English motorists (fuller details of the sample are given in Stradling et al, this volume, full details are given in Stradling et al, 1999), driving and employment were closely coupled. Respondents rated 'How often you drive ... To and from work' and '... As part of your work' on a 6-point scale:

**TABLE 2**  
**Frequency of commuting and driving as part of work by employed car drivers**  
**(full-time, part-time and self-employed)**

How often do you drive...?	To and from work	As part of your work
1 Every Working Day	69%	22%
2 Several Times a Week	16%	19%
3 Once a Week	3%	6%
4 More than once a Month	2%	8%
5 Less than once a Month	2%	9%
6 Never or almost never	9%	36%

Table 2 shows that 69% of car drivers in employment (78% of those in full-time employment - Stradling et al, 1999) used their car to travel to and from work 'every working day'. And almost

two-thirds of those in work (64%: Table 2; 74% of males, 49% of females: Table 3) say they drive a car 'as part of their work' at least some of the time.

We also asked about the ownership of the car 'you normally drive'. Eight per cent of our sample were driving a car owned by their employer. UK national figures report company cars as comprising 10.5% of the UK car fleet - and accounting for c20% of the UK car mileage, due to the extensive mileages often driven by company car drivers. In Table 3 the 6-point scale has been recoded to four values, combining scale points 3, 4 and 5 into 'Sometimes'. Table 3 shows that it was not the case that the company car drivers in our sample were those driving every working day as part of their work. In fact barely above a third (37%) of company car drivers were driving as part of their work every working day. Indeed a fortunate 4% reported they 'Never or almost never' had to drive their company car as part of their work.

**TABLE 3**  
**Proportions of company car drivers driving as part of work**

[column %s]	Employer owned	Not employer owned
Always (every working day)	37%	20%
Often (> once a week)	35%	17%
Sometimes	24%	23%
Never or almost never	4%	40%

### IS DRIVING AS PART OF YOUR WORK DANGEROUS?

Table 4 gives some further characteristics of the car drivers in our sample.

**TABLE 4**  
**Sex, mileage and crash involvement by extent of driving as part of work**

	M	F	Annual Mileage	Crash last 3 yrs
Always (every working day)	27%	13%	18,600	30%
Often (> once a week)	22%	15%	14,500	22%
Sometimes	25%	21%	11,800	23%
Never or almost never	26%	51%	7,600	22%

Twice as many males (27%) as females (13%) drove every working day as part of their work, but the differential reduces amongst those driving as part of their work less often until almost as many employed females (21%) as males (25%) report driving a car 'sometimes' as part of their work. The annual reported mileage differs substantially across the four groups, and the proportion who had been crash involved in the previous three years was highest for those who drove every working day.

But is this elevated crash risk for those who drive as part of their work every working day due to the type or the amount of driving they do?

This was examined using ANCOVA, with Drive As Work entered as a factor, and sex, experience (number of years a full licence had been held) and reported annual mileage entered first as covariates (all in unskewed forms). Crash involvement increased with increasing mileage, and decreased with increasing experience and, once the covariates had been statistically controlled for, the extent of driving as part of work made no significant difference (Table 5).

It would thus appear that the elevated crash risk of those who drive frequently as part of their work results from the amount of driving they do as a result, and is moderated by the accumulation of driving experience (or wisdom - age and experience correlate at  $r = .84$  for this sample; more experienced and older drivers crashed less).

**TABLE 5**  
**Means on safety-critical variables for those driving always, often, sometimes or never as part of their work with p values for drive as work factor and for sex, years driving experience and annual mileage entered as covariates**

	Alw	Oft	Some	Nev	DAsW	Sex	Exp	Mil
Crash involved	.32	.22	.23	.22	ns	ns	.003	.010
Normal speed	.36	.16	.97	-.30	.024	.000	.035	.024
Preferred speed	.23	.65	.99	-.35	.019	.000	ns	.000
H/Code Violations	9.44	9.30	10.46	7.59	.031	.000	.001	.000
Aggressive Violations					ns	.004	.000	ns
Errors					ns	ns	.026	ns
Thrill					ns	.000	.000	.000
Skill	52.8	49.2	47.6	46.1	.002	.000	.048	.000
Safety	38.9	35.8	33.6	36.0	.000	.000	.000	ns

Means which do not differ significantly ('ns') are omitted from the table.

The effect of Drive As Work on a number of driving style variables was also investigated. Respondents had been asked to nominate their normal speed ('speed you normally drive') and preferred speed ('speed you prefer to drive') on four different road types (motorways, other main roads, suburban roads, rural roads). Scores in miles/hr were converted to z-scores for each road type and the z-scores then averaged. Thus the mean for the sample as a whole was close to zero, positive scores indicate speeds above the mean and negative scores indicate nominated scores below the mean for the sample. Males and high mileage drivers nominated higher normal and preferred speeds, experienced drivers nominated lower 'normal' speeds. But, as may be seen from the means in Table 5, those who drive 'sometimes' as part of their work nominated normal and preferred speeds which are significantly higher even after the effects of the covariates have been controlled for. The same pattern was found for Highway Code Violations (see Lawton et al, 1997a, b for derivation of this measure).

Extent of driving as work had no significant effect of reported errors (Reason et al, 1990; Parker et al, 1995), Aggressive Violations (Lawton et al, 1997a,b) or thrill-seeking while driving (using the thrill-seeking sub-scale from the battery of measures developed by Matthews et al, 1997) though the covariates had their anticipated effects on these variables.

On Lajunen's skill and safety measures (Lajunen & Summala, 1995; Lajunen, 1997; Lajunen et al, 1999) those who drive as part of their work every working day rated themselves significantly more skilful, while those who drove 'sometimes' as part of their work rated themselves less safe.

Thus those who drive some of the time as part of their work tend to drive faster, breach the rules of the road more often, and score lower on a self-report safety scale. While, for this sample, no more of them had been crash involved, their manner of driving raises some disquiet.

## **SPEEDING, VIOLATIONS AND DRIVING AS WORK**

Table 6 identifies the demographic and vehicle characteristics of those car drivers in this sample who had been penalised for speeding 'in the past 3 years' and of those who nominated high 'normal' speeds across the four road types ('preferred' speeds gives a similar profile – Stradling et al, 1999).

**TABLE 6**

### **Demographic and vehicle characteristics of speeding offenders and drivers who nominate high 'normal' speeds**

Factor	Speeding Offences	Normal Speed
Age Band	60+: 0%	17-24 > 25-58 > 58+
Sex	no effect	M > F
SES	D/E, Retired: 3%	A/B > C1, C2 > D/E, Retired
Income	<£10K: 2%; >£50K: 18%	£30K+ > £20-30K > <£20K
Region	no effect	Midlands faster
Domicile	no effect	Out-of-town faster
Experience	no effect	1-3 yrs faster
Engine Size	1.8+: 13% [60% of speeders!]	1.6+ faster
Age of Car	1-3 yrs: 12%	1-7 yrs faster
Annual Mileage	>20K: 24%	>10K > 5-10K > <5K
Company Car	Yes: 18%	Yes, faster
Drive As Work	Always: 16% [+ >14K: 37%]	Sometimes, fastest

### **Characteristics Of Speeding Offenders**

1 in 12 (8%) of the sample had been penalised for speeding offences within the previous three years.

Older drivers, those from social class D/E and the economically retired, and those from low income households (below £10K pa) were the least likely to have been penalised for speeding. Car drivers from high-income households (£40K pa and above), and high-mileage (above 20,000 miles p.a.) drivers of newer, larger-engined cars (1-3 years; 1.8L and above), those who drove employer-owned cars and those who drove as part of their work every working day were all more likely to have been penalised for speeding.

18% of company car drivers and 16% of those who drove a car as part of their work every working day had been penalised. 37% of those who drove a car every working day and drove more than 14,000 miles per annum had been penalised. And, intriguingly, 60% of those who had been penalised for speeding (currently: at the time of completing our questionnaire) drove cars of 1.8 litres or above.

### **Characteristics Of Speeders**

Young drivers are faster, older drivers slower. Recently qualified - and thus inexperienced - drivers want to drive faster (Stradling et al, 1999; Stradling, 1999) and report that they do so (Table 6). Male drivers drive faster than female drivers.

The higher social classes, and the better-off, drive faster. Drivers who dwell out of town, who drive high mileages, those in newer and those in larger-engined cars, drive faster. Drivers of employer-owned cars and those who sometimes drive a car as part of their work drive faster.

### **Why Worry About Speeders?**

35% - 1 in 3 - of those car drivers in the sample who had been penalised for speeding offences 'in the past 3 years' had also been accident-involved 'as a driver during the past 3 years' (Table 7). It is not just that 'Speed Kills' but that 'Speeders Crash' - the kinds of drivers who have been penalised for speeding are 50% more likely to have been crash-involved (35%: 22%).

**TABLE 7**  
**Elevated crash involvement of drivers penalised for speeding**

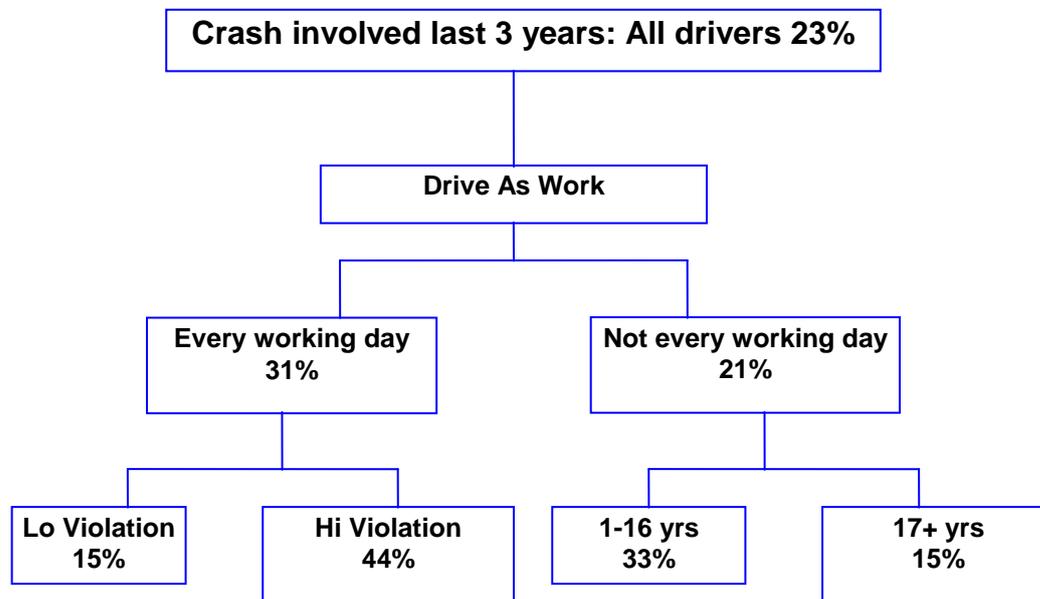
		Speeding Offences last 3 years	
		None	1 or more
Accidents last 3 years	None	78%	66%
	1 or more	22%	35%

### Why Worry About Violators?

SPSS Answer Tree analysis was used to examine possible interactions between Drive As Work, Highway Code Violations, and driving experience (number of years with a full driving licence).

Figure 1 shows that those who drove a car every working day as part of their work, and scored higher on highway code Violations were almost twice as likely to have been crash involved compared to the figure for this sample as a whole (44%: 23%). Contrarily, being a low violating driver, even if driving every working day, is prophylactic. Only 15% of this group had been crash involved in the previous three years, below the level for the sample as a whole and equal to that for experienced drivers who did not drive a car as part of their work every working day (15%).

**FIGURE 1**  
**Elevated crash involvement of hi violating frequent drivers**

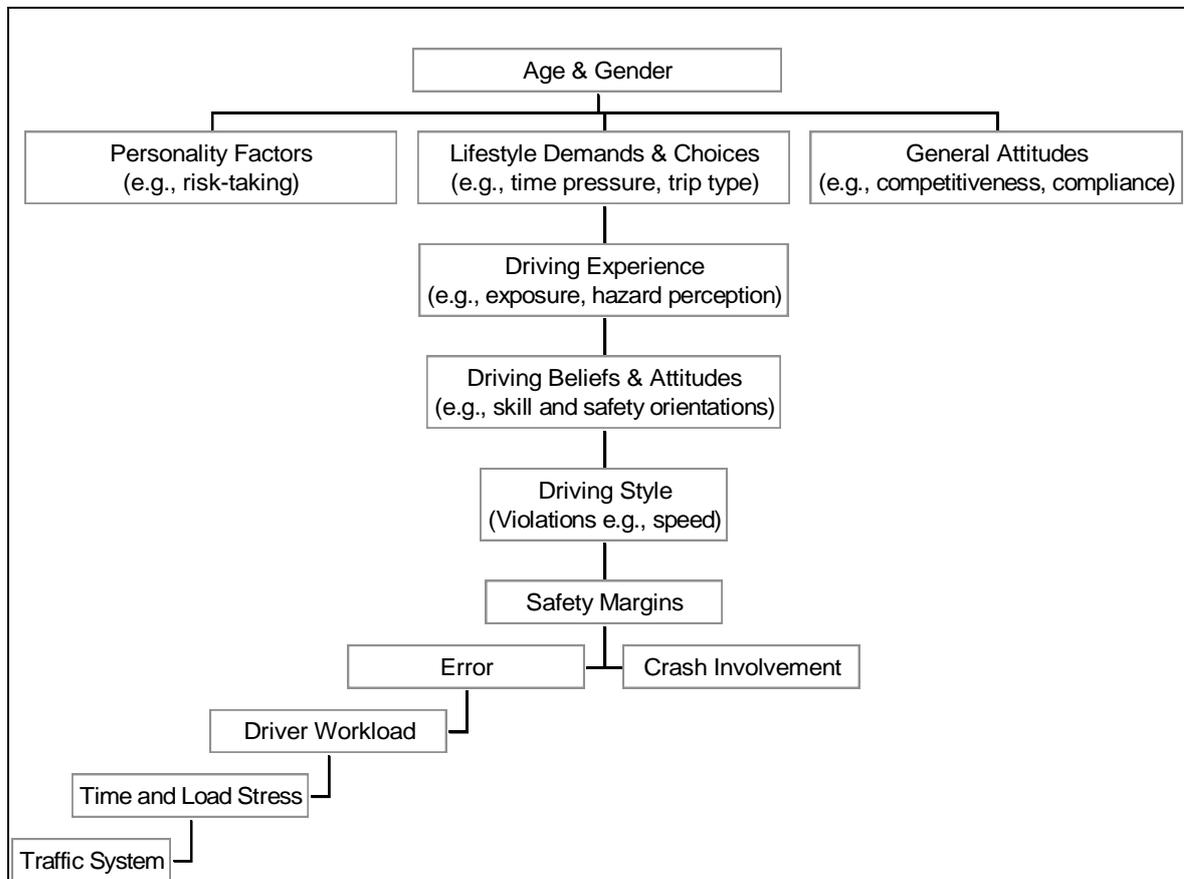


The descriptive model we have developed of factors influencing car drivers' crash-involvement is shown in Figure 2.

The model (Lajunen, 1997; Stradling et al, 1998; Stradling, 1999; Meadows & Stradling, 2000) attempts to summarise factors with documented influence on crash involvement. Distal features are hypothesised to exert their influence through more proximal features. Having to drive as part of your work would here be located under Lifestyle Demands and Choices. Demands because of the time and schedule pressures usually associated with such trips. Choices because the kinds of persons who drive for a living are not randomly allocated to such jobs but generally elect to put themselves forward, believing they will find the task sufficiently congenial and rewarding. We have seen (Table 3) that there are sex differences amongst those who drive a car very working day as part of their work. There are also age differences (Stradling et al, 1999), with the frequent drivers tending to be older. We have seen that frequency of driving as part of your work makes considerable difference to exposure to

risk (Table 4) and to drivers' skill and safety orientations, speeds and violations (Table 5). Driving as part of your work is likely to expose you to the worst exigencies of the traffic system, both places and times, and to require you to drive under time stress whilst also being under load stress from the demands of the work that you are driving in connection with. Thus the model suggests driving as part of work is likely to increase your vulnerability to risk on the road. And it also identifies the sources of such risk. So reducing the likelihood of driving as part of your work damaging your health will need to address a range of factors.

**FIGURE 2**  
**A summary descriptive model of person and system influences on crash involvement**



## CONCLUSIONS: REDUCING THE HEALTH RISK OF DRIVING AS PART OF YOUR WORK

Amongst those who drive a car as part of their work every working day, high Violators are twice as likely to crash as low Violators (Figure 1). What drives drivers to violate the rules of the road? We can distinguish between persons and the conditions under which they are operating. We now know the profile of high violators in some detail (e.g., Stradling, 1999) and we can list the external presses towards violating, such as:

- vehicle type
  - power
  - image
- traffic norms
  - pulled forward
  - pressed from behind
- time pressures

and the immediate, internal benefits to the violator, such as:

- instrumental gains
  - reduced journey time
- affective benefits
  - thrill-seeking
  - expressing autonomy
  - gaining advantage
  - maintaining progress.

In similar vein we can analytically separate external and internal barriers to violating. External constraints - intended to protect people from themselves - such as:

- road engineering
- vehicle engineering
- gridlock
- enforcement
  - signage
  - active and passive surveillance
- company policy

and internal restraints such as:

- anticipated consequences
  - arrest
  - crash
  - disapprobation
  - regret
- moral norms.

For those who drive as part of their work, driving high mileage will increase crash risk through increasing exposure (and driving long hours will increase crash risk through fatigue); time and schedule pressures will increase the likelihood of violating which elevates crash risk; and time pressure and other distractions ('Have I got all the paperwork for the next meeting?', 'Should I call the office on my mobile?') will increase the likelihood of oversight, lack of concentration on the primary task, and crash. Violation + Error = Crash.

And such drivers and their driving also pose a health risk to more vulnerable road users. The improved passive safety of the kinds of cars which company car drivers and others driving cars as part of their work tend to drive may reduce crash severity for vehicle occupants but has the effect of exporting injury risk out of the vehicle.

What should be done? Red-light cameras are an ecologically valid device for reliably spotting drivers who are likely to be high Violators. All drivers caught running red lights should attend a Driver Improvement Course. As should those who persistently acquire speeding tickets. Driver Improvement Courses offer a better opportunity to adjust driver behaviour and attitude than do Fixed Penalty Notices.

When persons are employed to operate other large and dangerous pieces of equipment, the following conditions typically apply:

1. there is a rigorous selection procedure
2. there is extensive initial training
3. there is frequent supervision providing fast feedback to the operator
4. there is regular audit and appraisal of continuing competence
5. there is continual updating of skills as operating conditions and equipment change
6. there is retraining and remediation when necessary

7. there are mechanisms for removing those whose manner of operation threatens the safety of themselves or others.

None of these apply in the case of driving a car. Few apply in the case of driving a car as part of your work. Some apply to some extent in the case of driving a fleet car - but properly trained, properly motivated and properly supported fleet car drivers are probably not the problem. One step in the right direction would be the introduction of a scheme to re-appraise the competence of a (small) sample - perhaps drawn at random as in selection for jury service - of UK drivers. It should look at vehicle handling, road-reading and hazard-perception skills - perhaps using commentary driving or in-car video - theory-testing, and attitude. Such a quality assurance procedure would, if nothing else, signal that good driving matters - and that it matters enough for the powers-that-be to invest time, effort and resources in monitoring the standards of driving in the UK. Another step would be for the Health and Safety Executive to find a way to regulate the driving behaviour - not just the loading behaviour - of those who drive in connection with their employment. As we have seen, company car and fleet car drivers are just a subset of these. And, not surprisingly, further research is needed, particularly into just who are these 'irregulars' who 'sometimes' drive as part of their work but seem to do so in a manner that puts their continued health, and that of others, at risk.

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#### Short Abstract

Company or fleet car drivers are part of a much larger group who drive a car as part of their work. This paper reports findings taken from a recent DETR funded study of factors affecting car use choices of the crash involvement and driving style of such drivers and makes some suggestions for changing the culture of the roads.

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