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INVESTIGATION OF PEDESTRIAN ACCIDENTS: ANALYSIS AT SIGNALISED PEDESTRIAN CROSSINGS IN EDINBURGH

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Abstract: *Purpose* – This study investigates in more detail the factors that affect accident occurrence at Pelican crossings and signalised pedestrian crossings.
Design/Methodology/Approach – Accident data for 14 years at the selected site; 441 pedestrian accidents occurring in or within 50 metres (m) of signalised pedestrian crossing areas. Grid references of accident locations as well as locations of pedestrian crossings were obtained from the STATS19 database and local city councils.
Findings – The results show a decrease in accident rates as distance increases from the pedestrian crossing facilities. The most risky locations are those at or within 10m of the pedestrian crossings, and those at a distance of 10–30m from the pedestrian crossing facilities.
Originality/value – The data were used to identify the locations of accidents relative to the location of pedestrian crossing facilities. New research into pedestrian accident rates for each Pelican and signalised crossing was discussed.

Keywords: *Pedestrians accidents, STATS19, Accidents analysis, Pedestrian crossing behaviour Pedestrians crossing in Edinburgh*

Paper type Research paper

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INTRODUCTION

In this paper the issue of rights of way of pedestrians will be examined. This issue varies greatly throughout the world, with different regulations and bodies in place to outline the methods of enforcement involved. The main reason for debate to arise in this area is when an accident has occurred and there is a need to assign blame for the incident to a relevant party. Measures have been taken in various countries to deal with such incidents and reduce the possibility of such accidents occurring.

Knowing and applying the right of way for pedestrians and motorised vehicle drivers or riders can help to prevent injuries and fatalities. To increase the safety of public roads, pedestrians should use marked crossing points to cross roads, and the drivers of motorised vehicles should yield to the rights of way of pedestrians and vice versa.

DEFINITION

Pedestrian right of way violations, or jaywalking, commonly refer to the crossing of a pedestrian from one side of the road to another in unauthorised areas or in violation of pedestrian laws. In some US jurisdictions that have imposed jaywalking laws, pedestrians are only authorised to cross on those parts of the road specially marked as being safe pedestrian walkways. Different jurisdictions treat jaywalking in different ways. North American countries such as the US and Canada have laws that make jaywalking illegal, as does Australia. The UK, however, does not have anti-jaywalking laws, leaving pedestrians to exercise prudence in crossing roads and to look out for their own safety.

Jaywalking laws were first introduced in the early 1900s in the US, accompanying the rise of the automobile industry. The term "jaywalking" itself began as a description of pedestrians by automobile drivers in the early 20th century, as a defensive gesture deriving from the ill-treatment generally received by drivers from members of the public who considered them a road nuisance; later on, it evolved to refer to pedestrians who disobeyed road traffic rules. The early 1900s saw the rise of the automobile industry, when automobile ownership shifted from a mere enthusiast hobby to mass personal ownership as a result of advancing automobile technology. The rapid rise of the industry was accompanied by a parallel rise in pedestrian fatalities, with children

constituting most of the statistical fatalities. Public anger towards cars and their drivers characterised the early reception of the industry. In response, local governments had to impose stricter traffic laws, which were at first geared only towards the slowing down of vehicle drivers. This was underpinned by the initial belief that pedestrians had more rights on the roads than vehicle drivers, because automobiles were not necessities but luxuries. At the urging of particularly pragmatic people, and of the automotive industry itself, which stood to lose out if public perception did not change, pedestrians were eventually swayed from their belief that they took precedence on the road and that vehicles could not enjoy the same rights as they did.

Pedestrian laws expanded throughout the US, as well as in other countries such as Australia. Yet, despite progress in the laws and advances in both the automobile industry and road technology, pedestrian deaths persist to this day, albeit in smaller numbers. To streamline traffic laws and reduce traffic-related fatalities, several states in the US have changed their pedestrian laws from giving right of way to pedestrians at crossings, to obliging drivers to stop. In Australia the authorities have waged a campaign to reduce pedestrian deaths through the launching of programmes designed to combat road deaths, investigating safety measures at all levels and perspectives.

In the UK the laws pertaining to pedestrian rights are set out in a number of legislative documents (Department of Transport, 1991; Department of Transport, 1997) which are summarised in a concise, easy to read manual named the Highway Code. As the Highway Code is not a legislative document in itself, special care is taken in its production to ensure that all relevant legislation is quoted correctly; as a result, this code "may be used in evidence in any court proceedings under the Traffic Acts" (Department of Transport, 2012).

In this manual specific attention is paid to the rights and codes to which the pedestrian must adhere. It can be seen that a major emphasis is placed on this information as it is the first section in the manual, which ensures that it is taken into account by all road users. In total there are 35 codes outlining the responsibilities of pedestrians towards other road users, along with the responsibilities of other road users to the pedestrian. For the purposes of this document we shall be taking specific interest in Rules 7, 8 and 18–30 (Department of Transport, 2012). Rule 8 is of particular interest to us in this investigation as it states:

At a junction: when crossing the road, look out for traffic turning into the road, especially from behind you. If you have started crossing and traffic wants to turn into the road, you have priority and they should give way.

This rule is of particular interest as it clearly indicates to us that priority should be set for pedestrians crossing a roadway which does not have a specific pedestrian crossing in place. However, that this does not allow for the free, unobstructed crossing of the road by pedestrians is clearly demonstrated prior to this rule in Rule 7, which states: "Do not cross until there is a safe gap in the traffic and you are certain that there is plenty of time." The issues which can arise from this situation are what legally defines a safe gap in traffic and how it can be proved at a later date that adequate time to cross has been provided. This therefore puts the onus on the pedestrian to ensure that they are capable of crossing the road without causing any delay to other road users. Rules 204–210 (Department of transport, 2012), on the other hand, place emphasis on the importance of pedestrians and the responsibility of vehicle users to take care of them. It is clear from all these measures that the pedestrian has right of way over the vehicle user; however, it is not clearly stated at any point and this can lead to a certain level of ambiguity. Nevertheless, common sense should allow drivers to be capable of realising that, should they injure a pedestrian to such an extent that death results, they are likely to face legal proceedings.

In the US there is a Uniform Vehicle Code, which is produced by a non-governmental body, the National Committee on Uniform Traffic Laws and Ordinances. While this is not a legal document in itself, it has been adopted by the majority of states so as to provide the foundation for the majority of their road traffic legislation.

In Australia, until as recently as 1999 there were separate road laws in place, in the individual states and territories within the country. In this year the then Australian Transport Council, now the Standing Council on Transport and Infrastructure (SCOTI), developed the Australian Road Rules. These are a set of guidelines which contain the basic road rules for all road users including motorists, motorcyclists, cyclists and pedestrians. This document is not a legally binding set of rules; however, due to agreements which were made at the time of inception it has been adapted and introduced as law by each individual state. The complete Australian Road Rules is widely available for free download from the internet, allowing all road users to easily become familiar with all rules in place throughout the country.

The rules pertaining to pedestrian road users, which we are interested in for the purposes of this study, are covered in Part 7, Division 5 of the 2012 version of the rules. This section contains a number of separate rules for pedestrians, which cover the rights of way of different individuals at certain crossings (National Transport Commission, 2012).

TRAFFIC ACCIDENT DATA ANALYSIS

From data available from the National Highway Traffic Safety Administration (NHTSA, 2009) we can see that a total of 4,092 pedestrians were fatally injured in the US during 2009, accounting for 12% of the total traffic fatality numbers. From this overall fatality rate a total of 662 (16.2%) of these instances occurred as a result of failure of the pedestrian to yield right of way (NHTSA, 2012). Whether or not these incidents are a result of incorrect or lacking knowledge by the pedestrians of the regulations in place is not clear; however, it is clear that this is an alarmingly high percentage of overall pedestrian deaths. When these data are compared to those from Australia it is found that, in the latter, there is a total of 1,290 road traffic-related fatalities present for the 12 months prior to July 2011 (Department of Infrastructure and Transport, 2012), with pedestrian fatalities comprising a total of 173 (13.4%) of this overall number. This represents a slight increase in the overall percentage of road traffic deaths in Australia being attributed to pedestrians when compared to that of the US. This figure does, however, indicate a 4.5% decrease in overall fatality numbers in the period since 2001. The 2001 level is also based on a 2% decrease since1991. This indicates that there has been a significant reduction in overall pedestrian deaths in recent years. Whether or not this is due to the implementation of the Australian Road Rules in 1999 is unclear from the data, but whatever the cause there is a clear increase in driver and pedestrian caution.

In agreement with other countries in the EU, the UK has outlined its own approach to improving pedestrian crossing facilities, in order to ensure better pedestrian visibility and to provide them with more safety from moving vehicles (ERSO, 2009).

The UK currently has five types of formal pedestrian crossing: Zebra, Pelican, Puffin, Toucan and Pegasus. Zebra crossings are indicated by black and white stripes across the road, with flashing amber beacons on either side stating that drivers must give way to pedestrians (driveandstayalive.com, 2003). Pelican (Pedestrian Light Controlled) crossings have red,

amber and green signals that face drivers. They are triggered by a pedestrian pushing a button, which then alerts the drivers to stop. Puffin (Pedestrian User-Friendly Intelligent) crossings do not have a flashing green man or amber signal, but are instead controlled by on-crossing pedestrian detectors, which are triggered by a push-button unit combined with kerbside pedestrian detectors. Toucan crossings have been made for both pedestrians and cyclists, and are typically used adjacent to cycle paths, which have a green bicycle or a green man symbol, and have established on-crossing detectors, like the Puffin. Pegasus crossings are similar to Toucan crossings, but are also used to allow horse riders to cross on certain busy main roads

From data for Great Britain, made available online by the Department of Transport in the annual publication Reported Road Casualties Great Britain: 2010 (Department of Transport, 2011), we can see that a total of 405 pedestrians were killed in the previous 12 months. This figure accounted for a total of 21.9% of the total of 1,850 individuals who were killed on the nation's roads. This figure also represented a 19% decrease in the overall number of pedestrians killed when compared to the figures for the previous year; however, this still remains an unsettlingly large proportion of the overall fatalities occurring. When these levels are compared to those present in America and Australia we can see that pedestrian fatalities account for a significantly higher percentage of overall road fatalities in Great Britain. The overall objective of this paper is to attempt to ascertain the reasons for this significantly higher proportion of pedestrians being fatally injured.

LITERATURE REVIEW

In this section, various journal articles which deal with the issue under examination will be analysed and compared. It is hoped that through this analysis a more substantial data field, along with a larger knowledge base on the subject, will be obtained.

In their 2007 article, Mitman and Ragland further confirmed long-held beliefs that there was a serious lack of understanding of the relevant Vehicle Codes in the San Francisco area of California. Through the use of intercept surveys, which were carried out in a number of different locations in both urban and rural environments, targeting both vehicle drivers and pedestrians, a good overall representation of all road users under investigation was provided. This information, along with

information gathered from focus group data involving residents of six different areas in the surrounding area, was all compiled to produce an overview of driver and pedestrian views on pedestrian rights of way. For research purposes, a number of different scenarios were developed in which a vehicle–pedestrian conflict is likely to occur, and all participants were asked to indicate which had the right of way in each scenario. From the data collected we can see that in certain areas the general public is well aware of the codes, with a 100% correct response rate observed in one situation. However, as the scenario became more complex it can be seen that the percentage of correct responses steadily fell across all demographics, with scores as low as 11% correct answers being noted. From this data it can be seen that comprehension of the vehicle codes is lacking amongst the general public and that further education is required. It has also been put forward by a number of analysts that an extensive review of the Vehicle Code in the United States is required and that implementation of a uniform set of regulations, to be adopted throughout the country, may also be beneficial.

Further research carried out in the US by Sisiopiku and Akin in their 2003 study of pedestrian behaviour along a heavily pedestrianised corridor on the Michigan State University area revealed a serious lack of yielding to pedestrians by both left and right turning vehicles when both parties have a green signal. From the study it could be seen that nearly half of all survey participants felt that turning vehicles did not respect pedestrians who were attempting to cross during this time. This was further enforced by the findings of the field observations, where in most cases the vehicle drivers were aggressive towards the pedestrians choosing to cross during the period where both had a green signal. It was found as part of the study, which incorporated on-site studies through the use of video recordings of intersections along with off-site survey data, that this led to an increase in pedestrians choosing to cross at areas which they deemed safer even though there may not be any pedestrian crossing present. The fact that such a large proportion of drivers felt aggrieved by the actions of the pedestrians in this situation leads us to infer that there may be a lack of understanding of the laws governing right of way in this situation, whereby the pedestrian has the right over the vehicle and therefore drivers are obliged to wait.

It can be inferred, however, that the general public does have a good standard of knowledge when the evidence supplied by Mitman and Ragland above is further compared to the research carried out by Martinez

and Porter in their 2004 study on pedestrian fatality in Virginia. As part of this study they carried out an extensive survey of driving licence holders in Virginia, who were questioned on their knowledge of Virginia driving laws. As a result of this questionnaire it was found that 83.9% of respondents yielded to pedestrians correctly at crosswalks. This report also produced slightly more positive results when the issue of turning traffic was examined, with 63.9% of those surveyed stating that they always yielded to pedestrians when about to turn. However, 14.5% of all respondents never yielded to pedestrians in such situations. Another surprising result which this survey produced was the fact that 55% of those surveyed believed that under Virginia law, pedestrians had right of way when not crossing in a crosswalk or intersection; this is not in fact the case. This indicates that there is, once again, a lack of knowledge of the specific laws applying in certain situations and a need to either clarify these laws or further educate the public.

In an Australian study carried out by Hatfield *et al.* (2007), a misunderstanding of rules regarding pedestrian right of way in various road crossing situations has also been noticed. This research used both on-site observation data and interviews. The interviews were also carried out on-site and took into account both pedestrians and drivers who had recently passed through the junction under examination. As part of this questionnaire a series of ten different scenarios were presented to all participants, who were asked to identify which of the road users (driver or pedestrian) had right of way. As a result of this survey it was found that in the turning traffic versus pedestrian scenario outlined previously, 95.3% of respondents correctly believed that the pedestrian had right of way. However, this figure dropped to 50.3% and 12.7% when the pedestrians were crossing on a flashing Don't Walk signal and a Don't Walk signal respectively, with respondents believing that the pedestrian loses the right of way as the signal facing them changes; however, this is not true as the pedestrian is given right of way in all of these cases under the Australian Road Rules. Even though the vast majority of respondents were correctly aware of who has the right of way in the initial scenario, 11.8% of drivers surveyed indicated that that they would take right of way even though they were not entitled to it. A startling fact which emerged from this study was that only 8.2% of those surveyed believed that pedestrians crossing at an unmarked section of road would have right of way, even though legislation in effect in the area states that pedestrians have right of way at all times when there is a danger of collision. From this legislation it is clear that the pedestrian will have the right of way in this situation, contrary to the beliefs of those interviewed.

ANALYSIS OF ACCIDENT DATA

Some previous research and analysis has been conducted in terms of locations of pedestrian accidents. For example, Ward and colleagues (1994) investigated the location of accidents relative to road crossing facilities. They noted that although pedestrian accidents occurred mainly away from road crossing facilities, the highest number of pedestrian accidents occurred on signalised pedestrian crossings, during pedestrian phases at traffic signals and at Pelican crossings. However, they have not further investigated or modelled this issue. There is a lack of papers in this research area. Moreover, pedestrian accidents are expected to be more numerous and severe at places with no crossing facility, while a lower percentage of pedestrian accidents is expected at pedestrian crossing facilities.

The primary aim of this research is to investigate the rate and severity of pedestrian accidents on pedestrian crossing facilities or within 50 m of traffic junctions in Edinburgh. Most information in this research has been taken from accident injury database STATS19 (UK), which includes all necessary information about pedestrian accidents. Although the number of pedestrian accidents at no crossing facilities was greater than the number of pedestrian accidents at crossing facilities, the percentage of KSI (killed and seriously injured) for pedestrian accidents at crossing facilities (24.58) from 1993 to 2006 was higher than the percentage of KSI for pedestrian accidents where there were no crossing facilities (23.34) in the same period.

From STATS19 data (1993-2006), it appears that most pedestrian accidents occur at locations where there are no physical pedestrian crossing facilities; 409,474 accidents (74.6% of total pedestrian accidents) with KSI of 23.34%, while 25.4% of pedestrian accidents happen at physical crossing facilities with KSI of 24.58% (see table 1).

Table 1: Percentage of casualties and KSI for pedestrian accidents at physical crossing facilities

Pedestrian crossing–physical facilities	Number of accidents	%	Number of KSI	%
Pelican	54645	39%	13794	25.24
Pedestrian traffic signal junction	41123	30%	9631	23.41
Zebra	28328	20%	6107	21.55
Central refuge	13214	10%	3922	29.68
Footbridge or subway	1883	1%	712	37.81

With regard to physical pedestrian crossing facilities, the highest number of pedestrian accidents occurring over that 14-year period were at Pelican crossings (54, 645 or 39%), followed by those that occurred at a traffic signal junction (41, 123 or 30%); then those accidents which were at a Zebra crossing (28, 328 or 20%); then at a central refuge (13,214 or 10%); while the lowest number of cases of pedestrian accidents were recorded on a footbridge or subway (1,883 or 1%) (STATS19).

One of the main problems of modelling pedestrian accidents is lack of information on exposure data. For example, hazardous pedestrian behaviour, represented by pedestrian volume times vehicular volume, average distance walked per person per day or total aggregate distance of pedestrian travel across an intersection, average number of walking trips made by numbers of population or average time walked per person per day have been used in the literature in a number of forms. However, to the knowledge of the author, to date there is no single measure of pedestrian exposure which has been internationally accepted or used. One of the main aims of this research is to investigate measures of exposure in modelling pedestrian accidents using pedestrian volumes at pedestrian crossings. Lastly, previous work on modelling pedestrian accidents included factors such as traffic flows, width of road, type of crossing facility, time of crossing and socio-economic data. Not much work was done to investigate impacts of the distance of the pedestrian accidents from the crossing lines. In this section, a variable of particular interest is right of way (ROW), which is incorporated into the model calibration. The primary aim of the estimation of the aggregate crash model is to examine whether the ROW has an impact on accident severity while controlling for other variables.

The negative sign of coefficient for age groups (child and adult groups) indicates that child and adult groups are more likely to be involved in accidents in pedestrian ROW than elder groups. The odds ratios for child groups indicate that when all predictors are constant, a child group is 0.54 times more likely to be involved in accidents in ROW than non- pedestrian ROW. The adult group is 0.85 times more likely to be involved in accidents in pedestrian ROW than non-pedestrian ROW. Regarding the gender of casualty, the negative sign indicates that the female group is more likely to be involved in accidents the than male group in pedestrian ROW. The female group is 0.73 times more likely to be involved in pedestrian accidents in pedestrian ROW than the male group.

Variable		Categories of each variable	Frequency (%)	Coefficients (p-value)	Odds
Factors	Age group	Child (0-15)	105 (11.1%)	-0.61 (0.093)	0.544
		Adult (16-59)	731 (77.6)	-0.17 (0.570)	0.846
		Old (60+)	89 (9.4)	0	--
	Gender	Female	327(40.5)	-0.32 (0.068)	0.728
		Male	481 (59.5)	0	--
	Driver age group	16-21	79 (8.4)	0.63 (0.127)	1.873
		22-59	704 (74.7)	0.60 (0.056)	1.823
		60+	54 (5.7)	0	--
	Time of accident	Night-time	271 (28.8)	0.24 (0.262)	1.267
		Daytime	671 (71.2)	0	--
	Pedestrian movement	Crossing	765 (81.2	-0.13 (0.631)	0.878
		Not crossing	177 (18.8)	0	--
	Vehicle manoeuvre	Going ahead	754 (80.0)	0.27 (0.217)	1.304
		Other	172 (18.3)	0	--
	Heavy goods vehicles	Bus and goods vehicles	287 (30.5)	0.32 (0.137)	1.374
		Other	655 (69.5)	0	--
	Type of signalised pedestrian crossing	Pelican	232 (24.6)	-0.72 (0.000)	0.486
		Junction	710 (75.4)	0	--
	Type of road	One way street	14 (1.5)	-22.02 (1.000)	--
		Dual carriageway	131 (13.9)	-20.70 (1.000)	--
		Single carriageway	794 (84.3)	-20.78 (1.000)	--
		Other	3 (0.3)	0	--
	Width of single carriageway	1–2 lanes	582 (61.8)	-0.11 (0.610)	0.900
		3–4 lanes	212 (22.5)	0	--
		Other	148 (15.7)	0	--
	First impact of pedestrian accidents	Crossing from driver offside	298 (31.6)	00.17 (0.353)	1.190
		Other	644 (68.4)	0	--
	Day of accident	Weekend	265 (28.1)	0.20 (0.322)	1.224
		Weekday	677 (71.9)	0	--
	Road conditions	Wet	281 (29.8)	-0.24 (0.306)	0.785
		Dry	658 (69.9)	0	--
	Weather	Fine	783 (83.1)	0.40 (0.504)	1.491
		Rain	135 (14.3)	0.28 (0.636)	1.329
		Other	24 (2.5)	0	--
	Intercept	--	--	21.23 (1.000)	1.652

Summary statistics
-2 Log-likelihood at zero = 906.53
-2 Log-likelihood at convergence = 861.351
Log-likelihood ratio index (ρ^2) = 0.081
Observations = 942 (ROW1: 25.1%; ROW2: 24.4%; ROW3: 50.5%)

Table 2: Statistics summary and estimation results of the Binary Logit aggregate model by pedestrians' car accidents as a whole

The positive sign for the coefficient of driver age group (young drivers aged 16–21 and adult drivers 22–59) indicates that these age groups are more likely to be involved in pedestrian accidents in non-pedestrian ROW areas. Young and adult driver age groups are 1.87 and 1.82 times respectively more likely to be involved in pedestrian accidents in non-pedestrian ROW areas than elderly groups. The positive sign of the coefficient for night-time indicates that more accidents occurred at night-time in non-pedestrian ROW areas than pedestrian ROW areas. Inverting the odds ratio for night-time reveals that pedestrians are 1.27 times more likely to be involved in accidents in non-pedestrian ROW areas.

In terms of pedestrian movement (crossing or not crossing the road), the negative sign indicates that pedestrians who crossed the road from the driver's near side and driver's offside were more likely to be involved in accidents in pedestrian ROW than pedestrians who were standing or walking along the carriageway. The odds ratio for pedestrian movement indicates that pedestrians who crossed the road in pedestrian ROW were 0.88 times more likely to be involved in accidents than those who were standing or walking along the carriageway. In consideration of vehicle manoeuvres, the positive sign indicates that when the vehicle is going ahead it is more likely to be involved in accidents in non- pedestrian ROW than when it performs other manoeuvres (turning, reversing and starting). The odds ratio for manoeuvres of vehicles shows that the going-ahead manoeuvre caused more accidents than other manoeuvres (1.30).

Regarding the type of vehicle, the positive sign indicates that heavy goods vehicles and buses are more likely to be involved in pedestrian accidents in non-pedestrian ROW than cars, taxis and motorcycles. The odds ratio for this category is 1.37. The negative sign for pedestrian crossing facilities indicates that more pedestrian accidents occurred in Pelican, Puffin and Toucan areas than at junction crossings in pedestrian ROW. The odds ratio for pedestrian crossing facilities indicates that at Pelican, Puffin and Toucan crossings there are 0.49 times more accidents than at junctions in pedestrian ROW.

The positive sign for the coefficient of 1–2 lanes in single carriageways indicates that in single carriageways there were more pedestrian accidents in 1–2 lanes in non-pedestrian ROW than those occurring in three or more lanes. Inverting odds ratios for 1–2 lanes indicates that 0.90 more slight accidents occurred on 1–2 lane single carriageways than on other types. The positive sign for the coefficient of crossing the road from the

driver's offside area indicates that more pedestrian accidents occurred in non-pedestrian ROW areas when pedestrians cross the road from the driver's offside area. The odds ratio for this category is 1.19. Regarding the day on which accidents occurred, the positive sign for weekend indicates that pedestrians who were involved in accidents over the weekend are more likely to be involved in accidents in non-pedestrian ROW than those involved in accidents on weekdays. The odds ratio for this category is 1.22. Considering road conditions, the negative sign for wet road conditions indicates that there were more pedestrian accidents in pedestrian ROW areas than non-pedestrian ROW. The odds ratio for road conditions shows that wet road conditions caused more accidents in pedestrian ROW than road condition (0.79). The positive sign for the coefficient of fine and rainy weather indicates that more pedestrian accidents occurred in both fine and rainy weather in non-pedestrian ROW areas. The odds ratios for these categories are 1.49 and 1.33 respectively.

SUMMARY AND CONCLUSIONS

For the right of way consideration, in the UK it can be seen that there is a uniform set of rules to which all road users must adhere. As a result of this it should be expected that there should be a much higher level of adherence to these rules within the UK as a whole when compared to that of the other two countries (USA and Australia), where variations in the laws occur within the countries due to the existence of separate states with individual sets of laws. Also significant is the fact that many of the terms used in these regulations in the UK are ambiguous, with such phrases as "drive at a speed at which", "due care" and "plenty of time". As each of these phrases may be interpreted differently by different individuals, there is a lack of specific regulation in a number of situations and therefore the responsibility of care is unclear. However, these data alone cannot provide us with a definitive answer as to which is the most pedestrian-friendly country. To properly assess this situation, further research will be carried out based on national road traffic accident statistics to attempt to ascertain which country has the highest percentage of accidents per capita involving pedestrians. These data, along with on-site surveys with a view to ascertaining the level of compliance with the rules set out above, may aid us in identifying the most pedestrian-friendly country. From an analytical point of view, right of way has been modelled in this work. Further research in this area is strongly recommended.

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