



MONASH University
Accident Research Centre

**PRELIMINARY INVESTIGATION
OF INCREASES IN THE
1995 ROAD TOLL
IN VICTORIA**

by

**Kathy Diamantopoulou
Max Cameron**

**MONASH UNIVERSITY
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Author(s)

Kathy Diamantopoulou
Max Cameron

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Abstract

There has been an 11% increase in road fatalities in Victoria during 1995 from the previous year. This increase has been driven by rises in the number of pedestrian fatalities in Melbourne, and rises in the number of drivers and pedestrians killed in rural Victoria. The largest increases have occurred for pedestrians killed in Melbourne with BAC above 0.15g/100ml, Melbourne pedestrian fatalities aged 40-59, drivers killed in rural Victoria with BAC above 0.15g/100ml and driver fatalities aged 30-39 in rural Victoria. Suggested explanations for these increases may lie with the reduced random breath testing in rural Victoria during 1995, and reductions in unemployment rates in both Melbourne and rural Victoria during 1995.

There are also indications from the lodgement of TAC claims of an 8% increase in the overall number of pedestrian claims lodged in 1995 compared to the previous year. Further, the number of Police-reported serious injuries in 1995 have risen by 3% on the 1994 frequency. These increases warrant further analysis of Police-reported casualty crashes in 1995 to determine if the increase in fatalities has also occurred for serious and other injury crashes, particularly casualty crashes involving pedestrians in Melbourne and drivers in rural Victoria. This will increase the crash frequency and therefore increase the statistical reliability of the findings, which will lead to more definitive conclusions regarding factors which have contributed to the increase in the 1995 road toll from the previous year.

Key Words: (IRRD except when marked*)

Road Fatalities, Pedestrian, Blood Alcohol Concentration, Random Breath Test, Unemployment, Rural Driver, Alcohol Sales

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Monash University Accident Research Centre,
Wellington Road, Clayton, Victoria, 3168, Australia.
Telephone: +61 3 9905 4371, Fax: +61 3 9905 4363

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EXECUTIVE SUMMARY

There has been an 11% increase in road fatalities in Victoria during 1995 from the previous year. This increase has been driven by rises in the number of pedestrian fatalities in Melbourne, and rises in the number of drivers and pedestrians killed in rural Victoria. The largest increases have occurred for:

- pedestrians killed in Melbourne with BAC > 0.15g/100ml;
- Melbourne pedestrian fatalities aged 40-59;
- drivers killed in rural Victoria with BAC > 0.15g/100ml;
- driver fatalities aged 30-39 in rural Victoria.

Suggested explanations for these increases may lie with the reduced random breath testing in rural Victoria during 1995, and reductions in unemployment rates in both Melbourne and rural Victoria during 1995.

There are also indications from the lodgement of TAC claims of an 8% increase in the overall number of pedestrian claims lodged in 1995 compared to the previous year. In addition, TAC fatal pedestrian claims rose by 34% since 1994, with TAC pedestrian hospitalised claims and pedestrian minor claims being 6% and 7% higher than the 1994 totals, respectively.

Further, the number of Police-reported serious injuries decreased during 1991-94, but in 1995, the number rose by 3% on the 1994 frequency. This increase together with the increase in TAC pedestrian hospitalised claims, warrants further analysis of Police-reported casualty crashes in 1995 to determine if the increase in fatalities has also occurred for serious and other injury crashes (particularly casualty crashes involving pedestrians in Melbourne and drivers in rural Victoria).

The increases found for pedestrian fatalities and rural driver fatalities may be due to chance because of the relatively small frequencies involved. However, the corresponding increase in TAC pedestrian claims tends to indicate that at least some of the increase is a real trend rather than a statistical fluctuation. By analysing serious casualty crashes (crashes involving a fatality or serious injury) for pedestrians in Melbourne and drivers in rural Victoria, the numbers and therefore the statistical reliability of the findings will be increased. This will lead to more definitive conclusions regarding factors which have contributed to the increase in the 1995 road toll from the previous year.

1. INTRODUCTION

There has been an 11% increase in the 1995 road toll since the previous year. Key factors driving this increase have been increases in pedestrian fatalities and increases in driver deaths in country Victoria.

This study will attempt to analyse the 1995 Melbourne pedestrian fatalities and the 1995 country driver deaths (obtained from Police accident reports), and suggest possible reasons behind the trends indicated by the data. The small number of pedestrian fatalities in country Victoria limited the depth of analysis of this data.

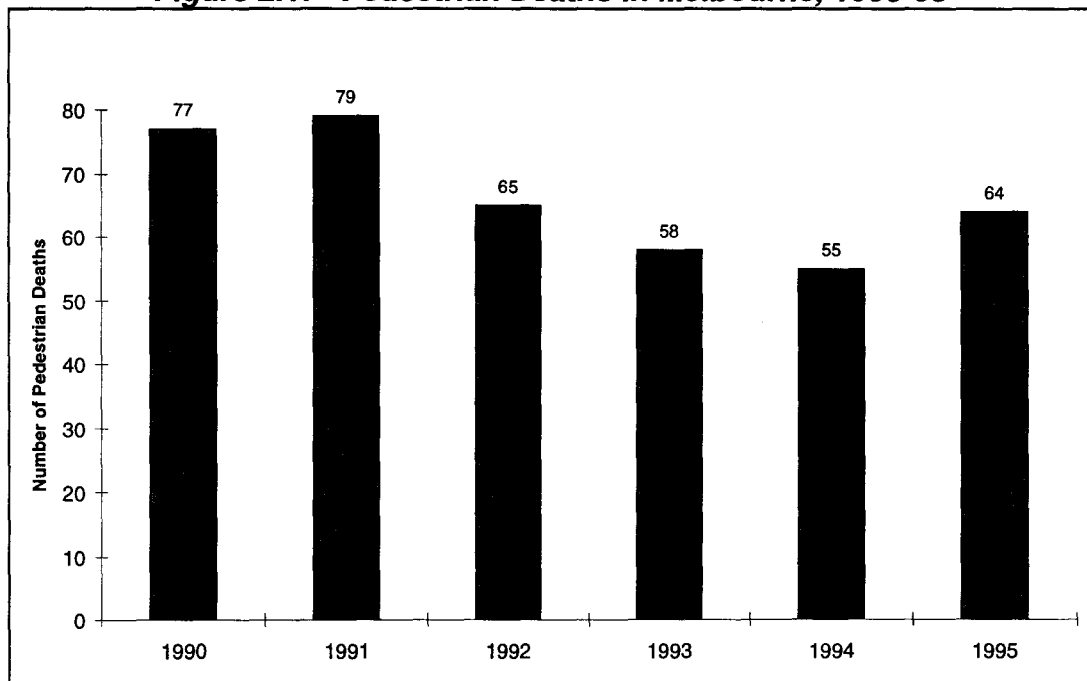
2. PEDESTRIAN FATALITIES IN VICTORIA

Melbourne

Figure 2.1 displays the annual number of pedestrian fatalities in Melbourne during 1990-95.

During 1991-94 there has been a progressive decrease in the number of pedestrian fatalities in Melbourne, falling to a low of 55 deaths in 1994. However, in 1995 the number of pedestrian deaths rose to 64, an increase of 16% on the 1994 road toll.

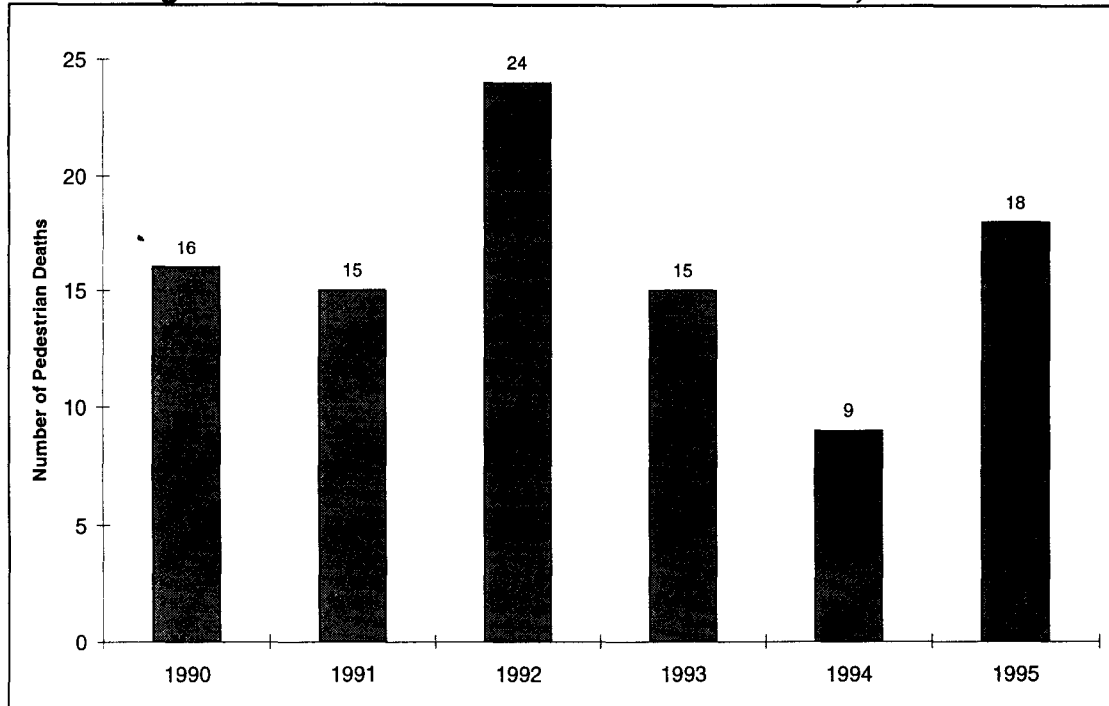
Figure 2.1: Pedestrian Deaths in Melbourne, 1990-95



Rural Victoria

For rural Victoria, annual pedestrian fatalities decreased during 1992-94 by 63%, but the number of pedestrian deaths doubled from 9 fatalities in 1994 to 18 fatalities in 1995 (Figure 2.2). Hence, for both Melbourne and rural Victoria, there have been substantial increases in pedestrian fatalities during 1995.

Figure 2.2: Pedestrian Deaths in Rural Victoria, 1990-95



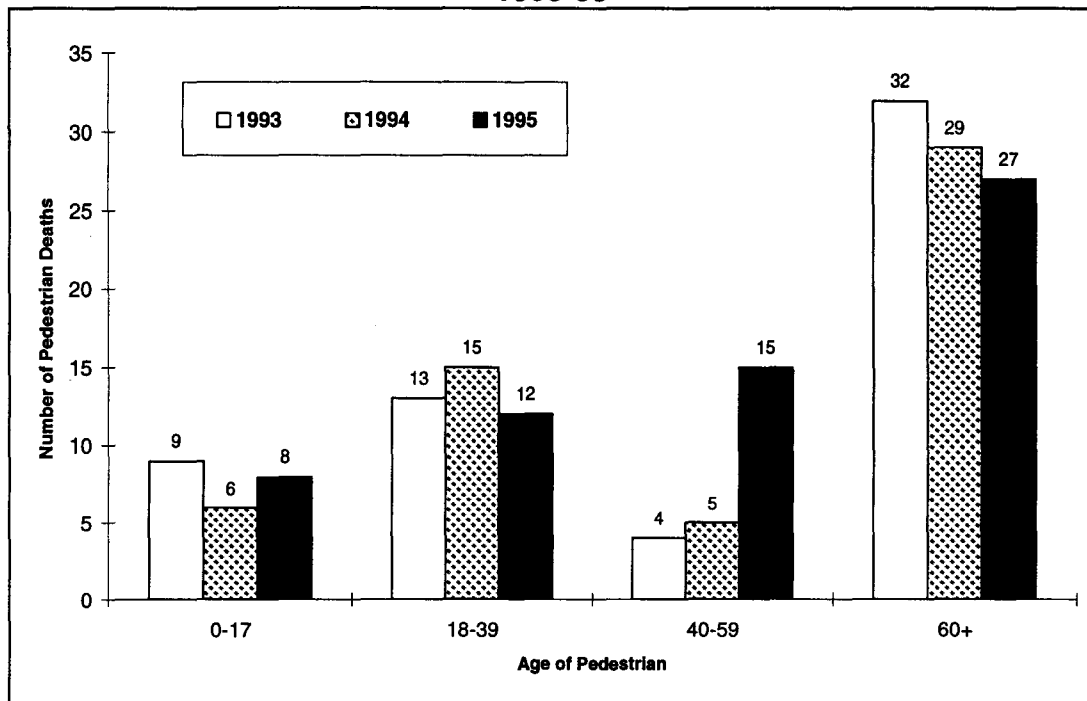
The following section will examine the 1995 increase in pedestrian fatalities by age and Blood Alcohol Concentration (BAC) for Melbourne only, as the number of pedestrian fatalities in rural Victoria were too small to produce reliable results.

2.1 PEDESTRIAN FATALITIES IN MELBOURNE BY AGE

Focusing only on the years 1993-95, Figure 2.3 presents the annual number of pedestrian fatalities that occurred in Melbourne by age.

The 1995 increase in pedestrian fatalities (depicted in Figure 2.1) has only occurred for pedestrians aged 0-17 and 40-59, particularly the latter age group. The number of pedestrian deaths in 1995 was three times the 1994 pedestrian road toll for the 40-59 age group, increasing from 5 to 15 fatalities. In addition, pedestrians aged under 18 years had a 33% increase in fatalities during 1995. Other age groups had no increases in 1995.

Figure 2.3: Age Distribution of Pedestrian Deaths in Melbourne, 1993-95



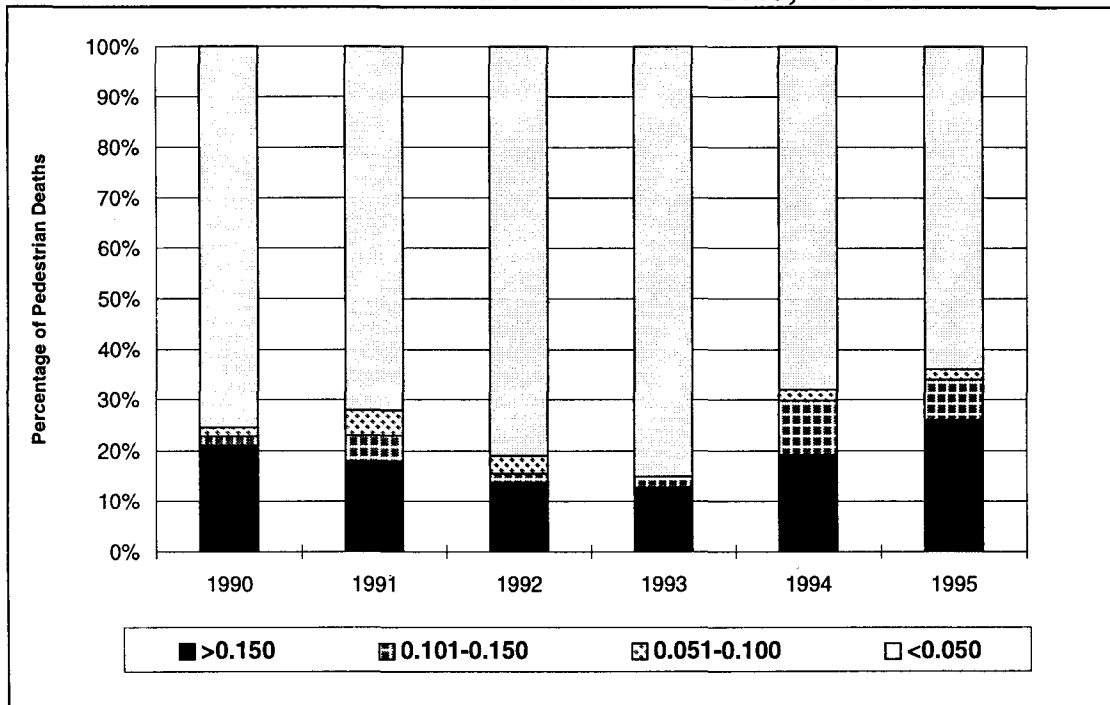
2.2 PEDESTRIAN FATALITIES IN MELBOURNE BY BAC

The Blood Alcohol Concentration (BAC) level for pedestrian fatalities in Melbourne during 1990-95 is given in Figure 2.4, where the fatalities are expressed as proportions of those pedestrian deaths whose BAC level was known. The following levels were used to categorise the pedestrian's BAC expressed in g/100ml:

- < 0.050 (including zero);
- 0.051-0.100;
- 0.101-0.150;
- > 0.150.

The lowest proportion of pedestrian fatalities (15%) with BAC > 0.05g/100ml occurred in 1993. By 1994 this proportion had risen to 32% and increased further in 1995 to 36%. However, amongst the 1995 pedestrian fatalities with illegal BAC readings, the largest increase has occurred for those with excessive BAC levels (> 0.15g/100ml). In 1994, 60% of pedestrians killed with BACs > 0.05g/100ml had a BAC reading greater than 0.15g/100ml, but in 1995 this proportion had risen to 72%. Further, of the 50 pedestrians killed in 1995 with a known BAC, 13 had an excessive BAC reading greater than 0.15g/100ml. This was a 44% increase on the 1994 proportion of the same type.

Figure 2.4: Pedestrian Deaths in Melbourne by BAC as a Proportion of Pedestrian Deaths with Known BAC, 1990-95

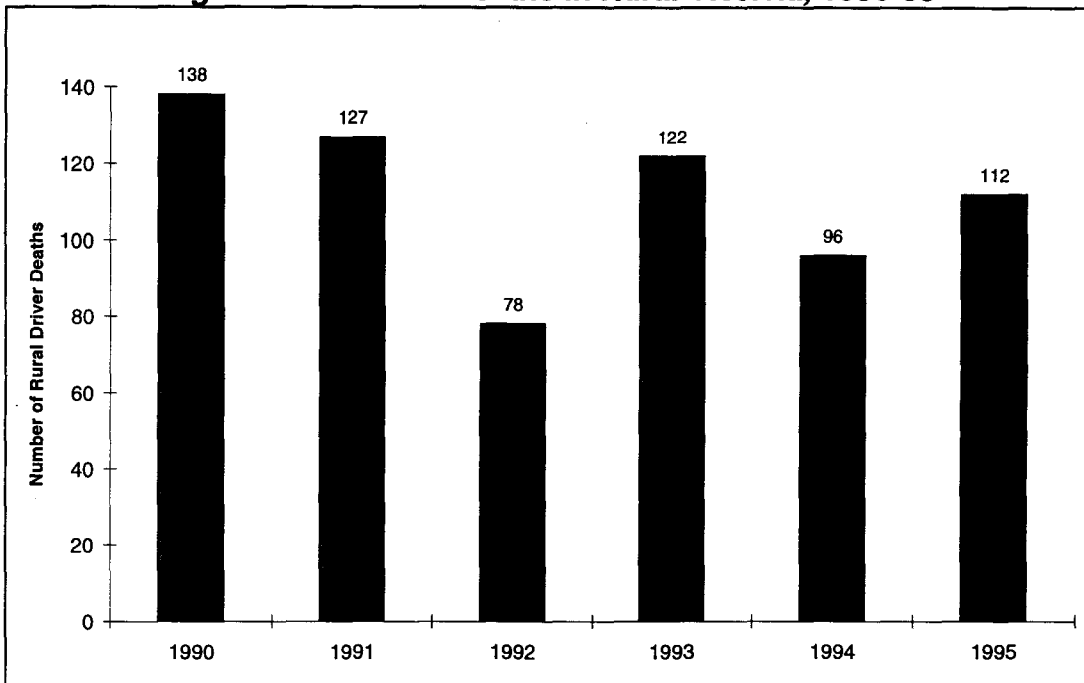


In summary, the increase in the pedestrian road toll during 1995 has been largely driven by pedestrians aged 40-59 and those with high BAC readings above 0.15g/100ml.

3. DRIVER FATALITIES IN RURAL VICTORIA

The other road user group contributing to the 1995 road toll increase was drivers in rural areas of Victoria. Figure 3.1 displays the annual number of fatalities for drivers in rural Victoria during 1990-95. The number of rural driver fatalities decreased by 44% during 1990-92, before increasing again in 1993 by 56%. A further decrease occurred in 1994 (21%), but by 1995 the number of rural driver deaths rose to 112, an increase of 17% on the 1994 road toll.

Figure 3.1: Driver Deaths in Rural Victoria, 1990-95

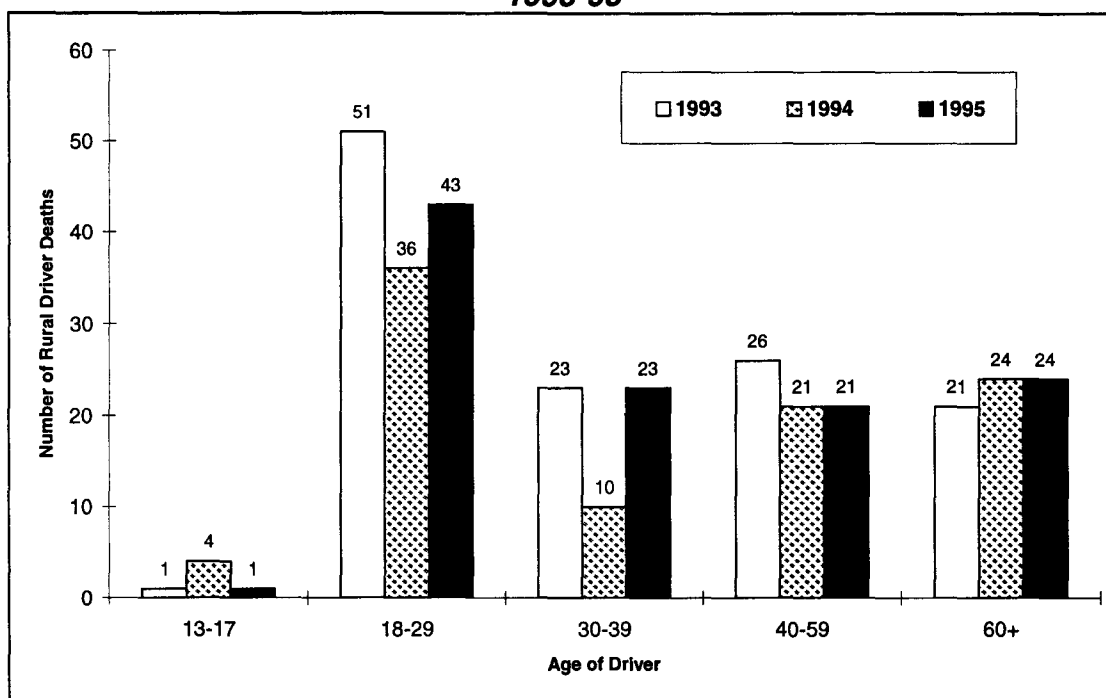


3.1 DRIVER FATALITIES BY AGE

Figure 3.2 depicts the age distribution of drivers killed in crashes in rural Victoria during 1993-95.

Increases in driver fatalities during 1994-95 have occurred for drivers aged 18-29 and 30-39. The number of drivers aged 18-29 killed in rural Victoria increased by 19% from 36 fatalities in 1994 to 43 fatalities in 1995. A larger increase occurred for drivers aged 30-39. The number of driver fatalities for this age group more than doubled in 1995, from 10 deaths in 1994 to 23 deaths in 1995. Other driver age groups have shown no increases.

Figure 3.2: Age Distribution of Driver Deaths in Rural Victoria, 1993-95



3.2 DRIVER FATALITIES BY BAC

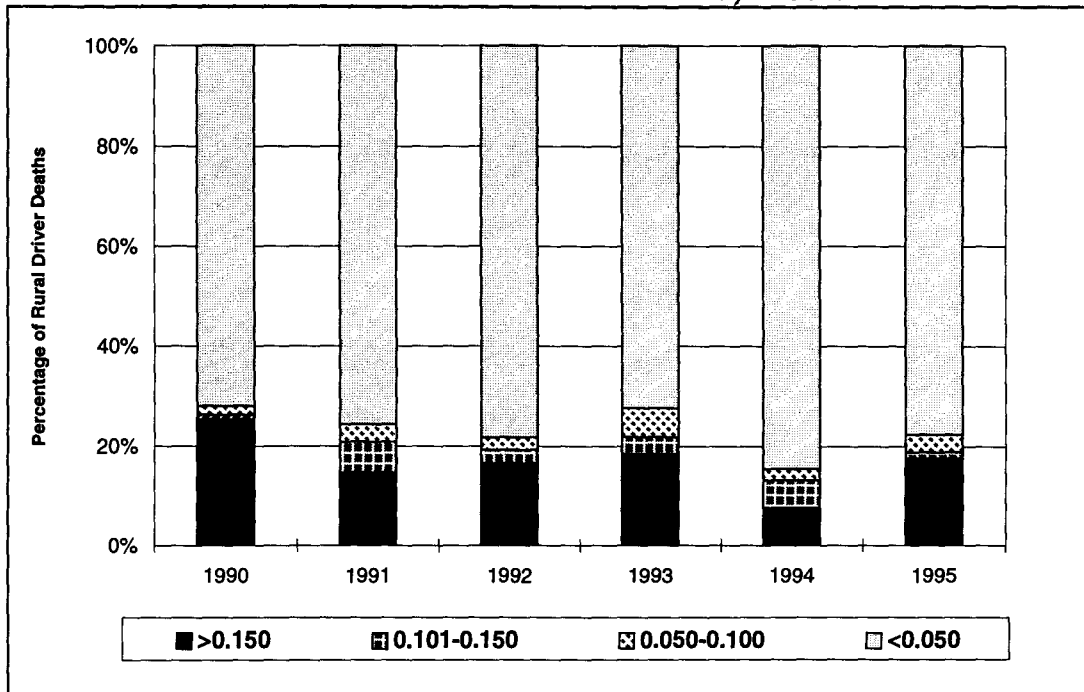
The same BAC levels used to analyse pedestrian fatalities in Melbourne in section 2.2 were used to categorise the BAC readings of drivers killed in rural Victoria.

The BAC level of drivers killed in rural Victoria during 1990-95 is presented in Figure 3.3 as a proportion of drivers killed with known BAC readings.

In 1993, 28% of drivers killed in rural Victoria had illegal BAC readings (>0.05g/100ml). Of these, 67% had excessive BACs greater than 0.15g/100ml. In 1994 the proportion of drivers killed in rural Victoria with illegal BACs had decreased to 16%, with half of these having excessive BACs. By 1995, however, the proportion of killed drivers with a BAC above 0.05g/100ml had increased again to 22%, and of these 79% had excessive BAC readings above 0.15g/100ml.

It should be noted that 24% of the drivers killed during 1995 in rural Victoria had an unknown BAC reading. The 1993 and 1994 unknown proportions were considerably less at 3% and 6%, respectively. The large 1995 unknown proportion may be because the 1995 fatality data was assembled too recently for all BAC readings to be recorded in the database.

Figure 3.3: Driver Deaths in Rural Victoria by BAC as a Proportion of Driver Deaths with Known BAC, 1990-95



In summary, the increase in the number of driver fatalities in rural Victoria during 1995 appears to have been predominantly for drivers aged 30-39 and those with excessive BAC readings above 0.15g/100ml.

4. SUGGESTED EXPLANATORY FACTORS FOR THE 1995 ROAD TOLL INCREASE

Recent work on the statistical modelling of Victorian road trauma trends during 1989-94 (Newstead et al, 1995 and 1996) has determined some major factors responsible for the substantial reduction in road trauma that has occurred in Victoria since 1989. These factors included:

- reduced economic activity;
- increased random breath testing, supported by mass media publicity;
- reduced alcohol sales;
- new speed cameras, supported by mass media publicity.

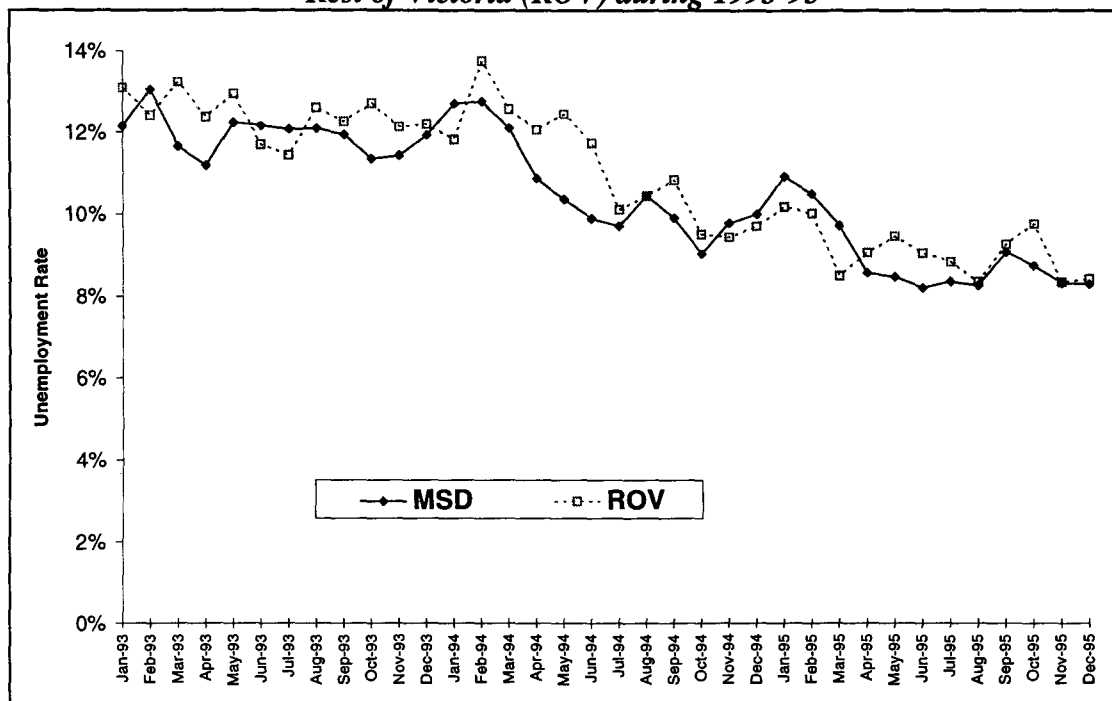
The increase in fatalities for pedestrians in Melbourne and rural Victoria, and for drivers in rural Victoria, that occurred in 1995 may be partially explained by changes that occurred in some or all of the above factors. The following sections will examine the trends in RBT and supporting publicity, economic measures such as unemployment rate and social measures such as alcohol sales during 1993-95, to offer possible explanations to the increase in the 1995 road toll.

4.1 ECONOMIC MEASURES

Unemployment Rate

Cameron et al (1993a and 1994) have found significant inverse relationships between unemployment rate and observed road trauma in Victoria. For both the Melbourne Statistical Division (MSD) and the rest of Victoria (ROV) the unemployment rate increased and peaked during 1990-93, but as shown in Figure 4.1, the unemployment rate began to fall during 1994 and decreased still further in 1995. A decrease in unemployment suggests an increase in total vehicle travel in Victoria (especially discretionary travel, eg. at night) and potentially an increase in road trauma.

Figure 4.1: Monthly Unemployment Rate for Melbourne (MSD) and Rest of Victoria (ROV) during 1993-95



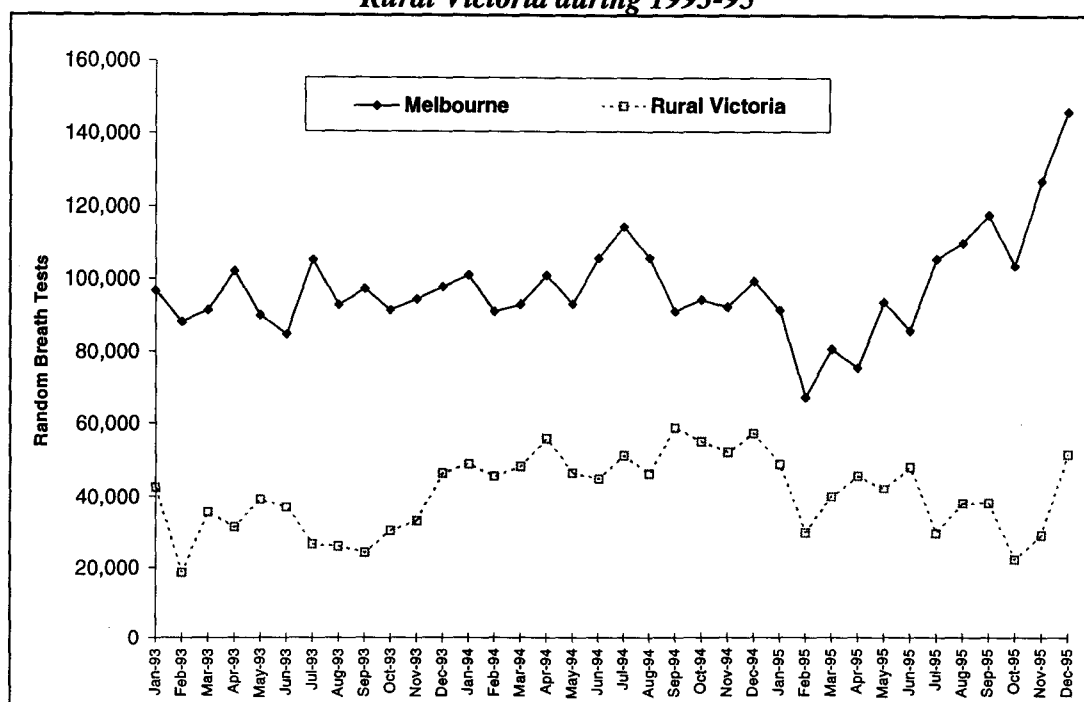
4.2 RANDOM BREATH TESTING

In late November 1993, the Victoria Police, in conjunction with the Transport Accident Commission (TAC) launched a major program aimed at increasing random breath testing (RBT) in rural Victoria. The program's major aim was to increase the number of random breath tests conducted in country Victoria to at least 700,000 during the first twelve months of the program. This goal was achieved, primarily due to the assistance of the Melbourne-based "booze buses" that were sent to country Police districts to supplement the six buses placed permanently in country areas. The program continued during 1995, but support from TAC is understood to have ceased at the end of June.

At a general level, a statistically significant 9.5% reduction in serious casualty crashes during high alcohol hours of the week occurred in country Victoria during November 1993 to December 1994 (MUARC, 1995). This reduction may, in part, have been due to the country RBT program

Figure 4.3 presents the total number of RBTs conducted per month in Melbourne and Rural Victoria during 1993-95.

Figure 4.3: Monthly Number of Total RBTs conducted in Melbourne and Rural Victoria during 1993-95



For rural Victoria, the number of random breath tests increased during the country RBT program, peaking in September 1994. However during 1995, there was a fall in random breath testing in rural Victoria, and an increase in Melbourne. In rural Victoria there was a 24% decrease in the annual number of RBTs during 1995 from the previous year (Figure 4.4), with an increasing downward trend after June 1995. For Melbourne the annual RBT frequency remained relatively constant for 1995 compared with 1994 but with an upward trend throughout the year. This indicates that there has been a shift in the percentage distribution of RBTs conducted in Melbourne and rural Victoria during 1994 and 1995.

In 1994, the monthly percentage of total RBTs conducted in rural Victoria was above 30%, peaking in September at 39% (or 58,992 tests). However, in 1995, the proportion of rural RBTs began to decline, particularly in the second half of the year, falling to a low of 18% (22,331 tests) in October. This decrease has primarily been due to a reduction in booze bus RBTs. Figures 4.5 and 4.6 present, respectively, the distributions of booze bus and car RBTs for Melbourne and rural Victoria during 1994-95. A 38% decrease in the number of tests conducted by buses in rural Victoria has occurred during 1995, compared with a 5% increase in Melbourne. However, the number of RBTs conducted by cars in rural Victoria increased slightly during 1995.

Figure 4.4: Annual Number of Total RBTs conducted in Melbourne and Rural Victoria during 1993-95

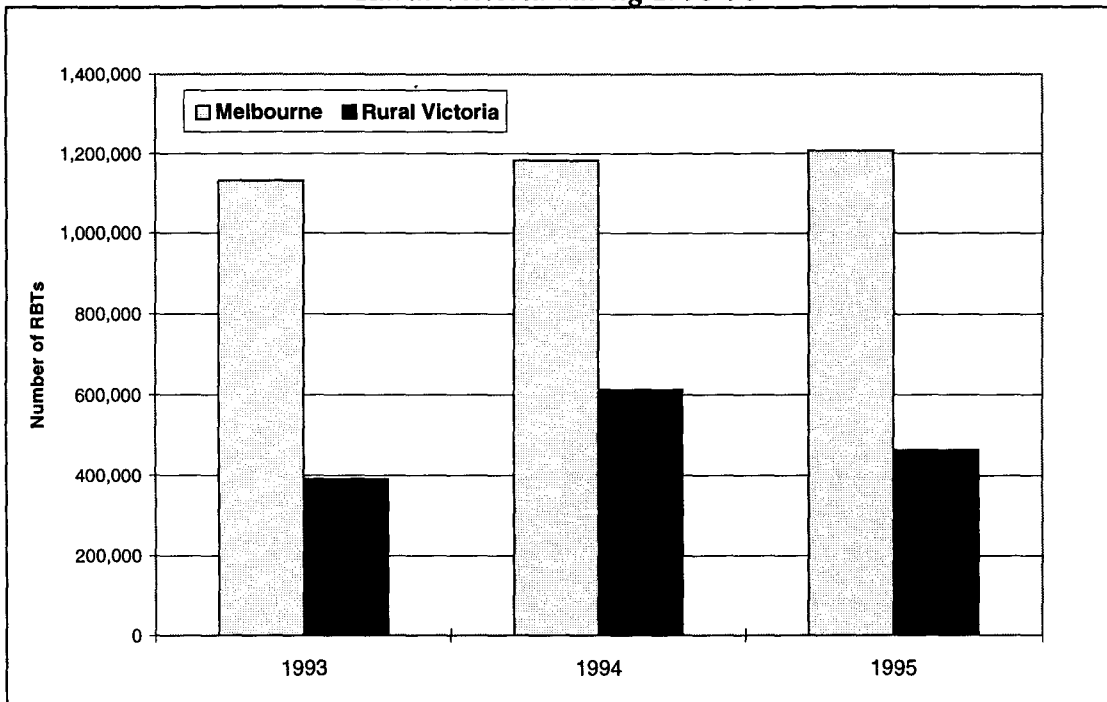


Figure 4.5: Percentage of BOOZE BUS RBTs conducted in Melbourne and Rural Victoria per Month during 1994-95

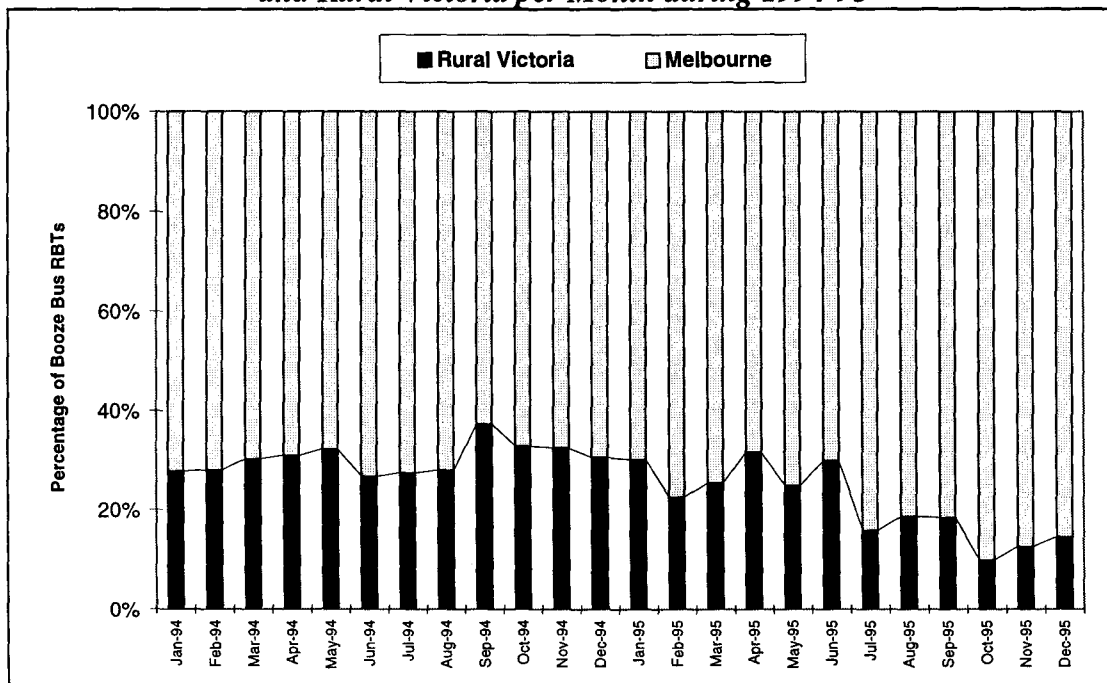
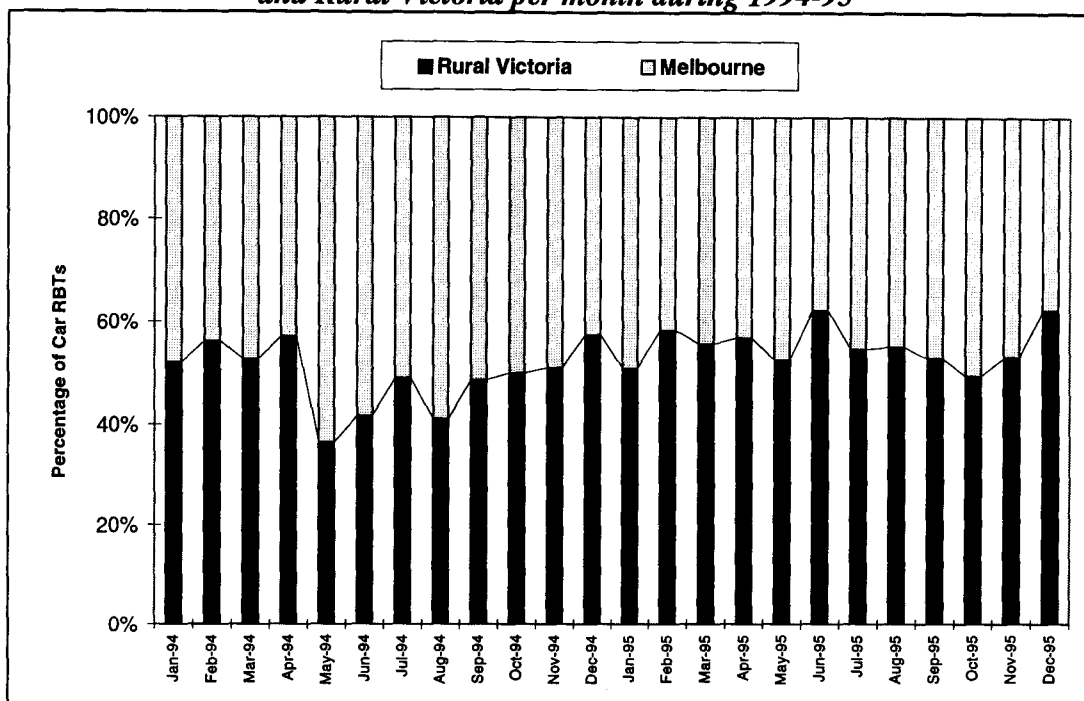


Figure 4.6: Percentage of CAR RBTs conducted in Melbourne and Rural Victoria per month during 1994-95



The BAC trends presented in Figure 3.3 could be partially explained by the decrease in booze bus RBT activity in rural Victoria that occurred in 1995. There is evidence that increased RBT enforcement reduces road trauma, which may explain the reduction in the number of drivers killed with illegal BAC readings during 1994 in rural Victoria. Conversely, the 24% decline in country random breath tests that occurred in 1995 may have contributed to the increase in the number of drivers killed with BACs above 0.05g/100ml in rural Victoria.

4.3 OTHER EXPLANATORY FACTORS

Other factors investigated as possible explanations for the increased 1995 road toll were monthly alcohol sales in Victoria and mass-media publicity support for speed and drink-driving enforcement.

Alcohol Sales

Modelling of road trauma trends in Victoria has shown that the levels of alcohol sales have a strong positive relationship with the number of serious casualty crashes occurring during high alcohol times of the week (Thoresen et al, 1992, Cameron et al, 1993b).

The monthly trends in alcohol sales (as measured by the monthly value of retail alcohol trade in Victoria in dollars deflated by the tobacco and alcohol component of the Consumer Price Index for Melbourne) were investigated for 1990-95. During 1990-93 the monthly alcohol sales decreased but in 1994 there were indications that alcohol sales were rising, with a 7% increase from the previous year. For 1995 no further increases occurred, with alcohol sales remaining relatively constant.

Thus the increase in the road toll for pedestrian fatalities in Melbourne and driver fatalities in rural Victoria during 1995 is unlikely to have been due to changes in alcohol sales in Victoria during that year.

Publicity Supporting Speed and Drink-Driving Enforcement

Since 1989, supporting RBT programs and speed enforcement operations (as well as other road safety themes) in Victoria have been mass-media publicity campaigns sponsored by the TAC. A measure of the audience reach of this publicity that is often used is TARPs (Target Audience Rating Points). TARPs measure the percentage of persons in the target audience in the viewing area estimated to be watching the specific television channel at the time of the advertisement. The rating points are cumulated for each showing of the advertisement during the week.

The trends in monthly TARPs during 1994-95 for various "themes" (drink-driving, speeding, concentration, fatigue) were investigated for both Melbourne and rural Victoria.

Although there was a decrease in RBT activity in rural Victoria during 1995, drink-driving publicity levels on regional Victoria television increased by 20%. There were increases in other themes as well. This was also found for Melbourne, with increases occurring for most themes during 1995. Thus, there was no suggestion that any declines in publicity support could have been contributing factors to the increased road toll in 1995.

5. SUMMARY AND DISCUSSION

There has been an 11% increase in road fatalities in Victoria during 1995 from the previous year. This increase has been driven by rises in the number of pedestrian fatalities in Melbourne, and rises in the number of drivers and pedestrians killed in rural Victoria. The largest increases have occurred for:

- pedestrians killed in Melbourne with BAC > 0.15g/100ml;
- Melbourne pedestrian fatalities aged 40-59;
- drivers killed in rural Victoria with BAC > 0.15g/100ml;
- driver fatalities aged 30-39 in rural Victoria.

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