

FATALITIES AND ACCIDENTS ON RURAL MAIN ROADS (FARM)

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Abstract

This study focuses on motor vehicle accidents occurring on journeys of under two hours in duration (driver fatigue over short distances) and the possible contribution of changes in driving environment (transitional driving) to this phenomenon. The study was conducted as two separate components, a statistical and an empirical analysis. The empirical, survey based component points towards a lack of understanding on two levels; firstly, the possibility of fatigue related crashes occurring at all on journeys of under two hours. Secondly, knowledge of the impact changes in road environment have on concentration levels.

The statistical research uses contemporary mapping of crash data and highlights the occurrence of accidents where fatigue is a factor happening within the controllers own Local Government Area (LGA). It also revealed the high rate at which accidents occurred in areas where road environments changed considerably, for example, when going from urban to rural environments (transitional driving) as drivers do regularly in the Baulkham Hills, Hawkesbury, Blue Mountains and Penrith LGAs.

The aim of the study is to firstly identify the occurrence of fatigue related accidents over short distance, and secondly, to reveal some of the contributing factors. Transitional driving, work environment pressure, and ever increasing work hours as contributory factors are discussed. The study is limited to four LGA's, chosen specifically for their geographical make up which, in each instance includes both urban and rural roads and a heavy reliance on motor vehicles when traveling to and from workplaces, both inside and outside the controllers LGA. To our knowledge this type of research has not been undertaken before. This FARM research is a completed set of two reports. However the findings of this study indicate the need for further research on both road safety issues.

Introduction

This project aims to undertake research focusing on the transition between urban and rural roads, driver fatigue over short distances, and the ways in which both of these factors impact on concentration levels. It is understood that driver fatigue has a negative impact on driver concentration levels. However, the occurrence of transitional driving from urban to rural and rural to urban is thought to increase the possibilities of driver fatigue over short distances. In accordance, this study seeks not only to supply valuable information about driver fatigue over short distances, but to show the link between the three factors; Transitional environments, changes in concentration levels, and serious driver fatigue over short distances.

In order to achieve these goals, the report has been compiled using data from four Local Government Areas (LGA's), which have been expressly chosen for their geographic suitability. Hawkesbury City, Penrith City, Baulkham Hills Shire, and The City of Blue Mountains all contain many areas where transitional driving is unavoidable. Further, these LGA's are situated such that many of their residents commute to trade centres out side of their LGA. As such, the incidence of both driver fatigue over short distances and the change in concentration levels, which is associated with transitional driving are prevalent within the LGA's chosen for this study.

Lastly, it is the aim of this report to de-mystify driver fatigue over short distances. By doing this a better understanding of the actions required to minimize fatigue related crashes can be obtained.

The seriousness of driver fatigue over short distances as a community issue can only be related via and appropriate study which takes into account transitional driving and the habits of the residents within the LGA's which are part of the study. Ongoing research into this field is required to accentuate the differences

between driver fatigue over short distances and driver fatigue over long distances, which has been the topic of much more literature to date.

Method: Component (1), Empirical

The project addressed current literature to help define the issue. RTA data was examined to gauge the extent of the problem. A community survey was developed to further improve the understanding of the situation within the four LGAs of: Baulkham Hills, Blue Mountains, Hawkesbury, Penrith.

As part of the consultation process, an in house pilot survey on driver fatigue over short distances was conducted at Baulkham Hills Shire Council. The purpose of the pilot was to make certain the language used was understandable, gain answers to provide options for some questions in the final survey and determine any misinterpreted questions. The questions attempt to identify Characteristics of respondent. For example, license status, age and gender and experience, knowledge and awareness of transitional driving and short distance driver fatigue. A total of eight council employees were interviewed to gain insight about driving experiences. Each survey was completed in eight minutes and comments included the following:

- Urban roads have more traffic volume as driving is usually at a “stop-start” pace.
- Rural road conditions are generally poor. For example, potholes and the lack of lighting and signage.
- Understanding of driver fatigue over short distances is generally limited.
- Work and social lifestyle factors accounted for drowsy driving.
- Heavy eyes were a cue for the driver knowing they felt tired.
- Drowsy driving generally occurs within one-hour trips.

The pilot survey was revised for the major research project where eighty people in each of the four LGAs were interviewed. The survey targeted people who drive at least five hours per week.

Three hundred and twenty people were surveyed in the four LGAs. One week per LGA was allowed to interview eighty participants in each area. The surveying locations were shopping centres, university campuses, car parks, community parks.

Statistical Packages for Social Sciences (SPSS) was used for data entry and analysis. Data was reviewed for each LGA and in total, using descriptive statistics. Comparisons were made between the four LGAs in pursuit of defining the problem and its extent. Data was also used in establishing patterns for the four LGAs.

Method: Component (2) Statistical and Mapping

This report is in essence based on data analysis. Large volumes of report data were examined, statistics formulated and compiled and council profiles generated. The raw data forming the basis for this report was sourced from the Road and Traffic Authority “*Traffic Accident Database*”. This system is contained on a CDROM and holds state accident data in a spreadsheet format. The database is divided into local government areas and years. The fields for each accident entry are extensive with each entry spread across approximately 78 fields.

A database for each council area was created whereby all the information for one government area for each of the five years was copied onto the same worksheet. The data was then examined and the figures from the relevant fields studied and extracted.

The fields examined providing the basis for this report are as follows: degree of accident, day of accident, date of accident, type of day (Christmas, Easter, Public Holidays, School holidays, Weekends, Weekdays.), time of accident, street name, street type, town, road classification, X-coordinate Longitude (degree locations specific place of accident can be mapped.), Y-coordinate Latitude (degree locations specific place of accident can be mapped.), weather, speed limit, road user movement (RUM), car involvement, truck involvement and type, bus Involvement, emergency vehicle involvement, motorcycle involvement, number of traffic vehicles involved, speed, fatigue, number of occupants, age of the controller gender of the controller and postcode of the controller.

The co-ordinates of the accidents are required to map the exact position of the accident. Once the relevant fields were determined, the overall number of accidents in the area was recorded and the remaining data culled down to accident entries involving fatigue. This was a matter of simply locating the fatigue field and deleting entries without fatigue as a factor.

The focus of this report is short distance driver fatigue. To accomplish this the approximate travel time of the driver had to be ascertained. The only relevant information contained in the database possibly relating to the distance of the journey was the controller's postcode. This research project is targeting primarily short distance accidents, journeys of less than two hours.

To generate a relevant class of entries each individual postcode in the database was examined and those controllers living in an approximate two-hour radius were identified. Those postcodes within each councils local government area were immediately included as within a short distance. Those postcodes outside of the LGA were located on a map. Places within an approximate 2-hour distance were identified and the entries included as relevant data short distance data.

Results: Component (1)

A total of three hundred and twenty people were interviewed. 43% of respondents did not have knowledge of short distance driver fatigue. Another 33% defined it as being sleepy and 17% tired. A larger group (69%) confessed to driving when feeling sometimes (or fairly often) tired, as shown in. Of these, 41% drive between one to two hours.

From the total survey respondents, it was found that 62% were aware of transitional driving between urban and rural roads. However, when asked to differentiate between the two, 39% did not know the difference.

Results: Component (2), Statistical Mapping

Hawkesbury City Council

Within the five-year period, 1996-2000, 3051 documented accidents occurred in the Hawkesbury area. Of these accidents, 9% (284 accidents) were recorded as having fatigue involvement. Therefore 91% of the accidents (2767) occurring in this area in this time period, were not identified as involving fatigue.

Of the accidents involving fatigue approximately 239 accidents occurred during a short distance trip. Basically 84% of these accidents occurred in a trip under two hours.

This figure could in reality be higher as 29 accidents in this time did not have available information to determine the length of the trip.

Out of all the fatigue accidents 172 of the drivers actually lived in the Hawkesbury area. This equates to 60% of all fatigue accidents and 72% of the short distance accidents.

Blue Mountains Council

In the Blue Mountains area, between 1996-2000, there were 2793 accidents. An examination of the fatigue data reveals that almost 10% (266) of these accidents involved fatigue. Leaving 90% (2527) of the accidents not identified as involving fatigue.

The majority of the 299 fatigue related accidents occurred during a short distance drive. Approximately 80% (213) of the accidents occurred during a trip of less than two hours duration. The time duration of 11% (31) of the accidents was not recorded.

Furthermore of all the fatigue accidents 58% (154) involved a driver that actually lived in the Blue Mountains Local Government Area. This equates to 72% of the controllers in short distance fatigue accidents

Penrith City Council

In the five-year period 1996-2000 there were 6818 RTA recorded accidents in the Penrith area. Focusing on fatigue, there were 449 fatigue-related accidents over these years. 7% of the accidents in this area were recorded as being related to fatigue.

Of the 449 fatigue accidents, 361 (80%) appeared to be short distance journeys (less than two hours). Furthermore 248 of the 471 drivers actually lived in the Penrith area when they crashed. In other words 55% of the drivers in these fatigued accidents lived in the area. And 69% of the short distance accidents involved a driver living in the direct LGA.

Baulkham Hills Shire Council

In the Baulkham Hills Local Government Area, there were 5050 database-recorded accidents during the years 1996,1997,1998,1999 and 2000.

Of these accidents 358 were identified as involving fatigue. Demonstrating that 7% of all the accidents had fatigue as a contributor.

Looking at fatigue and distance, of these 358 accidents 318 (86% of the fatigue accidents) were identified as short distance accidents, in that the driver had been making a journey of less than 2 hours duration. This figure may be even higher as in 37 accidents (10% of incidents) the approximate distance travelled was unknown.

Of the drivers in these fatigue-related accidents, 244 actually lived in the Baulkham Hills local government area. Therefore 68% of all fatigued drivers crashing in this area lived in this area. This translates into 77% of the short distance controllers were living in the Baulkham Hills area.

Discussion and Conclusions Component 1

The data for all four LGA's strongly suggests that people do not commonly have knowledge of driver fatigue over short distances. This is true for 43% of all respondents, and similar in each individual LGA.

During the survey process, many respondents actually questioned the existence of driver fatigue over short distance and its relevance as a contemporary transport issue. It is however, widely accepted that driver fatigue happens over long distances. This was principally due to such RTA awareness campaigns as Stop Revive Survive and Microsleeps. The results indicated that long distance fatigue campaigns were working against an awareness of the seriousness of driver fatigue over short distances.

Having identified a lack of common knowledge, it is alarming to note that 69% of drivers admitted to driving occasionally while feeling tired. Driving while tired as a response was evident in Baulkham Hills, Penrith and Hawkesbury. In the mountains however, the response was split evenly between driving tired Never/Rarely, and Sometime/fairly often. One possible reason for this is that there are only two main roads in and out of the Blue mountains. The police target these main roads and their presence may act as a deterrent to driving fatigued. The majority of drivers reported experiencing fatigue on a drive under two hours in duration. Journeys of this duration are typically between work and home or a social outing. For the majority of 17-20 year olds the duration of the journey was only thirty minutes before fatigue was experienced. These journeys are more likely than other age groups to be within the LGA such as trips to visit friends or go shopping.

All drivers are aware of common cues indicating tiredness, however on journeys under two hour drivers are more likely to ignore these symptoms despite their severity. Heavy eyes, yawning and loss of concentration were popular responses although only 17% stopped for a rest or changed drivers and this was more prevalent in Baulkham Hills and Blue Mountains than it was in the other two LGA's. Results show that respondents are most likely to wind down a window or turn on the air conditioning when feeling fatigued. This result indicates that action is taken in order to continue driving in preference to resting to alleviate fatigue.

Many contemporary lifestyle issues contribute to peoples insistence to continue driving when feeling fatigued. 42% of respondents indicated that they did not stop when fatigued due to the importance of arriving at their destination. 17% suggested that knowing the journey was over a short distance was the main factor while 15% indicated time was a major factor. In general participants indicated that they did not see a need to rest when driving over a short distance, for example, driving children to school. It is evident that people do not believe that fatigue related crashes happen over short distances, despite the fact that this is a statistically common occurrence.

Discussion and Conclusions Component 2

Responses show that people understand that they may drive between different roads classed as either urban or rural. There was evidence that this awareness was dependent on differing personal definitions of such roads. Respondents in the Blue Mountains had the greatest understanding of undertaking transitional driving. One possible explanation of this is that the Blue Mountains Shire bears the least resemblance to highly developed urban or city lifestyle of the four LGA's. As such, drivers in the Blue mountains have more experience of driving on rural roads and the stark contrast when entering a township. In Baulkham Hills for instance, there was little understanding of not only the physical differences between urban and rural roads, but also the need for differing driver behaviours when driving on different roads

Due to the lack of understanding of the difference between urban and rural roads, it was difficult for respondents to comment on the factors which indicate transitional driving. Change in traffic volume, physical environment and road condition as well as speed limits were the responses given by those with an understanding of transitional driving. Even more difficult was ascertaining the difference in the driver when transitional driving had taken place. However, when moving from urban to rural roads some drivers indicated changes in concentration levels. While in some LGA's drivers experienced feeling more relaxed when moving from urban to rural environments, in other LGA's, drivers reported the same change in concentration when moving from rural to urban. This indicates that drivers become more relaxed when entering the environment which they are most used to. For instance, Baulkham Hills is typically urban with some rural parts, while the Blue Mountains is more predominantly rural.

In contrast to this finding were the respondents who reported that they became more alert when moving into urban or Rural roads. For some, moving to a rural road required a higher level of alertness characterized by higher speed limits, fewer street lights and awareness of the presence of animals which may enter the road. On urban roads, those who experienced greater stress reported higher traffic volumes, more traffic lights, and more frequent and more confusing signage as the main reasons for this change in state. Few respondents were able to illustrate the specific nature of the changes in their driving behaviour when undertaking transitional driving. This indicated that there is a lack of understanding of the need for changes in driver behaviour to compensate for changes in concentration levels in these instances. Due to this lack of understanding it is clear that public awareness is required to inform the public of the need to recognize when transitional driving has taken place, and how the changes in concentration levels associated with this effect perceptions of fatigue as experienced by the driver even over short distances.

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