Characteristics of Police and Other Emergency Vehicle Crashes in New South Wales

MA Symmons, NL Haworth & CM Mulvihill

Monash University Accident Research Centre
Building 70, Monash University, Victoria 3800, Australia
mark.symmons@general.monash.edu.au
ph 61399051092 fax 61399051809

ABSTRACT

Emergency vehicle drivers are generally more highly trained than other drivers. However their task can be significantly more demanding, such as the occasional but unpredictable need to travel at high speed, the need to operate communications equipment while driving, etc. The public also expects them to set the highest example of driving behaviour, and a crash, particularly while driving at speed, is considered very newsworthy. Such a high profile may make incidents involving emergency vehicles seem more common to the public than they actually are.

Making comparisons between emergency service vehicle crashes and "ordinary" vehicle crashes, such as police car crashes versus all other car crashes, is problematic. For example, an emergency service vehicle is part of the workplace for driving officers and their on-road exposure is likely to be higher. However, comparisons with other, similar vehicles driven for work purposes may yield a more accurate picture.

In this paper, crashes of vehicles classified as belonging to specific emergency service fleets were analysed on their own and in comparison to similar, non-emergency fleet vehicles that had also crashed. For example, crashed police cars were compared with crashed fleet-registered cars. Analyses were conducted for crash-related variables, driver-related variables, and behaviour-related variables.

Keywords: fleet safety, emergency vehicles, police, ambulance

INTRODUCTION

Drivers of emergency vehicles face demands additional to the general classes of driving tasks. There are qualitative differences in the characteristics of driving under normal conditions and in emergencies (Rechnitzer, Richardson, Hoareau, Deveson, Triggs & Fitzgerald, 2002). Emergency vehicle driving will often involve episodes of high demand that occur in a range of operational environments. An accurate awareness of the current and developing situation in terms of other traffic and road features ('situation awareness') is therefore imperative.

Any type of emergency driving necessarily involves high-risk conditions. Broadly, the risks associated with driving an emergency vehicle may be categorised into two groups; factors associated with the environment inside the vehicle and those associated with the traffic environment. In terms of the 'in-vehicle' environment, the driver is likely to be affected to some extent by the stressful nature of the circumstances. For example, in ambulances there is potential for distraction by the patient and/or any other emergency personnel in the vehicle. In some cases the use of lights, sirens and two-way radios may also create driver distraction.

The combined effects of such factors are likely to increase the mental workload of the driver which in turn increases the opportunities for error and the risk of crash involvement.

Factors associated with the traffic environment are also likely to make driving more risky. For example, high-speed travel decreases the time available for the driver to detect and respond to hazards such as the unpredictable and potentially dangerous actions by other road users (Macdonald, 1994). Driving at night is intrinsically riskier than driving in daylight, which may be due in part to the degraded quality of visual information available to drivers at night (Macdonald, 1994). Adverse weather conditions are also likely to increase stopping distance and reduce visibility, particularly at high-speed travel. The combined effects of 'in-vehicle' and traffic factors are likely to increase the workload of the driver and therefore the potential for driver error.

There has been a wide range of research into the safety of emergency vehicle operations in Australia in recent years. This has included projects to reduce the propensity for vehicle rollover and improvements in occupant protection in Police vehicles (Rechnitzer et al., 2002), investigations of potential improvements to emergency vehicle conspicuity (Doyle, 2003; Dunn & Tunnicliff, 2003; and Lenné, Mulvihill, Regan, Triggs, Corben & Verdoorn) and assessments of the likely impact of allowing holders of probationary licences to drive ambulances (Haworth & Mulvihill, 2004).

The safety of Police drivers has been the subject of considerable research, both in Australia and elsewhere. While much of the research has focussed on vehicle crashworthiness, driver training and management have also received some attention. A MUARC study of safety and performance requirements for Victoria Police vehicles (Rechnitzer et al., 2002) included a review of driver training and the management of driver safety in addition to vehicle crashworthiness. The report indicates that Police sedans (the most common vehicles in the fleet) average 85,000 kms per collision. This corresponds to a crash rate of 11.8 collisions per million kilometres travelled. Police pursuits result in relatively more collisions, averaging about 120 kms per collision.

The safety of ambulances for both drivers and patients being transported is the subject of considerable research in Australia and internationally. In the US between 1996-99, there were 8,500 ambulance and fire vehicle crashes per year. Between 1995-98, 140 people were killed in ambulance crashes and 10,000 were seriously injured (FARS/GES). The minimum annual overall cost of ambulance crash injury in the US was estimated to be in excess of $100 million.

Driving an ambulance is also likely to be stressful in ways that are different to other types of emergency vehicle driving. In the case of ambulances, there are likely to be several vehicle occupants, some of whom may be unrestrained such as the paramedic/s who may be required to tend to the patient whilst in transit. More than one vehicle occupant is a factor, which, by itself, increases the potential for injury and death in the event of a crash, particularly when occupants and equipment are unrestrained and have the potential to act as projectiles. Research also that shows that the design of ambulance vehicles offers only minimal protection of vehicle occupants in the event of a crash (Levick, 2001). The interior design of the vehicles has hostile surfaces even for restrained occupants. Ambulance patient compartments are one of the few passenger vehicle environments for which there are no automotive occupant protection safety standards. There, it becomes paramount that the driver is skilled enough to handle the risks associated with driving under such adverse conditions.

It is estimated that more than half of the fatal collisions involving ambulances may be directly attributable to the ambulance driver (Levick, 2001). Most of the people killed are drivers. A study by Biggers, Zachariah and Pepe (1996) examining the characteristics of 86 collisions involving emergency medical services vehicles in Houston during 1993 found that emergency vehicle drivers involved in previous collisions accounted for a disproportionate number (33 percent) of collisions and nearly 90 percent of all injuries. The study also showed that the majority of collisions occurred at some site other than an intersection. There was no association between crash severity and occurrence at an intersection, day versus night, weekend versus weekday, presence or absence of inclement weather, or use of lights and sirens versus severity of collision.

This paper analyses the number and characteristics of emergency vehicle crashes in New South Wales and compares these with crashes of non-emergency vehicles. The roles of excessive speed and fatigue are particularly examined.

DATA

The data for the analyses in this paper came from a matched file of crash and vehicle registration data for NSW covering the period 1996 to 2000 (inclusive). The linkage was made using the vehicle's registration number, which was present in both the registration and crash databases. The registered keeper of the vehicle was the organization or individual on record within the six months immediately preceding the crash (a particular vehicle could therefore appear more than once in the crash database and be registered to different keepers). The crash data contains each crash reported to Police in NSW, and each crash is classified as involving a fatality, an injury or no injury (a towaway crash). The data was supplied to MUARC post-matched and de-identified. According to the New South Wales Roads and Traffic Authority, the matching process was successful for more than 94% of all crashed NSW-registered vehicles (see Symmons & Haworth (2005) for further details on the matching process and a more in-depth description of the data set).

The primary reason for linking the crash and registrations databases was that the latter included whether the vehicle was registered to a "fleet owner". Fleet owners included organizations or individuals with one or more business registrations, and organizations with more than two private registrations (vehicles registered to car dealers and rental companies were classed as non-fleet vehicles).

Two variables included in the file and analysed here in relation to emergency vehicle crashes concern whether the vehicle was thought to be speeding at the time of the crash and whether the crashed driver was considered to be fatigued, where those factors were determined to have contributed to the crash. According to the RTA guidelines, speeding is judged to have contributed to a crash if:

- The controller (driver or rider) was charged with a speeding offence, or
- The vehicle was described by police as travelling at an excessive speed, or
- The stated speed of the vehicle was in excess of the speed limit.

Additionally, if the vehicle jack-knifed, skidded, slid, went out of control or ran off the road on a bend then speed was considered to be a factor. Thus, speeding refers to an excessive speed for the prevailing conditions rather than necessarily exceeding the posted speed limit, and so could be noted for any speed limit zone.

As specified by RTA guidelines, fatigue is judged to have contributed to the crash if the vehicle's controller was described by police as being asleep, drowsy or fatigued. Fatigue was also a factor if the vehicle was involved in a head-on crash while travelling on the wrong side of the road (but was not overtaking and there were no other relevant mitigating circumstances), or the vehicle ran off the road (a straight section or the outside of a curve) but the vehicle was not considered to be travelling at an excessive speed.

In the 2000 registration data, 7,015 (0.19%) of all vehicles were registered as "emergency vehicles". Of these, 6,897 were coded as fleet vehicles. The registration data supplied did not identify the types of vehicles (e.g. car or truck) or the specific emergency services to which these vehicles belonged.

In the crash data, the "traffic unit type" variable includes the categories "ambulance", "fire brigade", "police", "tow truck", "police motor cycle" and "other emergency vehicle". The number of crashed vehicles in each of these classifications is shown in Table 1. Overall, 1,425 (0.4%) of the 396,899 crashed vehicles in the dataset were fleet emergency vehicles. A further 63 vehicles were non-fleet emergency vehicles, mostly made up of tow trucks (54%) followed by vehicles registered to the police (20 vehicles, or 32% of the non-fleet emergency vehicles). It is assumed some of these non-fleet registered emergency vehicles (other than the tow trucks) would be used by executives rather than for emergency service "front-line" work per se, so these vehicles were not included in further analyses. Tow trucks were also removed from further analyses as they are not generally considered to be part of emergency services and are not called upon to exceed the speed limit as part of their duties.

Table 1 Numbers of fleet and non-fleet emergency vehicles in crashes.

Emergency vehicle	Fleet		Non-fleet		Total	
type	No.	%	No.	%	No.	%
Ambulance	156	10.9	6	9.5	162	10.9
Fire brigade	70	4.9	1	1.6	71	4.8
Police	785	55.1	20	31.7	805	54.1
Police motorcycle	16	1.1	1	1.6	17	1.1
Tow truck	394	27.6	34	54.0	428	28.8
Other emergency veh	4	0.3	1	1.6	5	0.3
Total	1,425	100	63	100	1,488	100.0

RESULTS

Severity and types of crash

The relatively small numbers of fatal crashes (10 in total) constrains the discussion of the severity of emergency vehicle crashes. Overall, 1% of fleet emergency vehicle crashes were fatal and 51% resulted in injury. Of the emergency vehicles, police motorcycle crashes were most likely to result in fatality or injury (probably to the rider). As the crash file is not person based, it is not possible to reliably determine whether it was the emergency service officer who was killed. Crashes of fire brigade vehicles were less likely to involve injury than those of ambulance and Police vehicles (see Table 2).

Table 2 Numbers of fleet emergency vehicles in crashes by crash severity.

Crash severity	Ambulance No.	Ambulance %	Fire brigade No.	Fire brigade %	Police No.	Police %	Police MC No.	Police MC %	Total No.	Total %
Fatal	3	2%	1	1%	5	1%	1	6%	10	1%
Injury	74	47%	25	36%	411	52%	14	88%	524	51%
Towaway	79	51%	44	63%	369	47%	1	6%	493	48%
Total	156	100%	70	100%	785	100%	16	100%	1027	100%

Table 3 shows that the most common crash type for each emergency vehicle type was either a cross-traffic crash or a rear-end crash. The lack of a vehicle identifier variable in the data meant that it was not possible to determine the role of the emergency vehicle in the crash (e.g. bullet or struck vehicle), and so it was not possible to infer which vehicle may have been at fault. Two of the top five police motorcycle crashes involved an out of control vehicle (likely the motorcycle, although the loss of control may have been due to the rider attempting to avoid an obstacle rather than simply losing control).

Table 3 Five most common emergency vehicle crash types by proportion.

Ambulance Crash type	%	Fire brigade Crash type	%	Police Crash type	%	Police MC Crash type	%	Overall Crash type	%
Cross traffic	24%	Cross traffic	24%	Rear end	15%	Rear end	25%	Rear end	16%
Rear end	19%	Rear end	19%	Cross traffic	14%	Out of cont on bend	13%	Cross traffic	16%
Right through	7%	Right near	10%	Head on	5%	On road-out of cont.	13%	Head on	5%
Overtake turning	6%	Head on	7%	Off rd left into obj	5%	Head on	6%	Right through	5%
Head on	5%	Right through	7%	Right through	5%	U turn	6%	U turn	4%
Total	62%	Total	67%	Total	44%	Total	63%	Total	47%

Location and timing of emergency vehicle crashes

Overall, almost three-quarters of all emergency vehicle crashes occurred in the Sydney metropolitan area (see Table 4). Of the types of emergency vehicle, ambulances were most likely to crash outside the Sydney area. In addition, ambulance crashes outside the Sydney metropolitan area were likely to be more serious, with a higher proportion of injury crashes in these areas and a higher proportion of towaway crashes in the Sydney metropolitan area. Fire brigade and police motorcycle crashes were also more serious outside the Sydney area, while there was little difference in police vehicle crashes between Sydney and outside Sydney.

Figure 1 displays the time of day of emergency vehicle crashes (police motorcycle crashes are not shown because of the small number of crashes). There is substantial variability in the crash distributions (at least partly due to small crash numbers in some cases), but police vehicle crashes are generally consistent across the day and fire and ambulance crashes are more likely between the hours 8am to 7pm. Due to the larger number of police vehicle crashes compared with the other vehicle types, an “overall” crash distribution would closely parallel that for police vehicles.

Table 4 Number of fleet emergency vehicles in crashes by severity and location.

Crash severity	Ambulance No.	Ambulance %	Fire brigade No.	Fire brigade %	Police No.	Police %	Police MC No.	Police MC %	Total No.	Total %
Sydney										
Fatal	2	2%	0	0%	3	1%	0	0%	5	1%
Injury	46	46%	18	35%	305	53%	12	92%	381	51%
Towaway	53	52%	33	65%	271	47%	1	8%	358	48%
Total	101	100%	51	100%	579	100%	13	100%	744	100%
Outside Sydney										
Fatal	1	2%	1	5%	2	1%	1	33%	5	2%
Injury	28	51%	7	37%	106	51%	2	67%	143	51%
Towaway	26	47%	11	58%	98	48%	0	0%	135	48%
Total	55	100%	19	100%	206	100%	3	100%	283	100%

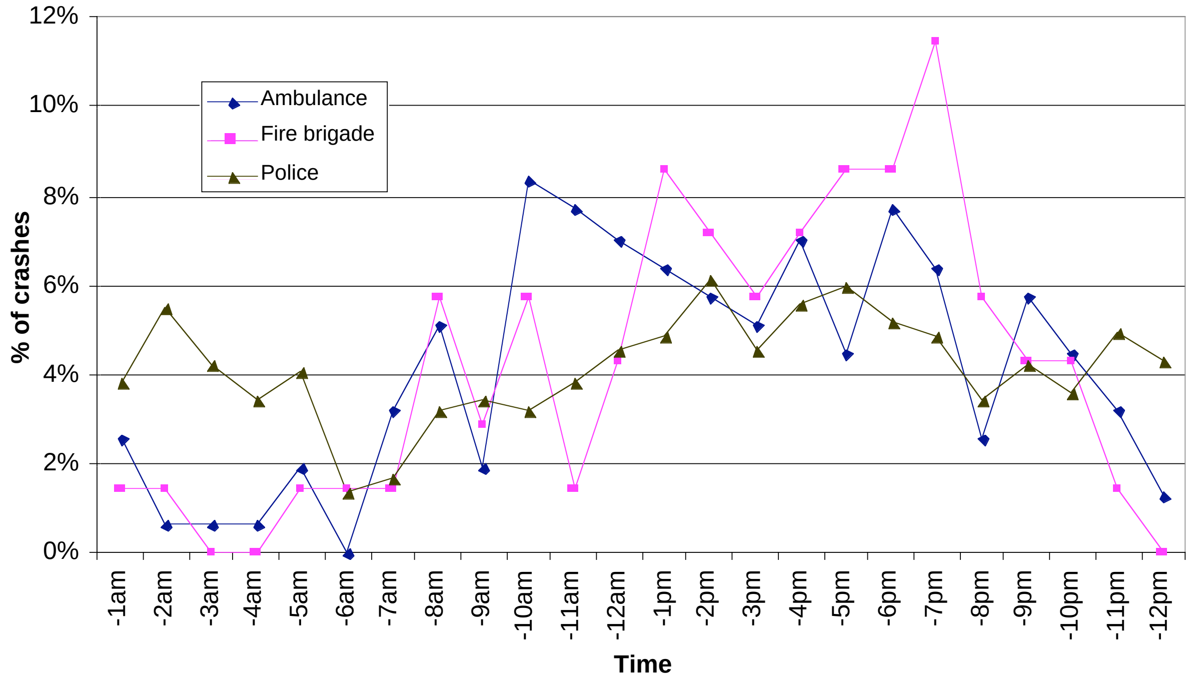

Figure 1 Percent of fleet emergency vehicles of each type in crashes by time of day.

In terms of the daily distribution of emergency vehicle crashes, fire service vehicle crashes are somewhat more likely to occur on Mondays and least likely on weekends (Figure 2). The proportion of ambulance crashes generally increases from Sunday through to a peak on Saturdays. It should be noted that in both cases the number of crashes for these categories is relatively small. Police vehicle crashes are approximately equally likely across the days of the week.

Driver characteristics

With an average age of 34.7 years (SD=6), police motorcycle riders were the youngest of the crashed emergency vehicle operators, followed by police drivers (M=39, SD=23) and ambulance drivers (M=39.4, SD=19), with fire brigade drivers the oldest with an average age of 46.7 years (SD=21). A one-way ANOVA revealed that this difference was significant ($F(2,1023)=2.8$; $p<0.05$). Post-hoc analyses indicated that crashed fire brigade drivers were significantly older than each other group of crashed drivers in terms of age, but that the other groups were not statistically different from each other. The most common age group for each driver group was 26-39 years old. Males represented the largest proportion of crashed emergency vehicle drivers, ranging from 82% of ambulance drivers to 100% of police motorcycle riders.

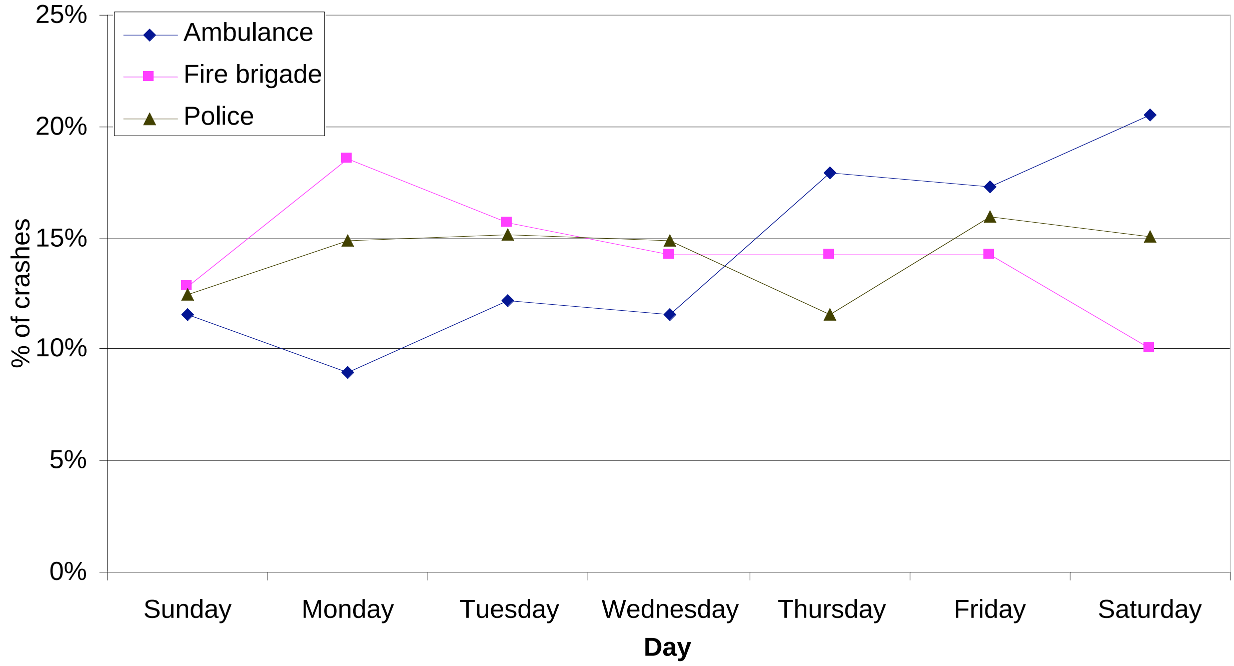

Figure 2 Percent of fleet emergency vehicles of each type in crashes by day of the week.

Risky driving behaviours

Table 5 shows the comparison between emergency vehicle types involved in crashes in terms of three separate "risky driving behaviours". These are crashes in which:

- The vehicle was considered to be travelling at an excessive speed for the prevailing conditions
- The driver was considered to be fatigued at the time of the crash
- The driver was not wearing a seatbelt (or helmet in the case of police motorcycle riders) at the time of the crash.

A fourth crash factor is whether the crashed driver had a blood alcohol content (BAC) in excess of legally allowed levels. None of the crashed emergency vehicle drivers had an excess BAC.

Travelling at an unsafe speed for the conditions was a common crash factor however, with a contribution ranging from 6% of fire brigade crashes up to 21% of ambulance crashes. Speeding was coded as a contributing factor to 6.4% of crashes of non-emergency fleet vehicles and 8.5% of crashes of non-emergency non-fleet vehicles. Fatigue as a crash factor was relatively rare, but more common for police vehicles. Non-use of seatbelts was most likely in fire brigade drivers, but this may reflect the availability of suitable seatbelts in some fire trucks.

Table 5 Numbers of emergency service vehicles in crashes in which speeding, fatigue, and illegal BAC was involved, and in which the driver was not wearing a seatbelt.

Crash factor	Ambulance		Fire brigade		Police		Police MC		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Speeding	33	21%	4	6%	128	16%	2	13%	167	16%
Fatigue	2	1%	1	1%	20	3%	0	0%	23	2%
No seatbelt/helmet	1	1%	10	14%	13	2%	0	0%	24	2%

It should be noted that the definitions for speeding-related crashes and fatigue-related crashes used here (and in many other jurisdictions and publications) might be considered somewhat imprecise. In both cases judgements are made based on information such as the location and type of crash, time of day that the crash occurred and eyewitness statements. There is no physical, after-the-fact, quantifiable measure for fatigue or speed as exists for an alcohol-involved crash, where a driver's blood alcohol content can be objectively tested. The lack of such an objective test for mass crash data is reflected in the lack of agreement between various jurisdictions as to the criteria to use to classify a crash as speed- or fatigue-involved. In the analyses presented here, comparisons were made vehicles of the various emergency services. Accordingly, a more critical issue is that the *same* definitions for speed-related crashes and for fatigue-related crashes were used for all three groups, rather than the appropriateness of the RTA's determination of the definitions per se.

Crashed emergency service cars vs. crashed fleet cars

Fleet emergency vehicles coded in the crash database as large or medium cars, 4WDs, sports cars and vans were reclassified as "emergency cars" in order to make comparisons with fleet and non-fleet cars (without emergency vehicles). Fleet emergency cars represented a relatively higher proportion of fatal and injury crashes, but a lower proportion of towaway crashes (see Table 6). There was a significant difference in crash severity between the car categories ($\chi^2(4)=168$; $p<0.001$).

Table 6 Numbers of fleet emergency cars, fleet cars, and non-fleet cars in crashes by crash severity.

Severity	Fleet emergency cars		Fleet cars		Non-fleet cars		Total	
	No.	%	No.	%	No.	%	No.	%
Fatal	8	1.2%	268	0.5%	1,793	0.7%	2,069	0.6%
Injury	314	47.5%	16,837	31.5%	91,021	33.5%	108,172	33.2%
Towaway	339	51.3%	36,326	68.0%	178,952	65.8%	215,617	66.2%
Total	661	100%	53,431	100%	271,766	100%	325,858	100%

There was also a significant difference between the car categories in terms of where the crashes occurred – within metropolitan Sydney versus outside Sydney ($\chi^2(2)=854$; $p<0.001$). Fleet cars were relatively most likely to crash within Sydney (75.5%), followed by emergency cars (72.5%) and then non-fleet cars (69.2%).

Fleet emergency car crashes were more likely to involve a fatality or an injury than fleet or non-fleet cars both within and outside Sydney, followed by non-fleet cars and then fleet cars (see Table 7). There was a significant difference between the car categories in terms of crash severity and where the crashes occurred (within Sydney: $\chi^2(4)=109$; $p<0.001$; outside Sydney: $\chi^2(4)=30$; $p<0.001$).

DISCUSSION

The results presented here show that the largest number of emergency vehicles in crashes were police vehicles, followed by ambulances and then fire brigade vehicles. This confirms the pattern found in Victorian data by Lenné et al. (2004) in their analysis which included injury crashes only. Tow trucks were excluded from both studies and were found in the current study to have been involved in more crashes than either ambulance or fire brigade vehicles. A more complete analysis would include comparative estimates of exposure to risk, such as a function of annual travel distances. However, information on distances travelled by the different types of emergency vehicle for a common period does not seem to be readily available.

Table 7 Numbers of fleet cars, non-fleet cars and fleet emergency cars in crashes by crash severity and location.

Severity	Fleet cars		Non-fleet cars		Fleet emergency cars		Total	
	No.	%	No.	%	No.	%	No.	%
Sydney								
Fatal	132	0.3%	829	0.4%	4	0.8%	965	0.4%
Injury	12,136	30.1%	59,236	31.5%	230	48.0%	71,602	31.3%
Towaway	28,090	69.6%	128,048	68.1%	245	51.1%	156,383	68.3%
Total	40,358	100.0%	188,113	100.0%	479	100.0%	228,950	100.0%
Outside Sydney								
Fatal	136	1.0%	964	1.2%	4	2.2%	1,104	1.1%
Injury	4,701	36.0%	31,785	38.0%	84	46.2%	36,570	37.7%
Towaway	8,236	63.0%	50,904	60.9%	94	51.6%	59,234	61.1%
Total	13,073	100.0%	83,653	100.0%	182	100.0%	96,908	100.0%

Cross traffic and rear end crashes were the most common crash types for all types of emergency vehicles (except Police motorcycles). These were similar to those reported by Lenné et al. (2004).

Not surprisingly, crashes involving police motorcycles were more severe than other emergency vehicle crashes. Where the vehicles were most likely to be “cars” or van-sized vehicles (ambulance and police) the proportions of crashes that were injury or towaway were similar. Where the vehicles were likely to be trucks (fire brigade), the crashes were mostly towaway. Crashes of fleet emergency vehicles that were cars were more severe on average, than those of either non-emergency fleet cars or non-fleet cars.

The greater contribution of speeding to emergency vehicle crashes may underpin some of the greater severity of these crashes. Speeding was coded as a contributor to more ambulance crashes (21%) than police (16%) or fire brigade crashes (6%). The lower involvement of speeding in crashes of fire brigade vehicles may reflect the larger size of these vehicles.

There were relatively more police vehicles in crashes between 11pm and 5am, times of the day when the likelihood of fatigue is greatest. Consistent with this result, fatigue was coded as a factor in more police vehicle crashes (3%) than crashes involving ambulances (1%) or fire brigade vehicles (1%).

Given the crash risks associated with the need to respond to emergencies, it is important to ensure that work practices are designed to minimise fatigue, that careful design of the communications and other equipment in emergency vehicles minimises the risk of distraction and also the risk of injury in the event of a crash and that overall crashworthiness of emergency vehicles is maximised.

While they may receive specialist driver training, emergency vehicle drivers are subject to particular demands that other drivers would not experience, such as the occasional but unpredictable need to travel at high speed. In some occupations, such as police highway patrol, the worker may spend a significant amount of time driving and/or travel substantial annual distances, resulting in considerable increases in exposure to the "ordinary" risks of driving that we all face.

REFERENCES

Biggers, W.A. Jr, , Zachariah, B.S., & Pepe, P.E. (1996). Emergency medical vehicle collisions in an urban system. *Prehospital and Disaster Medicine, 11,* (3), 195-201.

Doyle, R. (2003). Should fire engines be red? Contemporary urban fire fighting vehicles – Visibility, warning devices and local area traffic management. Proceedings Road Safety Research, Policing and Education Conference, 24-26 September, 2003. Sydney.

Dunn, K., & Tunnicliff, D. (2003). The safety and effectiveness of emergency vehicle lighting. Proceedings Road Safety Research, Policing and Education Conference, 24-26 September, 2003. Sydney.

Haworth, N., & Mulvihill, C. (2004). Probationary drivers of ambulances – Potential safety issues, operating procedures and mitigation of risks. MUARC report prepared for Metropolitan Ambulance Service and Rural Ambulance Victoria.

Lenné, M., Mulvihill, C., Regan, M., Triggs, T., Corben, B., & Verdoorn, A. (2004). The effects of an in-vehicle advanced warning device on the safety of driver interactions with emergency vehicles. Proceedings Road Safety Research, Policing and Education Conference, 14-16 November, 2004. Perth.

Levick, N. (2001). Emergency vehicle safety research – An overview of current status and history. *Proceedings of the Military and Emergency Vehicles Safety TOPical TECHnical (TOPTEC) Workshop 2001.*

Macdonald, W. A. (1994). *Young Driver Research Program: A Review of Information on Young Driver Performance Characteristics and Capabilities*: (CR 129). Canberra: Federal Office of Road Safety.

Rechnitzer, G., Richardson, S., Hoareau, E., Deveson, N., Triggs, T., & Fitzgerald, E. (2002). Police vehicles – defining safety and performance requirements. Unpublished MUARC Report for Victoria Police.

Symmons, M. & Haworth, N. (2005). *Safety attitudes and behaviours in work-related driving – Stage 1: Analyses of crash data.* Monash University Accident Research Centre, Report No. 232.

ACKNOWLEDGMENTS

The data were provided by the Roads and Traffic Authority of New South Wales as part of their support for the MUARC Baseline Project "Safety attitudes and behaviours in work-related driving" which was funded by VicRoads, Transport Accident Commission and Department of Justice. The conclusions are those of the authors and not of any of the organizations listed.