# Contract Report

## Crashes involving ACT vehicles and ACT controllers in NSW 1999-2003

*by* *Kelly Imberger, Tanya Styles & Peter Cairney*

for NRMA-ACT Road Safety Trust

RC4433-1 March 2005

arrb consulting

# Crashes involving ACT vehicles and ACT controllers in NSW 1999-2003

for NRMA-ACT Road Safety Trust

| | Reviewed |
|---|---|
| **Project Leader** | Dr Peter Cairney |
| **Quality Manager** | Kelly Imberger |

RC4433-1 March 2005

# Summary


### Background

An earlier report (Cairney and Gunatillake 2000) demonstrated that ACT drivers and ACT registered vehicle were involved in a large number of crashes in New South Wales, and provided a basic description of the problem in terms of location, crash type and other relevant factors. The NRMA ACT Road Safety Trust commissioned ARRB Group to re-examine these issues five years later to provide a comprehensive and up-to-date basis on which to plan interventions to address this problem.

### Method

NSW crashes between 1999 and 2003 which involved ACT registered vehicles or ACT licensed controllers were examined using SPSS (Statistical Package for Social Sciences) version 11.5 and ArcMap version 9.0. The inclusion of both ACT registered vehicles and ACT licensed controllers captures all possible scenarios where the driver, rider or vehicle originated in the ACT. The investigation focussed on crash, vehicle and controller characteristics, factors contributing to crashes and the spatial distribution of crashes. Metropolitan Sydney, the major traffic routes connecting the ACT to major towns and tourist locations, and neighbouring Local Government Areas provided spatial frameworks for the analysis of the crash data. The analysis was based on cross-tabulation of the crash factors, and is illustrated by maps plotting different crash characteristics.

### General findings

1. The number of fatal crashes in the ACT was approximately the same as the number of fatal crashes in NSW resulting from crashes involving ACT vehicles/controllers
2. The ACT driving population experiences large numbers of injury crashes in NSW, though the total is less than the injuries occurring in the ACT.
3. The highest concentration of crashes was in Metro Sydney, particularly pedestrian and intersection crashes. It is not clear whether this simply due to greater exposure of ACT drivers and vehicles in Sydney, a higher rate of reporting less serious crashes, or whether ACT drivers are not prepared for the more demanding driving environment.
4. Approximately 30% of crashes occurred within 100 km of Canberra and 90% occurred within approximately 250 km. The Hume and King's Highways had the highest number of crashes of the main routes under investigation. These results apply to both reports.
5. The major routes across NSW also accounted for a high proportion of ACT controller/vehicle involved crashes, particularly those involving vehicles running off the road on curves and straight sections of road. This result was found in the previous report.
6. Weekend crashes were over-represented on the highways connecting the ACT with the coast and mountains, but were not over-represented in Sydney or the Princes or Pacific highways. This was the case for both crash analyses, but for the current report the Princes Highway was over-represented on weekend crashes.

7. Holiday crashes accounted for approximately 30% of the total in both reports. Approximately 70% of controllers involved in crashes were male, and most were aged less than 40.

**Neighbouring LGAs**

1. Queanbeyan City (9%) and Yarrowlumla (6%) had the highest number of crashes of the study LGAs.
2. Yass (39%) followed by Yarrowlumla (38%) had the highest number of weekend crashes. This was slightly higher than that for total weekend crashes involving ACT controllers/vehicles in NSW (33%).
3. There was no typical increase of crashes for the study LGAs during the morning peak period. Crashes began to increase from 10.00 am, peaked at 4.00 pm and decreased substantially from 7.00 pm.
4. Queanbeyan City had the highest number of night time crashes of the study LGAs, followed by Yarrowlumla.
5. Queanbeyan City, Yarrowlumla and Yass had similar amounts of holiday crashes. Cooma-Monaro had approximately half the crashes of these LGAs (n=23).
6. The majority of crashes in Yarrowlumla (64%), Yass (71%) and Cooma-Monaro (70%) were single unit crashes. In comparison, the majority of crashes in Queanbeyan City were multiple unit crashes (83%) and this LGA had the highest proportion of pedestrian crashes (18%).
7. As per all crashes under investigation the majority of crashes in the study LGAs involved male controllers. Cooma-Monaro had the largest percentage of male controllers involved in crashes. In addition, the majority of controllers involved in crashes were aged less than 40 years of age for the study LGAs.

**The main findings arising from comparison with crashes in the ACT were:**

1. A lower percentage of crashes occurred on the weekend and a higher percentage of crashes occurred during the week in the ACT, compared to the crashes in New South Wales involving ACT controllers or vehicles.
2. There was an almost even split between male and female drivers in the ACT compared to the preponderance of male drivers in the New South Wales crashes.
3. There were fewer single vehicle crashes occurring in the ACT.

**Recommendations**

A comprehensive set of recommendations to address these issues is presented.

arrb consulting

# Contents

# Tables

# Figures

# Maps



# Maps in Appendix A

# 1 Introduction

On average, over 1,700 people are killed on Australia's roads each year. In New South Wales (NSW), from 1999 to 2003 an average 561 people were killed per year and in the Australian Capital Territory (ACT) this figure was 15 people killed per year. When exposure is taken into account (per 100,000 population for the years 1998 to 2002), Australia has an average fatality rate of 9.2, NSW has an average fatality rate of 8.7 and ACT has an average fatality rate of 5.4 (Australian Transport Safety Bureau 2003). The ACT's low crash rate has long been interpreted to be a reflection of Canberra's high quality road system. However, the ACT is a small region, embedded in the South Eastern region of NSW (see Map1). Many ACT residents use the neighbouring NSW road network for business, leisure and recreation travel. It is therefore possible that the ACT's low crash rate may be explained in part by the fact that much travel takes place outside the ACT. Consequently, many crashes involving ACT controllers or ACT registered vehicles may also occur outside the ACT. A comprehensive understanding of these crashes and the circumstances under which they occur will enable ongoing improved selection and targeting of crash countermeasures.

The aim of this report is to update a previous report (Cairney & Gunatillake 2000) examining crashes in NSW involving ACT licensed controllers or ACT registered vehicles that occurred between 1992 and June 1999. This report examines crash data for 1999 to 2003 and aims to:

- identify the number of crashes involving ACT vehicles or ACT licensed controllers in NSW ('controller' refers to the driver or rider of a vehicle) and their characteristics
- determine the locations of these crashes
- examine the crashes which occur on a range of travel routes and in Local Government Areas (LGAs) neighbouring the ACT (see Map 1 and Map 2)
- investigate a range of potential contributing factors to these crashes
- make comparisons to the results contained in the previous report
- suggest possible measures to reduce the incidence and/or severity of these crashes.


*Map 1 – Map of NSW and the ACT highlighting the routes of interest for the crash analysis*


*Map 2 – Map of ACT highlighting the neighbouring NSW LGAs of interest for the crash analysis*

# 2 Method

NSW crashes involving ACT registered vehicles or ACT licensed controllers and riders dated from 1999 to 2003 were examined using SPSS (Statistical Package for Social Sciences) version 11.5 and ArcMap version 9.0. The inclusion of both ACT registered vehicles and ACT licensed controllers captures all possible scenarios where the driver, rider or vehicle originated in the ACT. The investigation focussed on crash, vehicle and controller characteristics, factors contributing to crashes and the spatial distribution of crashes. Metro (Metro) Sydney and the major traffic routes connecting the ACT to major towns and tourist locations within NSW were the major focus in examining the spatial distribution of crashes. Crash patterns along the Metro Sydney region, routes and LGAs depicted in Table 1 were studied.

**Table 1 – Routes, regions and LGAs examined in the crash data analysis**

| Region/route/LGA | Between | Route Length (km)* |
|---|---|---|
| Metro Sydney (region) | N/A | N/A |
| Hume Hwy (route) | Ashfield to Albury | 560 km |
| King's Hwy (route) | Queanbeyan to Bateman's Bay | 110 km |
| Federal Hwy (route) | Goulburn to Sutton | 190 km |
| Pacific Hwy (route) | Nth Sydney to Tweed Heads | 860 km |
| Princes Hwy (route) | Sydney to Victorian Border | 550 km |
| Monaro Hwy (route) | ACT border near Canberra to Victorian border near Rockton | 250 km |
| Yass (LGA) | Neighbours ACT | N/A |
| Yarrowlumla (LGA) | Neighbours ACT | N/A |
| Cooma-Monaro (LGA) | Neighbours ACT | N/A |
| Queanbeyan City (LGA) | Neighbours ACT | N/A |

* Approximate route length only.

The study routes are highlighted in Map 1 and the study LGAs neighbouring ACT are shown in Map 2. (See Section 1 Introduction). Note that crashes may occur on a route that is also in the Metro Sydney region. These crashes are counted as part of the Metro Sydney region and not the route to avoid double counting.

The Hume Highway runs from Albury on the Victorian border to Ashfield, just south of the Sydney Metro region. The Federal Highway offers a direct link between Canberra and the Hume Highway heading toward Sydney. The Monaro Highway is the major link between the ACT and the Thredbo and Perisher Valley ski resorts in the Great Dividing Range. The highway carries 16,000 vehicles per week in the summer season and 18,000 per week in the winter season (Smith 1999).

The south coast of NSW is one of the State's premier tourist regions, housing national parks, historic settlements and the beaches which the residents of the inland ACT regularly use. The King's Highway connects Queanbeyan, which lies on the ACT border, to the south east coast. During the summer season, the King's Highway carries 37,000 vehicles per week. The Princes Highway runs along the south coast from the Victorian border towards Sydney and the Pacific Highway runs along the north east coast from Sydney to Tweed Heads in the far north. For

those in the ACT, the Pacific Highway offers passage to the north beaches and also to Queensland.

Global coordinates, in the form of latitudes and longitudes were obtained for each crash. This enabled geocoding of the crashes onto digital maps using the GIS computer package ArcMap version 9.0. Each point on the map represents a crash or fatality/injury as portrayed by the symbol used. These digital plots of crashes were used to visually supplement the more detailed analysis of the spatial distribution of crashes.

# 3 General crash data features and state comparisons

## 3.1 General crash, vehicle and casualty profile

This report investigates 3,453 crashes that occurred in NSW from 1999 to 2003 involving ACT registered vehicles or ACT licensed controllers (drivers and riders). A total of 6,367 vehicles were involved in these crashes, of which 3,006 were ACT registered. There were 3,617 vehicles that were either ACT registered or driven by an ACT controller (note that vehicles registered in other states may have been driven by ACT controllers). In relation to the casualties (those killed or injured only) involved in these crashes, there were 2,144 casualties in total (of which 1,366 were controllers). Of these, 60 were killed and 2084 were injured. In relation to controllers, there were 2,346 ACT controllers involved in these crashes and of these 43 were involved in fatal crashes, 926 were involved in injury crashes and 1,377 were involved in non-casualty (tow away) crashes. See Figure 1. There were 562 ACT controllers killed or injured in the crashes (19 killed, 543 injured).

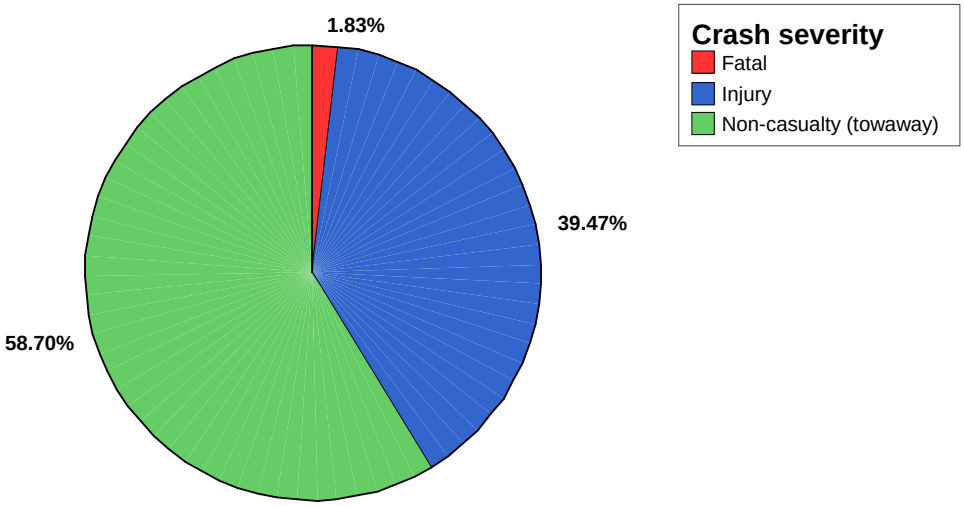



*Figure 1 – Percent of ACT controllers involved in crashes in NSW by crash severity 1999-2003*

## 3.2 Comparison of ACT and NSW crashes involving ACT controllers or ACT vehicles

Table 2 lists the number of fatal and injury crashes involving ACT vehicles or controllers which occurred in NSW compared to the crashes which occurred in the ACT. For the years 1999 to 2003, the number of fatal crashes outside the ACT was both less than or greater than the number occurring within it. Since 1999, the number of fatal crashes within the ACT decreased and the number outside ACT increased. In 2003, 16 fatal crashes involving an ACT vehicle or controller occurred in NSW compared to 10 fatal crashes in the ACT itself.

By 2003, the number of injury crashes in the ACT was similar to the number of injury crashes involving ACT controllers or vehicles in NSW. However, from 1999 to 2002 the number injury crashes in the ACT was higher than injury crashes involving ACT controllers or vehicles in NSW and for 1999 this figure was 50% higher than that of crashes involving ACT controllers or vehicles in NSW. Of interest, the injury crashes in the ACT in 2003 was the lowest since 1993 (ACT Government 2003).

**Table 2 – ACT crashes in NSW compared to crashes within the ACT (1999-2003) [ACT Government 2003]**

| Year | Fatal crashes | | Injury crashes | |
|---|---|---|---|---|
| | Fatal crashes within ACT | Fatal crashes involving ACT vehicles/ controllers in NSW | Injury crashes within ACT | Injury crashes involving ACT vehicles/ controllers in NSW |
| 1999 | 16 | 12 | 549 | 274 |
| 2000 | 16 | 10 | 511 | 284 |
| 2001 | 15 | 3 | 467 | 290 |
| 2002 | 8 | 11 | 317 | 268 |
| 2003 | 10 | 16 | 296 | 258 |

## 3.3 Comparison of ACT crashes with other states

As shown in Figure 2, between 1999 and 2003, the ACT recorded the lowest average annual road fatalities in Australia. The number of people killed on ACT roads proved lower than the average number killed on NSW roads in crashes involving an ACT controller. Of the average of 13 fatalities per annum in the ACT, it is unknown whether they all resulted from crashes involving ACT vehicles or controllers. Without this information, it is not possible to provide an accurate figure in terms of fatalities per 10,000 ACT registered vehicles. However, it is clear that a greater number of ACT vehicle occupant fatalities occurred outside the ACT for the five year time period depicted in Figure 2.

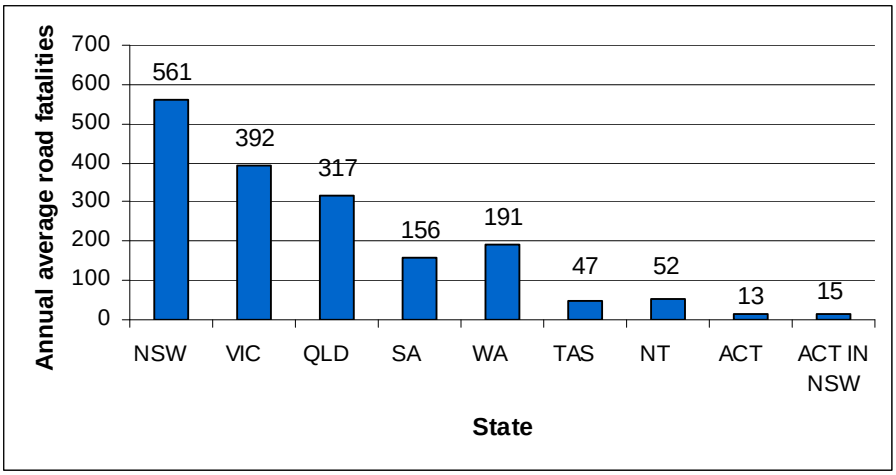



*Figure 2 – Average annual road fatalities (1999-2003) [Australian Transport Safety Bureau 2003]*

## 3.4 Crash trends

Figure 3 shows a general reduction in the number of crashes in NSW involving ACT registered vehicles or ACT licensed controllers. The total number of crashes has reduced from 757 to 633 since 1999, as has the number of injury crashes from 274 to 258. The greatest decrease in crash numbers was in non-injury crashes, a decrease from 471 crashes to 359 crashes (a 24% decrease). The number of fatal crashes fluctuated throughout the period, reaching a minimum in 2001. Fatalities in 2003 were higher than in 1999 (16 compared to 12) but it would be unwise to interpret this as an increasing trend in view of the variability in the fatality numbers and the downward trends in injury and non-casualty crashes.

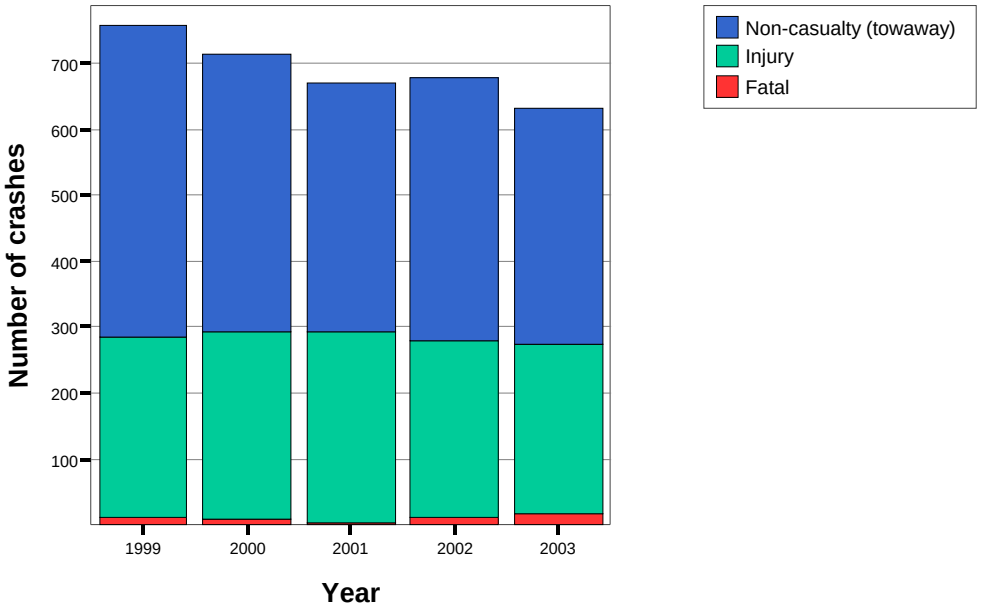



*Figure 3 – Crashes in NSW involving ACT controllers or ACT registered vehicles (1999-2003)*

## 3.5 Crash distribution

Figure 4 (on page 8) plots the spatial distribution of crashes in NSW involving ACT registered vehicles or ACT licensed controllers between 1999 and 2003. Ninety percent of all crashes occurred within 254 km of Canberra. The number of crashes levelled out after this distance, with the remaining 10% of crashes having occurred at distances of 255 km to 876 km from Canberra. This distance includes the Sydney Metro region, in which many of these crashes occurred. Another 34% of crashes occurred closer to home, approximately 100 km from Canberra. Note the distances quoted in Figure 4 are distances from Canberra and not from the ACT border. At the furthest point, the ACT/NSW border lies 80 km from Canberra.

Table 3 lists the crash distribution by the top 10 crash LGAs. Seven out of the 10 LGAs in NSW with the highest number of crashes involving ACT traffic (except for Liverpool City in Sydney, Shoalhaven City on the south east Coast and South Sydney City) all lie within approximately 100 km of the ACT border. However, Figure 4 indicates crashes in this vicinity only amounted to 34% of the total. The greatest percentage of crashes occurred in Queanbeyan

(n=295, 8.5%), which lies on the border between NSW and the ACT. Queanbeyan is located only 10 km from Federal Parliament and 60% of its population commute into the ACT for work each day. The Queanbeyan City Council estimates that between 1995 and 1998, 19% of all drivers involved in crashes in its municipality were from the ACT.

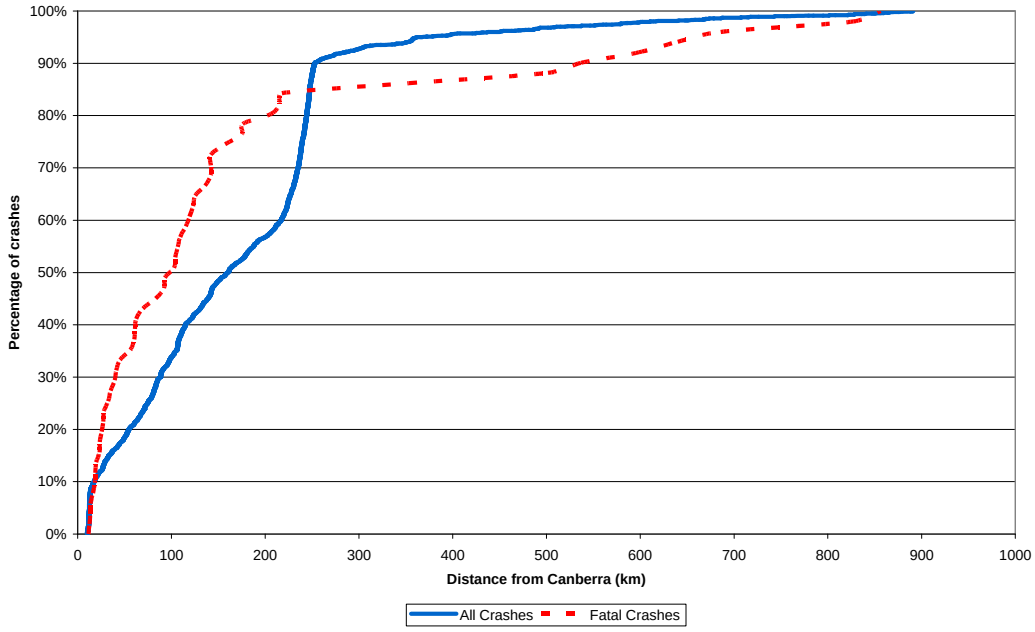



*Figure 4 – Distribution of crashes in NSW involving ACT controllers or ACT registered vehicles (1999-2003)*

**Table 3 – Total number and percentage of crashes in NSW involving ACT controllers or ACT registered vehicles by the top 10 crash LGAs (1999-2003)**

| LGA | Number of crashes | % of crashes |
|---|---|---|
| 1. Queanbeyan City | 295 | 8.5% |
| 2. Eurobodalla | 245 | 7.1% |
| 3. Yarrowlumla | 196 | 5.7% |
| 4. Yass | 148 | 4.3% |
| 5. Mulwaree | 138 | 4.0% |
| 6. Tallaganda | 120 | 3.5% |
| 7. Wingecarribee | 96 | 2.8% |
| 8. Shoalhaven City | 93 | 2.7% |
| 9. Liverpool City | 89 | 2.6% |
| 10. South Sydney City | 88 | 2.5% |
| TOTAL | 1508 | 43.7% |

Map 3 (on page 10) plots each crash in NSW involving an ACT controller or vehicle that occurred between 1999 and 2003. Table 4 (on page 9) lists the total number of crashes along the major traffic routes in NSW and in the Metro Sydney region and Table 5 lists these results for the study LGAs.

**Table 4 – Spatial distribution of crashes in NSW involving ACT controllers or ACT registered vehicles by region/route (1999-2003)**

| Region/route | Fatal crashes | (%) | Injury crashes | (%) | Tow away crashes | (%) | TOTAL | (%) |
|---|---|---|---|---|---|---|---|---|
| Metro Sydney | 2 | 3.8% | 388 | 28.2% | 685 | 33.8% | 1075 | 31.1% |
| Hume Hwy | 1 | 1.9% | 81 | 5.9% | 160 | 7.9% | 242 | 7.0% |
| King's Hwy | 6 | 11.5% | 124 | 9.0% | 168 | 8.3% | 298 | 8.6% |
| Federal Hwy | 5 | 9.6% | 36 | 2.6% | 49 | 2.4% | 90 | 2.6% |
| Pacific Hwy | 4 | 7.7% | 35 | 2.5% | 36 | 1.8% | 75 | 2.2% |
| Princes Hwy | 4 | 7.7% | 52 | 3.8% | 52 | 2.6% | 108 | 3.1% |
| Monaro Hwy | 3 | 5.8% | 30 | 2.2% | 38 | 1.9% | 71 | 2.1% |
| Other | 27 | 51.9% | 628 | 45.7% | 839 | 41.4% | 1494 | 43.3% |
| TOTAL | 52 | 100.0% | 1374 | 100.0% | 2027 | 100.0% | 3453 | 100.0% |

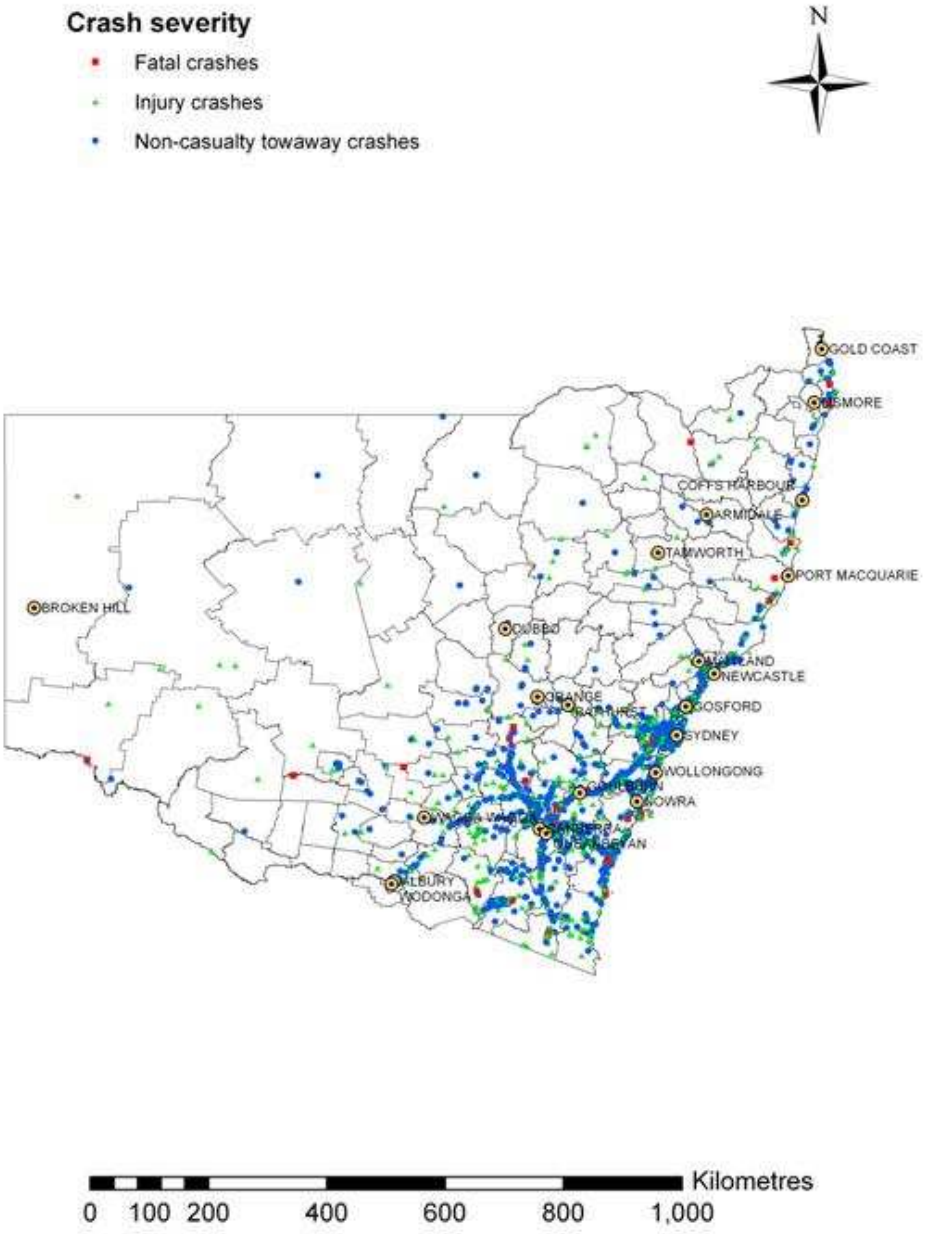
* Percentages refer to proportion of all crashes between 1999 and 2003 involving ACT vehicles or controllers of the severity specified. Note that crashes that occurred in both the Metro Sydney region and a particular route are counted in the Metro Sydney category.

**Table 5 – Spatial distribution of crashes in NSW involving ACT controllers or ACT registered vehicles by study LGAs (1999-2003)**

| LGA | Fatal crashes | (%) | Injury crashes | (%) | Tow away crashes | (%) | TOTAL | (%) |
|---|---|---|---|---|---|---|---|---|
| Queanbeyan City | 2 | 3.8% | 125 | 9.1% | 168 | 8.3% | 295 | 8.5 |
| Yarrowlumla | 9 | 17.3% | 84 | 6.1% | 103 | 5.1% | 196 | 5.7 |
| Yass | 6 | 11.5% | 58 | 4.2% | 84 | 4.1% | 148 | 4.3 |
| Cooma-Monaro | 2 | 3.8% | 29 | 2.1% | 46 | 2.3% | 77 | 2.2 |
| Other | 33 | 63.5% | 1078 | 78.5% | 1626 | 80.2% | 2737 | 79.3 |
| TOTAL | 52 | 100% | 1374 | 100% | 2027 | 100% | 3453 | 100% |

* Percentages refer to proportion of all crashes between 1999 and 2003 involving ACT vehicles or controllers of the severity specified.

Nearly one third of all crashes in NSW involving ACT registered vehicles or controllers, occurred in the Sydney Metro region and more than half of these crashes occurred in the Sydney Metro region or on a highway listed in Table 4. However, the highest proportion of fatal crashes occurred on the State's major highways outside Sydney. Twelve percent of fatal crashes occurred on King's Highway. The concentration of fatal crashes is clearly visible on Map 3. Of the six major highways, the majority of crashes occurred on King's Highway and the Hume Highway. Crashes along the major highways are likely to have occurred at greater average speeds than in the city, thereby increasing the force of the impact. Crashes involving speed are considered later in this report. Twenty-eight percent of all injury crashes and 34% of tow away crashes occurred in the Metro Sydney region. However, there is a significant number along the King's Highway and the Hume Highway around the Canberra region also. Note that the 'other' routes (rest of NSW) accounted for 43% of crashes at all severity levels.




*Map 3 – Crashes in NSW involving ACT controllers or ACT registered vehicles (1999-2003)*

Table 5 illustrates that Queanbeyan City (n=295) and Yarrowlumla (n= 196) had the highest number of crashes of the LGAs under investigation. This might be expected as these LGAs are in direct route of the east coast of NSW and Queanbeyan City has been noted as a destination. Yarrowlumla experienced the highest number of fatal crashes of the study LGAs (17.3%), although Queanbeyan City had the highest number of injury crashes (9.1%) and tow away crashes (8.3%).

# 4 Crash characteristics

## 4.1 Day of crash

Figure 5 shows that per year, an average of 119 crashes occurred on Fridays, 116 crashes occurred on Saturdays and 114 crashes occur on Sundays. Fewer crashes occurred in the middle part of the week, with the fewest crashes having occurred on Tuesdays. From Monday to Thursday, the average number of crashes each day per year ranges from 75 to 95. Daily crash numbers begin to rise on Thursday, increasing towards the weekend.

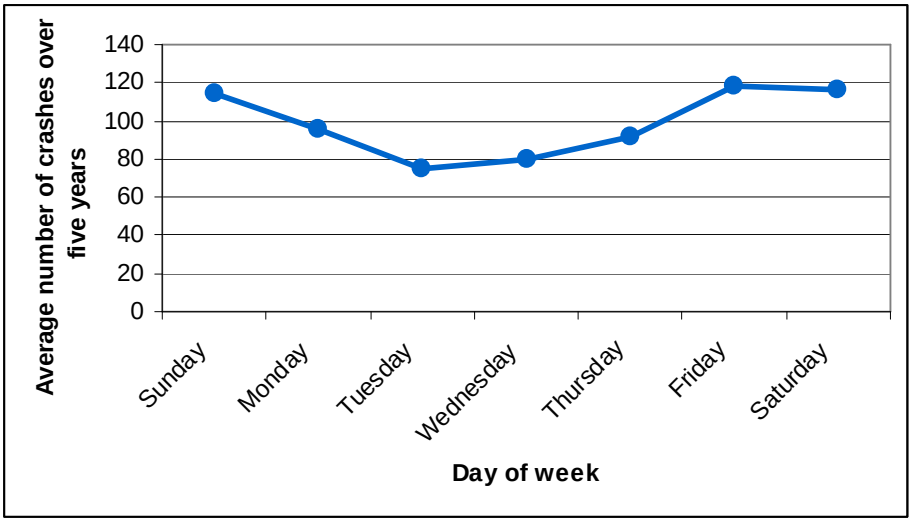



*Figure 5 – Five year average crash totals in NSW involving ACT controllers or ACT registered vehicles by day of week (1999-2003)*

### 4.1.1 Weekend crashes

Table 6 details the spatial distribution of weekend and weekday crashes in NSW involving ACT vehicles and controllers. (Refer to Map A 1, Appendix A – Crash Plots, page 55 for a plot of these crashes). In most locations, the percentage of crashes on weekends was higher than would be expected if crashes were evenly distributed throughout the week (28.6%). The exceptions were the Sydney region, where the percentage is close to the expected percentage given an even distribution, and the Pacific Highway, where the percentage is lower.

**Table 6 – Weekend versus weekday crashes in NSW involving ACT controllers or ACT registered vehicles by region/route (1999-2003)**

| Region/route | Weekday | | Weekend | |
|---|---|---|---|---|
| | Number of crashes | (%) | Number of crashes | (%) |
| Metro Sydney | 776 | 72.2% | 299 | 27.8% |
| Hume Hwy | 162 | 66.9% | 80 | 33.1% |
| King's Hwy | 189 | 63.4% | 109 | 36.6% |
| Federal Hwy | 57 | 63.3% | 33 | 36.7% |
| Pacific Hwy | 57 | 76.0% | 18 | 24.0% |
| Princes Hwy | 63 | 58.3% | 45 | 41.7% |
| Monaro Hwy | 47 | 66.2% | 24 | 33.8% |
| Other | 950 | 63.6% | 544 | 36.4% |
| TOTAL | 2301 | 66.6% | 1152 | 33.4% |

* Percentages refer to proportion of all crashes between 1999 and 2003 involving ACT vehicles or controllers in the region or on the route specified. Note that crashes that occurred in both the Metro Sydney region and a particular route are counted in the Metro Sydney category.

Table 7 reflects the same pattern for neighbouring LGAs, with the exception of Queanbeyan City, where the proportion on the weekend is lower than would be expected if crashes were evenly distributed throughout the week. This suggests that crashes in Queanbeyan are largely associated with the activities of the working week, while crashes in other LGAs are more associated with leisure activities on the weekend.

**Table 7 – Weekend versus weekday crashes in NSW involving ACT controllers or ACT registered vehicles by study LGAs (1999-2003)**

| LGA | Weekday | | Weekend | |
|---|---|---|---|---|
| | Number of crashes | (%) | Number of crashes | (%) |
| Queanbeyan City | 232 | 78.6% | 63 | 21.4% |
| Yarrowlumla | 122 | 62.2% | 74 | 37.8% |
| Yass | 90 | 60.8% | 58 | 39.2% |
| Cooma-Monaro | 50 | 64.9% | 27 | 35.1% |
| Other | 1807 | 66.0% | 930 | 34.0% |
| TOTAL | 2301 | 66.6% | 1152 | 33.4% |

* Percentages refer to proportion of all crashes between 1999 and 2003 involving ACT vehicles or controllers in the LGA specified.

Figure 6 indicates that between 1999 and 2003 there was a slight reduction in weekday and weekend crashes. However, the split between weekend and weekday crashes has remained fairly constant at 1:2. Per year, an average of 460 crashes occurred on weekdays and 230 occurred on weekends.

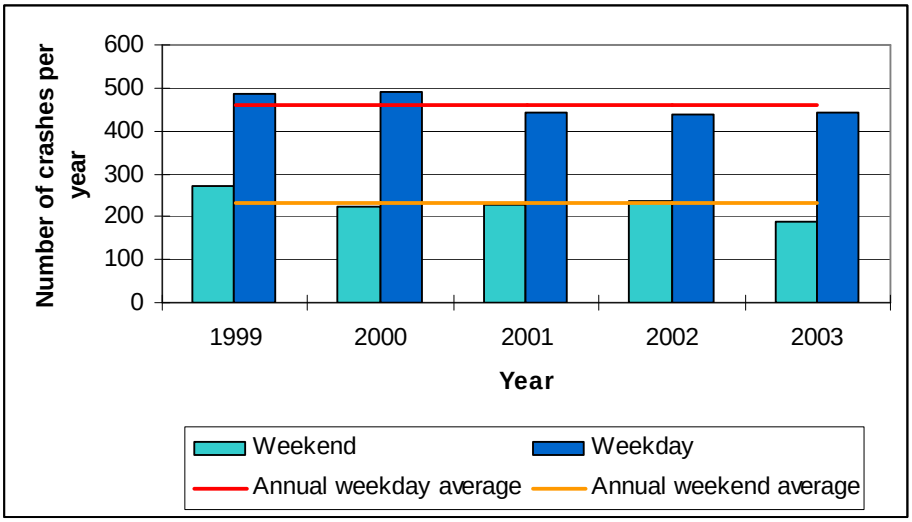



*Figure 6 – Crashes in NSW involving ACT controllers or ACT registered vehicles by weekday and weekend and by year (1999-2003)*

## 4.2 Time of crash

Figure 7 illustrates the percentage of crashes involving ACT controllers or vehicles which occurred in each hourly time period for three locations – Metro Sydney, the study routes and the rest of NSW from 1999 to 2003. (For example, crashes that occurred at 1 on the graph occurred from 1.00 am to 1.59 am inclusive.). With respect to Metro Sydney, the figure shows that the percentage of crashes increased from approximately 7.30 am – the start of the peak traffic period, to approximately 9.30 am – the end of the morning peak period. The percentage of crashes then increased from 11.00 am to 12.59 am, after which they decreased. However, at 3.00 pm the percentage of crashes increased and stayed at a higher level until 7.00 pm. The highest percentage of crashes occurred from 4.00 pm to 4.59 pm.

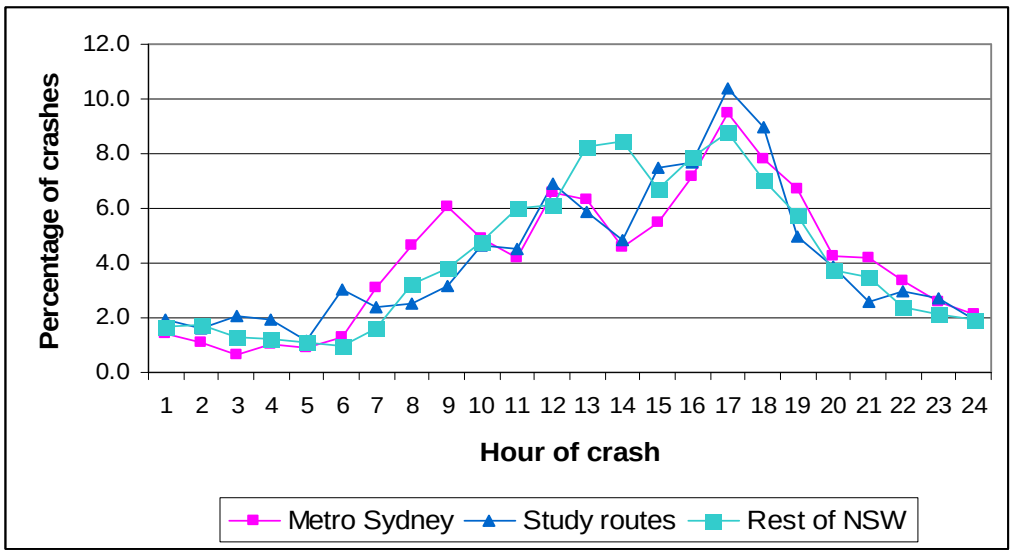



*Figure 7 – Percentage of crashes in NSW involving ACT controllers or ACT registered vehicles by time of crash and location (1999-2003)*

A similar pattern of crash occurrence by time is illustrated on the study routes. However, the crash percentages increased from 2.00 pm, an hour earlier than in Metro Sydney. Also the crashes were at slightly higher levels for the study routes compared Metro Sydney for the time period of 3.00 pm to 5.00 pm. The rest of NSW showed the same crash pattern, but rather than the percentage of crashes dropping off mid-morning they continued to increase until 1.59 pm. The percentage of crashes for this group of crashes then dropped slightly before they increased for the afternoon peak period and finally decreased steadily from 5.00 pm. The study routes had the highest percentage of crashes that occurred from 4.00 pm to 4.59 pm.

Figure 8 depicts the percentage of crashes involving ACT controllers or vehicles by time of day for the study LGAs. Unlike the Metro Sydney region and study routes, there is no increase in the percentage of crashes over the typical morning peak period. As shown by the 'other' LGAs the crashes increased from 10.00 am, peaked at 4.00 pm and decreased substantially from 7.00 pm. In Cooma-Monaro, the percentage of crashes stayed relatively stable until 11.00 am when they increased substantially (from 3.9% in the previous hour to 10.4%). High levels of crashes were maintained until 3.59 pm after which they decreased (except for the period of 5.00 pm to 5.49 pm). Queanbeyan City's and Yass's peak crash periods also occurred from 11.00 am continuing through till 18.59 pm. Yarrowlumla showed a slightly different crash percentage pattern. This LGA's crashes were at higher levels from 1.00 pm through to approximately 7.59 pm and the majority of crashes occurred between 4.00 pm and 7.59 pm. The incidence of crashes at night and in the early morning is investigated further in Section 4.2.1 (page 15), which focuses on the characteristics of night time crashes and their distribution across the State.

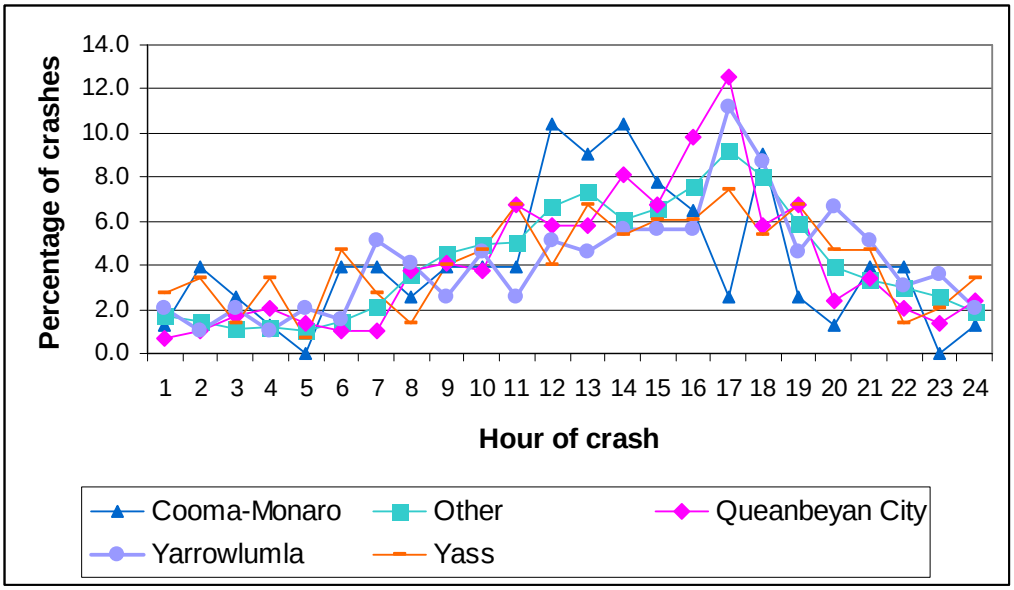



*Figure 8 – Percentage of crashes in NSW involving ACT controllers or ACT registered vehicles by time of crash and study LGA (1999-2003)*

### 4.2.1 Natural lighting and night time crashes

Figure 9 illustrates crashes in NSW involving ACT controllers or vehicles by crash severity and natural lighting level. The majority of crashes occurred during daylight, with 65% to 70% of crashes for each crash severity level falling into this category. The percentage of crashes that occurred in darkness ranged from 23% to 29% with an increased number of fatal crashes having occurred during darkness than injury and tow away crashes. This suggests that the crashes which occurred during darkness tended to be more severe.

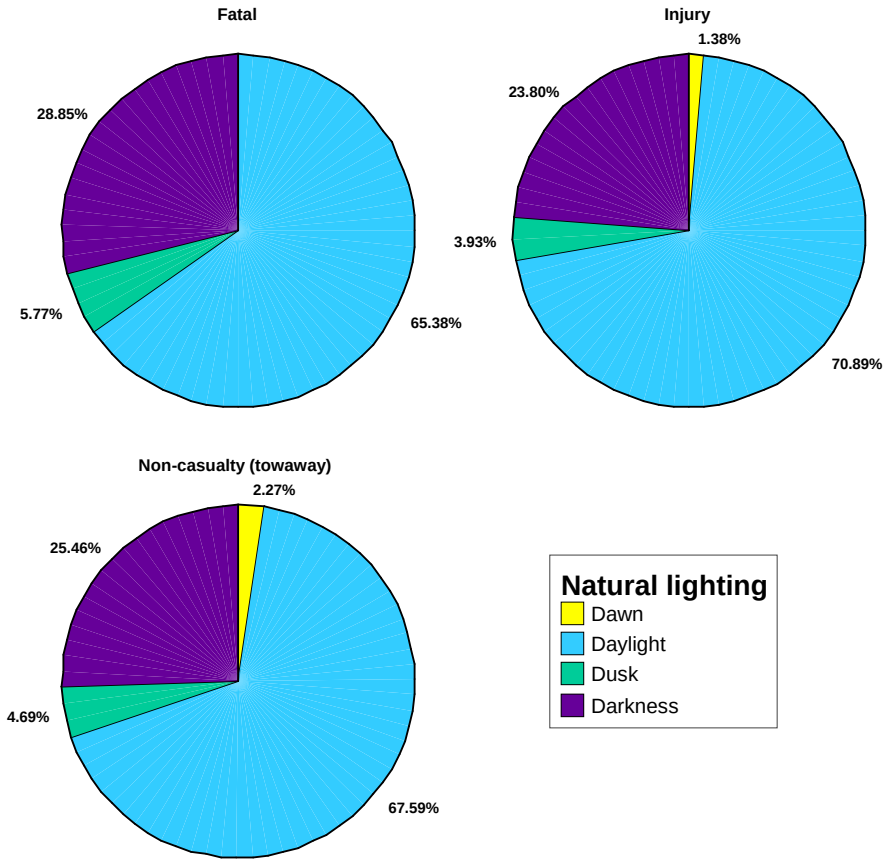



*Figure 9 – Crashes in NSW involving ACT controllers or ACT registered vehicles by natural lighting and crash severity (1999-2003)*

Table 8 lists the distribution of night time crashes involving ACT vehicles and controllers across NSW by severity. (Refer to Map A 2, Appendix A – Crash Plots, page 56 for a plot of night time crashes). The percentages quoted next to each figure represent the proportion of all crashes along the particular route or region specified.

Figure 9 above shows that 29% of all fatal crashes occurred at night. The majority of these fatal night time crashes occurred either on the Federal, Pacific or Princes Highways (two crashes per highway) [consideration of study routes only, not the rest of NSW]. Table 8 shows that a total

of 85 crashes along the Hume Highway occurred at night, the highest number of crashes at night among the study routes. This total number of crashes is followed by King's Highway with 57 crashes and the Federal Highway with 47 crashes. In general, a greater number of crashes happen during the day than at night along the study routes and Metro Sydney. However, for Federal Highway over half of the crashes occurred at night (52%).

**Table 8 – Distribution of night time crashes NSW involving ACT controllers or ACT registered vehicles by region/route (1999-2003)**

| Region/route | Fatal crashes | | Injury crashes | | Tow away crashes | | TOTAL | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Metro Sydney | 1 | 0.4% | 100 | 36.8% | 171 | 62.9% | 272 | 100% |
| Hume Hwy | 0 | 0% | 31 | 36.5% | 54 | 63.5% | 85 | 100% |
| King's Hwy | 1 | 1.8% | 15 | 26.3% | 41 | 71.9% | 57 | 100% |
| Federal Hwy | 2 | 4.3% | 24 | 51.1% | 21 | 44.7% | 47 | 100% |
| Pacific Hwy | 2 | 12.5% | 6 | 37.5% | 8 | 50.0% | 16 | 100% |
| Princes Hwy | 2 | 18.2% | 4 | 36.4% | 5 | 45.5% | 11 | 100% |
| Monaro Hwy | 0 | 0% | 7 | 35.0% | 13 | 65.0% | 20 | 100% |
| Other | 7 | 2.0% | 140 | 40.0% | 203 | 58.0% | 350 | 100% |
| TOTAL | 15 | 1.7% | 327 | 38.1% | 516 | 60.1% | 858 | 100% |

* Percentages refer to proportion of all crashes between 1999 and 2003 involving ACT vehicles or controllers of the severity specified. Note that crashes that occurred in both the Metro Sydney region and a particular route are counted in the Metro Sydney category.

Table 9 shows the number and percentage of night time crashes involving ACT controllers and vehicles by severity for the study LGAs. Yarrowlumla had a higher proportion of night time fatal crashes (6%) than the other study LGAs and the rest of NSW (1%). Cooma-Monaro had the highest proportion of night time injury crashes (45%) and Yass had the highest proportion of night time tow away crashes (66%). Queanbeyan City had the highest number (n=69) of total night time crashes in comparison to the other study LGAs, despite being a small sized LGA.

**Table 9 – Distribution of night time crashes NSW involving ACT controllers or ACT registered vehicles by study LGAs (1999-2003)**

| LGA | Fatal crashes | | Injury crashes | | Tow away crashes | | TOTAL | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Queanbeyan City | 2 | 2.9% | 29 | 42.0% | 38 | 55.1% | 69 | 100.0% |
| Yarrowlumla | 4 | 6.3% | 27 | 42.9% | 32 | 50.8% | 63 | 100.0% |
| Yass | 1 | 2.3% | 14 | 31.8% | 29 | 65.9% | 44 | 100.0% |
| Cooma-Monaro | 0 | .0% | 9 | 45.0% | 11 | 55.0% | 20 | 100.0% |
| Other | 8 | 1.2% | 248 | 37.5% | 406 | 61.3% | 662 | 100.0% |
| TOTAL | 15 | 1.7% | 327 | 38.1% | 516 | 60.1% | 858 | 100.0% |

* Percentages refer to proportion of all crashes between 1999 and 2003 involving ACT vehicles or controllers of the severity specified.

## 4.3 Date of crash

### 4.3.1 Holiday crashes

Table 10 outlines the holiday periods each year. Dates vary from year to year as does the duration of each holiday depending on what day of the week it falls. (When a holiday falls either side of a weekend then the weekend is counted as part of the holiday count. However, when the holiday does not fall next to the weekend it is counted as one day. See Appendix B – Holidays used in the crash data analysis.). Holidays in NSW and the ACT share the same dates. Public holidays amount to 29 days each year on average (including weekends and the Christmas period). School holidays amount to 89 days a year, but contain within them the public holidays for New Year's, Australia Day, Easter, Labour Day and Christmas. Including school holiday periods, other public holidays and weekends, there is an average of 118 days of holidays each year. Holidays account for 32% of each year.

**Table 10 – Holiday periods in the ACT**

| Holiday | Dates | Period |
|---|---|---|
| New Year's Day | 1 January | 1 – 3 days |
| Australia Day | 26 January | 1 – 3 days |
| Canberra Day | 15 – 20 March | 1 – 3 days |
| Easter | Variable (March/April) | 4 days |
| Anzac Day | Variable (April) | 1 – 3 days |
| Queen's Birthday | Variable (June) | 3 days |
| Bank Holiday | Variable (August) | 3 days |
| Labour Day | Variable (October) | 3 days |
| Christmas | 24 December to 31 December | 7 – 8 days |
| School holidays* | January 2 – end January/start February | 30 – 32 days |
| | April | 12 – 13 days |
| | July | 16 days |
| | Late September/Early October | 12 – 21 days |
| | 18 – 20 December to 31 December | 11 – 14 days |
| **TOTAL HOLIDAYS (including School holidays)** | | **105 days (min)** |
| | | **130 days (max)** |
| | | **118 days (average)** |

* The school holidays includes Christmas, New Year's Day, Australia Day, Easter and Labour Day holidays.

Figure 10 shows the holiday crashes by crash severity. One percent of crashes were fatal crashes, 38% injury crashes and 61% tow away crashes. The percentage of holiday crashes by severity is almost identical to the severity levels for all crashes over the five year study period.

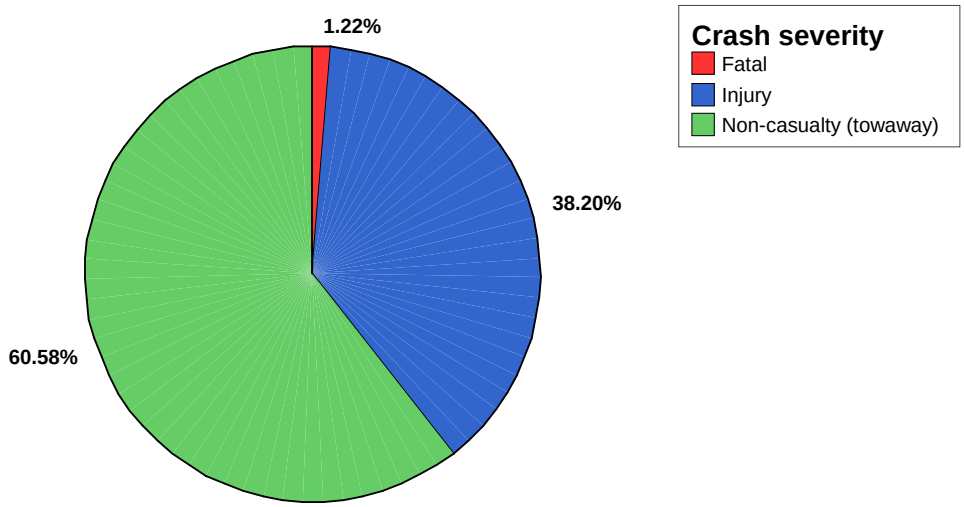



*Figure 10 – Holiday crashes in NSW involving ACT controllers or ACT registered vehicles by crash severity (1999-2003)*

Table 11 illustrates the distribution of crashes in NSW involving ACT vehicles and controllers across the holiday period. It is evident from these tables that 32% of crashes occurred during the 32% of the year classified as holidays. This denies any over representation of crashes during holiday periods. Eleven percent of holiday crashes occurred during public holidays. Twenty two percent or 154 average annual crashes occurred during the portion of school holidays which did not include public holidays. In comparison, each year an average of 22 crashes occurred over Christmas, the next most dangerous holiday period. Perhaps enforcement and advertising campaigns should not be restricted to public holidays but stretch over the entire school holiday period.

The highest daily crash rate occurred over Australia Day (2.8 crashes per day) followed by Canberra Day (2.7 crashes per day) and Easter (2.5 crashes per day). However, Easter accounted for 5.8% of holiday crashes (the third highest following Christmas, after consideration of school holiday crashes). The daily crash rate of Australia Day, Canberra Day and Easter were all higher than the school holidays (2.2 crashes per day). Daily crash rates were also particularly high during New Year's Day, Labour Day and Christmas. Traditionally, interstate travel features largely amongst the holiday activities which occur during these periods.

**Table 11 – Holiday crashes in NSW involving ACT controllers or ACT registered vehicles (1999-2003)**

| Holiday | Total crashes (1999 to 2003) | Average annual crashes (over 5 years) | Average annual daily crashes | % of holiday crashes (n=1096) | % of total crashes (n=3453) |
|---|---|---|---|---|---|
| School holidays* | 979 | 195.8 | 2.2 | 89.3% | 28.4% |
| *School holidays* *(not including public holidays)* | *768* | *153.6* | *2.1* | *70.1%* | *22.2%* |
| New Year's Day | 20 | 4 | 2.1 | 1.8% | 0.6% |
| Australia Day | 32 | 6.4 | 2.8 | 2.9% | 0.9% |
| Canberra Day | 44 | 8.8 | 2.7 | 4.0% | 1.3% |
| Easter | 63 | 12.6 | 2.5 | 5.8% | 1.8% |
| Anzac Day | 28 | 5.6 | 2.4 | 2.6% | 0.8% |
| Queens Birthday | 22 | 4.4 | 1.7 | 2.0% | 0.6% |
| Bank Holiday | 17 | 3.4 | 1.5 | 1.6% | 0.5% |
| Labour Day | 32 | 6.4 | 2.2 | 2.9% | 0.9% |
| Christmas | 110 | 22 | 2.5 | 10.0% | 3.2% |
| Total holiday crashes | 1096 | 219.2 | 2.1 | 100% | 31.8% |

* School holidays include New Year's, Australia Day, Easter (except for one occasion), Anzac Day (except for one occasion) Labour Day and Christmas Holidays.

Table 12 shows the distribution of all holiday crashes by location and severity. (Refer to Map A 3, Appendix A – Crash Plots, page 57, for a plot of these crashes.). Of all holiday crashes in NSW involving ACT controllers or vehicles, 28% occurred in the Metro Sydney region. Eight percent occurred along the Hume Highway and 10% occurred along the King's Highway which connects the ACT to the southeast beaches. There were a greater number of fatal crashes along the highways than in Metro Sydney (where fatal crashes did not occur). Thirty-one percent of all fatal holiday crashes occurred along the King's Highway. This accounts for 67% of all fatal crashes on the King's Highway, which means that that the majority of the highway's fatal crashes occurred during the holiday periods.

Table 13 illustrates that Queanbeyan City, Yarrowlumla and Yass had similar amounts of holiday crashes over the five year study period (a range of 63 total crashes to 54 total crashes). Cooma-Monaro had approximately half the crashes of these LGAs (n=23). Cooma-Monaro is likely to be less popular as a holiday destination or as a route to a holiday destination (for example, Queanbeyan City and Yarrowlumla are en route to the coast and Yass is en route to Sydney).

**Table 12 – Holiday crashes in NSW involving ACT controllers or ACT registered vehicles by region/route (1999-2003)**

| Region/route | Fatal crashes | | Injury crashes | | Tow away crashes | | Total crashes | |
|---|---|---|---|---|---|---|---|---|
| | n | %* | n | % | n | % | n | % |
| Metro Sydney | 0 | 0% | 110 | 26.1% | 201 | 30.4% | 311 | 28.4% |
| Hume Hwy | 0 | 0% | 27 | 6.4% | 57 | 8.6% | 84 | 7.7% |
| King's Hwy | 4 | 30.8% | 50 | 11.9% | 51 | 7.7% | 105 | 9.6% |
| Federal Hwy | 1 | 7.7% | 12 | 2.9% | 17 | 2.6% | 30 | 2.7% |
| Pacific Hwy | 0 | .0% | 13 | 3.1% | 13 | 2.0% | 26 | 2.4% |
| Princes Hwy | 1 | 7.7% | 17 | 4.0% | 23 | 3.5% | 41 | 3.7% |
| Monaro Hwy | 1 | 7.7% | 9 | 2.1% | 12 | 1.8% | 22 | 2.0% |
| Other | 6 | 46.2% | 183 | 43.5% | 288 | 43.5% | 477 | 43.5% |
| Total Holiday crashes | 13 | 100.0% | 421 | 100.0% | 662 | 100.0% | 1096 | 100.0% |

* Percentages refer to proportion of all crashes between 1999 and 2003 involving ACT vehicles or controllers of the severity specified. Note that crashes that occurred in both the Metro Sydney region and a particular route are counted in the Metro Sydney category.

**Table 13 – Holiday crashes in NSW involving ACT controllers or ACT registered vehicles by study LGAs (1999-2003)**

| LGA | Fatal crashes | | Injury crashes | | Tow away crashes | | Total crashes | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Queanbeyan City | 1 | 7.7% | 22 | 5.2% | 40 | 6.0% | 63 | 5.7% |
| Yarrowlumla | 1 | 7.7% | 21 | 5.0% | 35 | 5.3% | 57 | 5.2% |
| Yass | 1 | 7.7% | 18 | 4.3% | 35 | 5.3% | 54 | 4.9% |
| Cooma-Monaro | 0 | 0% | 8 | 1.9% | 15 | 2.3% | 23 | 2.1% |
| Other | 10 | 76.9% | 352 | 83.6% | 537 | 81.1% | 899 | 82.0% |
| Total Holiday crashes | 13 | 100.0% | 421 | 100.0% | 662 | 100.0% | 1096 | 100.0% |

* Percentages refer to proportion of all crashes between 1999 and 2003 involving ACT vehicles or controllers of the severity specified.

## 4.4 Single and multiple vehicle crashes

Single vehicle crashes include off-path or run-off-the road crash types. Multi-vehicle crashes include rear end, manoeuvring, side swipe, head-on and intersection crash types. Figure 11 shows that of all NSW crashes involving ACT vehicles or controllers, 64% involved multiple vehicles. Slightly more than one third were single unit crashes. Table 14 and Table 15 reveal the distribution of these crashes across NSW by region/route and study LGAs. (Refer to Map A 5, Appendix A – Crash Plots, page 59 for a plot of these crashes).

High proportions of single unit crashes occurred along the Kings Highway (13%) and the Hume Highway (12%). Crashes along the Hume, Kings, Federal and Monaro Highways were predominantly single vehicle. Conversely, the majority of crashes along the two coastal highways, the Princes Highway and the Pacific Highway, involved multiple vehicles. Spanning over 1,400 km in total, the two highways pass through large coastal towns such as Newcastle, Wollongong and Coffs Harbour. The traffic movements through these towns, the number of

intersections along the highways, the traffic volumes and the general alignment may be more conducive to multi-vehicle crashes than the inland routes. Overall, the majority of multi-vehicle crashes (46%) occurred in the densely trafficked Sydney Metro region. Multiple vehicle crashes accounted for 94% of all crashes in this region. The majority of pedestrian crashes also occurred in the Sydney region (40%).

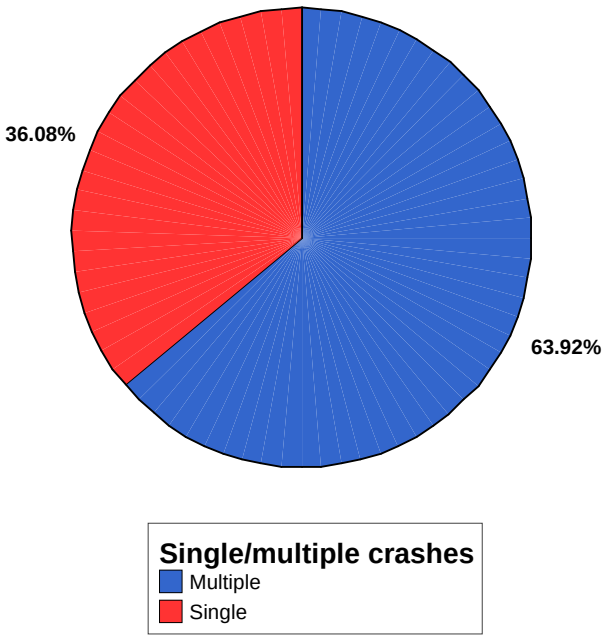



*Figure 11 – Crashes in NSW involving ACT controllers or ACT registered vehicles by single unit and multiple units (1999-2003)*

**Table 14 – Crashes in NSW by region/route involving ACT controllers or ACT registered vehicles by single unit, multiple units and involving pedestrians (1999-2003)**

| Region/route | Single unit | | Multiple unit | | Pedestrian crashes | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Metro Sydney | 61 | 4.9% | 1014 | 45.9% | 20 | 40% |
| Hume Hwy | 146 | 11.7% | 96 | 4.3% | 1 | 2% |
| King's Hwy | 164 | 13.2% | 134 | 6.1% | 5 | 10% |
| Federal Hwy | 69 | 5.5% | 21 | 1.0% | 1 | 2% |
| Pacific Hwy | 20 | 1.6% | 55 | 2.5% | 1 | 2% |
| Princes Hwy | 27 | 2.2% | 81 | 3.7% | 2 | 4% |
| Monaro Hwy | 48 | 3.9% | 23 | 1.0% | 0 | 0% |
| Other | 711 | 57.1% | 783 | 35.5% | 20 | 40% |
| TOTAL | 1246 | 100.0% | 2207 | 100.0% | 50 | 100% |

* Percentages refer to proportion of all crashes between 1999 and 2003 involving ACT vehicles or controllers of the unit/crash type specified. Note that crashes that occurred in both the Metro Sydney region and a particular route are counted in the Metro Sydney category. All pedestrian crashes were multiple unit crashes, where both pedestrians and vehicles were counted as units.

As illustrated in Table 15, the majority of crashes in Yarrowlumla (64%), Yass (71%) and Cooma-Monaro (70%) were single unit crashes. In comparison, the majority of crashes in Queanbeyan City were multiple unit crashes (83%). Queanbeyan City also had the highest proportion of pedestrian crashes (18%). This is most likely because Queanbeyan City is a destination LGA rather than a means of travelling to the east coast or Sydney.

**Table 15 – Crashes in NSW by study LGA involving ACT controllers or ACT registered vehicles by single unit, multiple units and involving pedestrians (1999-2003)**

| LGA | Single unit | | Multiple unit | | Pedestrian crashes | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Queanbeyan City | 51 | 4.1% | 244 | 11.1% | 9 | 18% |
| Yarrowlumla | 126 | 10.1% | 70 | 3.2% | 2 | 4% |
| Yass | 105 | 8.4% | 43 | 1.9% | 2 | 4% |
| Cooma-Monaro | 54 | 4.3% | 23 | 1.0% | 0 | 0% |
| Other | 910 | 73.0% | 1827 | 82.8% | 37 | 74% |
| TOTAL | 1246 | 100.0% | 2207 | 100.0% | 50 | 100.0% |

* Percentages refer to proportion of all crashes between 1999 and 2003 involving ACT vehicles or controllers of the unit/crash type specified. All pedestrian crashes were multiple unit crashes, where both pedestrians and vehicles were counted as units.

## 4.5 Crash types

The major crash type involving ACT registered vehicles or controllers was vehicles running off the road. Vehicles running off the path on curves or during turning accounted for 20% of all crashes and vehicles running off the path on straight sections of road accounted for 17%. In total, off path crashes accounted for 37% of all crashes involving ACT traffic in NSW. Rear end crashes, side swipes and conflicts during lane changing manoeuvres accounted for 27% of crashes and crashes resulting from vehicles heading in opposing directions (e.g. head on collisions) accounted for 13% of the total crashes. This is shown in Figure 12. (Refer to Map A 6, Appendix A – Crash Plots, page 60 for a plot of these crashes).

In terms of crash severity, 35% of fatal crashes involved vehicles from opposing directions. Off path crashes accounted for 44% of fatal crashes. The majority of injury crashes involved vehicles from the same direction (26%) as did the majority of non casualty crashes (28%). Although only 1% of all crashes involved pedestrians, 100% of these were injury or fatal crashes.

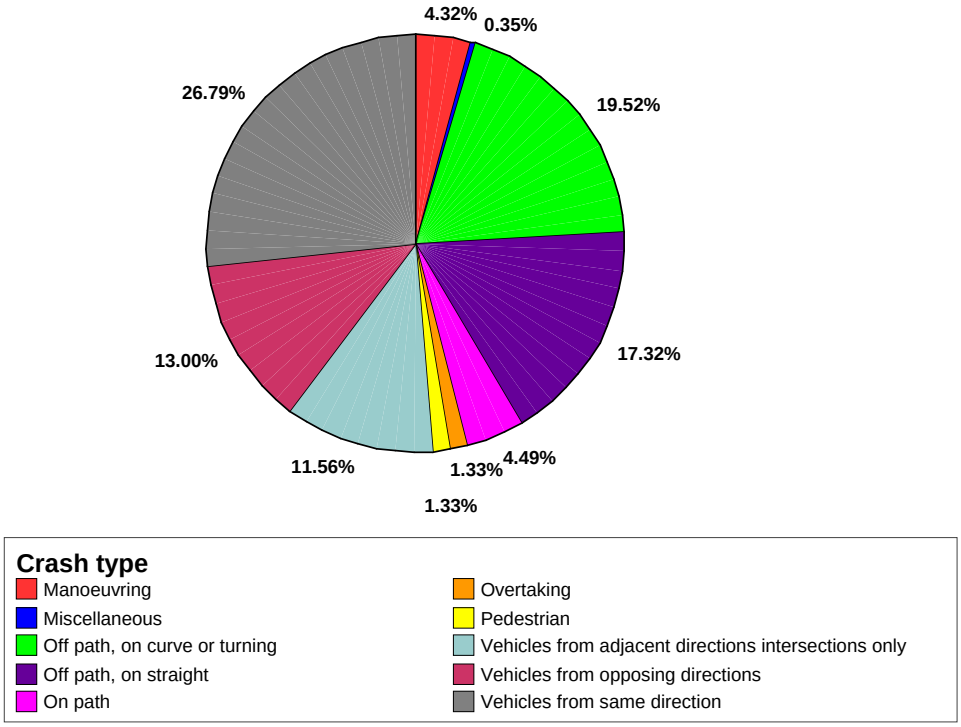



*Figure 12 – Crashes in NSW involving ACT controllers or ACT registered vehicles by crash type (1999-2003)*

The distribution of these crash types across NSW is listed in Table 16 and Table 17. The majority of crashes involving ACT traffic occurred in the Sydney Metro region (n=1055). Crash types most common in the region involved vehicles heading in the same direction (n=525), followed by crashes that involved vehicles from opposing directions (n=172) and vehicles from adjacent directions (n=157). These crash types are characteristic of intersection crashes in urban areas. 'Off path' crashes on straight sections of road occurred most frequently on the Hume Highway (n=82). The Hume Highway also experienced a large proportion of crashes involving vehicles heading in the same direction (n=56), suggesting side swipe collisions are common. These crashes may have occurred on sections which have since been upgraded. The King's Highway, which follows a winding path through the Great Dividing Range towards the coast, recorded the highest number of overtaking crashes (n=5) and crashes involving vehicles driving 'off path' on curves (n=112) for the study routes/region. There is also a high proportion of crashes involving vehicles travelling in the opposite direction along this route, suggesting problems with head-on crashes and side-swipes. There is a prevalence of 'off path' crashes along the Hume and other highways. These crash types are generally associated with the alignment of the roadway, delineation, sight distances and higher operating speeds.

As shown in Table 17, Queanbeyan City had the highest number of vehicles from adjacent directions crashes (n=83), vehicles from opposing directions crashes (n=34), vehicles from same direction crashes (n=73) and manoeuvring crashes (n=46) in comparison with the remaining

study LGAs. As mentioned earlier this would be expected as Queanbeyan City appears to be a destination LGA rather than an LGA used for mainly through travel.

**Table 16 – Crashes in NSW involving ACT controllers or ACT registered vehicles by crash type and region/route (1999-2003) [pedestrian crashes omitted]**

| Region/route | Crash type | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Vehicles from adjacent directions intersections only | Vehicles from opposing directions | Vehicles from same direction | Manoe-uvring | Off path, on curve or turning | Off path, on straight | On path | Over-taking | Miscell-aneous |
| Metro Sydney | 157 | 172 | 525 | 46 | 41 | 82 | 25 | 3 | 4 |
| Hume Hwy | 7 | 8 | 56 | 7 | 49 | 82 | 30 | 2 | 0 |
| King's Hwy | 9 | 51 | 54 | 6 | 112 | 46 | 9 | 5 | 1 |
| Federal Hwy | 2 | 2 | 8 | 5 | 18 | 44 | 10 | 1 | 0 |
| Pacific Hwy | 6 | 11 | 29 | 3 | 11 | 10 | 2 | 2 | 0 |
| Princes Hwy | 7 | 17 | 43 | 8 | 15 | 12 | 3 | 1 | 0 |
| Monaro Hwy | 0 | 7 | 13 | 2 | 14 | 25 | 9 | 1 | 0 |
| Other | 211 | 181 | 197 | 72 | 414 | 297 | 67 | 31 | 7 |
| TOTAL | 399 | 449 | 925 | 149 | 674 | 598 | 155 | 46 | 12 |

Yarrowlumla (n=60) and Yass (n=54) had the highest number of 'off path' crashes of the study LGAs and Yarrowlumla had the highest number of overtaking crashes (n=5). The majority of Cooma-Monaro's crashes were also 'off-path' crashes. As discussed above, these crash types are generally associated with the alignment of the roadway, delineation, sight distances and higher operating speeds.

**Table 17 – Crashes in NSW involving ACT controllers or ACT registered vehicles by crash type and study LGA (1999-2003) [pedestrian crashes omitted]**

| LGA | Crash type | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Vehicles from adjacent directions intersections only | Vehicles from opposing directions | Vehicles from same direction | Manoe-uvring | Off path, on curve or turning | Off path, on straight | On path | Over-taking | Miscell-aneous |
| Queanbeyan City | 83 | 34 | 73 | 18 | 27 | 44 | 3 | 3 | 1 |
| Yarrowlumla | 11 | 20 | 25 | 4 | 60 | 50 | 19 | 5 | 0 |
| Yass | 9 | 15 | 12 | 2 | 54 | 43 | 10 | 0 | 1 |
| Cooma-Monaro | 0 | 7 | 12 | 2 | 24 | 22 | 8 | 2 | 0 |
| Other | 296 | 373 | 803 | 123 | 509 | 439 | 115 | 36 | 10 |
| TOTAL | 399 | 449 | 925 | 149 | 674 | 598 | 155 | 46 | 12 |

# 5 Vehicle characteristics

## 5.1 Vehicle types

Eighty-two percent of vehicles with ACT registration or an ACT licensed controller involved in NSW crashes between 1999 and 2003 were cars. Of this proportion, 1% of cars were involved in fatal crashes, 37% were involved in injury crashes and 62% were involved in non-casualty crashes. Five percent of ACT registered or controlled vehicles were motorcycles and 13% were other types. A greater number of buses, trucks and motorcycles were involved in fatal crashes in comparison to cars. Five percent of all buses were involved in fatal crashes, as were 5% of all trucks and 4% of all motorcycles. As depicted in Figure 13, cars were the vehicles that featured more than other vehicles in all crash types. This might be expected as there is a higher number of cars on the road in comparison to other vehicle types.

Cars were involved in 53% of fatal crashes, 76% of injury crashes and 87% of tow-away crashes. Motorcycles were involved in 11% of fatal crashes, 10% of injury crashes , but hardly any tow-away crashes. Trucks were involved in 34% of the fatal crashes, 12% of the injury crashes and 11% of the non-casualty crashes.

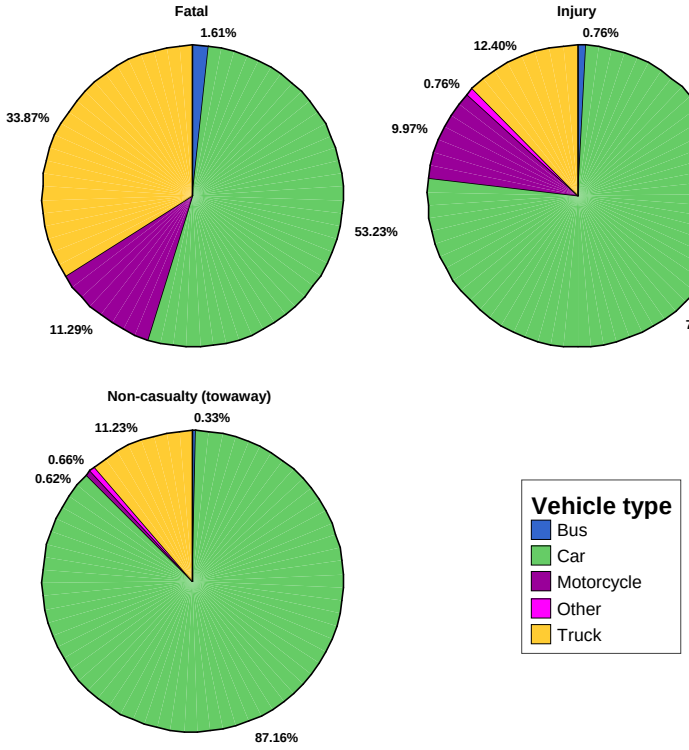



*Figure 13 – Vehicle types with ACT registration or ACT licensed controller involved in crashes (fatal, injury and non-casualty) in NSW (1999-2003)*

The percentage of crashes involving cars varied with a narrow range between 79% and 85%. The largest number of motorcycle crashes occurred in Sydney, followed by King's Highway,

the Prince's Highway. The highest number of truck crashes was in Sydney, followed by King's Highway, the Hume Highway, then the Federal Highway (19%). There was no particular pattern for buses and other vehicles in relation to their location in crashes.

The distribution of vehicle types involved in crashes by the study LGAs is shown in Table 19. With the exception of trucks, vehicle types that were involved in crashes were fairly evenly distributed across the study LGAs and the rest of NSW. A higher proportion of crashes involving trucks occurred in Queanbeyan City (20% in comparison with 12% for all LGAs).

**Table 18 – Distribution of vehicle types with ACT registration or ACT licensed controller involved in crashes across regions and routes in NSW (1999-2003)**

| Region/route | Cars | | Motorcycles | | Trucks | | Buses | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % |
| Metro Sydney | 902 | 83.2% | 34 | 3.1% | 125 | 11.5% | 8 | 0.7% | 15 | 1.4% |
| Hume Hwy | 216 | 85.0% | 6 | 2.4% | 28 | 11.0% | 4 | 1.6% | 0 | 0% |
| King's Hwy | 291 | 84.6% | 10 | 2.9% | 41 | 11.9% | 0 | 0% | 2 | 0.6% |
| Federal Hwy | 79 | 79.0% | 1 | 1.0% | 19 | 19.0% | 0 | 0% | 1 | 1% |
| Pacific Hwy | 61 | 80.3% | 1 | 1.3% | 13 | 17.1% | 1 | 1.3% | 0 | 0% |
| Princes Hwy | 96 | 85.0% | 8 | 7.1% | 9 | 8.0% | 0 | 0% | 0 | 0% |
| Monaro Hwy | 62 | 81.6% | 1 | 1.3% | 13 | 17.1% | 0 | 0% | 0 | 0% |
| Other | 1265 | 80.6% | 103 | 6.6% | 189 | 12.0% | 6 | 0.4% | 7 | 0.4% |
| TOTAL | 2972 | 82.2% | 164 | 4.5% | 437 | 12.1% | 19 | 0.5% | 25 | 0.7% |

* Percentages refer to proportion of all crashes between 1999 and 2003 involving ACT vehicles or controllers of the region/route specified. Note that vehicles involved in crashes that occurred in both the Metro Sydney region and a particular route are counted in the Metro Sydney category.

**Table 19 – Distribution of vehicle types with ACT registration or ACT licensed controller involved in crashes across study LGAs in NSW (1999-2003)**

| LGA | Cars | | Motorcycles | | Trucks | | Buses | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % |
| Queanbeyan City | 161 | 75.6% | 9 | 4.2% | 43 | 20.2% | 0 | 0% | 0 | 0% |
| Yarrowlumla | 131 | 81.9% | 5 | 3.1% | 24 | 15.0% | 0 | 0% | 0 | 0% |
| Yass | 288 | 79.3% | 14 | 3.9% | 54 | 14.9% | 1 | 0.3% | 6 | 1.7% |
| Cooma-Monaro | 64 | 79.0% | 2 | 2.5% | 15 | 18.5% | 0 | 0% | 0 | 0% |
| Other | 2328 | 83.1% | 134 | 4.8% | 301 | 10.8% | 18 | 0.6% | 19 | 0.7% |
| TOTAL | 2972 | 82.2% | 164 | 4.5% | 437 | 12.1% | 19 | 0.5% | 25 | 0.7% |

* Percentages refer to proportion of all crashes between 1999 and 2003 involving ACT vehicles or controllers of the LGA specified.

## 5.2 Vehicle occupancy

This report investigates 3,453 crashes in NSW from 1999 to 2003 involving ACT registered vehicles and ACT licensed controllers. A total of 6,367 vehicles were involved in these crashes, of which 3,006 were ACT registered and 2,346 were driven by an ACT controller. There were 3,617 vehicles that were either ACT registered or driven by an ACT controller. There were 3,589 vehicles that were either ACT registered or driven by an ACT controller and 2,492 other vehicles[1]. The average occupancy of ACT registered or ACT controlled vehicles and other vehicles were both equal to 1.7. (See Table 20). Figure 14 shows minor variation in the occupancy rate for both vehicle categories from year to year.

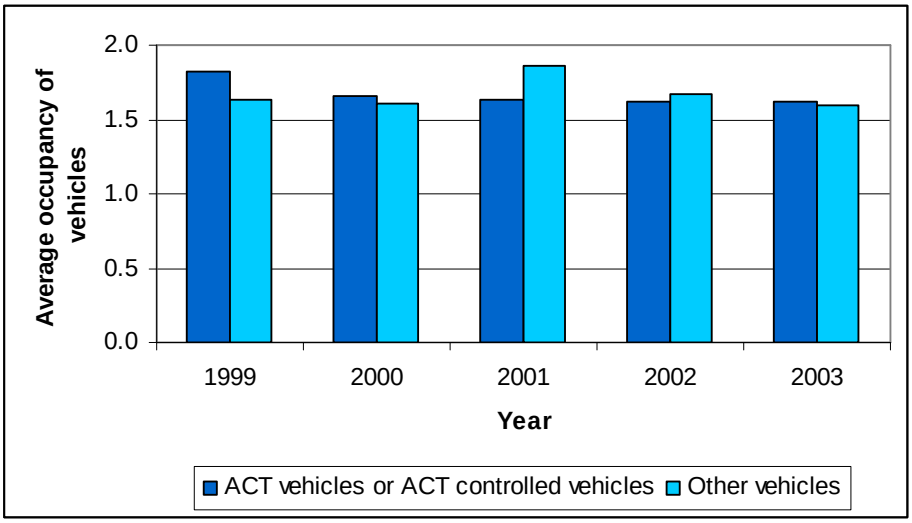



*Figure 14 – Average occupancy of vehicles involved in crashes in NSW where at least one vehicle held ACT registration or was driven by an ACT controller compared to other vehicles (1999-2003)*

For ACT registered or ACT controlled vehicles, the average vehicle occupancy ranged from 1.47 for the Federal Highway to 2.37 for the Pacific Highway. The average occupancy for the Sydney Metro region was 1.5. The average occupancies for other vehicles were higher than that for ACT registered/controlled vehicles, with the exception of Pacific Highway used to travel to Queensland. (Refer to Map A 7, Appendix A – Crash Plots, page 61 for a plot of crashes by vehicle occupancy).

[1] The ACT registered vehicles/vehicles driven by an ACT controller and other vehicles do not add up to the total vehicles in the crash data set due to missing data on vehicle occupancy, state of licence and state of registration.

**Table 20 – Average occupancy of vehicles involved in crashes in NSW where at least one vehicle was registered in ACT or controlled by ACT licensed controller compared to other vehicles by region/route (1999-2003)**

| Region/route | ACT registered or controlled vehicles | | Other vehicles | |
|---|---|---|---|---|
| | Mean | N | Mean | N |
| Metro Sydney | 1.54 | 1069 | 1.54 | 1335 |
| Hume Hwy | 2.03 | 253 | 2.22 | 102 |
| King's Hwy | 1.77 | 344 | 1.80 | 112 |
| Federal Hwy | 1.47 | 100 | 2.08 | 12 |
| Pacific Hwy | 2.37 | 76 | 2.08 | 71 |
| Princes Hwy | 1.76 | 113 | 1.86 | 92 |
| Monaro Hwy | 1.67 | 76 | 1.74 | 19 |
| Other | 1.66 | 1558 | 1.75 | 749 |
| TOTAL | 1.67 | 3589 | 1.67 | 2492 |

1 outlines the average vehicle occupancy involved in crashes in NSW for the study LGAs. All of the study LGAs had higher average vehicle occupancies for other vehicles in comparison to the ACT registered or controlled vehicles. Average occupancy for ACT vehicles is particularly low in Queanbeyan, consistent with many of these crashes resulting from everyday activities.

**Table 21 – Average occupancy of vehicles involved in crashes in NSW where at least one vehicle was registered in ACT or controlled by ACT licensed controller compared to other vehicles by study LGA (1999-2003)**

| LGA | ACT registered or controlled vehicles | | Other vehicles | |
|---|---|---|---|---|
| | Mean | N | Mean | N |
| Queanbeyan City | 1.40 | 358 | 1.72 | 187 |
| Yarrowlumla | 1.70 | 212 | 1.76 | 58 |
| Yass | 1.66 | 159 | 2.41 | 37 |
| Cooma-Monaro | 1.69 | 81 | 1.75 | 20 |
| Other | 1.71 | 2779 | 1.65 | 2190 |
| TOTAL | 1.67 | 3589 | 1.67 | 2492 |

# 6 Controller characteristics

## 6.1 Gender of controller

Figure 15 illustrates there were 2,346 ACT controllers involved in the crashes under investigation and of these 43 (2%) were involved in fatal crashes, 926 (40%) were involved in injury crashes and 1,377 (59%) were involved in non-casualty (tow away) crashes. Figure 15 also shows the percentage of ACT male and female controllers involved in crashes by severity. A greater proportion of male controllers were involved in crashes, almost 70% for each crash severity in comparison to approximately 30% for female controllers. As the severity of crash increased from tow away to fatal, the number of male controllers involved increased also. The contrary was true for females, as crash severity increased the number of female controllers increased decreased.

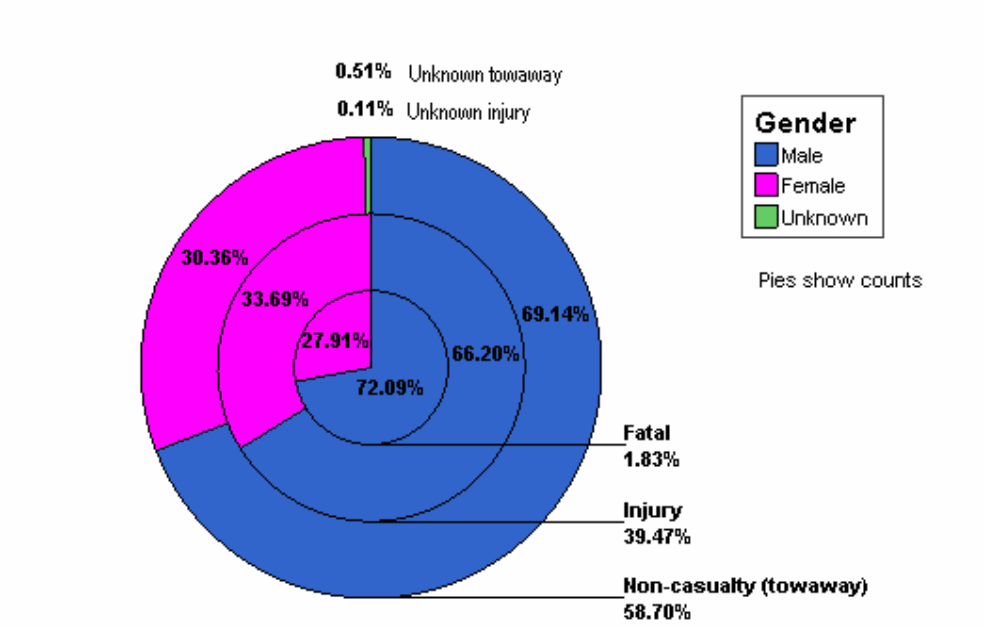



*Figure 15 – ACT controllers involved in crashes in NSW by gender and crash severity (1999-2003)*

There is a fairly consistent split between male and female controllers across the various regions and routes in NSW. (See Table 22 and refer to Map A 8, Appendix A – Crash Plots, page 62 for a plot of these crashes). Of all ACT controllers involved in crashes in NSW, the highest proportion of male controllers was on the Monaro Highway (80%) followed by the Pacific Highway (78%). The highest proportion of female drivers involved in crashes was along the Kings Highway (36%). As depicted by Table 23, a similar pattern emerged for the study LGAs, with a consistent split between male and female controllers with a greater amount of males involved in crashes (ranging from 64% to 78%).

**Table 22 – ACT controllers involved in crashes in NSW by gender and region/route (1999-2003)**

| Region/route | Males | | Females | |
|---|---|---|---|---|
| | N | % | N | % |
| Metro Sydney | 441 | 70.1% | 184 | 29.3% |
| Hume Hwy | 128 | 69.2% | 56 | 30.3% |
| King's Hwy | 166 | 64.1% | 93 | 35.9% |
| Federal Hwy | 51 | 69.9% | 21 | 28.8% |
| Pacific Hwy | 35 | 77.8% | 10 | 22.2% |
| Princes Hwy | 55 | 71.4% | 22 | 28.6% |
| Monaro Hwy | 48 | 80.0% | 12 | 20.0% |
| Other | 672 | 66.0% | 344 | 33.8% |
| TOTAL | 1596 | 68.0% | 742 | 31.6% |

* Note unknowns not included. Percentages refer to proportion of all crashes between 1999 and 2003 involving ACT controllers of the region/route specified. Note that information pertaining to crashes that occurred in both the Metro Sydney region and a particular route are counted in the Metro Sydney category.

**Table 23 – ACT controllers involved in crashes in NSW by gender and study LGA (1999-2003)**

| LGA | Males | | Females | |
|---|---|---|---|---|
| | N | % | N | % |
| Queanbeyan City | 155 | 70.5% | 65 | 29.5% |
| Yarrowlumla | 84 | 63.6% | 47 | 35.6% |
| Yass | 77 | 65.3% | 41 | 34.7% |
| Cooma-Monaro | 52 | 77.6% | 15 | 22.4% |
| Other | 1228 | 67.9% | 574 | 31.7% |
| TOTAL | 1596 | 68.0% | 742 | 31.6% |

* Note unknowns not included. Percentages refer to proportion of all crashes between 1999 and 2003 involving ACT controllers of the region/route specified.

## 6.2 Age of controller

Figure 16 shows that of 2,346 controllers with an ACT licence involved in crashes in NSW, 29% were aged below 25 years. Thirty-one percent of controllers were aged 26 to 39. Only 8% of controllers were aged 60 and above. However, this older age group accounted for 14% of all ACT controllers involved in crashes on the Kings Highway which connects the ACT to NSW's south beaches. However, the number of crashes on this route is small, so excessive weight should not be attached to this finding. (See Table 24). The table also shows that the age distribution of ACT controllers varies little across the major routes and regions, with the majority of controllers aged below 40 years. (Refer to Map A 9, Appendix A – Crash Plots, page 63 for a plot of these crashes). The age distribution of ACT controllers also varies little across the study LGAs, with the majority of controllers aged below 40 years (see Table 26).

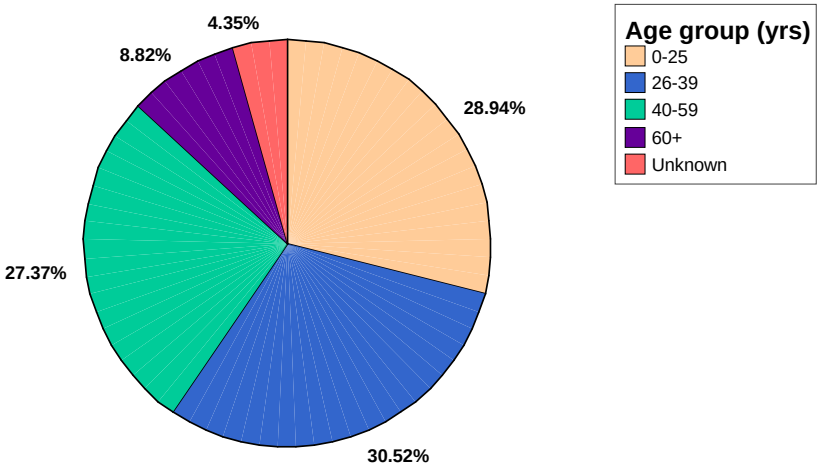



*Figure 16 – ACT controllers involved in crashes in NSW by age group (1999-2003)*

**Table 24 – ACT controllers involved in crashes in NSW by age group and region/route (1999-2003)**

| Region/route | <25 | | 26-39 | | 40-59 | | 60+ | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Metro Sydney | 170 | 27.0% | 206 | 32.8% | 179 | 28.5% | 33 | 5.2% |
| Hume Hwy | 54 | 29.2% | 56 | 30.3% | 58 | 31.4% | 13 | 7.0% |
| King's Hwy | 67 | 25.9% | 75 | 29.0% | 74 | 28.6% | 37 | 14.3% |
| Federal Hwy | 24 | 32.9% | 17 | 23.3% | 25 | 34.2% | 6 | 8.2% |
| Pacific Hwy | 12 | 26.7% | 9 | 20.0% | 17 | 37.8% | 4 | 8.9% |
| Princes Hwy | 20 | 26.0% | 21 | 27.3% | 23 | 29.9% | 8 | 10.4% |
| Monaro Hwy | 12 | 20.0% | 17 | 28.3% | 21 | 35.0% | 8 | 13.3% |
| Other | 320 | 31.4% | 315 | 30.9% | 245 | 24.1% | 98 | 9.6% |
| TOTAL | 679 | 28.9% | 716 | 30.5% | 642 | 27.4% | 207 | 8.8% |

* Percentages refer to proportion of all ACT controllers involved in crashes between 1999 and 2003 in the region/route specified. Note that controllers involved in crashes that occurred in both the Metro Sydney region and a particular route are counted in the Metro Sydney category.

**Table 25 – ACT controllers involved in crashes in NSW by age group and study LGA (1999-2003)**

| LGA | <25 | | 26-39 | | 40-59 | | 60+ | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Queanbeyan City | 66 | 30.0% | 72 | 32.7% | 46 | 20.9% | 23 | 10.5% |
| Yarrowlumla | 45 | 34.1% | 27 | 20.5% | 41 | 31.1% | 14 | 10.6% |
| Yass | 34 | 28.8% | 46 | 39.0% | 27 | 22.9% | 7 | 5.9% |
| Cooma-Monaro | 16 | 23.9% | 20 | 29.9% | 22 | 32.8% | 7 | 10.4% |
| Other | 518 | 28.6% | 551 | 30.5% | 506 | 28.0% | 156 | 8.6% |
| TOTAL | 679 | 28.9% | 716 | 30.5% | 642 | 27.4% | 207 | 8.8% |

* Percentages refer to proportion of all ACT controllers involved in crashes between 1999 and 2003 in the region/route specified.

### 6.2.1 Age and gender

As illustrated in Figure 17, 59% of male ACT licensed controllers were aged below 40 years of age, with 28% in the below 25 age group and 31% in the 26 to 39 group. Sixty-two percent of female ACT controllers were aged below 40 years of age. Thus a similar pattern was shown regarding male and female controllers aged below 40 years involved in crashes. A slightly larger proportion of controllers involved in crashes were males aged 60 and above (10%) compared to female controllers of that age (7%).

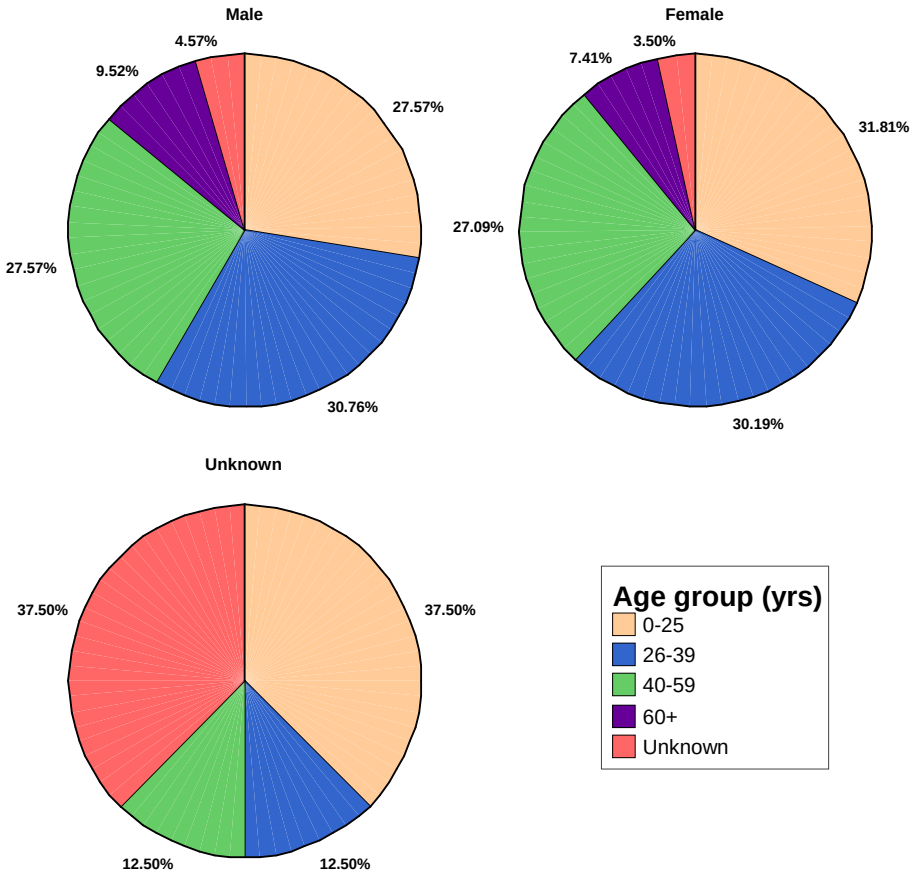



*Figure 17 – ACT controllers involved in crashes in NSW by gender and age group (1999-2003)*

# 7 Factors contributing to crashes

In this section, the possible role of the factors fatigue, speeding, alcohol and restraint use are considered. In the case of fatigue, a vehicle controller is deemed to have been fatigued if police describe the controller as having been asleep, fatigued or drowsy or if the crash resulted from a manoeuvre which suggests fatigue on the part of the driver (e.g. wandering to the wrong side of the road or running off the road on the outside of a curve).

A similar type of definition applies to speeding, which is defined as excessive speed for the prevailing conditions. A vehicle is deemed to have been speeding if its controller is charged with a speeding offence, if it is described by police as travelling at excessive speed, the stated speed was in excess of the speed limit or if the vehicle carried out a manoeuvre characteristic of excessive speed, such as skidding or other type of loss of control.

In many cases, an element of subjective judgement is involved. In the case of alcohol, privacy concerns prevent the release of Blood Alcohol Concentration (BAC) data associated with individual crashes, so the analysis was carried out in terms of crashes that occurred during the times which have been demonstrated to be associated with higher than usual levels of alcohol-affected driving. In this case, the link with alcohol is very tenuous, as many people driving during these times will not have been drinking alcohol at all or will have low BACs. Finally, police officers are not always accurate in their assessment of whether or not restraints were being worn at the time of the crash. In view of these limitations, the analysis in this section of the report should be regarded as indicative of factors which may be influencing crashes rather than a definitive account of the role of these factors.

## 7.1 Fatigue related crashes

A driver survey conducted by AAMI Insurance in 1999 revealed that 38% of drivers admitted to driving while fatigued, despite the dangers associated with it (AAMI Insurance 1999). Fatigue is commonly associated with long distance driving and sleep deprivation. It is an important issue for tourists and other interstate travellers. Fatigue is also becoming more widely recognised as a problem with local traffic in the early hours of the morning due to disturbed sleep patterns and activities such as shift work and social events. Identifying and classifying fatigue as a contributing factor in crashes is difficult and procedures vary across jurisdictions. Figure 18 indicates the percentage of controllers with an ACT licence involved in crashes in NSW between 1999 and 2003, who were classified as fatigued. Of the 2,346 ACT controllers involved in crashes, 8% were fatigued.

The highest proportion of fatigued controllers was found in crashes along the Federal Highway (27%), Monaro Highway (23%) and Prices Highway (14%). (See Table 26). Fewer crashes were reported in Metro Sydney, where only 1% (n=4) of ACT controllers were classified as fatigued. In terms of severity, 23% of controllers involved in fatal crashes were identified as fatigued, the highest concentration being along the Princes, Monaro and Federal Highways, where 67%, 33% and 33% of all ACT controllers involved in fatal crashes respectively were reportedly fatigued. (Refer to Map A 10, Appendix A – Crash Plots, page 64 for a plot of these crashes).

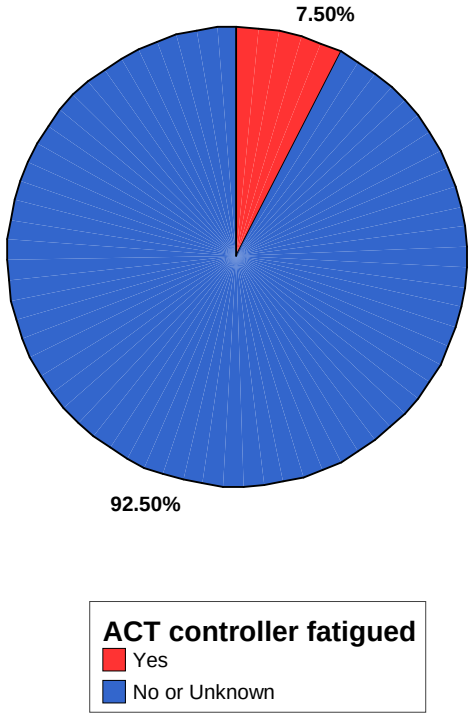



*Figure 18 – ACT controllers involved in crashes in NSW who were classified as fatigued (1999-2003)*

The results show that a larger proportion of ACT controllers along the major highways were fatigued in comparison to the inner city areas. It would be expected that a higher number and proportion of fatigue related crashes would occur along major routes where the effects of long distance driving might take more effect. However, as the number of cases is very small too much weight should not be attached to this finding.

Table 27 indicates that Queanbeyan City had very few ACT fatigued controllers involved in crashes (3%), whereas Yass (23%) and Comma-Monaro (16%) had a higher number of ACT fatigued controllers involved in crashes. Yarrowlumla, Yass and Cooma-Monaro each had one fatigued controller involved in a fatal crash. Note that the crash numbers were very small.

**Table 26 – ACT fatigued controllers involved in crashes in NSW by region/route and crash severity (1999-2003)**

| Region/route | Fatigued controllers in fatal crashes | | Fatigued controllers in injury crashes | | Fatigued controllers in tow away crashes | | Fatigued controllers in all crashes | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Metro Sydney | 0 | 0% | 1 | 0.5% | 3 | 0.7% | 4 | 0.6% |
| Hume Hwy | 0 | 0% | 6 | 10.3% | 16 | 12.7% | 22 | 11.9% |
| King's Hwy | 0 | 0% | 9 | 7.9% | 13 | 9.4% | 22 | 8.5% |
| Federal Hwy | 2 | 33.3% | 12 | 44.4% | 6 | 15.0% | 20 | 27.4% |
| Pacific Hwy | 0 | 0% | 2 | 10.0% | 1 | 4.5% | 3 | 6.7% |
| Princes Hwy | 2 | 66.7% | 5 | 12.5% | 4 | 11.8% | 11 | 14.3% |
| Monaro Hwy | 1 | 33.3% | 7 | 29.2% | 5 | 15.2% | 14 | 23.3% |
| Other | 5 | 25.0% | 33 | 7.8% | 43 | 7.5% | 81 | 8.0% |
| TOTAL | 10 | 23.3% | 75 | 8.1% | 91 | 6.6% | 176 | 7.5% |

* Percentages refer to the proportion of all controllers with an ACT licence involved in crashes between 1999 and 2003 in NSW of the severity specified, along the route or in the region specified e.g. one ACT controller was involved in an injury crash in Metro Sydney was reportedly fatigued. In other words, 0.5% of all ACT controllers involved in injury crashes in Sydney were reportedly fatigued. Note that controllers involved in crashes that occurred in both the Metro Sydney region and a particular route are counted in the Metro Sydney category.

**Table 27 – ACT fatigued controllers involved in crashes in NSW by study LGAs and crash severity (1999-2003)**

| LGA | Fatigued controllers in fatal crashes | | Fatigued controllers in injury crashes | | Fatigued controllers in tow away crashes | | Fatigued controllers in all crashes | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Queanbeyan City | 0 | 0% | 1 | 1.0% | 5 | 4.1% | 6 | 2.7% |
| Yarrowlumla | 1 | 14.3% | 8 | 14.8% | 10 | 14.1% | 19 | 14.4% |
| Yass | 1 | 20.0% | 5 | 11.9% | 11 | 15.5% | 27 | 22.9% |
| Cooma-Monaro | 1 | 50.0% | 6 | 25.0% | 4 | 9.8% | 11 | 16.4% |
| Other | 7 | 25.0% | 55 | 7.7% | 61 | 5.7% | 123 | 6.8% |
| TOTAL | 10 | 23.3% | 75 | 8.1% | 91 | 6.6% | 176 | 7.5% |

* Percentages refer to the proportion of all controllers with an ACT licence involved in crashes between 1999 and 2003 in NSW of the severity specified, in the LGA specified.

## 7.2 Speed related crashes

Figure 19 indicates the percentage of controllers with an ACT licence involved in crashes in NSW between 1999 and 2003, who were classified as speeding. Of the 2,346 ACT controllers involved in crashes, 20% were speeding (n=474). (Refer to Map A 11, Appendix A – Crash Plots, page 65 for a plot of these crashes).

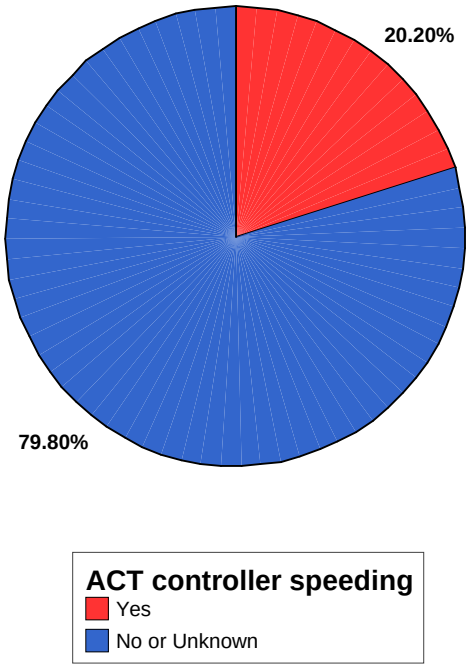



*Figure 19 – ACT controllers involved in crashes in NSW and speed compliance (1999-2003)*

Table 28 summarises the distribution of the speeding ACT controllers across NSW by crash severity. Twenty percent of controllers were not reported as speeding, but this varied considerably from locality to locality. The Metro Sydney region had very few speeding controllers involved in all crashes (3%). However, along NSW major routes, the proportion of crashes involving speeding was significantly higher in fatal crashes. Kings Highway had the highest proportion of speeding controllers (33%) for total crashes in comparison to all speeding controllers (20%) and the other highways. The combination of high speeds and the curved alignment of the King's Highway offers an explanation to the prevalence of 'off path' on curve crashes along the route. The incidence of speeding was also higher for more severe crashes with 33% of ACT controllers involved in fatal crashes assessed as speeding compared to 19% of ACT vehicles involved in two away crashes.

Table 29 outlines the figures pertaining to speeding ACT controllers by crash severity for the study LGAs. Queanbeyan City had very few speeding controllers involved in all crashes (7%). This might be expected as there are no major highways through this LGA. Yarrowlumla (30%) and Yass (38%) had a higher proportion of speeding controllers involved in all crashes in comparison to the 20% for all crashes involving ACT controllers in NSW. Also, both Yarrowlumla and Yass had high percentages of speeding controllers involved in fatal (57% and 40% respectively) and injury (33% and 41% respectively) crashes.

**Table 28 – ACT controllers involved in crashes in NSW exceeding the speed limit by region/route and crash severity (1999-2003)**

| Region/route | Speeding controllers in fatal crashes | | Speeding controllers in injury crashes | | Speeding controllers in tow away crashes | | Speeding controllers in all crashes | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Metro Sydney | 0 | 0% | 5 | 2.3% | 11 | 2.7% | 16 | 2.5% |
| Hume Hwy | 1 | 100.0% | 10 | 17.2% | 25 | 19.8% | 36 | 19.5% |
| King's Hwy | 2 | 33.3% | 41 | 36.0% | 42 | 30.2% | 85 | 32.8% |
| Federal Hwy | 2 | 33.3% | 3 | 11.1% | 6 | 15.0% | 11 | 15.1% |
| Pacific Hwy | 0 | 0% | 3 | 15.0% | 3 | 13.6% | 6 | 13.3% |
| Princes Hwy | 0 | 0% | 5 | 12.5% | 2 | 5.9% | 7 | 9.1% |
| Monaro Hwy | 0 | 0% | 4 | 16.7% | 3 | 9.1% | 7 | 11.7% |
| Other | 9 | 45.0% | 126 | 29.9% | 171 | 29.6% | 306 | 30.1% |
| TOTAL | 14 | 32.6% | 197 | 21.3% | 263 | 19.1% | 474 | 20.2% |

* Percentages refer to the proportion of all controllers with an ACT licence involved in crashes between 1999 and 2003 in NSW of the severity specified, along the route or in the region specified e.g. five ACT controllers were involved in an injury crash in Metro Sydney were reportedly speeding. In other words, 2.3% of all ACT controllers involved in injury crashes in Metro Sydney were reportedly speeding. Note that controllers involved in crashes that occurred in both the Metro Sydney region and a particular route are counted in the Metro Sydney category.

**Table 29 – ACT controllers involved in crashes in NSW exceeding the speed limit by study LGAs and crash severity (1999-2003)**

| LGA | Speeding controllers in fatal crashes | | Speeding controllers in injury crashes | | Speeding controllers in tow away crashes | | Speeding controllers in all crashes | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Queanbeyan City | 0 | 0% | 2 | 2.1% | 14 | 11.4% | 16 | 7.3% |
| Yarrowlumla | 4 | 57.1% | 18 | 33.3% | 18 | 25.4% | 40 | 30.3% |
| Yass | 2 | 40.0% | 17 | 40.5% | 26 | 36.6% | 45 | 38.1% |
| Cooma-Monaro | 0 | 0% | 6 | 25.0% | 9 | 22.0% | 15 | 22.4% |
| Other | 8 | 28.6% | 154 | 21.7% | 196 | 18.3% | 358 | 19.8% |
| TOTAL | 14 | 32.6% | 197 | 21.3% | 263 | 19.1% | 474 | 20.2% |

* Percentages refer to the proportion of all controllers with an ACT licence involved in crashes between 1999 and 2003 in NSW of the severity specified, in the LGA specified.

## 7.3 Alcohol hours

The Blood Alcohol Concentration (BAC) levels of drivers are reported in the event of a crash in NSW. However, BAC readings for ACT controllers involved in the crashes investigated were unable to be acquired due to confidentiality considerations and other constraints. The concept of high alcohol hours was employed as an alternative means of determining the influence of alcohol on crashes involving ACT vehicles and controllers in NSW. Research has shown that the involvement of alcohol in a crash is higher during certain times of the day and the week. High alcohol times is defined as those times of the day and week when casualty crashes are ten times more likely to involve alcohol than casualty crashes at other times (i.e. low alcohol times). High Alcohol times are defined as:

- weekdays 6 pm to 6 am
- Fridays 4 pm to midnight
- Saturdays 2 pm to 8 am
- Sunday midnight to 10 am and 4 pm to midnight.

The hours defined above account for 42% of the week. Overall, 43% of crashes (n=1,467) in NSW involving ACT vehicles or controllers occurred during high alcohol times. (Refer to Map A 12, Appendix A – Crash Plots, page 66 for a plot of these crashes). Of this 43% and as illustrated by Figure 20, 2% were fatal crashes, 40% were injury crashes and 59% were tow away crashes. The proportion of crashes is similar to the proportion of hours in a week defined as high alcohol times. However, the proportion of crashes varies by location, as shown in Table 30.

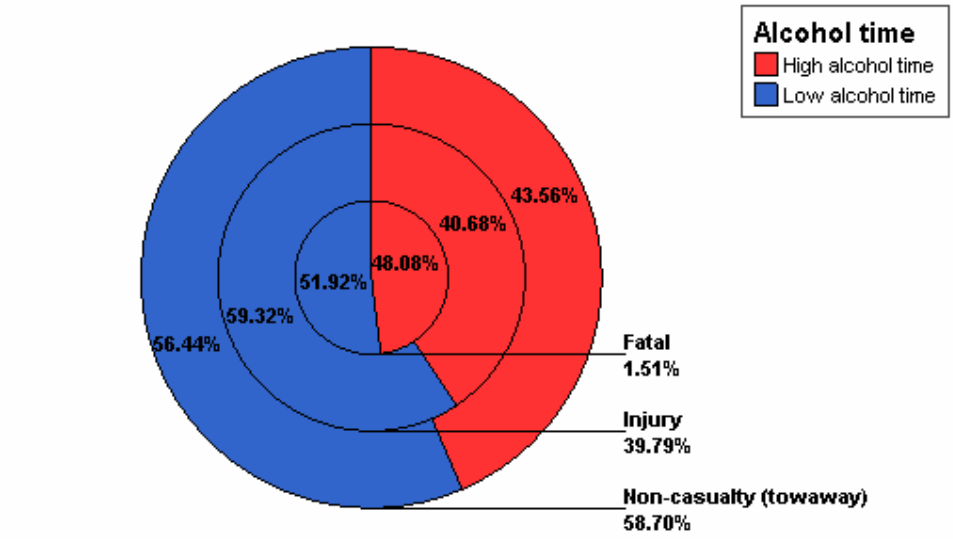



*Figure 20 – Crashes in NSW involving ACT controllers or ACT registered vehicles occurring at high and low alcohol times (1999-2003)*

Four hundred and sixty-one of all crashes during high alcohol times occurred in Sydney. High alcohol period crashes accounted for 43% of crashes in the Metro Sydney region compared to 69% of all crashes on the Federal Highway and 56% of crashes on the Hume Highway. While the proportion of crashes that occurred during high alcohol times was quite high across NSW, it must be noted that the incidence of a crash during high alcohol times does not automatically classify it as alcohol related. The times defined coincide with periods of heavy traffic flow along highways (i.e. during weekends and at night time). It is unlikely that alcohol levels are high amongst this group at these times.

**Table 30 – Crashes in NSW involving ACT controllers or ACT registered vehicles that occurred at high alcohol times by region/route (1999-2003)**

| Region/route | Fatal crashes | | Injury crashes | | Tow away crashes | | Total crashes | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Metro Sydney | 1 | 50.0% | 165 | 42.5% | 295 | 43.1% | 461 | 42.9% |
| Hume Hwy | 0 | 0% | 42 | 51.9% | 93 | 58.1% | 135 | 55.8% |
| King's Hwy | 1 | 16.7% | 41 | 33.1% | 80 | 47.6% | 122 | 40.9% |
| Federal Hwy | 4 | 80.0% | 30 | 83.3% | 28 | 57.1% | 62 | 68.9% |
| Pacific Hwy | 3 | 75.0% | 13 | 37.1% | 11 | 30.6% | 27 | 36.0% |
| Princes Hwy | 2 | 50.0% | 16 | 30.8% | 13 | 25.0% | 31 | 28.7% |
| Monaro Hwy | 1 | 33.3% | 10 | 33.3% | 17 | 44.7% | 28 | 39.4% |
| Other | 13 | 48.1% | 242 | 38.5% | 346 | 41.2% | 601 | 1.2% |
| TOTAL | 25 | 48.1% | 559 | 40.7% | 883 | 43.6% | 1467 | 42.5% |

* Percentages refer to the proportion of all crashes involving ACT controllers or vehicles between 1999 and 2003 in NSW of the severity specified, along the route or in the region specified e.g. 165 injury crashes occurred in Metro Sydney during high alcohol times. In other words, 42.5% of all injury crashes in Metro Sydney were at high alcohol times. Note that crashes that occurred in both the Metro Sydney region and a particular route are counted in the Metro Sydney category.

Yarrowlumla and Yass had a higher percentage of alcohol crashes (42% and 43% respectively) which involved ACT controllers or vehicles in comparison to the other study LGAs and total NSW (50% and 55% respectively). Of interest, is that the total fatal crashes (n=2) that occurred in Queanbeyan City's were at high alcohol times, although injury and tow away high alcohol time crash percentages were lower than that for all of NSW.

**Table 31 – Crashes in NSW involving ACT controllers or ACT registered vehicles that occurred at high alcohol times by study LGA (1999-2003)**

| LGA | Fatal crashes | | Injury crashes | | Tow away crashes | | Total crashes | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Queanbeyan City | 2 | 100.0% | 43 | 34.4% | 62 | 36.9% | 107 | 36.3% |
| Yarrowlumla | 5 | 55.6% | 43 | 51.2% | 50 | 48.5% | 98 | 50.0% |
| Yass | 3 | 50.0% | 26 | 44.8% | 52 | 61.9% | 81 | 54.7% |
| Cooma-Monaro | 0 | 0% | 12 | 41.4% | 17 | 37.0% | 29 | 37.7% |
| Other | 15 | 45.5% | 435 | 40.4% | 702 | 43.2% | 1152 | 42.1% |
| TOTAL | 25 | 48.1% | 559 | 40.7% | 883 | 43.6% | 1467 | 42.5% |

* Percentages refer to the proportion of all crashes involving ACT controllers or vehicles between 1999 and 2003 in NSW of the severity specified, in the LGA specified.

## 7.4 Restraint use

Non-wearing of restraints was a factor in only 1% of crashes involving ACT controllers in NSW. Of the 2,346 ACT controllers involved in crashes, 28 were not restrained or did not wear a helmet. (Refer to Map A 13, Appendix A – Crash Plots, page 67 for a plot of these crashes). Figure 21 shows restraint use of ACT controllers by vehicle type. It demonstrates that less than 1% of ACT car drivers were unrestrained, 14% of ACT bus drivers were unrestrained, 7% of ACT truck drivers were unrestrained and 2% of ACT motorcycle riders were not wearing a helmet at the time of crash.

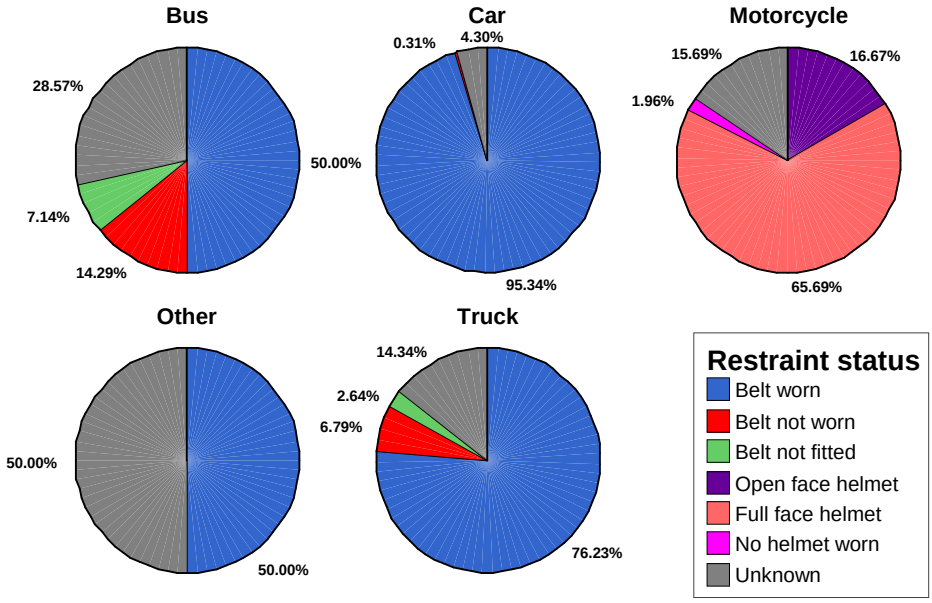



*Figure 21 – ACT controllers involved in crashes in NSW by restraint use and vehicle type (1999-2003)*

Table 32 depicts the high use of restraints (seatbelts and helmets) by ACT controllers involved in crashes by region/route. Note that the unknowns have not been excluded – unknowns consist of 6.3 percent of the ACT controllers analysed and should be added to the total percentage in this table. Of note is the lower restraint use on the Pacific and Princes highways in relation to the fatal crashes (both 68%). The Federal Highway demonstrated the lowest restraint use for injury crashes (85%) followed by the Hume Highway (86%). The tow away crashes demonstrated the highest levels of restraint use (all regions/routes showed a 90% level of use or higher).

Restraint use by ACT controllers in each study LGA is outlined in Table 33. Results are similar to those in Table 32. The highest level of restraint use occurred in tow away crashes (above 90% of controllers were restrained). Yarrowlumla and Yass had the lowest level of restraint use for injury crashes (87% and 86% respectively).

**Table 32 – ACT controllers involved in crashes in NSW by use of restraints (seatbelts/helmets), severity and region/route (1999-2003)**

| Region/route | Fatal crashes | | Injury crashes | | Tow away crashes | | Total crashes | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Metro Sydney | 1 | 100% | 198 | 89.2% | 368 | 90.6% | 567 | 90.1% |
| Hume Hwy | 1 | 100% | 50 | 86.2% | 118 | 93.6% | 169 | 91.4% |
| King's Hwy | 6 | 100% | 111 | 97.4% | 134 | 96.4% | 251 | 96.9% |
| Federal Hwy | 5 | 83.3% | 23 | 85.2% | 39 | 97.5% | 67 | 91.8% |
| Pacific Hwy | 2 | 66.7% | 18 | 90.0% | 21 | 95.5% | 41 | 91.1% |
| Princes Hwy | 2 | 66.7% | 37 | 92.5% | 33 | 97.1% | 72 | 93.5% |
| Monaro Hwy | 0 | - | 22 | 91.7% | 32 | 97.0% | 54 | 90.0% |
| Other | 17 | 85% | 383 | 91.0% | 549 | 95.1% | 949 | 93.2% |
| TOTAL | 34 | 79.1% | 842 | 91.3% | 1294 | 94.0% | 2170 | 92.5% |

* Percentages refer to the proportion of all ACT controllers involved in crashes between 1999 and 2003 in NSW of the severity specified, along the route or in the region specified e.g. 198 ACT controllers were involved in an injury crash in Metro Sydney were reportedly restrained. In other words, 89.2% of all ACT controllers involved in injury crashes in Sydney were reportedly restrained. Note that controllers involved in crashes that occurred in both the Metro Sydney region and a particular route are counted in the Metro Sydney category. Note that unknowns are included – unknowns consist of 6.3% of the total ACT controllers analysed for restraint use.

**Table 33 – ACT controllers involved in crashes in NSW by use of restraints (seatbelts/helmets), severity and study LGA (1999-2003)**

| LGA | Fatal crashes | | Injury crashes | | Tow away crashes | | Total crashes | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| Queanbeyan City | 1 | 100% | 89 | 92.7% | 113 | 91.9% | 203 | 92.3% |
| Yarrowlumla | 6 | 85.7% | 47 | 87.0% | 66 | 93.0% | 119 | 90.2% |
| Yass | 5 | 100% | 36 | 85.7% | 69 | 97.2% | 110 | 93.2% |
| Cooma-Monaro | 0 | - | 22 | 91.7% | 40 | 97.6% | 62 | 92.5% |
| Other | 22 | 78.6% | 648 | 91.3% | 1006 | 93.9% | 1676 | 92.6% |
| TOTAL | 34 | 79.1% | 842 | 90.9% | 1294 | 94.0% | 2170 | 92.5% |

* Percentages refer to the proportion of all ACT controllers involved in crashes between 1999 and 2003 in NSW of the severity specified, in the LGA specified e.g. 22 ACT controllers were involved in an injury crash in Queanbeyan City were reportedly restrained. In other words, 22.9% of all ACT controllers involved in injury crashes in Queanbeyan City were reportedly restrained. Note that unknowns are included – unknowns consist of 6.3% of the total ACT controllers analysed for restraint use.

# 8 The findings in context

In this section, key findings from the analysis are compared with other findings to assist their evaluation and interpretation. The first comparison is with crash rates in NSW and the ACT. the second comparison is between the crash patterns involving ACT drivers and crash patterns in the ACT itself. The final comparison is between key aspects of crashes in the present report with those identified in the earlier report on which this based.

## 8.1 Crash rate in NSW, ACT and ACT drivers and vehicles in NSW

The ACT has consistently had the lowest fatal crash rate in Australia. As an index of the impact of road crashes on the health of the ACT population, this statistic would appear to be misleading as the analysis reported in Figure 22 shows that, for the period 1999 to 2003, the number of fatal crashes in NSW involving ACT drivers or ACT registered vehicles was approximately the same as the number of fatalities resulting from crashes occurring within the ACT. Note that some of the fatal crashes within the ACT would have involved persons or vehicles from outside the ACT when population figures are taken into account. However, ACT drivers and vehicles are certain to have accounted for the majority of fatal crashes in the ACT, thus it is clear that considering the ACT figures alone represents a serious underestimate of the health impacts on ACT controllers. Although the numbers were smaller in relation to the NSW figures, it should also be noted that there were crashes involving ACT controllers that occurred within other States over the same time period. (See Table 34 and Table 35).

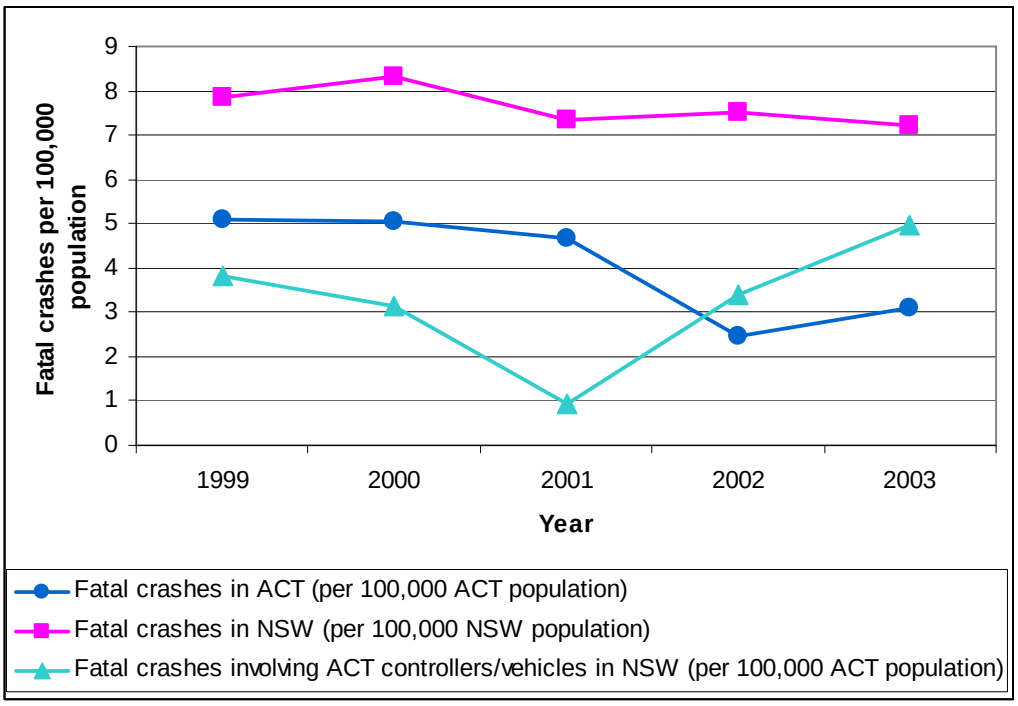



*Figure 22 – Trends in fatal crashes in NSW and the ACT (1999-2003)*

There are indications that the crash rate trends have been changing over the five year study period. Annual fatal crash rates in the ACT on a population basis decreased from 1999 (5.1 fatal crashes per 100,000 population) to 2003 (3.1 fatal crashes per 100,000 population). The population of the ACT increased by 3% in the same period. Annual fatal crash rates involving ACT controllers or vehicles in NSW increased from 3.8 to 5.0 fatal crashes per 100,000

population (an increase of 32%). In the same period, the fatal crash rates in NSW on a population basis declined from 7.9 to 7.2 fatal crashes per 100,000 population (a decrease of 9%).

**Table 34 – Fatal, serious injury and other injury crashes involving ACT registered vehicles or ACT controllers by State (1999-2003)**

| State | Year | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1999 | | | 2000 | | | 2001 | | | 2002 | | | 2003 | | |
| | F | SI | OI | F | SI | OI | F | SI | OI | F | SI | OI | F | SI | OI |
| Victoria | 2 | 19 | 12 | 0 | 28 | 13 | 1 | 28 | 6 | 1 | 17 | 9 | 0 | 11 | 12 |
| Queensland | 0 | 9 | 14 | 0 | 8 | 13 | 0 | 2 | 10 | 0 | 11 | 10 | 0 | 8 | 17 |
| South Australia | 0 | 0 | 5 | 0 | 0 | 11 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 6 |
| Northern Territory | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 0 |
| Western Australia | 0 | 1 | 6 | 0 | 1 | 6 | 0 | 0 | 9 | 0 | 1 | 2 | 0 | 2 | 4 |
| TOTAL | 2 | 29 | 38 | 0 | 38 | 43 | 1 | 30 | 32 | 1 | 30 | 27 | 0 | 21 | 39 |

* F = fatal crash, SI =serious injury crash, OI= other injury crash. Note that Tasmanian data is not provided due to injury severity coding differences and NSW and ACT crash data is supplied below due to severity differences.

**Table 35 – Fatal and injury crashes which crashes involving ACT registered vehicles or ACT controllers by State (continued) [1999-2003]**

| State | Year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1999 | | 2000 | | 2001 | | 2002 | | 2003 | |
| | Fatal | Injury | Fatal | Injury | Fatal | Injury | Fatal | Injury | Fatal | Injury |
| New South Wales | 12 | 274 | 10 | 284 | 3 | 290 | 11 | 268 | 16 | 258 |
| GRAND TOTAL | 14 | 341 | 10 | 365 | 4 | 352 | 12 | 325 | 16 | 318 |

* Note ACT has been omitted as the data involves non-ACT controllers or vehicles.

Conclusions drawn from fatal crash statistics alone are limited in that they are based on a relatively small sample size. Thus injury crashes per 100,000 population for NSW, ACT and crashes involving ACT controllers or vehicles in NSW are compared in Figure 23. Encouragingly, injury crash rates have decreased over the five year study period. There was a 48% decrease in the ACT injury crash rate, a 1% decrease in the NSW injury crash rate and a 9% decrease in the ACT controllers or vehicles involved in NSW crash rate. This appears to indicate an improvement in crash rates for all three crash groups over the five year study period, although there were increases in the fatal crash rate for crashes involving ACT controllers or vehicles in NSW. Thus there is a need to concentrate on addressing methods to decrease more severe crashes involving ACT controllers or vehicles in NSW.

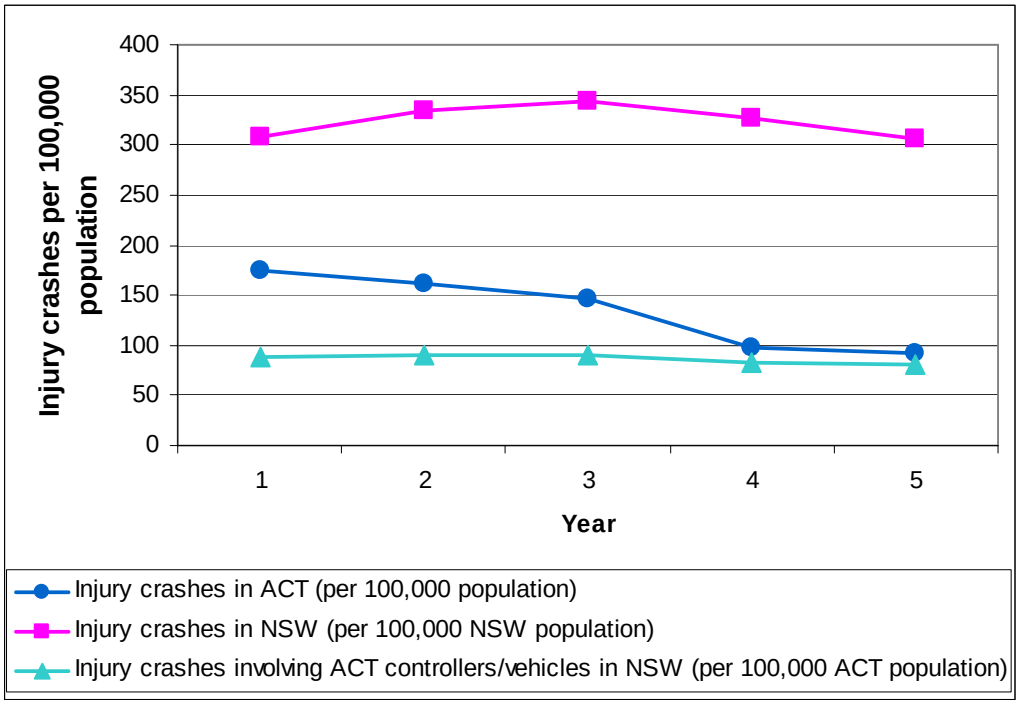



*Figure 23 – Trends in injury crashes in NSW and the ACT (1999-2003)*

## 8.2 Comparison between crashes involving ACT drivers in NSW and crashes in the ACT

There are very clear differences between crashes involving ACT drivers or vehicles in New South Wales and those which occur in the ACT.

**Table 36 Comparison of times of crashes in ACT and crashes involving ACT vehicles or controllers in New South Wales**

| | | Crashes in the ACT | Crashes involving ACT drivers or vehicles in NSW |
|---|---|---|---|
| Day | Weekday | 79% | 66% |
| | Weekend | 21% | 34% |
| Time of day | 7-10 am | 21% | 13% |
| | 3-6 pm | 28% | 26% |
| | 8-midnight | 8% | 11% |
| Light conditions | Dark | 23% | 24% |

Table 36 compares the time characteristics of the two sets of crashes. More of the crashes in the ACT occurred during weekdays, and fewer at weekends. A higher percentage appear to occur during the morning peak, slightly more in the evening peak, and fewer late at night. However, there appears to be little difference in the percentage of crashes which occur during darkness.

**Table 37 Comparison demographic characteristics of controllers in crashes in ACT and crashes involving ACT vehicles or controllers in New South Wales**

| | | Crashes in the ACT* | Crashes involving ACT drivers or vehicles in NSW |
|---|---|---|---|
| Gender | Male | 51% | 68% |
| | Female | 48% | 32% |
| Age | 0-24 | 29% | 29% |
| | 25-39 | 34% | 31% |
| | 40-59 | 25% | 27% |
| | 60 and over | 12% | 9% |

These are percentage of cases where gender or age was known, as these were missing in many cases in the ACT data set. No correction was made to the NSW data as there were too few missing cases to affect the percentages.

Table 37 shows that for crashes in the ACT, the percentages of male and female controllers was similar. However, for the crashes involving ACT drivers or vehicles in NSW, there were almost twice as many male as there were female controllers. There appears to be little difference in the age distribution of the two sets of controllers.

**Table 38 Comparison of vehicles and crash types in crashes in ACT and crashes involving ACT vehicles or controllers in New South Wales**

| | | Crashes in the ACT* | Crashes involving ACT drivers or vehicles in NSW |
|---|---|---|---|
| Crash type | Single vehicle | 8% | 36% |
| | Multiple vehicle | 92% | 64% |
| Vehicle type | Car | 91% | 82% |
| | Motorcycle | 1% | 5% |
| | Other | 8% | 13% |

Table 38 shows a large difference in crash types. Only 8% of crashes in the ACT were single vehicle crashes, whereas 36% of the crashes involving ACT drivers or vehicles were single vehicles. There are corresponding changes in the proportions of multi-vehicle crashes. As the ACT and New South Wales categorise crash types differently, no more detailed comparison is possible. The types of vehicle differed too, with a higher percentage of cars in crashes in the ACT, fewer other vehicles and dramatically fewer motorcycles.

Thus there are some very clear differences between crashes in the ACT and those involving ACT controllers or vehicles in New South Wales. These differences are a lower percentage of crashes on the weekend and a higher percentage of crashes during the week in the ACT, an almost even split between male and female drivers in the ACT and a preponderance of men in the New South Wales crashes, and few single vehicle crashes occurring in the ACT.

## 8.3 Comparison of the present study with Cairney and Gunatillake, 2000

In this section, the results of the present study are compared with those of the earlier study on which the present study is based (Cairney and Gunatillake 2000).

**Table 39 Comparison of frequency of fatal and injury crashes involving ACT drivers or vehicles in NSW in Cairney and Gunatillake (2000) and present study**

| | | 1992-1998 | 1999-2003 |
|---|---|---|---|
| Average number of crashes per year | Fatal | 13.6 | 10.4 |
| | Injury | 271.2 | 274.1 |
| | Tow-away | 510.1 | 405.4 |

Table 39 shows that, compared to the earlier study, there was a 24% drop in fatal crashes. However, the numbers are small and, as pointed out in Section 3.4, there is considerable variability in fatal crashes from year to year. Offsetting this was a 1% increase in the number of injury crashes. The most surprising finding was 21% drop in tow-away crashes. The numbers are large, so the reduction is likely to be reliable. The reason for this substantial reduction is not clear. The lack of progress with reducing injury crashes suggests that it may have more to do with crash reporting than an improvement in safety.

**Table 40 Comparison of times and locations for crashes involving ACT drivers or vehicles in NSW in Cairney and Gunatillake (2000) and present study**

| | | 1992-1998 | 1999-2003 |
|---|---|---|---|
| Location | Sydney | 33% | 31% |
| | Major routes | 26% | 26% |
| | Rest of NSW | 41% | 43% |
| Day | Weekday | 66% | 66% |
| | Weekend | 34% | 34% |
| Holiday time | Crashes occurring during holiday time | 30% | 32% |
| Light conditions | Dark | 26% | 25% |
| | Daylight | 68% | 69% |

There was little difference in the location or times of the crashes, suggesting that underlying travel patterns had changed little (see Table 40). There were a slightly lower percentage of crashes in Sydney and slightly more in the rest of New South Wales. The distribution of crashes across the major routes changed little, with a small increase on King's Highway compensated for by reductions on other routes.

There was a slight increase in the percentage of crashes occurring at holiday times, possibly due to more accurate handling of ACT holiday times in the present report compared to the earlier one. The time of day of crashes is unchanged. Inspection of the distributions indicates similar patterns, and the percentages of crashes occurring in daylight and in the dark is almost identical in both reports.

**Table 41 Comparison of crash types for crashes involving ACT drivers or vehicles in NSW in Cairney and Gunatillake (2000) and present study**

| | | 1992-1998 | 1999-2003 |
|---|---|---|---|
| Number of vehicles | Single vehicle | 36% | 36% |
| | Multiple vehicle | 64% | 64% |
| Crash type | Adjacent direction | 14% | 12% |
| | Opposite direction | 14% | 13% |
| | Same direction | 27% | 27% |
| | Manoeuvring | 4% | 4% |
| | Overtaking | 2% | 1% |
| | On Path | 5% | 4% |
| | Off Path - Straight | 16% | 17% |
| | Off Path - Curve | 21% | 20% |
| | Pedestrian | 2% | 1% |
| Vehicle type | Car | 84% | 82% |
| | Motorcycle | 4% | 5% |
| | Other | 12% | 13% |
| Vehicle occupancy | Persons in vehicle | 1.7 | 1.7 |

Crash types, vehicle types and vehicle occupancy are shown in Table 41. In both reports, the percentage of single vehicle and multiple vehicle crashes is identical, and the distribution of crash types is virtually identical. The mix of vehicle types is also virtually identical, and vehicle occupancy is unchanged.

**Table 42 Comparison of demographic characteristics of controllers in crashes involving ACT drivers or vehicles in NSW in Cairney and Gunatillake (2000) and present study**

| | | 1992-1998 | 1999-2003 |
|---|---|---|---|
| Age | Under 25 | 36% | 29% |
| | 26-39 | 32% | 31% |
| | 40-59 | 21% | 27% |
| | 60 and over | 6% | 9% |
| Gender | Male | 70% | 68% |
| | Female | 27% | 32% |
| | Unknown | 3% | 0% |

Table 42 shows that the drivers involved in the target crashes were older than those in the previous study. Twenty-nine percent of drivers were in the youngest age group, compared to 36% in the earlier study, a 19% reduction. This is compensated for by substantial increases in the 40-59 and 60 and over age groups, which were 29% and 50% respectively. There was a small increase in the proportion of women controllers.

**Table 43 Comparison of contributing factors in crashes involving ACT drivers or vehicles in NSW in Cairney and Gunatillake (2000) and present study**

| | | 1992-1998 | 1999-2003 |
|---|---|---|---|
| Fatigue | Crashes where fatigue was identified as a factor | 7% | 8% |
| Speeding | Crashes where speeding was identified as a factor | 17% | 20% |
| Alcohol hours | Crashes in alcohol hours | 44% | 43% |
| Restraint use | Restraint used | 90% | 93% |

Finally, there were changes in the contributing factors. The percentage of crashes in which fatigue was cited as a contributing factor, and the percentage of crashes in high alcohol hours changed little. The percentage of crashes in which a restraint was used increased from 90 to 93%. The percentage of crashes in which speeding was identified as a contributing factor increased from 17% to 20%.

The main findings of the comparisons outlined in Section 8.3 therefore are that travel patterns have changed little from the earlier period, and the types of crash are essentially the same. However, the driving population is slightly older. There was a small improvement in restraint use, which must be offset against an increase in speeding.

# 9 Conclusion

This study involved updating a previous report (Cairney & Gunatillake 2000) examining crashes in NSW involving ACT licensed controllers or ACT registered vehicles that occurred between 1992 and June 1999, with crash data for 1999 to 2003. The current crash data analysis focussed on crash, vehicle and controller characteristics, factors contributing to crashes and the spatial distribution of crashes. The main findings and findings pertaining to study region and routes which stem from the crash data analysis undertaken in this report are outlined below. In addition, comparisons to the results[2] contained in the previous report are also made.

1. The number of fatal crashes in the ACT was approximately the same as the number of fatal crashes in NSW resulting from crashes involving ACT vehicles/controllers, although in 2002 and 2003 the number of crashes in NSW resulting from crashes involving ACT vehicles/controllers was slightly higher than that in the ACT. This result was similar to that in the previous report.
2. Fatal crash rates per population were examined. Annual fatal crash rates involving ACT controllers or vehicles in NSW increased from 3.8 to 5.0 fatal crashes per 100,000 population (an increase of 32%) from 1999 to 2003. In the same period, the fatal crash rate in NSW on a population basis declined from 7.9 to 7.2 fatal crashes per 100,000 population (a decrease of 9%). In the previous report the fatal crash rate for ACT controllers or vehicles in NSW had decreased.
3. The number of injury crashes in the ACT was higher than the number of injury crashes in NSW resulting from crashes involving ACT vehicles/controllers. The number of ACT injury crashes was 275 crashes higher than that of injury crashes in NSW resulting from crashes involving ACT vehicles/controllers in 1999, but by 2003 this figure was only 38 injury crashes higher than injury crashes in NSW resulting from crashes involving ACT vehicles/controllers. This cannot be compared to the first report (as the first report outlined serious injury crashes).
4. Injury crash rates per population were examined. Encouragingly, injury crash rates decreased over the five year study period. There was a 48% decrease in the ACT injury crash rate, a 1% decrease in the NSW injury crash rate and a 9% decrease in the ACT controllers or vehicles involved in NSW crash rate. This cannot be compared to the first report (as the first report outlined serious injury crashes).
5. The highest concentration of crashes was in Metro Sydney, particularly pedestrian and intersection crashes. The traffic and road environment in Sydney is far more demanding than in the ACT and it is possible that Canberra drivers are not adequately prepared for it. Alternatively, it may simply reflect the amount of travel by ACT drivers and vehicles in Sydney, or a higher reporting rate of minor crashes that is the case elsewhere in NSW. This result was evident in the previous report.
6. The spatial distribution of crashes revealed that approximately 30% occurred within 100 km of Canberra and 90% occurred within approximately 250 km of Canberra. Queanbeyan City, which lies on the ACT/NSW border accounted for approximately 8% of crashes, the highest crash level of all LGAs. The Hume and King's Highways had the highest number of crashes of the main routes under investigation. These results apply to both reports.
7. The major routes across NSW also accounted for a high proportion of ACT controller/vehicle involved crashes, particularly those involving vehicles running off the road on curves and straight sections of road. This result was found in the previous report.

[2] Where not specified, crashes in this section of the report refer to those crashes involving ACT controllers or ACT vehicles that occurred in NSW.

8. Weekend crashes were over-represented on the highways connecting the ACT with the coast and mountains, but were not over-represented in Sydney or the Princes or Pacific highways. This was the case for both crash analyses, but for the current report the Princes Highway was over-represented on weekend crashes.
9. The time of crash in both reports in Metro Sydney, major routes and other locations corresponded primarily to the am and pm commuter peak periods. The same pattern across reports is shown for in relation to natural lighting – the majority of crashes (approximately 65%) occurred during daylight, and single/multiple crashes – the majority of crashes (approximately 65%) were multiple unit crashes. There were a larger number of single vehicle crashes along the major routes in comparison to multiple vehicle crashes. As would be expected in an urban environment, there were far more multiple vehicle crashes in Sydney than single vehicle crashes.
10. Holiday crash results for both reports were similar. In the previous report Easter (3.8) had the highest average daily crash numbers, followed by Australia Day (3.4) and Labour Day (3.1). In the current report the highest average daily crash numbers were for Australia Day (2.8), Canberra Day (2.7) and Easter (2.5). Note that Canberra Day was not considered in the previous report. Metro Sydney had the highest number of total crashes that occurred during holidays in both reports.
11. Over 80% of vehicles involved in the crashes under investigation were cars and 1% of all vehicles were involved in fatal crashes. This result was the same for both reports. The current crash analysis found that a greater proportion of buses, trucks and motorcycles were involved in fatal crashes in comparison to cars. Trucks were over-represented on the Federal and Pacific highways and motorcycles were over-represented on the Princes Highway.
12. Vehicle occupancy was very similar or the same for both ACT controlled or registered vehicles in comparison to other vehicles for both crash analyses. The average vehicle occupancy in crashes was approximately 1.65 persons.
13. A greater percentage of male controllers were involved in crashes (approximately 70% versus 30% for females across the crash severities). This split was fairly consistent across the region and routes investigated. The age of controllers in crashes had a majority below 40 years of age. Over fifty percent of male controllers involved in crashes were aged below 40 years. These results applied to both reports.
14. The percentage of fatigued controllers in crashes (approximately 8%), remained stable from the previous report to the current report. In addition, the amount of fatigued controllers involved in fatal crashes on NSW highways was over-represented.
15. The percentage of speeding controllers increased from 17% in the previous report to 20% in the current report. Speeding was also over-represented along half of the NSW highways in fatal crashes in the present report.
16. The causal factors may have represented an underestimate of the involvement of fatigue and speeding in crashes in both reports.
17. Approximately 44% of crashes occurred during high alcohol times in both reports. However, use of alcohol hours as an indicator tends to over estimate the effects of alcohol on crashes on major highways, since some peak travel times (i.e. weekend late night travel) may coincide with high alcohol times even though the social context of the travel is such that it is unlikely to lead drivers to consume alcohol before setting out on these journeys.
18. The non-wearing of restraints was a factor in 8% of crashes in the previous report and 1% of crashes for the current report. The current report investigated restraint wearing by vehicle type and found that a higher number of truck drivers were unrestrained (7%)

and bus drivers (14%) in comparison to car drivers (1%) and motorcycle riders (only 2% did not wear a helmet). There was a lower restraint use for all vehicle types for the Pacific and Princes highways in relation to fatal crashes.

The main findings[3] for the study LGAs were:

1. Queanbeyan City (9%) and Yarrowlumla (6%) had the highest number of crashes of the study LGAs. Queanbeyan City also had the highest number of crashes of all LGAs in NSW for the study period (and had 50 crashes higher than the second highest crash LGA for NSW). It should be noted that Queanbeyan City is small in comparison to the other study LGAs and the LGA is most probably a destination LGA for ACT controllers/vehicles. Both Queanbeyan City and Yarrowlumla are en route to the east of coast of NSW. Yarrowlumla (17%) and Yass (12%) had the highest number of fatal crashes.
2. Yass (39%) followed by Yarrowlumla (38%) had the highest number of weekend crashes. This was slightly higher than that for total weekend crashes involving ACT controllers/vehicles in NSW (33%).
3. There was no typical increase of crashes for the study LGAs during the morning peak period. Crashes began to increase from 10.00 am, peaked at 4.00 pm and decreased substantially from 7.00 pm.
4. Queanbeyan City had the highest number of night time crashes of the study LGAs, followed by Yarrowlumla.
5. Queanbeyan City, Yarrowlumla and Yass had similar amounts of holiday crashes over the five year study period (a range of 63 total crashes to 54 total crashes). Cooma-Monaro had approximately half the crashes of these LGAs (n=23). Comma-Monaro is likely to be less popular as a holiday destination or as a route to a major holiday destination.
6. The majority of crashes in Yarrowlumla (64%), Yass (71%) and Cooma-Monaro (70%) were single unit crashes. In comparison, the majority of crashes in Queanbeyan City were multiple unit crashes (83%) and this LGA had the highest proportion of pedestrian crashes (18%).
7. As per all crashes involving ACT controllers/vehicles in NSW, the study LGAs had higher numbers of 'off path' crashes compared to other crash types. Overtaking crashes also featured in Yarrowlumla.
8. With the exception of trucks, vehicle types involved in crashes were fairly evenly distributed across the LGAs with the majority of vehicles featured being cars. However, an over-representation of trucks involved in Queanbeyan City crashes featured.
9. Average vehicle occupancy was lower for ACT controlled/registered vehicles for the study LGAs in comparison to non-ACT registered vehicles, but the difference was small.
10. As per all crashes under investigation the majority of crashes in the study LGAs involved male controllers. Cooma-Monaro had the largest percentage of male controllers involved in crashes. In addition, the majority of controllers involved in crashes were aged less than 40 years of age for the study LGAs.
11. Queanbeyan City had very few ACT fatigued controllers involved in crashes (3%), whereas Yass (23%) and Comma-Monaro (16%) had a higher number of ACT fatigued

[3] Where not specified, crashes in this section of the report refer to those crashes involving ACT controllers or ACT vehicles that occurred in NSW.

controllers involved in crashes. This was higher than the state average of 8%. Note that the crash numbers were very small.

12. As per the fatigue crashes, Queanbeyan City had very few speeding controllers involved in all crashes (7%). This might be expected as there are no major highways through this LGA. Yarrowlumla (30%) and Yass (38%) had a higher proportion of speeding controllers involved in all crashes in comparison to the 20% for all crashes involving ACT controllers in NSW.
13. LGA crashes which occurred during alcohol hours did not differ remarkably from all alcohol hours crashes and nor did the LGA restrained controllers involved in crashes to the results for all crashes which focussed on restraint use.

The main findings arising from comparison with crashes in the ACT were:

1. A lower percentage of crashes occurred on the weekend and a higher percentage of crashes occurred during the week in the ACT, compared to the crashes in New South Wales involving ACT controllers or vehicles.
2. There was an almost even split between male and female drivers in the ACT compared to the preponderance of male drivers in the New South Wales crashes.
3. There were Fewer single vehicle crashes occurring in the ACT.

# 10 Recommendations

As a result of the results found in the current study the following recommendations are made:

1. Major effort should continue to be put into addressing crashes outside the ACT, as there has only been a minor shift in injury crash patterns involving ACT vehicles and controllers and fatal crashes continue to be a problem. Thus there should be a particular focus on fatal crashes involving ACT vehicles and controllers in NSW.
2. Focus countermeasures to address fatal crashes involving buses, trucks and motorcycles.
3. Undertake further investigation of the truck crashes that occurred on the Federal and Pacific Highways and motorcycle crashes on the Princes Highway.
4. As males have a higher crash involvement than females, countermeasures specifically targeted at controllers should ensure that they appeal to the male population.
5. Effort into countermeasures addressing speeding should be increased, particularly on the NSW highways investigated in this study (e.g. speed cameras).
6. Consider education regarding restraint wearing for truck and bus controllers.
7. Continue to pursue education and publicity in the areas of speed, fatigue and city driving. Further information can be found in the previous report.
8. Queanbeyan City appears to have a substantial crash problem involving ACT controllers/vehicles when compared to the other study LGAs. A detailed crash analysis of this LGA could be undertaken to assist in the development of focussed countermeasures.
9. Countermeasures to decrease pedestrian crashes and addressing city driving in Queanbeyan City should be considered.
10. Countermeasures to decrease fatigue involvement in crashes for the LGAs of Yass and Cooma-Monaro should be considered.
11. Consider the differences between crashes in the ACT and those involving ACT drivers in New South Wales when planning interventions, especially education and publicity interventions.

## References

AAMI Insurance 1999, *AAMI crash index IV*, press release.

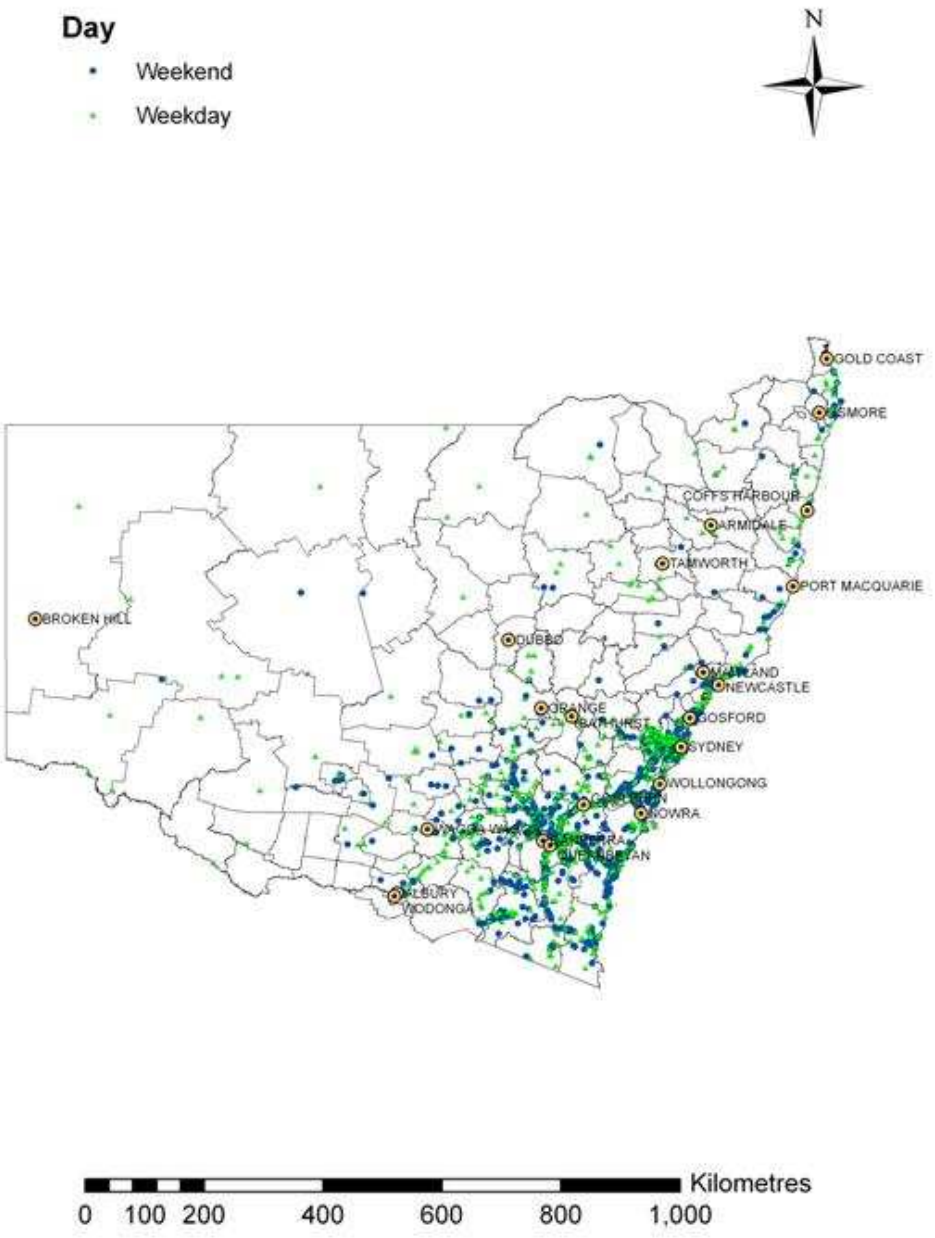
ACT Government 2003, *2003 Road Traffic Crashes in the ACT,* ACT Government, ACT.

Australian Transport Safety Bureau 2003, *Road crash data and rates, Australian States and Territories, 1925 to 2002*, Australian Transport Safety Bureau, ACT.

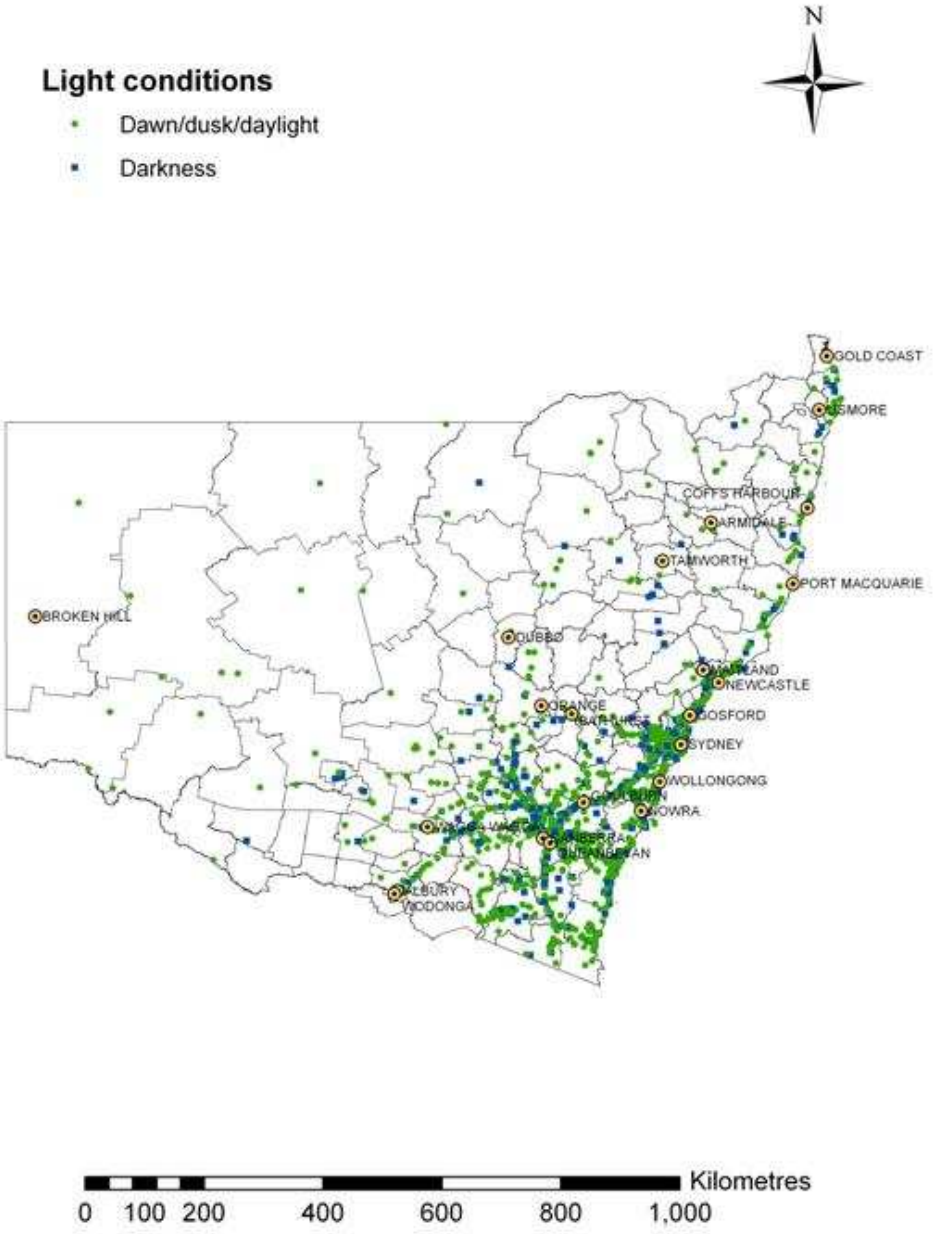
Cairney, P & Gunatillake, T 2000, *Crashes involving ACT vehicles outside the ACT*, contract report RC91091-1, Vermont South, Australia.

Smith, RJ 1999, *Impact of the ACT on the Surrounding Regions*, presentation to Citizens Jury Panel for the Healthy City Canberra by the Queanbeyan City Council.

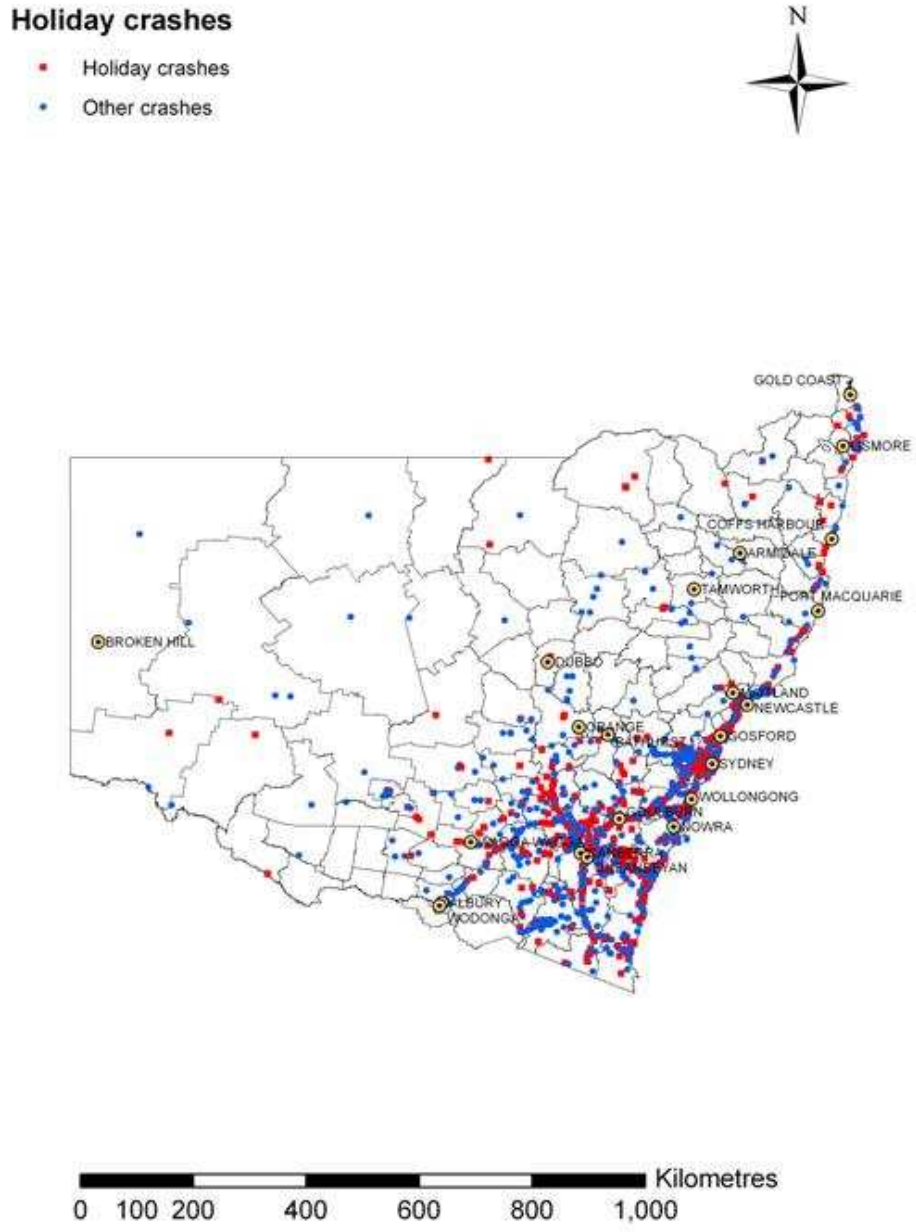
# Appendix A – Crash Plots



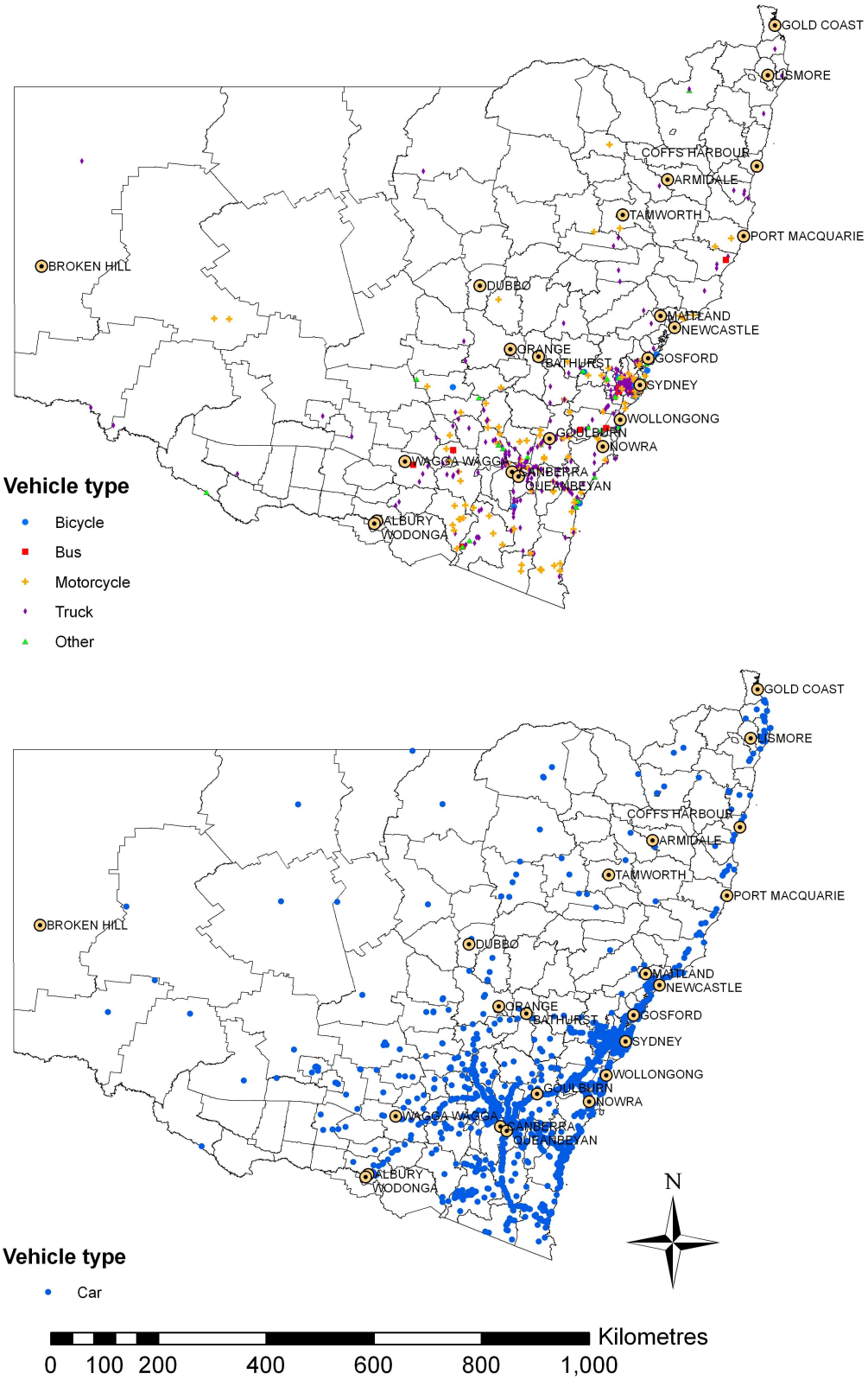

*Map A 1 – Crashes in NSW involving ACT controllers or ACT registered vehicles by weekend and weekday (1999-2003)*



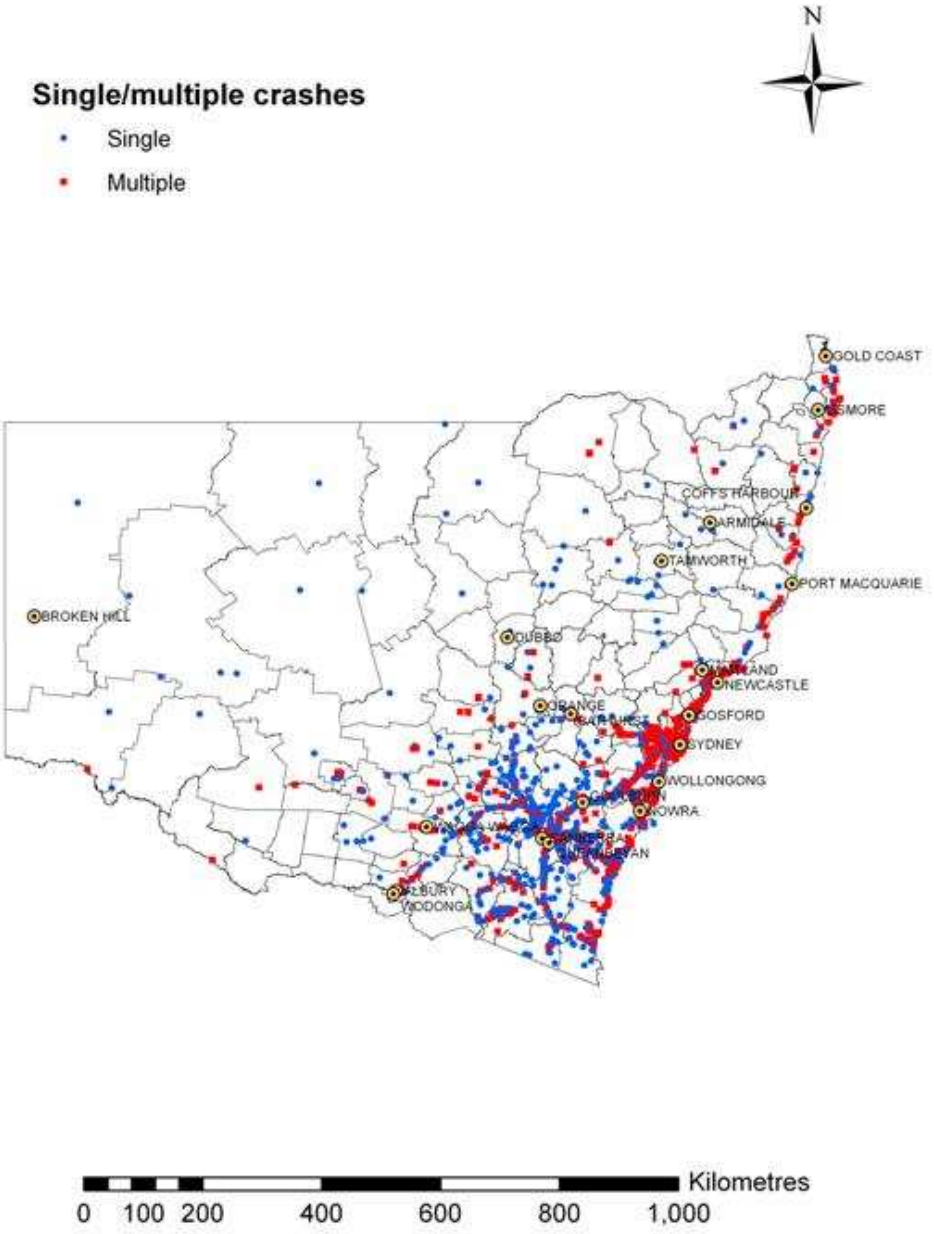

*Map A 2 – Crashes in NSW involving ACT controllers or ACT registered vehicles at night time (1999-2003)*



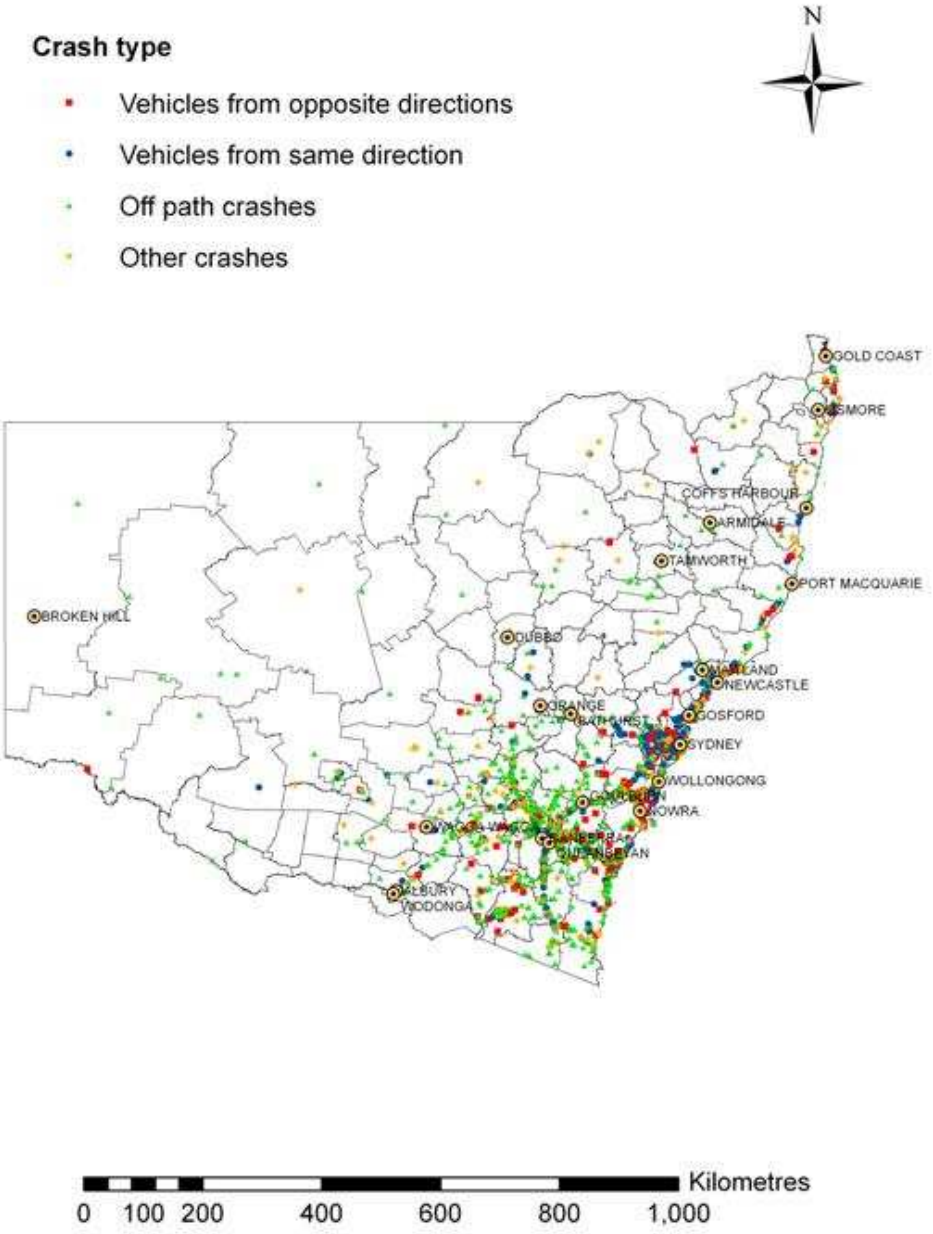

*Map A 3 – Crashes in NSW involving ACT controllers or ACT registered vehicles during holidays (1999-2003)*



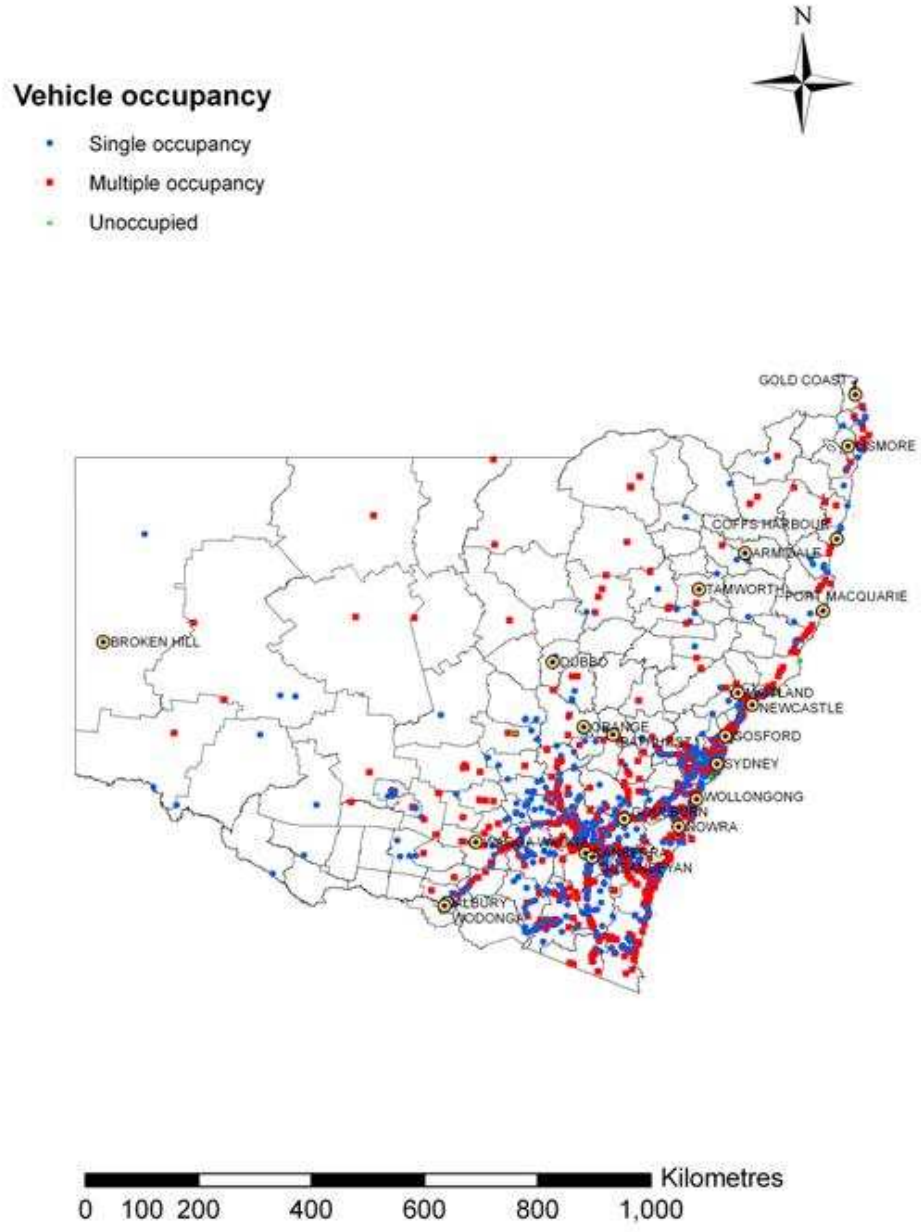

*Map A 4 – ACT registered/controlled vehicles involved in crashes in NSW by vehicle type (1999-2003)*



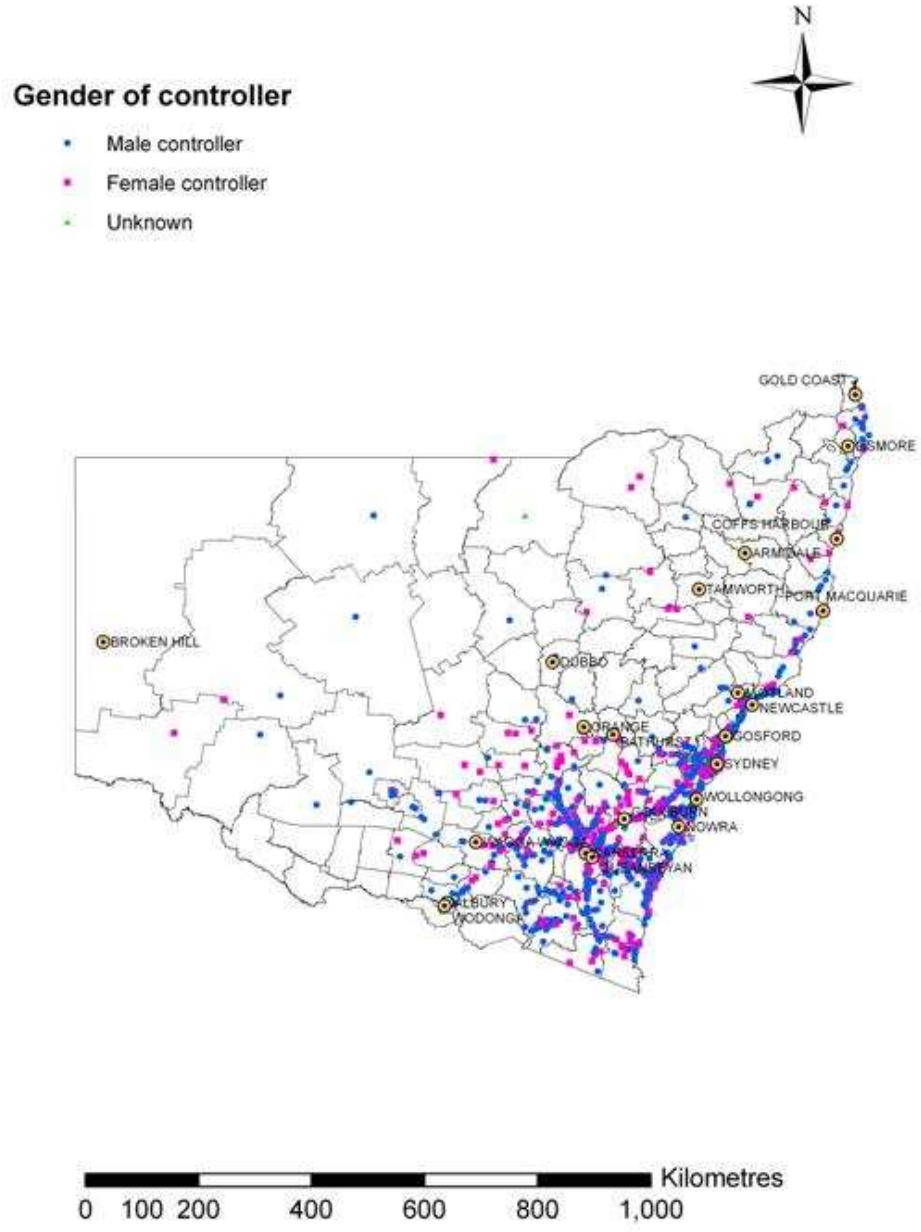

*Map A 5 – Single and multiple vehicle crashes in NSW involving ACT controllers or ACT registered vehicles (1999-2003)*



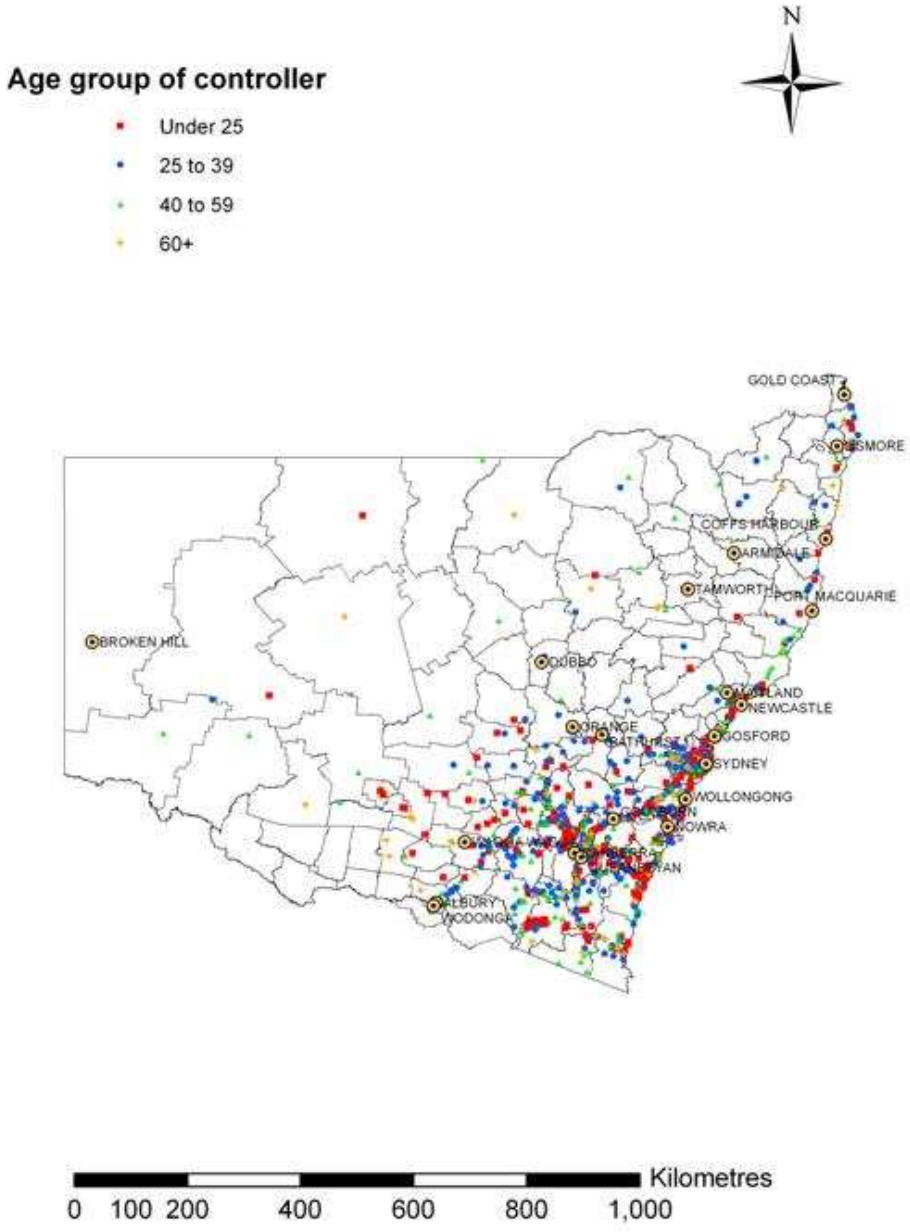

*Map A 6 – Crashes in NSW involving ACT controllers or ACT registered vehicles by major crash types (1999-2003)*



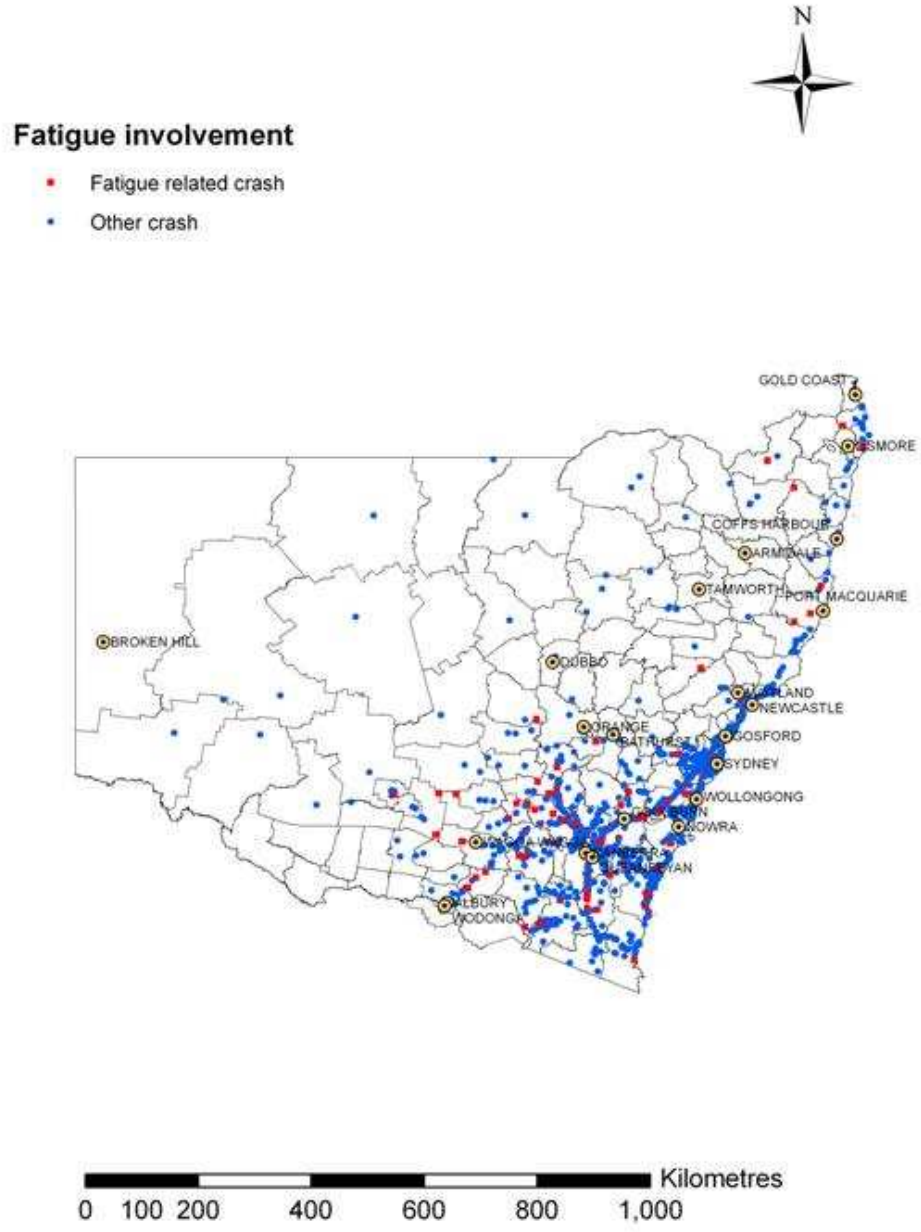

*Map A 7 – ACT registered/controlled vehicles involved in crashes in NSW by vehicle occupancy (1999-2003)*



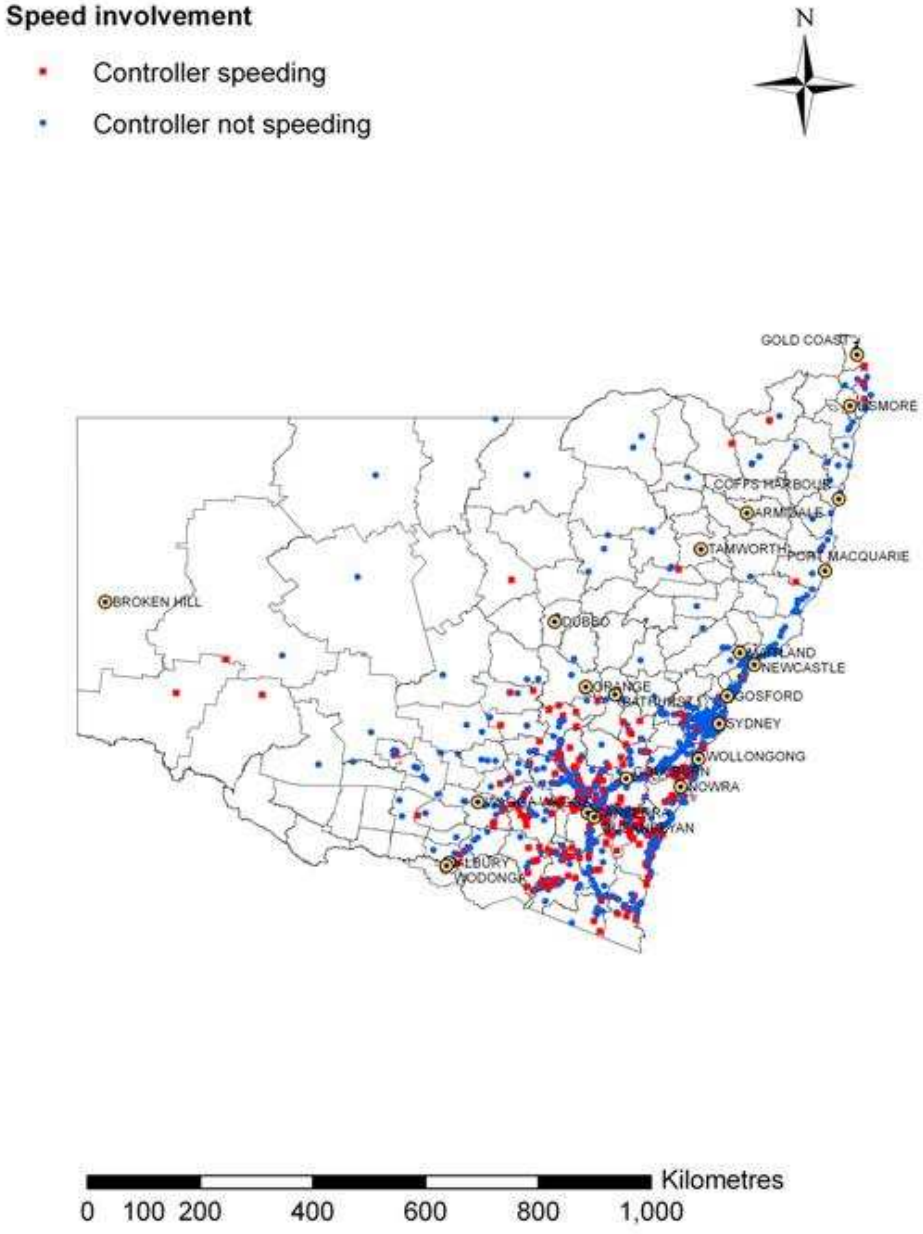

*Map A 8 – ACT controllers involved in crashes in NSW by gender (1999-2003)*



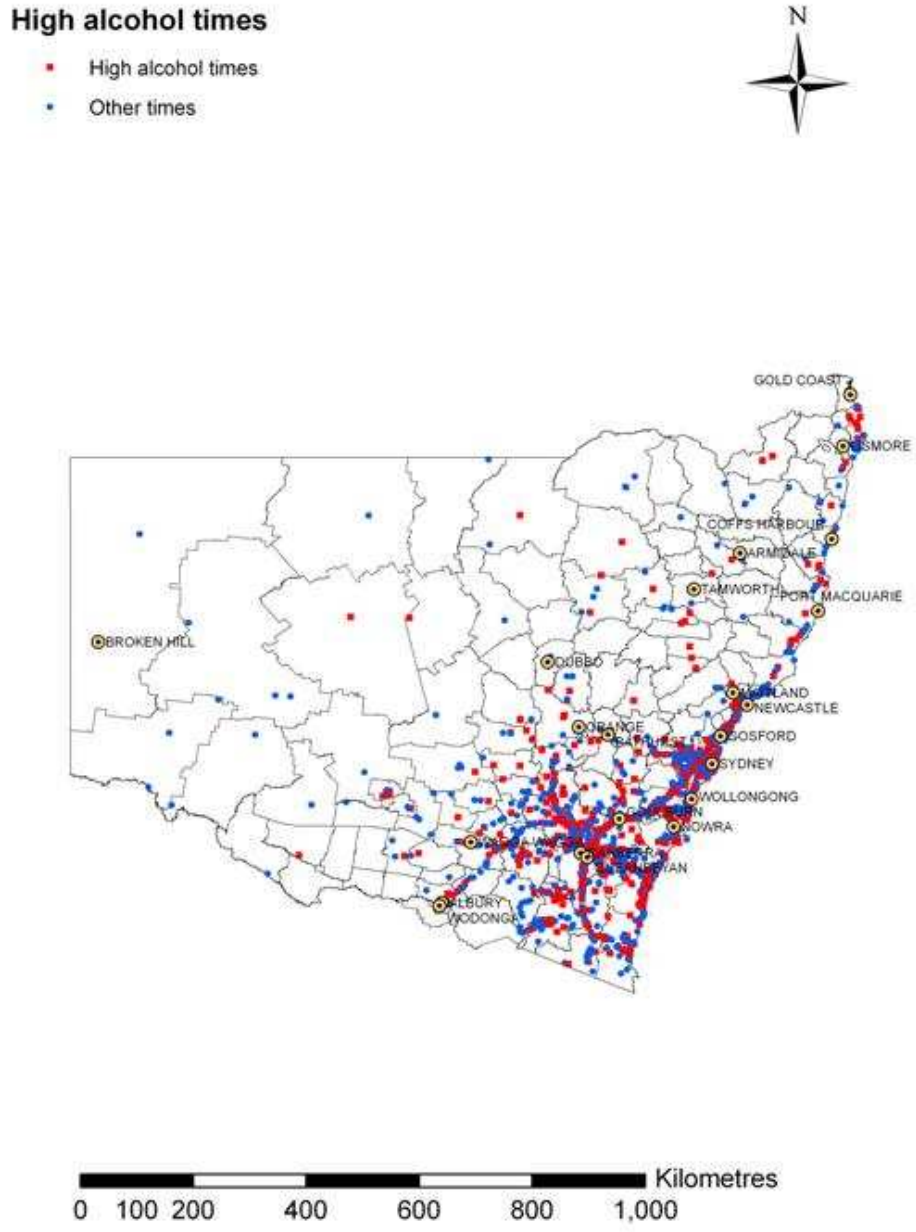

*Map A 9 – ACT controllers involved in crashes in NSW by age group (1999-2003)*



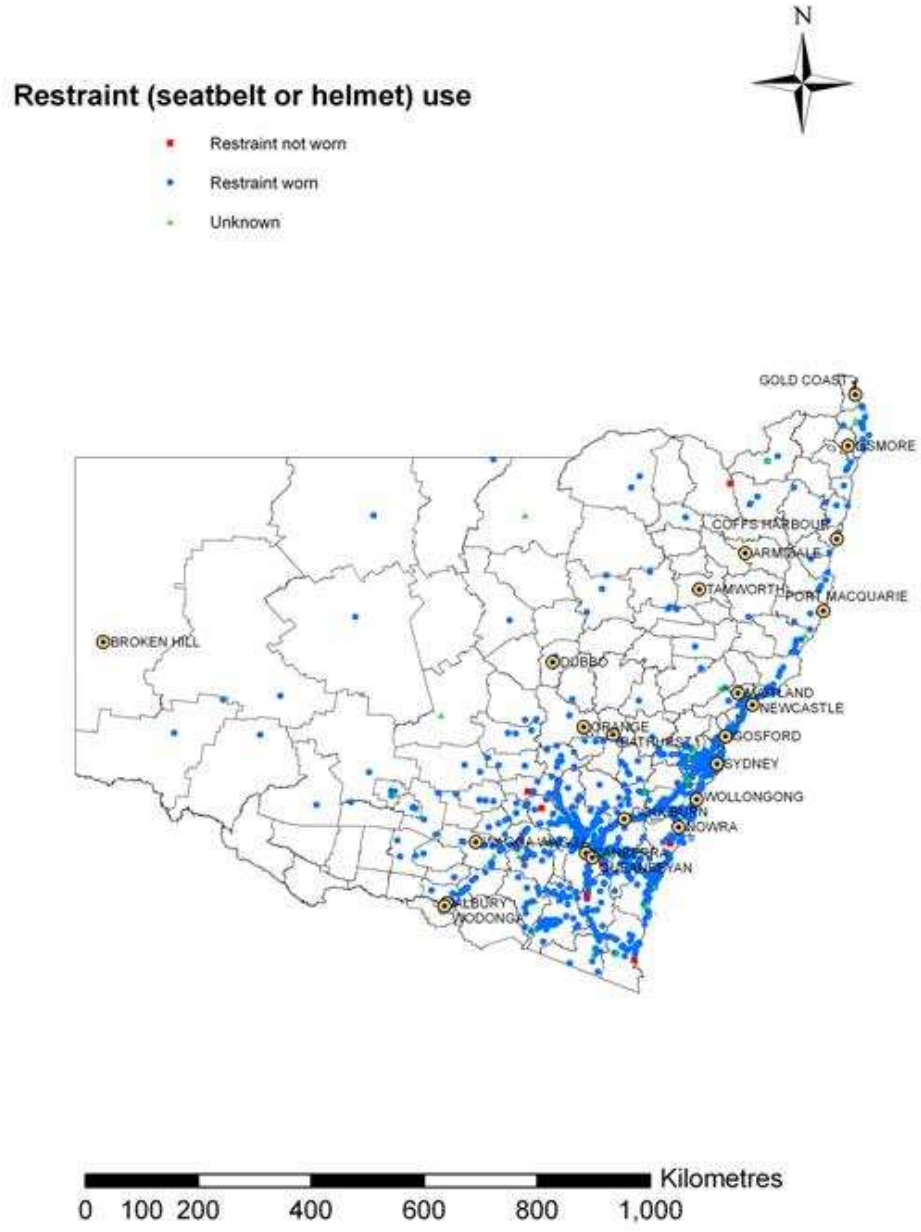

*Map A 10 – ACT controllers involved in crashes in NSW who were fatigued (1999-2003)*




*Map A 11 – ACT controllers involved in crashes in NSW that were exceeding the speed limit (1999-2003)*




*Map A 12 – Crashes in NSW involving ACT controllers or ACT registered vehicles that occurred during high alcohol times (1999-2003)*




*Map A 13 – ACT controllers involved in crashes in NSW by restraint use (1999-2003)*

## Appendix B – Holidays used in the crash data analysis

**1999**

- Friday 1 Jan thru Thurs 28 Jan (New Year's Day, School holidays, Australia Day)
- Sat 13 Mar thru Mon 15 Mar (Canberra Day)
- Friday 2 April thru Sun 18 April (Easter and School holidays)
- Sat 24 April thru Mon 26 April (Anzac Day)
- Sat 12 June thru Mon 14 June (Queen's Birthday)
- Sat 3 July thru Sun 18 July (School holidays)
- Sat 31 July thru Mon 2 August (Bank Holiday)
- Sat 25 Sept thru Sun 10 October (School holidays and Labour Day)
- Sat 18 Dec thru Fri 31 Dec (Xmas and School holidays)

**2000**

- Sat 1 Jan thru Sun 30 Jan (New Year's Day, School holidays, Australia Day)
- Sat 18 Mar thru Mon 20 Mar (Canberra Day)
- Sat 15 April thru Sun 30 April (Easter, School holidays, Anzac Day)
- Sat 10 June thru Mon 12 June (Queen's Birthday)
- Sat 1 July thru Sun 16 July (School holidays)
- Sat 5 Aug thru Mon 7 Aug (Bank Holiday)
- Sat 7 Sept thru Mon 2 Oct (School holidays and Labour Day)
- Weds 20 Dec thru Sun 31 Dec (Xmas and School holidays)

**2001**

- Mon 1 Jan thru Sun 4 Feb (New Year's Day, School holidays, Australia Day)
- Sat 17 Mar thru Mon 19 Mar (Canberra Day)
- Fri 13 April thru Sun 29 April (Easter, School holidays, Anzac Day)
- Sat 9 June thru Mon 11 June (Queen's Birthday)
- Sat 7 July thru Sun 22 July (School holidays)
- Sat 4 Aug thru Mon 6 Aug (Bank Holiday)
- Sat 29 Sept thru Sun 14 Oct (School holidays and Labour Day)
- Sat 20 Dec thru Mon 31 Dec (Xmas and School holidays)

**2002**

- Tues 1 Jan thru Sun 3 Feb (New Year's Day, School holidays, Australia Day)
- Sat 16 Mar thru Mon 18 Mar (Canberra Day)

- Fri 29 Mar thru Mon 1 April (Easter)
- Sat 13 April thru Sun 29 April (School holidays, Anzac Day)
- Sat 8 June thru Mon 10 June (Queen's Birthday)
- Sat 6 July thru Sun 21 July (School holidays)
- Sat 3 Aug thru Mon 5 Aug (Bank Holiday)
- Sat 28 Sept thru Sun 13 Oct (School holidays and Labour Day)
- Fri 20 Dec thru Tues 31 Dec (School holidays and Xmas)

**2003**

- Weds 1 Jan thru Sun 2 Feb (New Year's Day, School holidays, Australia Day)
- Sat 15 Mar thru Mon 17 Mar (Canberra Day)
- Sat 12 April thru Sun 27 April (Easter, Anzac Day and School holidays)
- Sat 7 June thru Mon 9 June (Queen's Birthday)
- Sat 5 July thru Sun 20 July (School holidays)
- Sat 2 Aug thru Mon 4 Aug (Bank Holiday)
- Sat 27 Sept thru Sun 12 Oct (School holidays and Labour Day)
- Fri 19 Dec thru Weds 31 Dec (School holidays and Xmas)

(Note - dates over more than one day are inclusive)