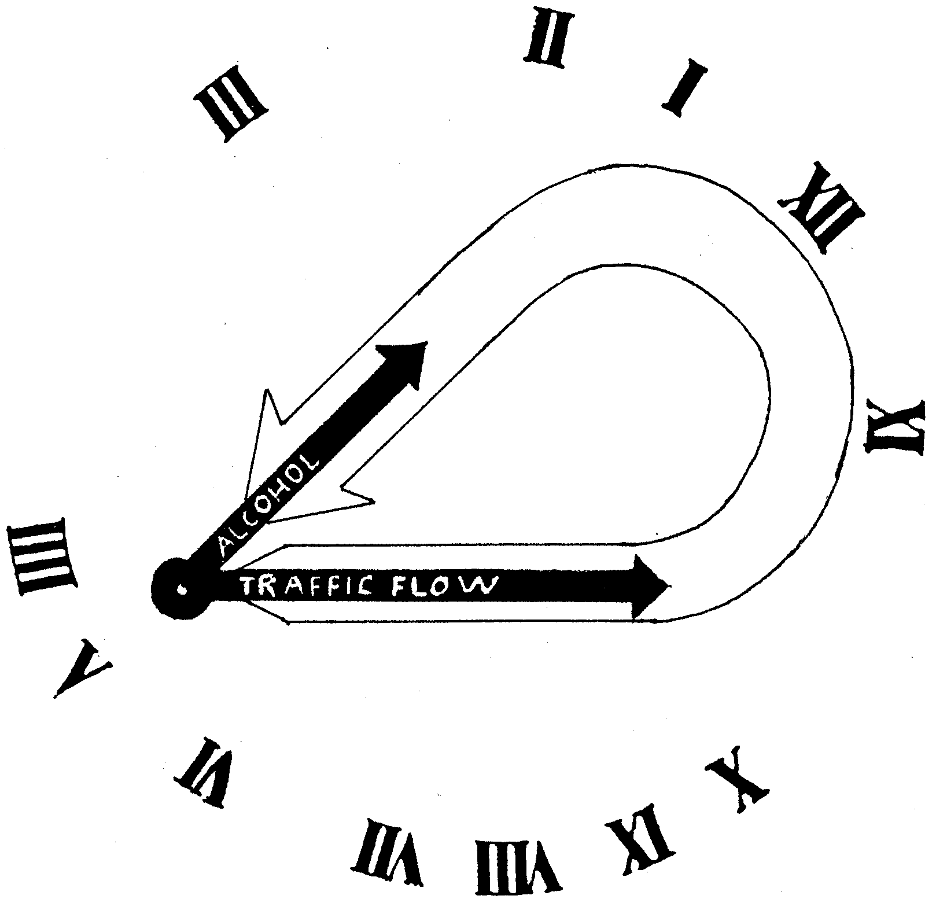
DRUNK DRIVING DEATHS, QUEENSLAND: ESTIMATING THE INCIDENCE

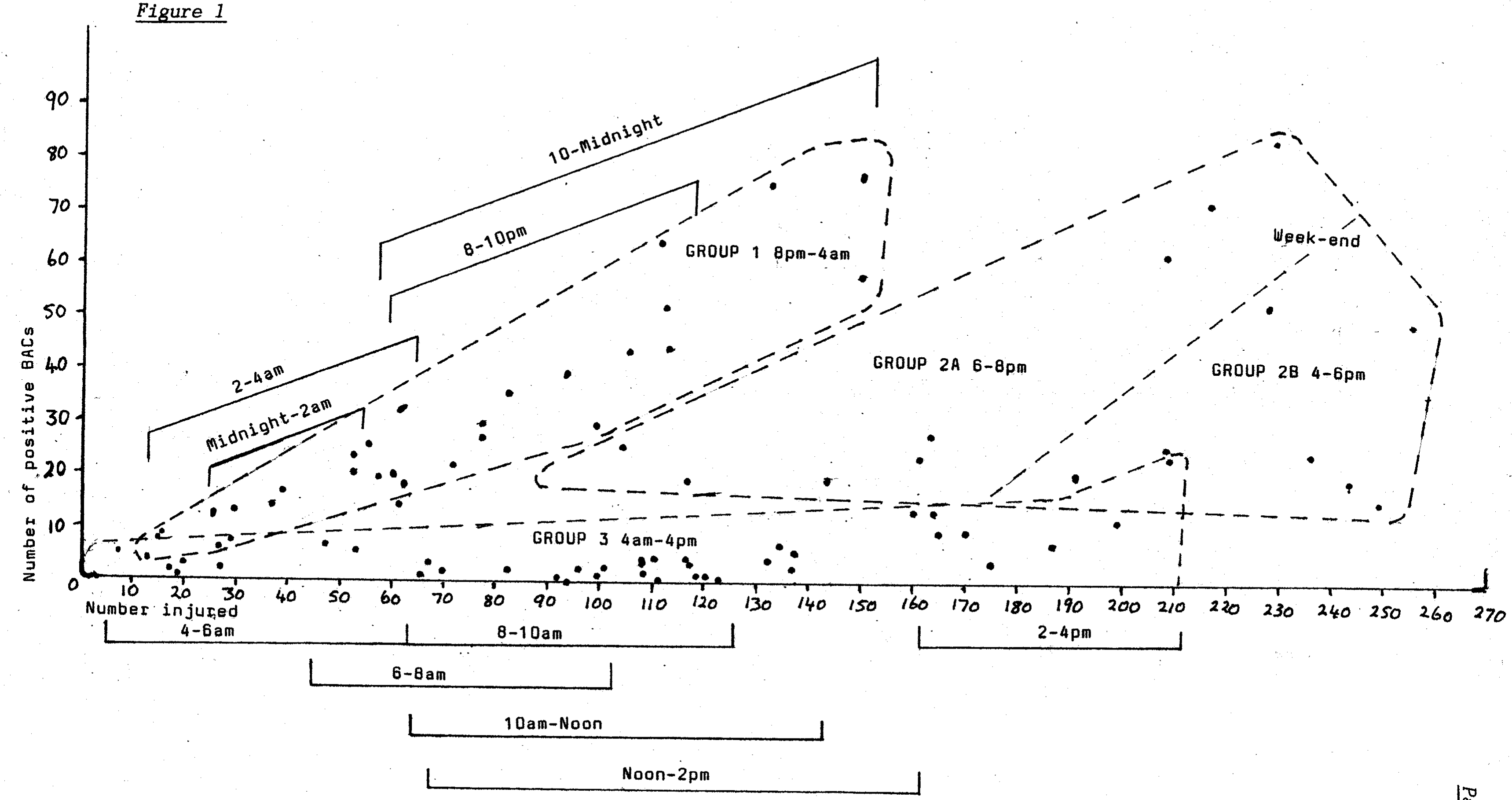


by Colin den Ronden

Citizens Against Road Slaughter

Correlation between drunk driving/driver behaviour and persons injured - 1984

Figure 1



In Queensland nearly 40% of road users involved in fatal smashes are not tested for Blood Alcohol Concentration levels. Of those that are tested approximately 50% give a positive reading. Sometimes statements are made on the basis of this that 36% of road users gave a positive reading. When all road users are not tested this is a misleading statement. Alcohol is a critical factor amongst the causes of many crashes. It impairs judgement and reflexes. For example, running a red light may appear to be the cause of a smash, but the person involved might have shown better judgement and reflexes had their behaviour not been impaired by alcohol. Furthermore, a person with an alcohol problem may be still suffering some impairment even though no alcohol is detected in the blood.

For example, a Brisbane-based psychologist, Mrs Irena Kubarek, who performs psychological tests on commercial drivers, has equipment that detects alcohol induced problems through the persons reflexes even where alcohol has not been consumed for a fortnight before-hand. The question then to be asked is; "What percentage of the road toll is caused by impaired driving?" Figure 1 indicates a way to calculate more accurately the incidence of impaired driving, by plotting number of persons injured by number of persons detected with positive BACs within various time periods. Data used is from Australian Bureau of Statistics figures for time of day and day of week for the year 1984. Plotting deaths against number of positive BACs produces similar results, but because the sample for one year is small in the statistic sense, trends are not as clearly shown. To obtain a clearer picture of the death rates a four-year period between 1983 and 1986 was chosen for examination, the number of deaths for each year being added together. However, because the road toll can vary from year to year, instead of comparing this with injuries, casualty crashes or number of positive BAC tests for any particular year between 1983 and 1986, it was compared with a mean value for this four-year period.

Colour coding of the points on the graph according to time periods, which it has not been possible to reproduce here, shows a horizontally inclined tear-drop shaped locus moving in an anti-clockwise direction. The incidence of injuries is thus cyclical in behaviour. The group of points dispersed near the bottom of the graph indicates a low correlation between alcohol intake and injuries. However, the colour coding reveals that they are clustered according to time period, mainly between 4 a.m. and Noon on weekdays. Obviously this shows that the relationship in this area of the graph is more dependent on traffic density than alcohol intake, as it covers the rush hour periods and not the off-duty hours for most workers where there would be more imbibing of alcohol. Directly above this is another cluster of points that shows a strong correlation between drunk driving and injuries. This covers the period between 8 p.m. and 4 a.m. This is the after-socialising period, when people start heading home in their vehicles after imbibing alcohol. The clusters of points at the far right represents the transition period between these other two periods and also the week-end times which are at highest risk.

Figure 2 is a graph of the mean number of casualty crashes for each two hour time period of the week between 1983-86 plotted against the mean number of persons detected with a positive BAC for those same periods. The isolation of the weekend intoxication period, which includes Friday from 4 p.m. onwards, is more pronounced in this graph. Plotting total accidents produces similar results. In regard to weekdays, the transition period shows that the imbibing of alcohol starts around lunchtime, and that drivers involved in this activity start appearing on the road after this. Those taking longer lunch hours start to merge with those workers whose working day ends early and who spend time at licensed premises before heading home. As the afternoon progresses more workers cease work to do the same. Hence, this transition period covers crashes that are both a function of evening rush hour traffic flow and a function of the incidence of drunk driving. The other two main groupings also involve both these functions, but one function plays a much larger part than the other. To isolate these functions much further requires looking at those statistics where drunk driving is at a minimum, and compare it with traffic flow.

Figure 2

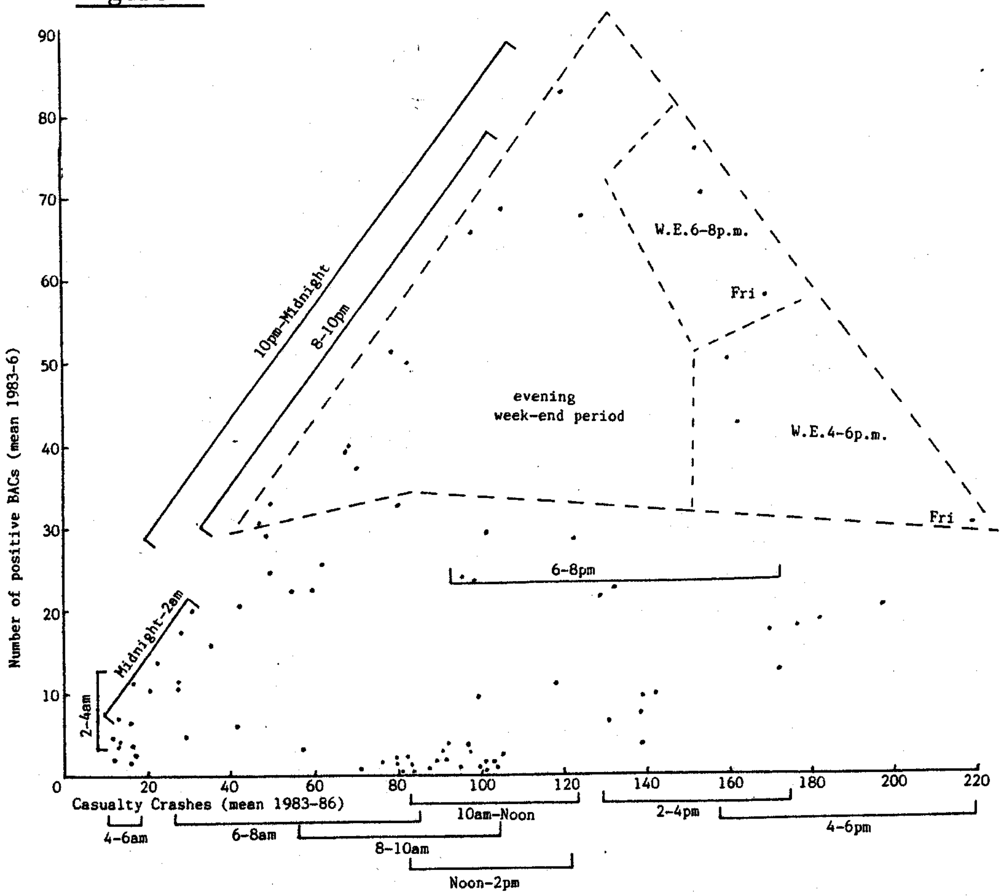
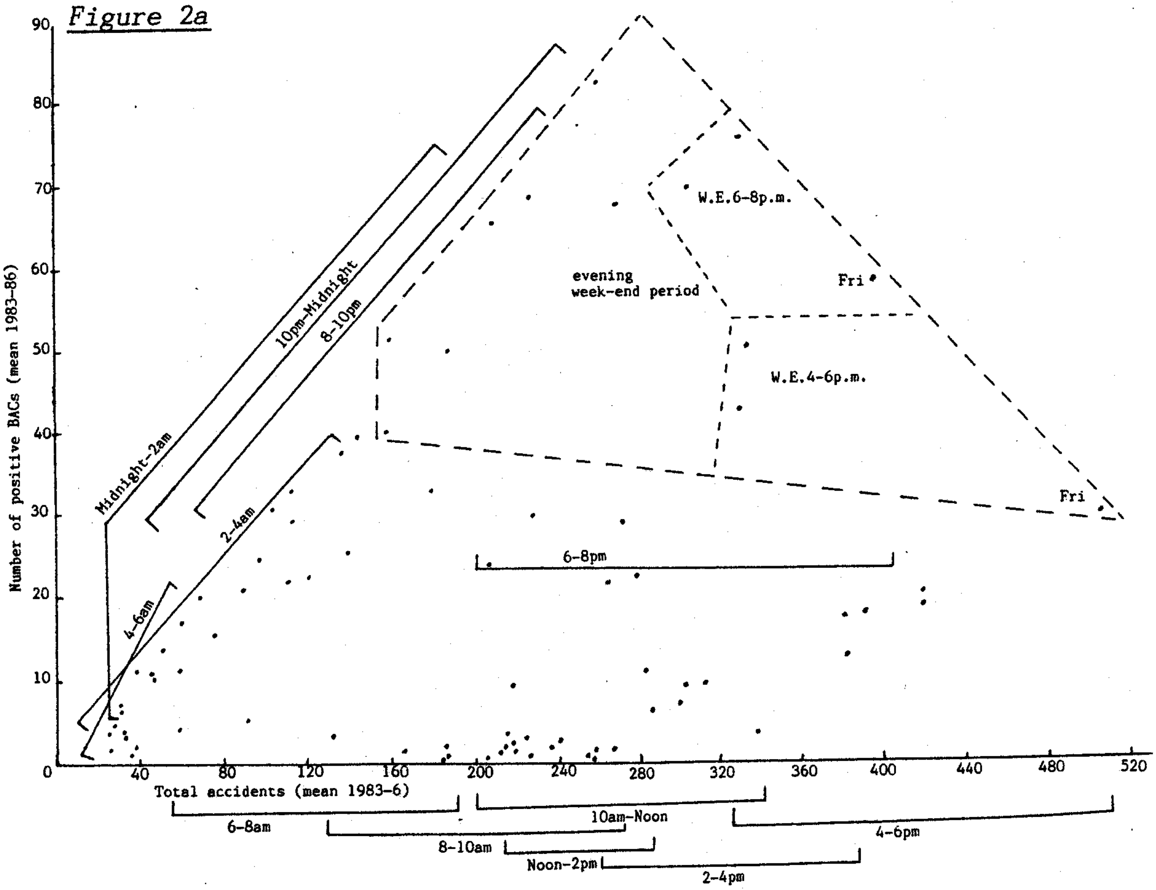


Figure 2a



As the statistics cover crashes throughout the state, the question is; how does one obtain measurements for traffic flow throughout the state? It is reasonable to make the assumption that work and social activities on average do not vary greatly throughout the state, and thus relative concentrations of traffic flow at various times would not vary much from one point to the other. Thus, for example, if it were found that a busy intersection in Brisbane had nine times as much traffic flow at 4 o'clock in the morning then a rural road, on average, would display similar relativities. The busier the road, the more would the statistical 'bumps' be smoothed out, giving a better indication than statistics from less well used roads. For this exercise statistics were obtained from the Main Roads Department showing relative traffic flows for different periods for the Story Bridge in Brisbane in 1985. A further assumption can be made that relative traffic flows for different times of the day would not vary greatly from each other between 1983 and 1986.

Figure 3 is a graph showing the relationship between traffic flow and total accidents for the period 4 a.m. to Noon weekdays. Each two-hour period is seen to be in separate clusters, so this therefore can be refined even further. Other research has shown that the more serious the crash, the more likely alcohol is to be involved. Conversely, one would expect that those crashes where no alcohol is involved would produce less severe results. Rush hour collisions could be expected to involve less alcohol impairment and gross misjudgement by drivers and thus less severe injuries.

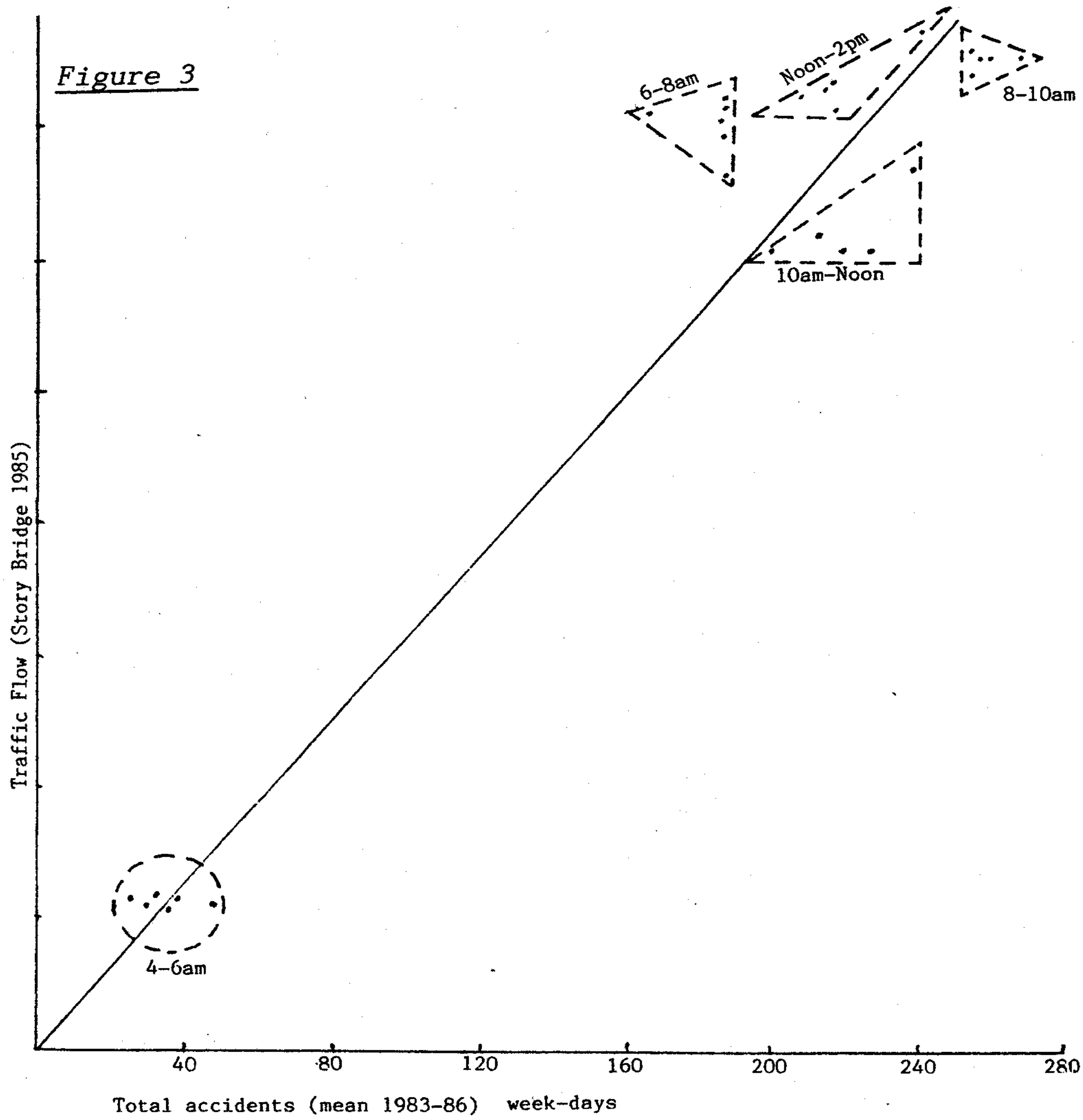
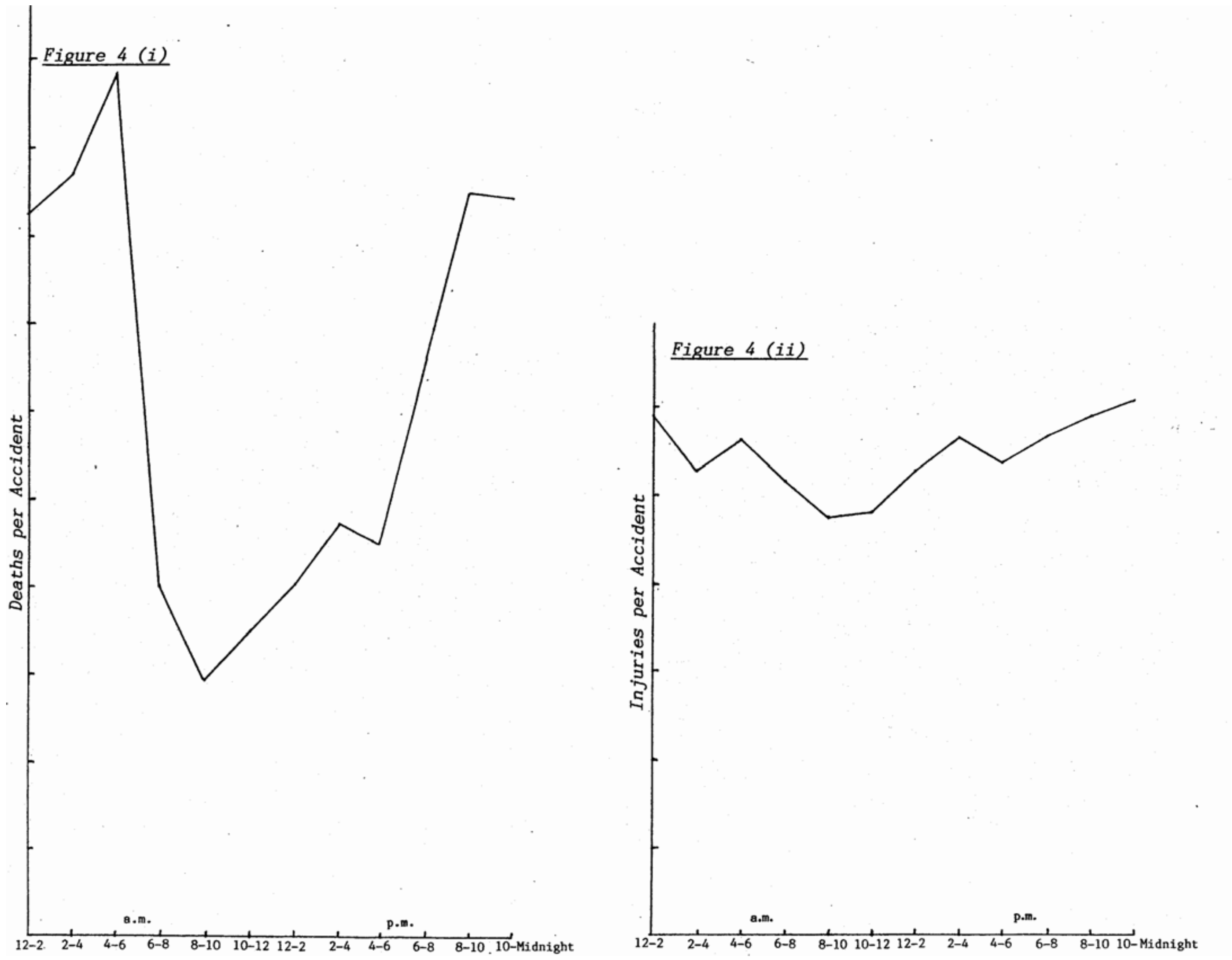


Figure 4 is an accident severity graph showing injuries per total accidents and deaths per total accidents for each of the two-hour time periods. From this it is apparent that crashes between 8 a.m. to 10 a.m. are likely to be less severe and less likely to involve alcohol. Thus, this period provides the best measure of crashes as a function of traffic flow. By obtaining the mean number of total accidents per traffic flow for this period and multiplying this figure by the traffic flow for each period one can determine the number of accidents for each period expected if these crashes were mainly a function of traffic flow and not impaired driving. By doing this one is assuming a zero intoxication level between 8- 10 a.m., whereas in fact it is a period of *minimum* intoxication. It also has to be remembered that there are close to 40% of road users who are not tested, and thus the expected number of crashes is still an over-estimation. By taking the mean number of total accidents per deaths for the 8 - 10 a.m. period and dividing the expected number of accidents for each period by this figure one can obtain the expected number killed if intoxication were at a minimum. For the 1983 to 1986 period this would have resulted in 708 deaths, whereas the actual number killed for this period was 1995. Thus, only about 35% of deaths that did occur can be expected to have happened if driving impairment was at a minimum. Conversely, about 65% of deaths are caused through driver impairment.



Due to the base period for comparison being a minimum level of intoxication, and also due to not all drivers being tested, this is a minimum figure for the estimate of impairment. Those persons with an alcohol problem that affects performance long after the last ingestion of alcohol will be included in this figure, as would those who are under the influence of other drugs, such as marijuana or prescribed drugs. However, it can be assumed that most impairment is through alcohol, showing the need for more measures to be introduced to minimise drunk driving. Due to all the extrapolations, the estimate of 65% for driver impairment may be somewhat tenuous, but the figure should not be all that surprising when one considers that a survey in one Australian state capital showed that at any average time nearly one in ten drivers had been drinking, over I in 50 was above 0.05 BAG, nearly I in 50 was above 0.08 and nearly one in 200 was greater than 0.15 (*Alcohol and Crashes: Identification of Relevant Factors in this Association*, A.J. McLean et al, 1980). Furthermore, at night towards the end of the week this soared to nearly one in three who had been drinking, nearly one in six who were over 0.05 BAG, over one in ten who were over 0.08, and nearly I in 50 who were over 0.15. The worst offenders were males in the 21-29 years age group, where on average one in seven had been drinking.

Figure 5