2010-2014 NATIONAL ROAD SAFETY DATA REPORT

PAPUA NEW GUINEA

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Executive Summary

The Road Traffic Authority (RTA) has a responsibility to '*monitor the road safety performance of the public road network*' (Section 5(2)(d) of the Road Traffic Act) as well as maintaining and preserving records in order to assist, advise and work cooperatively with its stakeholders in relation to land transport regulatory matters, road safety and the efficient use of land transport (Sections 5(2)(c) and (e) of the Road Traffic Act). One way that it can achieve the above is by collating and analysing the crash data that is reported to and recorded by the Police and subsequently sharing this information to its partner agencies and the public. This Road Safety Data Report is just one example of information provided by the RTA.

Specifically, this Data Report helps identify the PNG road safety performance by presenting national facts and figures as reported to and by the Royal PNG Constabulary (Police). Whilst this is the first five-year crash and casualty data report for PNG of its kind, subsequent reporting is planned on a rolling annual basis as the data is processed by the RTA.

It is acknowledged and highlighted that despite this Data Report being prepared in 2019, the most recently available information in the crash database is for a period up to 2014[1]. As such, the five-year period between 2010 and 2014 has been used for the analysis of the crash data. A five-year period (rather than a single year) has been used given that reported crash and casualty data can fluctuate from year to year, with a five-year average providing a reasonably sound statistical basis to identify common road safety issues.

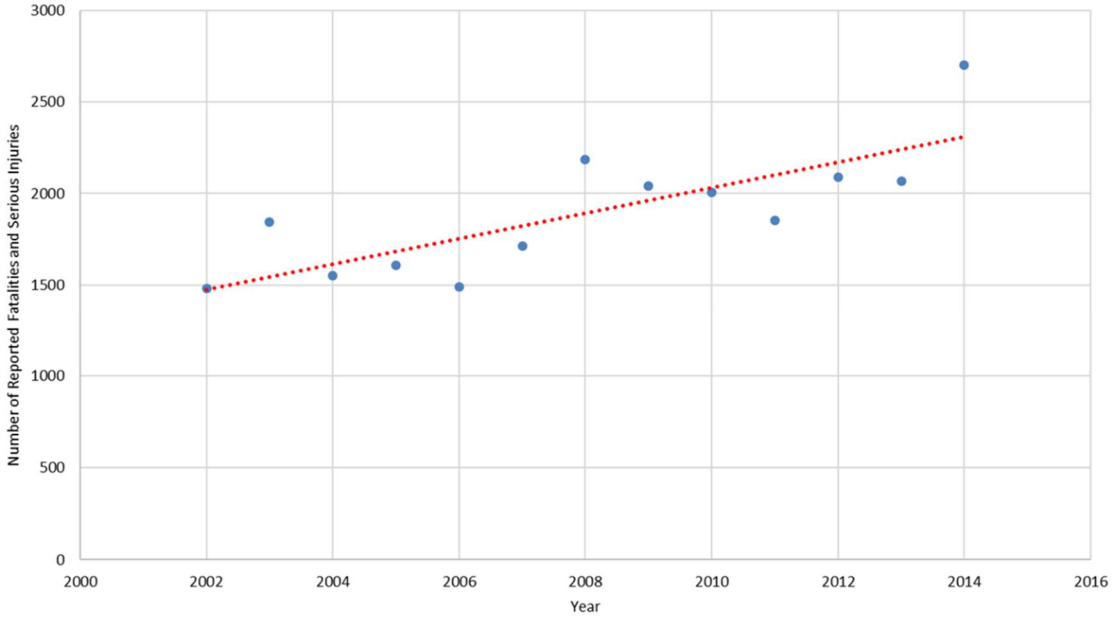
The information contained in this national Data Report is primarily intended to assist the PNG Government, road controlling authorities (such as the Department of Works – DoW, the National Roads Authority – NRA, and other regional Provincial and Local Level Governments), the Royal PNG Constabulary (Police), donor agencies and the RTA (for instance when undertaking awareness/education campaigns) with understanding the extent of the road safety problem in PNG. Researchers, consultants, students and other organisations with an interest in road safety (such as Motor Vehicle Insurance Limited - MVIL) will also find the information useful.

This Road Safety Data Report primarily contains information relating to fatal and injury road crashes/casualties that have been reported to the Police. As part of this, it sets out common contributory factors identified by the Police associated with the road environment, road user behaviour and vehicles. As part of this, it is acknowledged that actual number of road crashes, deaths and injuries is likely to be much greater than the reported amount. Modelling work set out in the World Health Organisation (WHO) Global Status Report on Road Safety 2018 estimates that due to under-reporting, the actual number of road deaths in PNG could be three times greater than the number reported. The under-reporting of less severe crashes can be expected to be even greater.

Whilst the Data Report is focussed on the 2010-2014 time period with respect to crash and casualty types, it also provides a high-level overview with respect to longer term trends for fatal and seriously injured road users from 2002 onwards. As shown in Figure E1, the total number of reported killed and seriously injured road users has been increasing over this period.

[1] The database is consistently being updated with more recent crash information. Data reports with more updated information will be prepared as and when more recent data has been entered and each year's records finalised.

Figure E1 Killed and Seriously Injured Road Users by Year (Trend Line shown in Red)



Overall, there was a total of 12,558 reported crashes in PNG during the five-year period between 2010 to 2014, resulting in 15,992 known deaths and/or injuries. In terms of injury crashes (i.e. excluding damage only crashes), on average, 2.8 people were killed or injured in each crash. Whilst the vast majority (60%) of fatal and casualty crashes involved only a single death or injury, there were 44 reported instances where 20 or more people were injured and/or killed in each of the crashes over this five-year period.

On average, 307 people were killed on our roads each year over the 2010-2014 period based on reported crashes. A further 1,837 people per year were reported to be seriously injured. Overall, for each reported/recorded death, there were six serious injuries reported to occur. It is noted and acknowledged that this is much lower than the ratio of 10 serious injuries per road death from other research[2]. This may well further reflect the level of under-reporting in PNG, particularly in some Provinces.

A breakdown of the reported road fatality data by Province[3] and road user type is provided in Table E1. As indicated, two out of every five people killed on our roads were pedestrians.

[2] McMahon K and Dahdah S. The True Cost of Road Crashes: Valuing life and the cost of a serious injury. iRAP. 2008

[3] Due to the crash database being established prior to Jiwaka and Hela being becoming their own Provinces, the crash and casualty data for these two Provinces are included within the data for Western Highlands and Southern Highlands Provinces respectively.

Table E1 Annual Average Number of Fatalities (2010-2014)

Province	2010-2014 Annual Average Fatalities			
	Driver	Passenger	Pedestrians	Total
ABG	0	0.2	0	0.2
Central	2.6	14	4.4	21
Chimbu	1	4	6	11
East New Britain	0.8	3	2.6	6.8
East Sepik	1	5.4	3.4	10
Eastern Highlands	2.6	12.2	10.8	25.6
Enga	0.6	9.2	9	18.8
Gulf	0	0.4	0.4	0.8
Madang	1.8	12.4	7.4	21.6
Manus	0	0.2	0	0.2
Milne Bay	0.6	1.8	0.6	3
Morobe	3.6	14.6	12.4	30.6
New Ireland	1.2	5.4	4	10.6
NCD	5.6	16	30	51.6
Northern	0.6	1.4	1.4	3.4
Southern Highlands	0.8	6.2	5.2	12.2
Sundaun	1.2	7.4	1.6	10.6
West New Britain	2	6.4	5.8	14.2
Western	0	0	0.2	0.2
Western Highlands	3.6	24.2	27	54.8
Total	29.6	144.4	132.2	307.2

The data indicates that overall:

- Collisions with pedestrians along with single vehicle overturn/run-off road crashes are the most common type of crash –
  - Whilst 15% of crashes were 'overturn' type collisions, they resulted in 27% of all fatalities and casualties.
  - Utility vehicles (utes/pick-ups) were the main type of reported vehicle in overturn crashes.
- Speed/loss of control and inattention (for instance due to mobile phone use) along with drink-driving are major contributory factors to crashes in terms of road user behaviour –
  - 13% of all crashes were reported as 'alcohol suspected' or tested positive. On Saturdays however, this increases to approximately 21%.
- Pedestrians along with passengers in the back of trucks, utes and PMVs/buses are those road users that are most commonly killed and/or injured in a road crash –
  - Pedestrians made up 17% of all casualties but 43% of all fatalties, reflecting the vulnerability of such road users.
  - Over 35% of all pedestrians killed and/or injured were aged 15 years or less.

1. Introduction and General Information

1.1 Background

To put road safety issues into perspective on a global scale, the World Health Organisation (WHO) forecasts that road traffic deaths will rise to become the fifth leading cause of death by 2030 (ranked as ninth in 2004), ahead of issues such as HIV/AIDS[4]. Furthermore, for the Western Pacific Region (which includes Papua New Guinea), the WHO *Global Burden of Disease – 2004 Update* project indicates that injuries sustained as a result of a road traffic crash are the primary cause of death for people between 15 and 44 years of age, and the second main cause of death for children between 5 and 14 years of age in the Region.

Whilst reported crash data has been collated by the Police for a number of years in Papua New Guinea (PNG), very little formal review, analysis and dissemination of the information has occurred. As such, in 2009, the National Road Safety Council (NRSC) – which subsequently became the Road Traffic Authority (RTA), received Government funding to set up a database utilising crash reports prepared by the Police to try and better understand the extent of the road safety problem in PNG, along with identifying the main contributory factors and crash locations. Whilst the NRSC/RTA has endeavoured to use the database to guide its road safety activities, formal national reporting was restricted to a single year - 2007 (given that more recent data was still being entered into the crash database with a time lag existing between a crash occurring and the report reaching the NRSC/RTA to enter it into the database). More recent crash data however has now been entered into the database allowing a larger and more detailed analysis to occur.

Strategic Framework

It is acknowledged that the Government's Vision 2050 and the PNG Development Strategic Plan 2010-2030 do not specifically highlight road safety as an issue. This, however, is perhaps unsurprising given the lack of quality information made available to politicians and the public over recent years concerning the scale of the problem.

Notwithstanding the above, targets relating to health (e.g. life expectancy), disability and standards of living (e.g. economic impacts) are set out in these strategic documents, which in turn are particularly relevant to road safety given that road deaths and injuries are a major contributor to the shortening of people's lives and/or the cause of disability. Furthermore, research has shown that those people that are involved in a road crash are usually in the age range that can be considered the most economically active. Reducing the number of people being killed and/or injured in PNG can therefore strongly contribute to meeting the Government's strategic objectives.

Following the preparation of the above guiding national plans, the National Transport Strategy (NTS) developed in 2013 set out the transport sector's overall policy principles and the approach to be adopted across all three modes of transport. As part of this, the Strategy specifically highlights that safety "continues to be a concern" and will "be an

[4] World Health Organisation. Road Safety in the Western Pacific Region – Call for Action (2008)

area of high priority." Amongst a range of policies aimed at road safety (along with identified safety initiatives) includes the "development of safety action plans in each transport mode backed by improved databases of accidents and incidents with monitorable targets and reporting of achievement".

In addition to the above, the NTS provides guidance with respect to expected transport demand and future growth in terms of the population, the economy and increasing road transport usage. Whilst not explicitly stated, these elements in turn will have a major impact on road safety without any action being taken to address it given the increase in exposure to risk as a result of additional traffic on the road.

Furthermore, the Medium Term Development Plan (MTDP) III (2018-2022) highlights that an indicator of the Land Transport Infrastructure Goal to "establish a resilient and effective land transportation network that links all of PNG and provides access to flow of goods and services" is the number of road transport fatalities[5].

Legislation

Section 5 (2)(d) of the Road Traffic Act (the Act) notes that one of the functions of the RTA is to '*monitor the road safety performance of the public road network*' and to subsequently '*develop and implement action plans for improvements*' based on this data. Furthermore, the Act states that the RTA has a responsibility to maintain and preserve records in order to assist, advise and work cooperatively with its stakeholders in relation to land transport regulatory matters, road safety and the efficient use of land transport (Sections 5(2)(c) and (e) of the Road Traffic Act) as well as to 'promote and conduct research into land transport regulatory matters and road safety' (Section 5(2)(g) of the Act).

1.2 Purpose

One way that the RTA can help achieve the above legal functions is by collating and analysing the crash data that is reported to and recorded by the Police and subsequently sharing this information to its partner agencies and the public. This PNG Road Safety Data Report is just one example of information prepared by the RTA.

Without such information to assist with understanding where, when and how crashes occur, detailed action plans focussed on addressing specific locations and/or behaviours cannot be prepared in a meaningful way. Furthermore, the reporting of such data allows the RTA to transparently measure progress (or otherwise) towards the intended overall outcomes implied by the various guiding strategies and plans relating to a reduction in the number of people killed or injured in a road crash.

Specifically, this Data Report helps identify the extent of the road safety problem in PNG as well as providing evidenced based information regarding prevailing road safety issues. It has been prepared in support of existing and future monitoring and evaluating requirements associated with national strategic planning documents well as to guide,

[5] Note: this is erroneously referred to as 'casualties' in the MTDP III given the 276 average annual baseline amount referenced in the document.

engineering work, enforcement and education/awareness campaigns at a national level. Researchers, consultants, students and other organisations with an interest in road safety (such as Motor Vehicle Insurance Limited - MVIL) may also find the information useful.

It is acknowledged and highlighted that despite this Data Report being prepared in 2019, the most recently available information in the crash database to date is 2014. As such, a five-year period between 2010 and 2014 (rather than a single year) has been used for the detailed analysis. A five-year period has been used given that crash and casualty data can fluctuate from year to year with a five-year average providing a reasonably sound statistical basis to determine common contributory factors associated with crashes in the provinces.

1.3 Crash Data

Crash Reporting

Section 33 of the Road User Rules 2017 states that '*where injury or damage is caused to a person or to an animal or vehicle in the charge of a person because of an accident in which a motor vehicle is concerned*', the driver must report the crash to a Traffic Enforcement Officer or the officer in charge of the nearest police station as soon as practicable and within a maximum of 24 hours if a member of the Police is not called out to the scene of the crash to carry out an investigation.

Accordingly, in theory, every motor traffic crash in PNG should be reported to the Police, who in turn should complete a Road Accident Report Form (see Appendix A). Unfortunately, for various reasons, actual crash numbers can be expected to be under-reported, with the Asian Development Bank (ADB) Guidelines[6] acknowledging that the '*under-reporting of road crashes is a particularly serious problem in many developing countries'*. The full extent of under reporting in PNG is not yet known. However, modelling work carried out as by the World Health Organisation[7] has estimated that the actual number of road traffic deaths in PNG could be over 3 times higher than the number reported. The under-reporting of less severe crashes can be expected to be even greater. Further comment on levels of under-reporting at a national level are provided in Sections 2.2 and 2.3.

As part of the above, it should be noted that in some instances, as well as crashes not being reported to the Police, many Police Accident Report Forms are not sent through to Police HQ and/or are perhaps mistakenly sent to the wrong location/mis-placed. The RTA have recently completed additional training with the Police on this matter as well as provided greater clarity regarding the questions on the Police Road Accident Report Form. Based on the highest sequential number given for a crash for each Police Station/Province and the actual number of Accident Report Forms received at Police HQ, it is estimated that the details of only 70-85% of crashes reported at local Police Stations get sent to Police HQ for inclusion in the RTAs national crash database.

[6] ADB Road Safety Guidelines for the Asian and Pacific Region.
[7] World Health Organisation. Global Status Report on Road Safety 2018.

MAAP Crash Database

The RTA manages the national road traffic crash database (using the MAAP[8] system procured from the UK's *Transport Research Laboratory - TRL*) and is currently in the process of updating it with more recent crash reports that have been sent through to Police HQ. This work updates the previous Department of Transport (DoT) maintained database that was destroyed in a fire (but never re-instated) up the present day and into the future. Fortunately, as part of their previous work with the crash database, TRL had maintained a copy of previously entered crash data for 1987 to 1994 (see Section 2.1). This previous information now forms part of the basis of the current database with subsequent work having been carried out to enter all data between 2002 and 2014. Unfortunately, Police Road Accident Report Forms between 1995 and 2001 which would have allowed a complete record of reported crashes have been destroyed.

Accordingly, this report uses data from the RTAs crash database for 2010-2014. This database includes all reported crashes involving injury and non–injury for which Police Road Accident Report Forms have been completed and forwarded to the Police HQ.

Data Accuracy

A high-level review of the crash data provided on the Police Accident Report Forms indicated that in some instances, inconsistencies and inaccuracies in the reported information exist. This is perhaps unsurprising given the limited training that Police receive in filling out the Forms and/or in crash investigation as well as the fact that in many instances, the Police did not attend the crash scene, thereby making accurate crash reporting difficult. Overall, for the five-year period between 2010 and 2014, the Police attended 43% of the total reported crashes received at Police HQ (rising to 61% of reported fatal crashes) - see Figure 1.1.

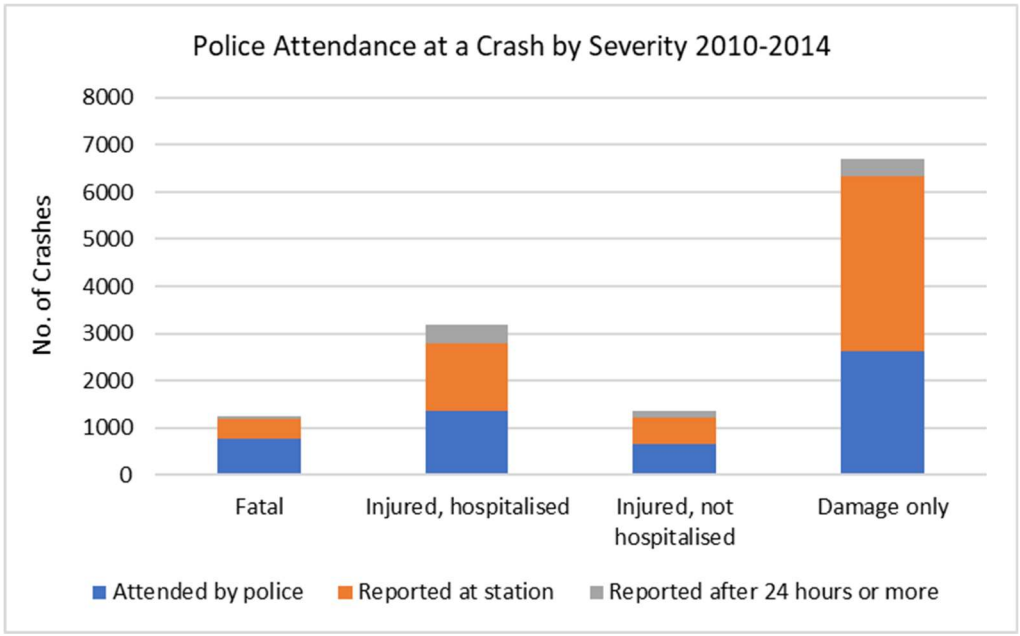


Figure 1.1 Police Attendance at Reported Crashes by Severity (2010-2014)

[8] Microcomputer Accident Analysis Package.

In addition, the Police Accident Report Form (which was last modified/created in approximately 1986) is not overly clear in many instances and does not always reflect current trends – for instance, there is no specific category for '4-wheel sport utility vehicles' when identifying the vehicle type – with such vehicles often identified as being either a 'car', 'utility vehicle' (i.e. a ute/pick-up) or 'other' by reporting officers.

As part of the work carried out by the RTA in entering and reviewing the data, a number of logic and sanity checks have been carried out, and where appropriate, based on the police crash reports, changes have been made to the entered data to better reflect the intent of the question in the Police Accident Report Form. Despite these checks and balances, it is acknowledged that some anomalies may well still exist with the data and where these are known to be potentially problematical (for instance road and/or shoulder width), reporting on those specific issues has not been carried out. As part of this, where appropriate, comment on data validity has been made in the following Report Sections.

Given there are major concerns relating to both the accuracy and reported numbers of crashes at present, a high level of care and caution is required when interpreting the data.

1.4 Explanatory Note

Crash and Casualty Injury Severity

As part of the process of filling in the Accident Report Form, the Police classify road crashes by the severity of injuries suffered by road users in the crash using the following levels:

- Fatal[9].
- Injured and hospitalised (Serious injury).
- Injured but not hospitalised (Minor injury).
- Damage only to vehicles/property.

Crash severity is classed by the most severe injury sustained in the incident i.e. a crash involving a hospitalised person and two injured but not hospitalised people is classed as a 'hospitalised' crash for official statistics – although in some instances due to errors in the completion of the Accident Form, the information provided doesn't always follow this convention (and hence has been subsequently 'cleaned' or rectified as part of the logic mapping process).

Unless specifically noted, the information provided in this Data Report is for casualty crashes only (i.e. only those involving a fatal or injured person) and typically excludes 'damage only' crashes. This is due to an initial focus being on seeking to reduce the

[9] At present, no formal agreement and definition exists with respect to a 'fatal crash' in terms of the time period over which a person is assumed to have died as a result of suffering an injury in a road crash. Typically, deaths within 24 hours of the crash are reported as such. Deaths beyond this period can be included within Police records subject to appropriate paperwork; however, it is suspected that such updates to records are rarely carried out. Whilst the recently enacted Road Traffic Act 2014 provides a definition of a fatal injury with respect to timeframes for certain offences, this Act has only recently come into use with the data contained in this report prior to its enactment. Elsewhere overseas, road deaths are typically defined as those occurring as a result of injuries received in a motor vehicle accident within 30 days of the crash occurring.

number of deaths and injuries (in particular, serious injuries) on our roads (rather than non-injury crashes). In addition, a slightly higher proportion of casualty crashes are attended by police compared to damage only crashes, and it is assumed that the details provided on Police Accident Report Forms from attended crashes are more accurate than self-reported crashes.

Data

This Road Safety Data Report contains information relating to:

- crashes - i.e. the actual crash event itself;
- vehicles involved in the crash and their driver; and
- casualties - i.e. the injured persons including fatalities which may include:
  - vehicle occupants i.e. drivers and passengers; and
  - pedestrians.

As such, one crash may involve two vehicles (with two drivers) and result in three casualties (e.g. both drivers and a passenger); or alternatively, one crash may involve a single vehicle (with one driver) and result in five casualties (e.g. four passengers and one pedestrian). Similarly, a fatal crash is not the same as a fatality – with the fatal crash referring to the crash and fatality referring to the casualty or casualties that have died. Due to the different elements that make up the crash data, great care is needed when analysing the database and/or using the enclosed data to ensure that outputs/information is correctly understood and referenced as such. Accordingly, to assist users of this Report, at the start of each Section, a short analysis and summation of the data has been provided.

1.5 Socio Economic Costs of Crashes

In addition to the pain, suffering and grief caused by road crashes, they also have a direct economic impact on society in the form of medical, property/vehicle damage and administrative/legal system costs along with the loss of future earnings/income for an injured/killed person as a result of the crash. The economic consequence of road crashes is generally estimated to be between 1% and 3% of the Gross Domestic Product of a country.

Whilst no specific, detailed socio-economic costs for individual road crashes have been calculated for PNG, accepted and acknowledged research[10] has indicated that for low and middle-income countries, a reasonable rule of thumb for calculating the statistical value of life is to multiply Gross Domestic Product (GDP) per capita by 70 (with a range between 60 and 80 for sensitivity testing) with the economic cost of a serious injury being a quarter (0.25) of the economic cost of a death.

Using the above as a basis along with GDP per capita (current prices) for PNG (2014) from the International Monetary Fund World Economic Outlook Database - April 2018 of K7,300 (2014 has been used as it reflects the most recently available crash/casualty

[10] McMahon K and Dahdah S. The True Cost of Road Crashes: Valuing life and the cost of a serious injury. iRAP. 2008

data shown in this Data Report as well as being the last available non-forecast value at the time of publication):

- the economic cost of a road death is estimated to be 70 x K7,300 = K511,000; and
- the economic cost of a serious injury as a result of a road crash is estimated to be 0.25 x K511,000 = K127,750.

When recalculating the above using 2018 prices, the economic cost of a road death increases to K712,000 and K178,000 for a serious road crash injury.

The above excludes costs associated with minor injuries and damage only crashes (i.e. damage to vehicles and property.

2. National Overview - Context

2.1 Historical Trends

As highlighted previously, the RTA continually updates the MAAP crash database with reports that have been sent to Police HQ in Port Moresby.

Figures 2.1 and 2.2 overleaf show the crash and casualty data that currently exists in the database for 1987 to 1994 and 2002 to 2014. Of specific note is the difference in the number of crashes reported in 2002 to 2014 compared to those in the late 1980s and early 1990s. Given the large increase in population and number of motor vehicles in PNG since the original 1980s/1990s data, coupled with no significant intervention to reduce road crashes, it is strongly suggested that the lower number of recorded crashes in the 21st Century is due primarily to increased levels of under-reporting, particularly of minor and damage only crashes, rather than any improvement in road safety. Notwithstanding the above, overall total casualty numbers from 2002 onwards are in line with previous deaths and injuries suggesting the number of people killed or injured per crash has increased. Figure 2.3 shows the casualty data for fatal and serious injuries only combined with the trend line for the 21st century (from 2002 through to 2014) in PNG.

Whilst both the combined number of fatal and serious injury crashes and the associated combined fatalities and serious injuries have shown an upward trend over the 13 years of data, a comparison of all reported fatal/injury crashes against total fatalities/casualties shows that whilst an increase in casualties has occurred, no similar increase in injury crash numbers has occurred – see Figure 2.4. This suggests that whilst reported injury crashes have been holding steady, the number of people killed or injured per crash has increased over time – from 2.2 casualties per injury crash in 2002 to 3.2 casualties per injury crash in 2014. Analysis indicates that this increase is due the number of passengers and pedestrians injured, rather than drivers of vehicles.

To put the historical crash data into perspective for PNG, Figures 2.5 and 2.6 show population growth as well as the number of registered (and/or MVIL third party insured) motor vehicles obtained from a number of sources[11] for those years where data is available (as well as the trend over the identified time period) noting that prior to 1987, the number of registered motor vehicles per year was relatively steady in the order of 43,000 - 47,000, less than half the current estimate.

Figure 2.7 shows the number of fatal and serious casualties (as indicated in Figure 2.3) relative to the increase in population between 2002 to 2014 in PNG.

[11] Motor vehicles volumes for the 1980s and 1990s have been obtained from Appendix D of the Road Safety Guides for the Asia-Pacific Region prepared by the Asian Development Bank (undated). Subsequent motor vehicle data has been obtained from the 2009, 2015 and 2018 WHO Global Status on Road Safety reports – with this data originally sourced by NRSC/RTA from MVIL and understood to be based primarily on records associated with owners of vehicles obtaining mandatory Third Party MVIL insurance (rather than simply on registered vehicles in those Provinces that MVIL operates in). As part of this, it is acknowledged and noted that Volume 3 of the National Transport Strategy refers to an estimated number of vehicles of 46,000 in 2010 – much lower than the indicated trend line and more in line with numbers during the 1980s and 1990s.

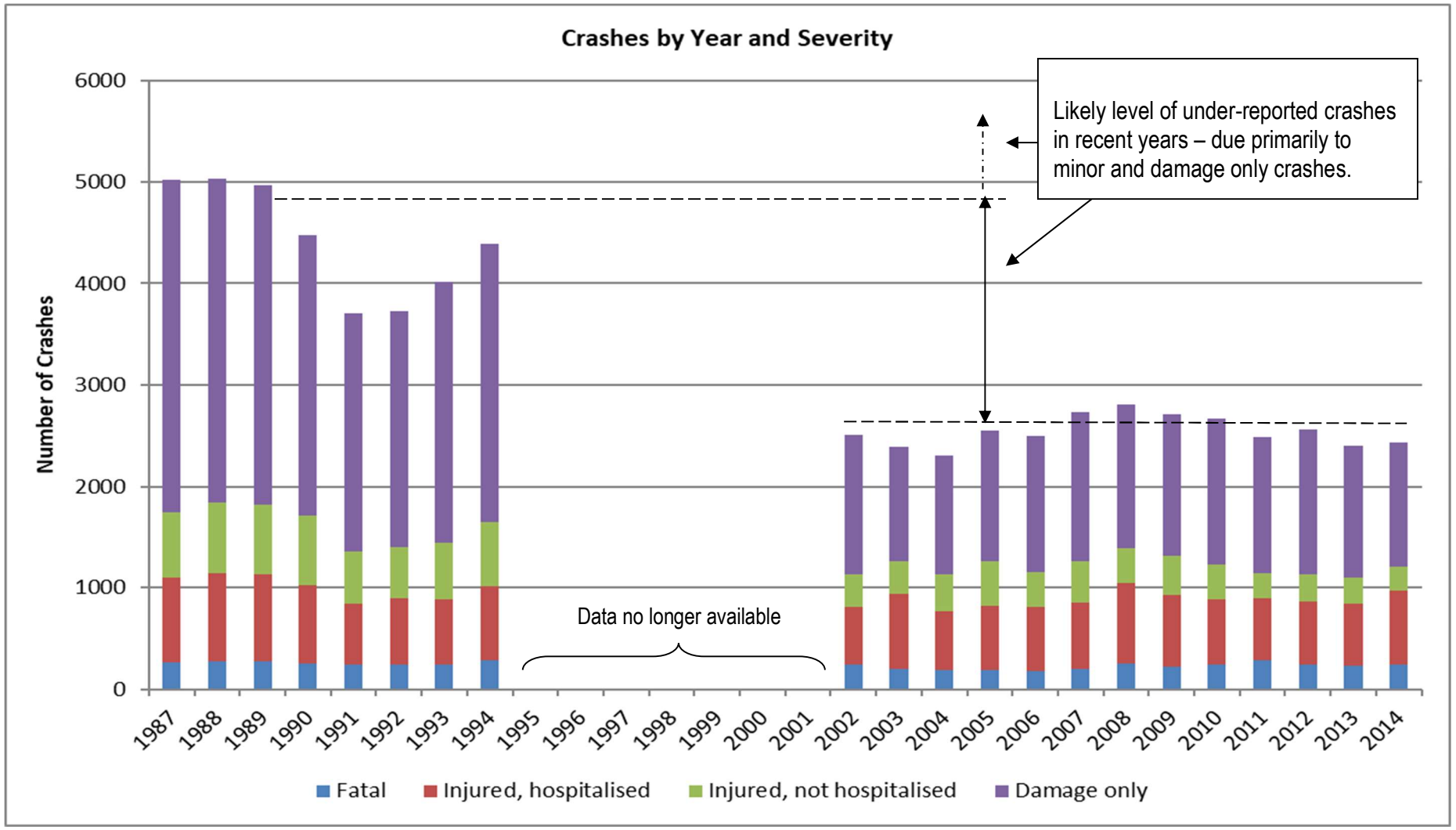


Figure 2.1 Annual Crash Numbers by Severity - PNG

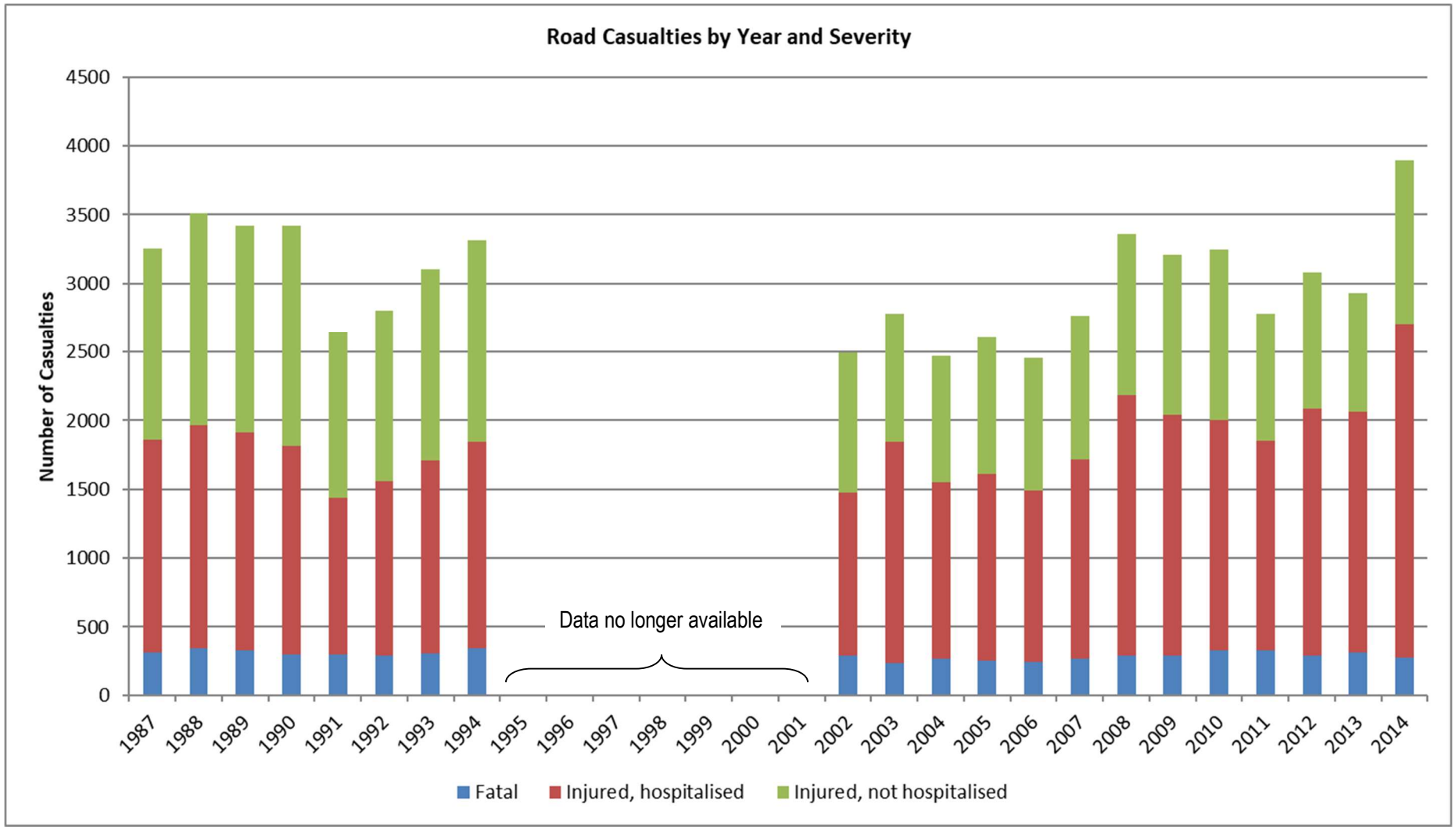


Figure 2.2 Annual Casualty Numbers by Severity - PNG

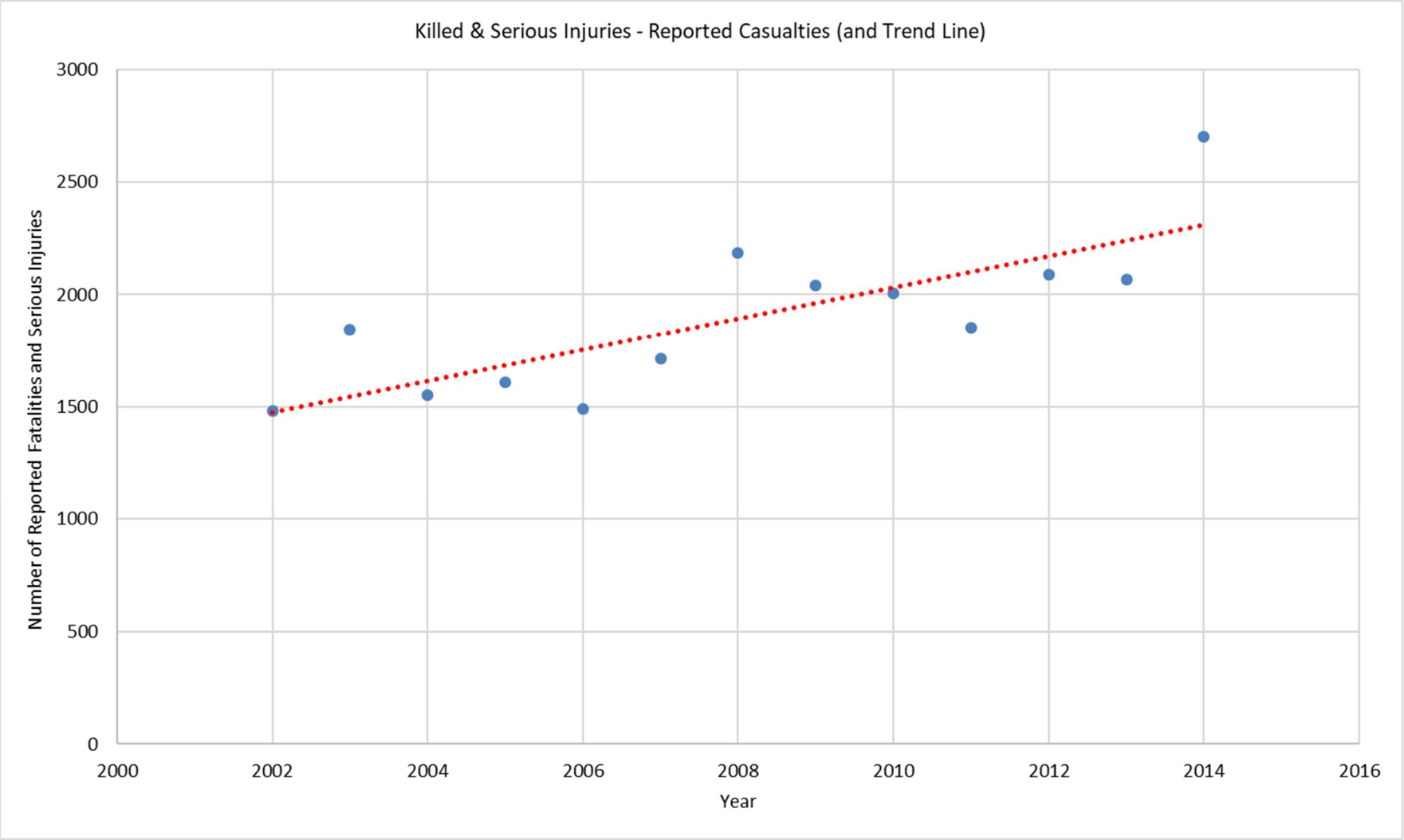


Figure 2.3 21st Century Annual Number of Fatal and Serious Injury Casualties (with trend line) - PNG

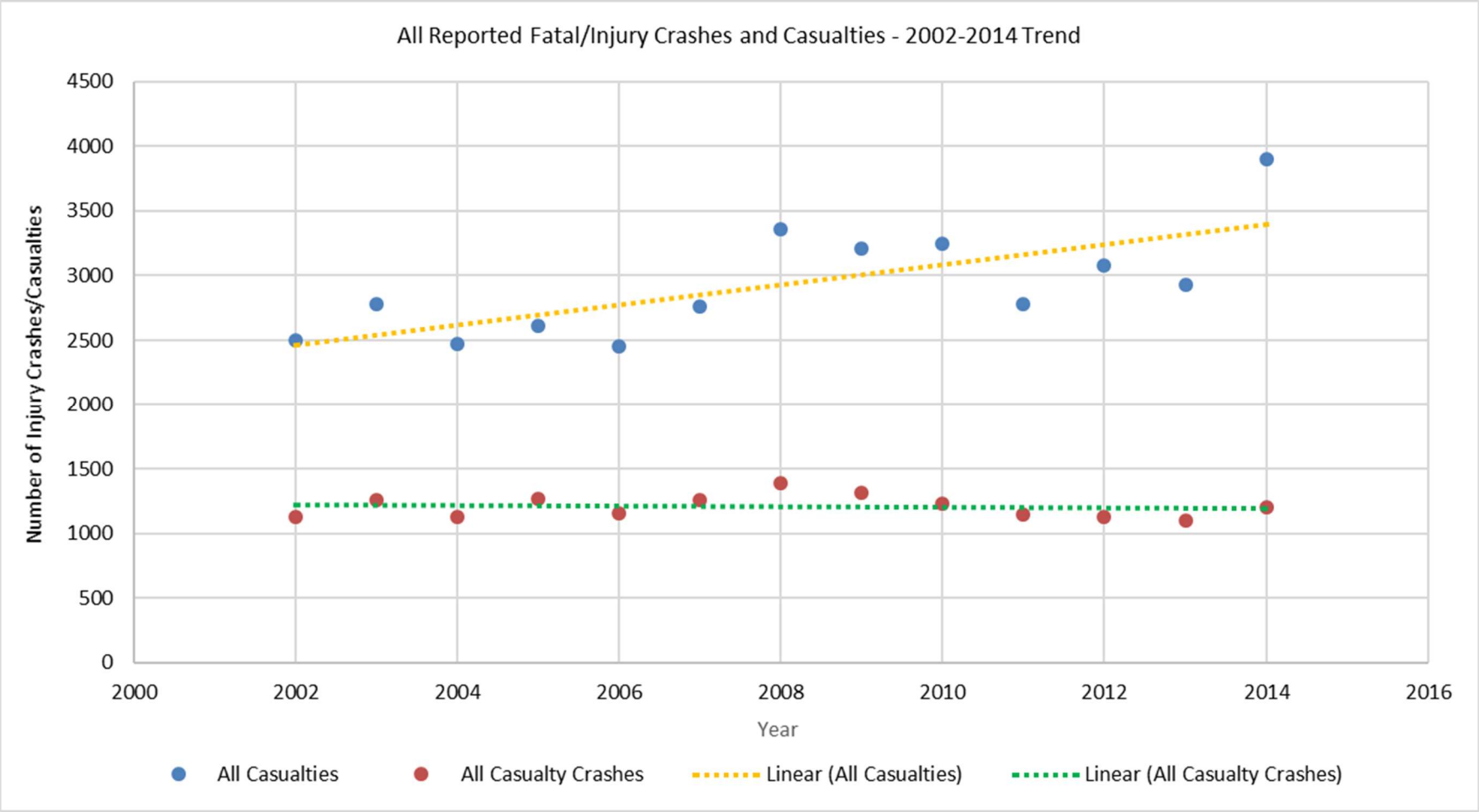


Figure 2.4 Fatal/Injury Crashes and Casualties (with trend lines) - PNG

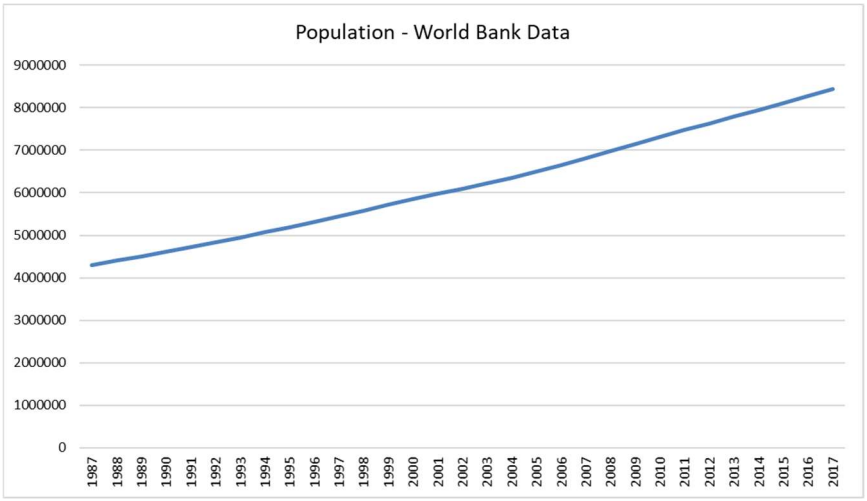


Figure 2.5 PNG Population by Year (1987 – 2017)

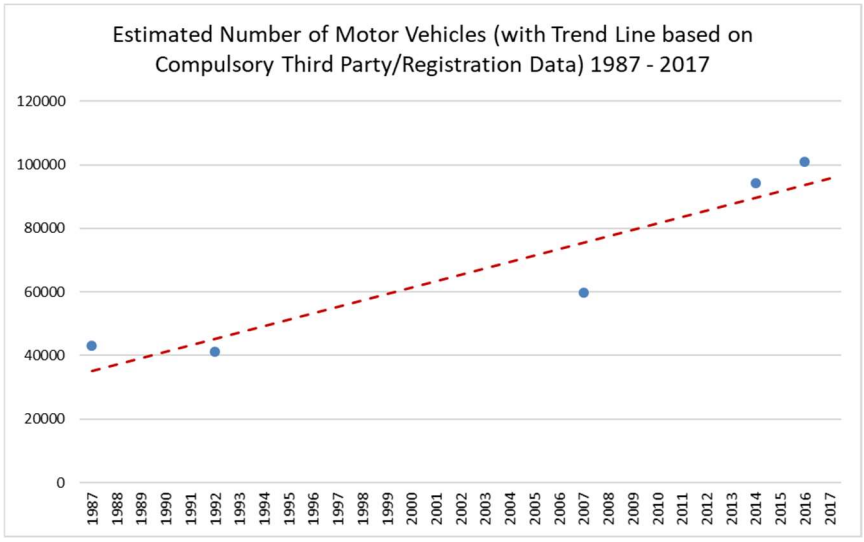


Figure 2.6 Estimated Number of Vehicles (Registered and/or Compulsory Third Party Insured) by Year (1987 – 2017) including Trend Line

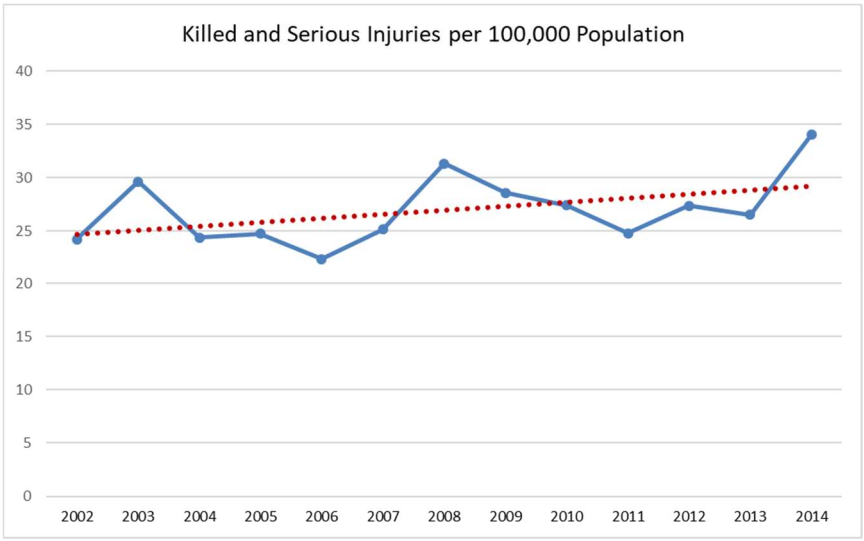


Figure 2.7 Fatal and Serious Casualty Risk (2002 – 2014) including Trend Line

2.2 2010-2014 Crash and Casualty Numbers

The annual average number of reported crashes and casualties by severity for 2010-2014 for PNG are shown in Table 2.1. (Summation of columns may not add up to the total due to rounding errors and/or unknown severity crashes/casualties not being shown.)

Table 2.1 Annual Average (2010-2014) Crash and Casualty Data (PNG)

Severity	Annual Average Crashes		Annual Average Casualties		Casualties per Crash
	Av. No.	%	Av. No.	%	
Fatal	249	21	307	10	-
Serious	641	55	1837	57	-
Minor	271	23	1043	33	-
Total Injury	1161	100	3198	100	2.8
Damage Only	1350				
TOTAL	2512				

There was a total of 12,558 reported crashes in PNG during the five-year period between 2010 to 2014, resulting in 15,992 known deaths and/or injuries. In terms of injury crashes (i.e. excluding damage only crashes), on average, 2.8 people were killed or injured in each crash. Whilst the vast majority (60%) of fatal and casualty crashes involved only a single death or injury, there were 44 reported instances where 20 or more people were injured and/or killed in each of the crashes over this five-year period.

Overall, for each reported/recorded death, there were six serious injuries reported to occur. It is noted and acknowledged that this is much lower than the ratio of 10 serious injuries per road death used by the International Road Assessment (iRAP) methodology[12].

Of interest to note is the higher number of serious crashes and casualties when compared to minor crashes and casualties. Elsewhere in developed countries, there are a greater number of minor crashes/casualties than serious – which may either reflect under-reporting of minor crashes (see Figure 2.1), an unclear definition/understanding of what constitutes a serious injury by the reporting Police and/or that crashes in PNG typically result in more serious injuries than minor injuries due to, for instance, poor 'in-crash' safety elements such as a lack of seat belt wearing, passengers sitting in the rear tray of a ute, or the lack of effective road safety barriers.

[12] McMahon K and Dahdah S. The True Cost of Road Crashes: Valuing life and the cost of a serious injury. iRAP. 2008

2.3 Medium Term Development Plan (MTDP) 3 and draft Medium Term Transport Plan (MTTP) 2 Measures

The following data is provided for a range of indicators contained in national and sectoral planning documents based on a five-year average for the 2010-2014 period:

MTDP 3:

- Number of road transport fatalities[13]: 307

Draft MTTP 2:

- Number of fatal crashes: 249
- Number of fatalities: 307
- Number of fatal crashes per 100,000 population[14]: 3.3
- Number of fatalities per 100,000 population[14]: 4.0

2.4 Estimated Fatal Crashes

The World Health Organisation (WHO) Global Status Report on Road Safety (2018) estimates the annual number of road deaths in PNG to be in the order of 1145 (based on a 95th percentile confidence interval of a range of 991 to 1298 deaths). Using the previously indicated iRAP expected ratio of 10 serious injuries for every fatality, this equates to 11,450 serious injuries per year.

The above compares with the average annual reported record between 2010 and 2014 of 307 deaths and 1,837 serious injuries.

2.5 Socio-Economic Cost

Based on the above reported annual casualty data for an average of 2010-2014 for fatalities (307/year) and serious injuries (1,837/year) as well as the 2014 GDP/capita economic cost values contained in Section 1.5, the estimated annual economic cost to PNG of:

- road deaths is K511,000 x 307 deaths = K156,877,000; and
- serious injuries as a result of a road crash is K127,750 x 1,837 serious injuries = K234,676,750.

Combined, the annual economic cost of road deaths and serious injuries to PNG (based on 2014 GDP/capita values) is K391,553,750. (Using 2018 values for the estimated GDP/capita, this amount increases to K545,000,000 i.e. over half a billion kina). This amounts to just under 1% of the national GDP.

Due to the level of under-reporting of crashes in PNG, further calculations using the estimated fatalities and serious injuries shown in Section 2.3 in 2014 prices indicate that the above economic cost of road deaths and serious injuries increases to over K2billion/year (K2.85billion in 2018 prices) and approximately 3.5% of the national GDP.

[13] MTDP 3 actually refers to 'casualties' in error rather than 'fatalities'

[14] Based on estimated 2012 population of 7,631,000 people obtained from World Bank data https://data.worldbank.org/country/papua-new-guinea

3. Provincial Data Overview

3.1 2010-2014 Crash and Casualty Numbers

Figures 3.1 to 3.6 provide a breakdown of road safety performance by Province[15] for 2010 to 2014 whilst Appendix B provides a detailed breakdown by crash severity as well as reported numbers by year by severity.

As shown in Figures 3.1, the NCD had the greatest annual average number of road crashes for each of the severity classes. However, as indicated in Figure 3.2, the highest number of road deaths occurred in Western Highlands Province with the greatest number of casualties occurring in Eastern Highlands Province, due in part to the large number of seriously injured casualties compared to other provinces.

Figure 3.3 allows a like for like comparison based on deaths per 100,000[16] population for each Province to indicate levels of risk. As indicated in Figures 3.3 and 3.4, when the number of road deaths in each Province is compared with deaths per 100,000, some provinces with a lower number of reported deaths, such as Central, have a relatively high level of risk in terms of population size.

In order to compare the relative risk of death in a road crash across Provinces, a Fatality Index has been calculated[17] - see Figure 3.5. The Fatality Index provides a guide with respect to how many people die as a result of an accident compared to those that are simply injured. The Fatality Index of most developed nations is in the order to 1% to 2% whereas for PNG, it's 10% based on current reported accidents/casualties. In some Provinces such as West New Britain and Sundaun however (discounting those Provinces with extremely low numbers of reported fatal crashes and crashes in general such as Bougainville), the Fatality Index exceeds 20%.

It should be noted that the Fatality Index is highly dependent upon accurate accident reporting – with high levels of under-reporting, particularly of less serious crashes, causing the Fatality Index value to increase. It is also influenced by other factors such as the number and quality of medical facilities[18] as prompt medical treatment, for instance at the scene of the crash, can help stabilise an injured person's condition and therefore minimise the chance of the person dying – and hence reduce the Fatality Index. In addition, the Fatality Index can be influenced by the nature of accidents and the high probability of fatal accidents as occurs with passengers travelling in the back of utility vehicles or heavy vehicles with limited protection for occupants – such that when an accident occurs, there is a high probability of the occupants being ejected from the vehicle and being killed.

[15] Due to the crash database being established prior to Jiwaka and Hela being becoming their own Provinces, the crash and casualty data for these two Provinces are included within the data for Western Highlands and Southern Highlands Provinces respectively.
[16] Population data obtained from 2011 Census data.
[17] Fatality Index values calculated by dividing the number of fatalities by the total number of casualties (including fatals) – and expressing the result as a percentage.
[18] ADB Guidelines for Road Safety in Asia and Pacific Region. Undated.

Figure 3.6 indicates the level of Police attendence/non-attendance at crashes (all severity) by Province. In theory, Police attendance at accidents should help improve the quality of the data as a detailed investigation can be carried out. It is highly unlikely that drivers reporting an accident at the Police Station will implicate themself as being at fault or having a defective vehicle. Whilst there may be many reasons why the Police cannot attend the scene of a crash, such as unawareness or logistics etc, the Police should be encouraged where possible to attend as many accidents as possible in order to try and improve the accident information being collected.

In addition to the above, Appendix C also contains lists of the most hazardous roads (in terms of reported crash numbers) in each Province.

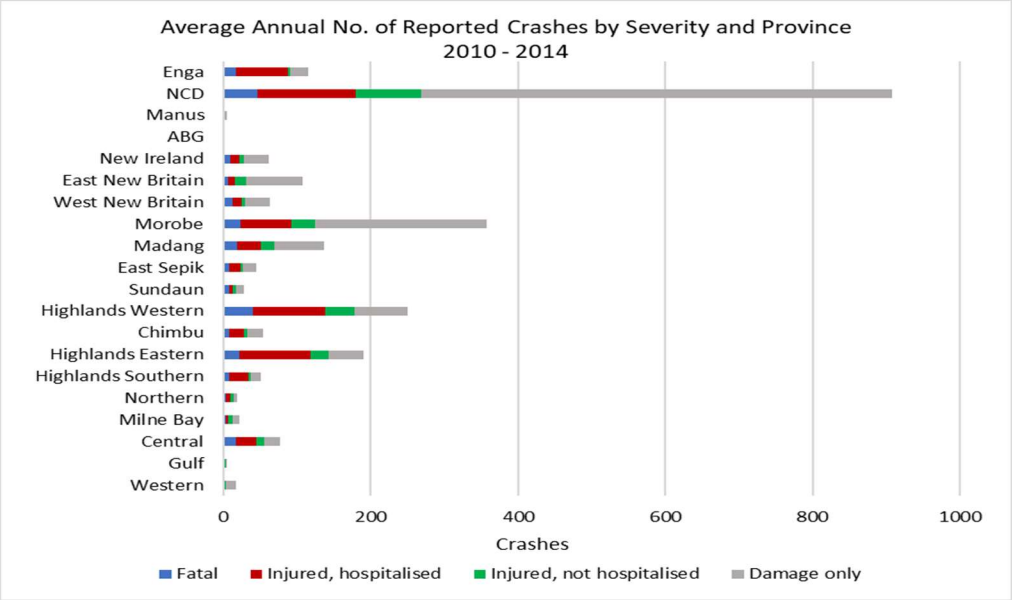


Figure 3.1 Average Annual Crash Severity by Province (2010-2014)

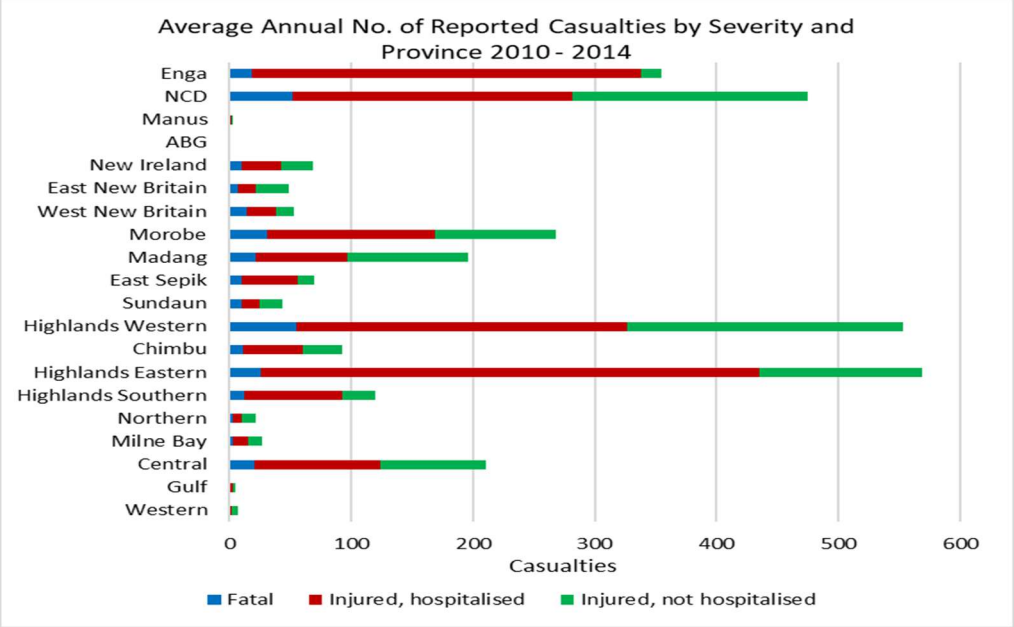


Figure 3.2 Average Annual Casualty Severity by Province (2010-2014)

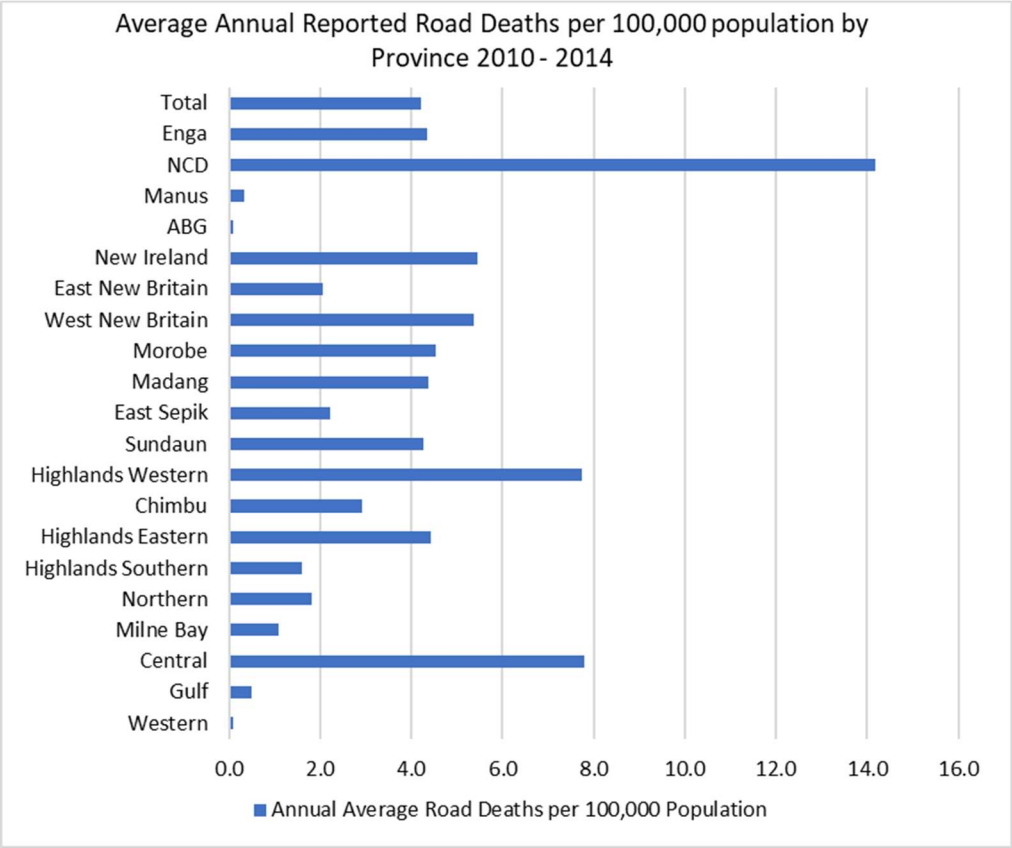


Figure 3.3 Average Annual Road Deaths per 100,000 population by Province

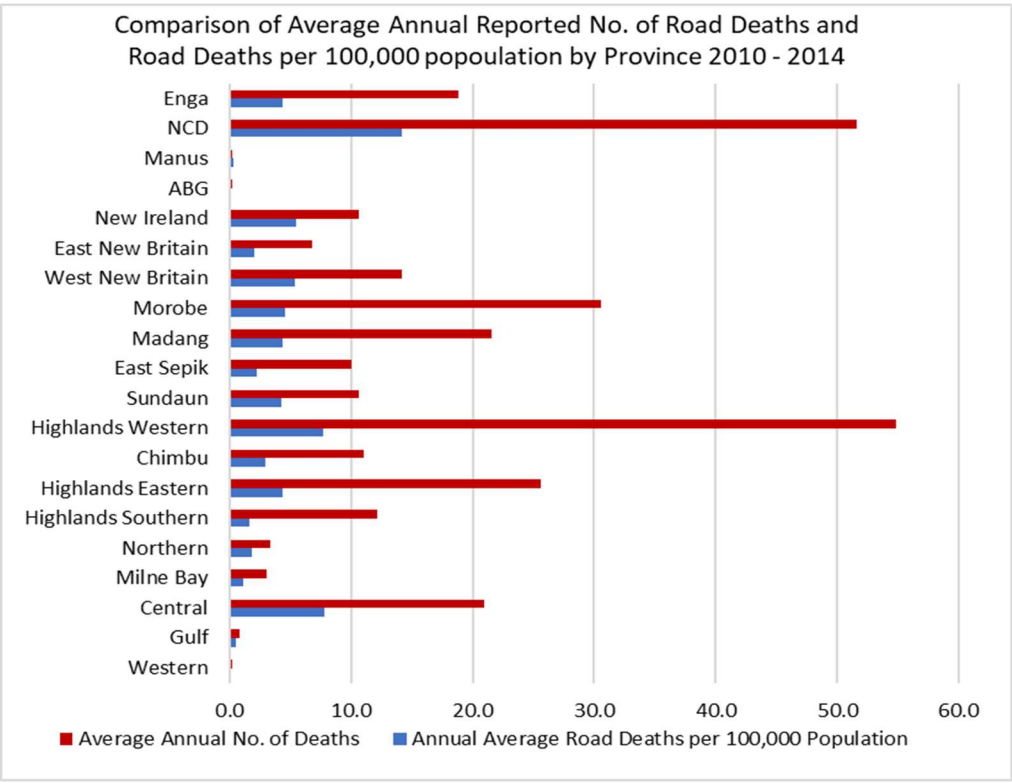


Figure 3.4 Comparison of Average Annual Road Deaths and Death Risk

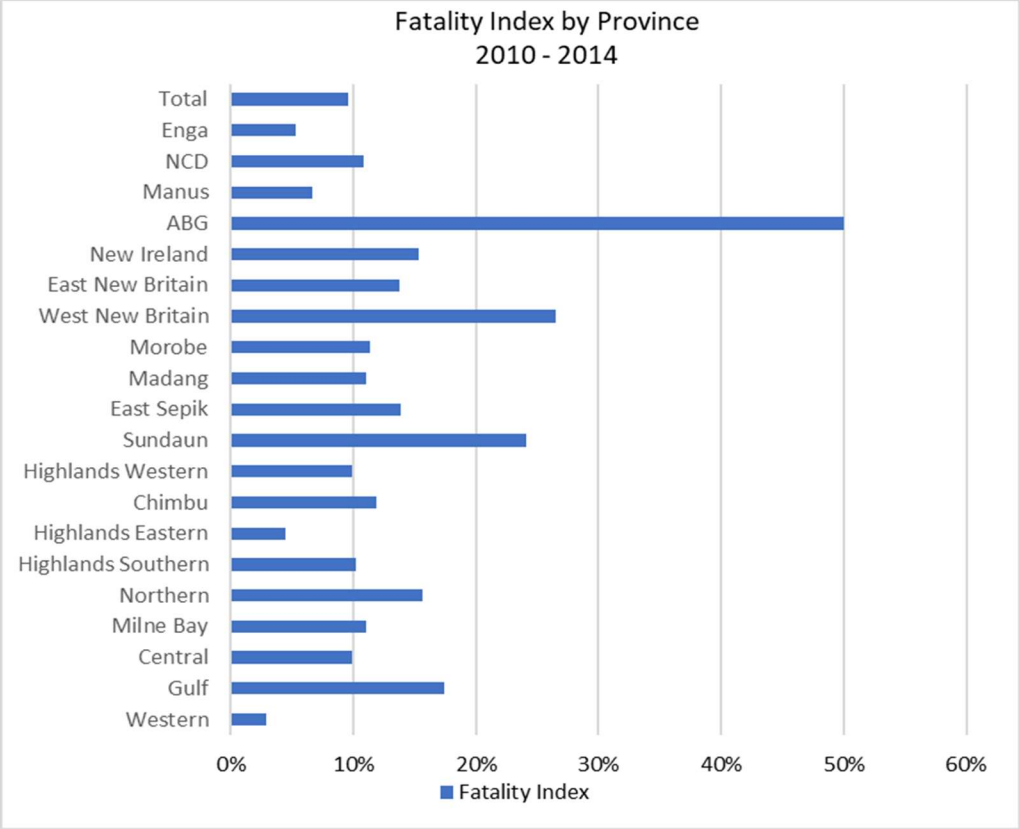


Figure 3.5 Percentage of Road Deaths per Total Reported Casualties

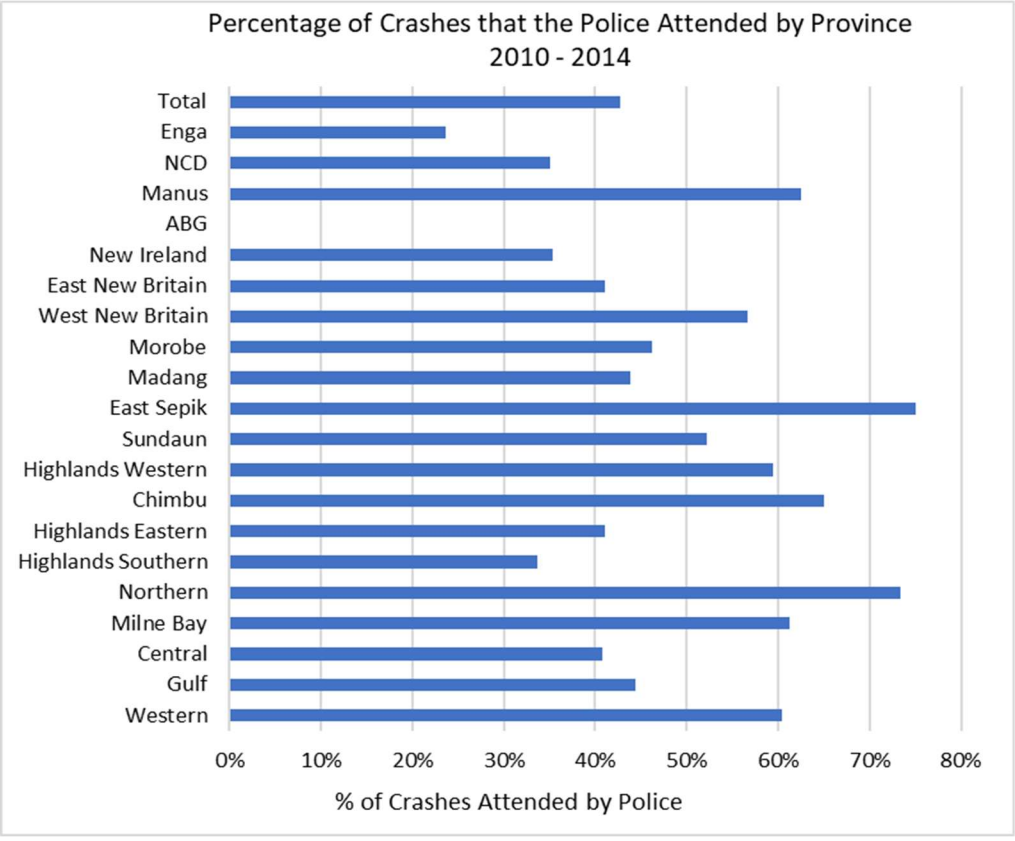


Figure 3.6 Police Attendance at All Crashes (fatal, injury and damage only)

3.2 Base Line Data and Monitoring for MTTP and MTDP

As indicated in Section 1.2, one of the purposes of this Data Report is to assist with annual reporting against various strategic planning documents such as the Medium Term Transport Plan (MTTP) 2014-2018 (and any future update) and the Medium Term Development Plan (MTDP) III (2018-2022).

Specifically, the MTDP III has a performance measure/indicator of the number of road transport casualties, with a 2016 baseline indicator of an average of 276 casualties shown and a target of 150 casualties by 2022. As highlighted previously, it is assumed that 'casualties' should actually refer to 'fatalities' given the average annual number of casualties recorded.

As part of the above, it is noted that a baseline figure for the 5-year average of 2010-2014 is 307 reported fatalities per year (as shown in Table 2.1).

In addition to the MTDP III indicator, the MTTP 2014-2018 contains the following key outcome performance indicators and targets for road safety:

- Reported and estimated fatal crashes and fatalities per 10,000 vehicles per year – with baseline figures of 50 and 150 and a 2025 target of 20 and 15 (presumed to be 25) respectively shown.
- Reported and estimated fatal crashes and fatalities per 100,000 population per year – with baseline figures of 5 and 15 and a 2025 target of 9 and 11 respectively shown.

It is unclear whether the baseline and target values given for the above indicators are actually fatal crashes or fatalities (noting Section 1.4). It is presumed that the higher values shown are the estimated values given the known high level of under-reporting. It is also of interest to note that future targets of reported (but not estimated) fatal crashes/fatalities increase compared to the baseline. It is unclear if this is intended to reflect the potential for an increase in crashes as a result of the increased population or any desired improved reporting rates.

As such, using the above reported and estimated fatality risk in terms of population as an indicator, a baseline figure for the 5 year average of 2010-2014 is 4.2 reported fatalities per 100,000 population per year (based on 2011 census data) or 3.4 reported fatal crashes per 100,000 population per year (based on 2011 census data). In terms of estimated fatalities, the recent WHO report indicates 14.2 estimated fatalities per 100,000 population per year (decreasing from the previous 2015 WHO report of 16.8 estimated fatalities per 100,000 population per year).

In addition, as indicated in Section 2.1, vehicle registration data is difficult to accurately obtain due to the current provincial systems currently in place, and as such cannot be easily measured. Accordingly, no baseline is provided – although it is noted that using the limited vehicle data available, a rate of 33 reported fatalities per 10,000 vehicles per year and 121 estimated fatalities per 10,000 vehicles per year can be calculated, whilst acknowledging the issues associated with the base registration vehicle data.

4. Crash Date, Time and Location

Figures 4.1 and 4.2 show reported crash numbers (broken down by severity) by the day of the week and the month of year respectively. Whilst no particular trend exists throughout the year in terms of monthly crash numbers, it is clear that crash numbers increase on Friday and Saturday. Unfortunately, little traffic flow data exists to better understand the risk of travelling on either a Friday or Saturday compared to other days of the week. However, as shown in Figure 4.3, both Friday and Saturday have a higher number of crashes occurring outside of daytime hours (i.e. at night-time, dawn or dusk) compared with any other day of the week. Overall, 74% of fatal and injury crashes occur during hours of daylight, 3 % at dawn/dusk and 23% at night. Figure 4.4 shows crash times by time of day and indicates most casualty crashes occur during the evening peak period.

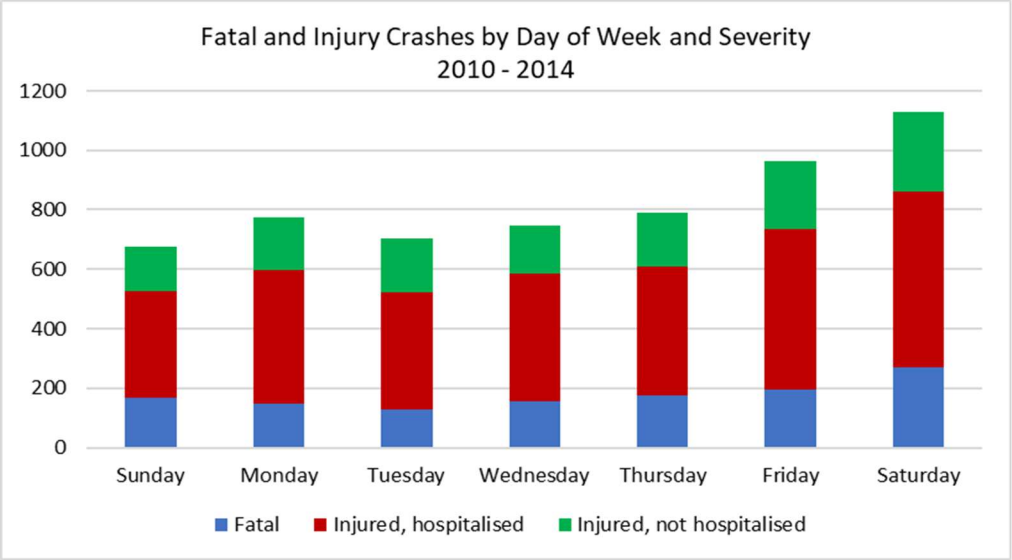


Figure 4.1 Crash Severity by Day of Week

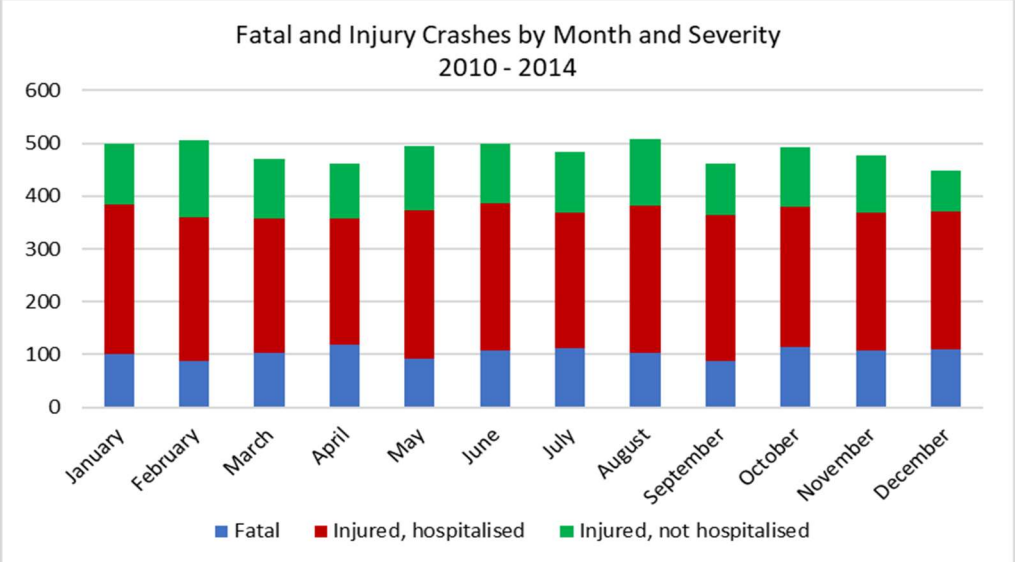


Figure 4.2 Crash Severity by Month

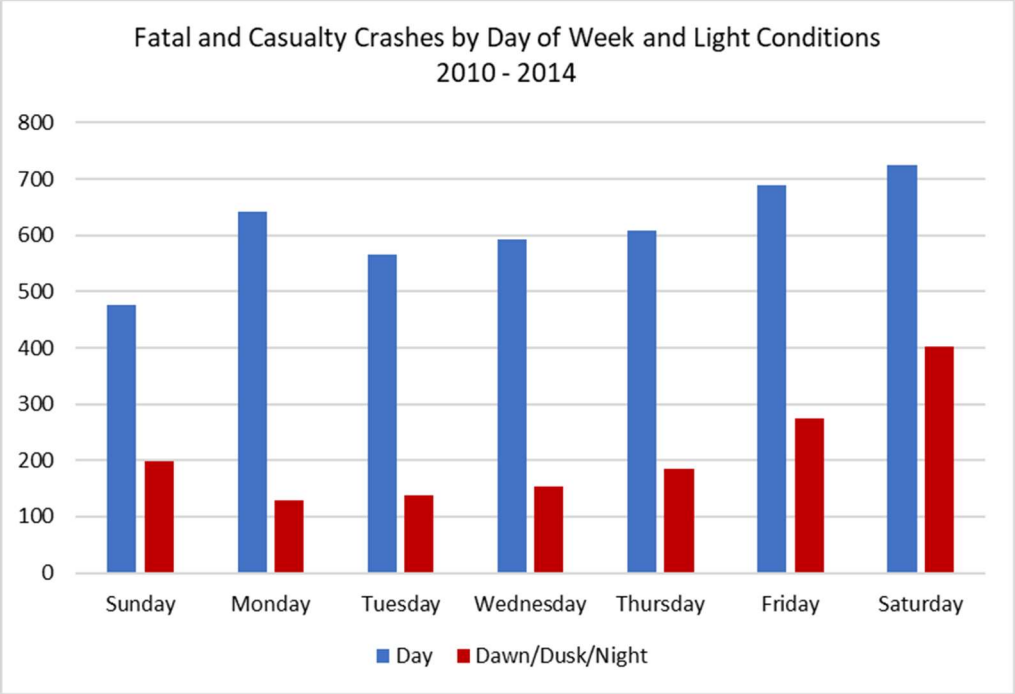


Figure 4.3 Daily Crashes by Light Condition

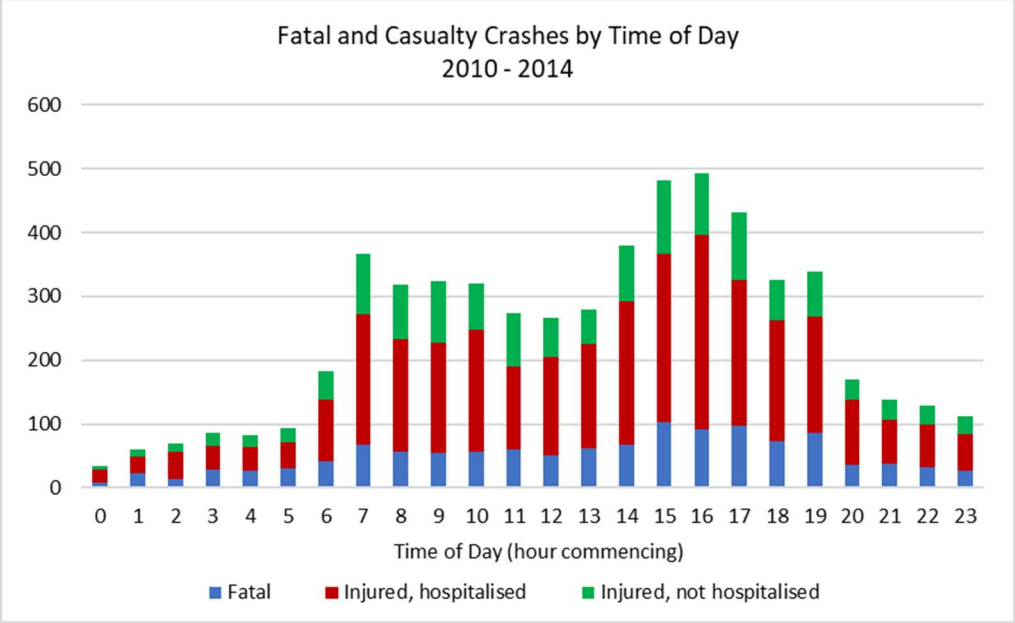


Figure 4.4 Crash Severity by Time of Day

4.1 Urban/Rural Split

Crash and casualty data have been split down by urban (city) and rural areas, as shown in Figures 4.5 and 4.6. For the purposes of this analysis, it is assumed that an urban area has a 60km/h speed limit and rural areas typically have a 75km/h (recently changed to 100km/h as part of the Road User Rule 2017) speed limit - regardless of actual operating speeds.

Rural areas have a higher number of both fatal and serious injury crashes (Figure 4.5) along with a much higher number of fatalities and casualties (regardless of the severity) – Figure 4.6. This may well be due to higher operating speeds in rural areas compared to urban areas where a higher proportion of crashes result in damage only.

It should also be noted that whilst only 13%[19] of PNGs population live in urban areas, the proportion of crashes (48% of casualty crashes and 64% of all crashes including damage only) and casualties (34%) occurring in such areas is much greater. This can be attributed to the higher number of motor vehicles in urban areas compared to rural locations and hence an increase in the associated exposure to risk.

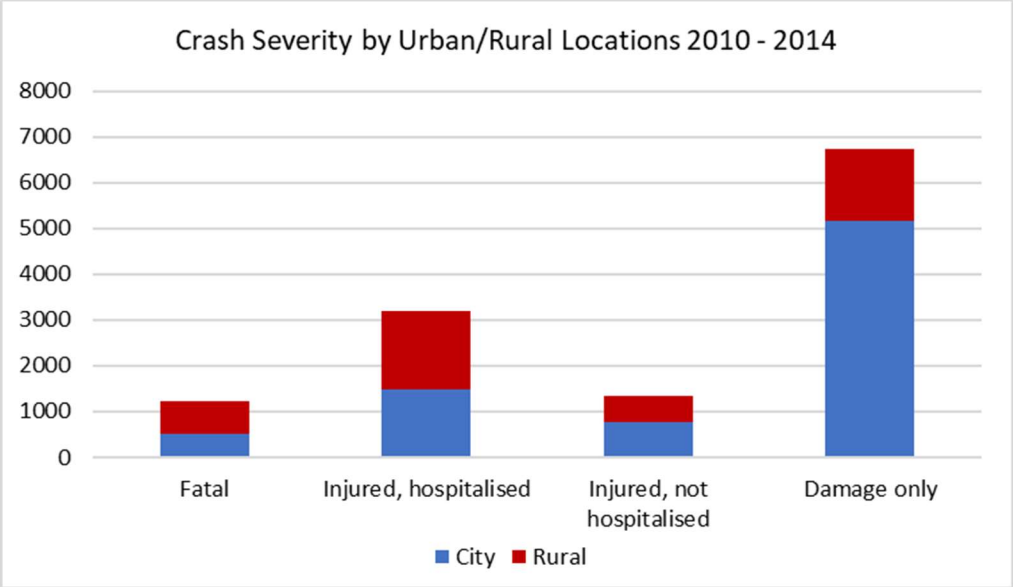


Figure 4.5 Crash Severity by Location

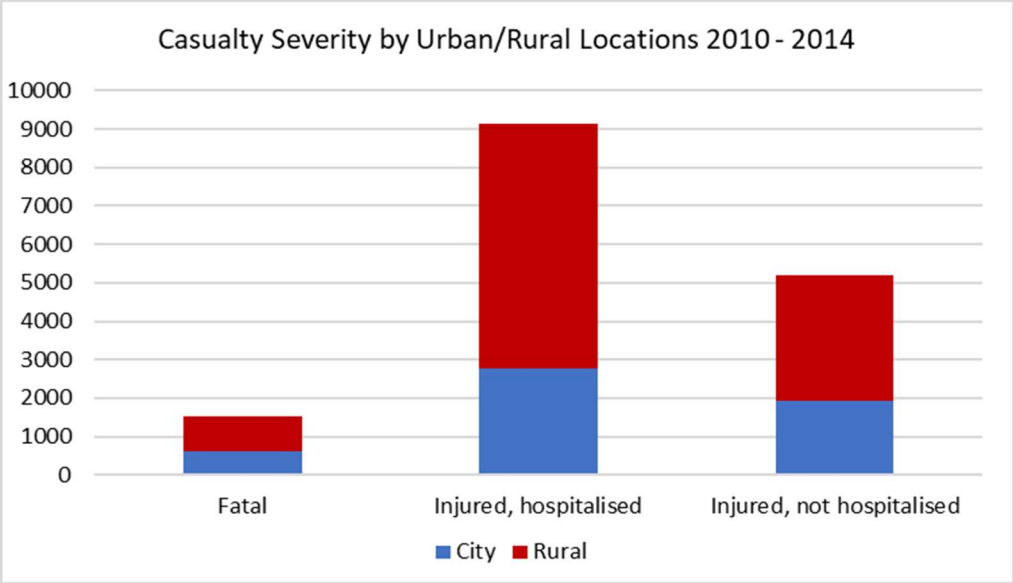


Figure 4.6 Casualty Severity by Location

[19] https://www.macrotrends.net/countries/PNG/papua-new-guinea/urban-population

5. Crash Types

Figure 5.1 sets out the number of fatal and casualty crashes by the reported type of collision for both urban and rural roads. (It is noted that care should be taken with respect to the accuracy of some of this data in terms of the Police Officer's stated collision type.) In both urban and rural areas, the most common crash type involved collisions with pedestrians, whilst (single vehicle) overturned and/or run-off road (hit object off road) crashes are also common types of crashes on rural roads.

Almost 80% of all reported fatal and casualty crashes are noted as involving only one vehicle.

It should be noted however that whilst pedestrian collisions are the most common crash type (and involved the highest number of fatalities), 'overturn' types of crashes resulted in the highest number of casualties – see Figure 5.2. Indeed, whilst 15% of crashes were 'overturn' type collisions, they resulted in 27% of the total fatalities and casualties. This compares with pedestrian collisions which made up 40% of crash types but 19% of all casualties. Collisions involving a vehicle over-turning typically involved utility vehicles/utes (pick-ups) – 35% of all vehicles involved in such a collision type, followed by trucks (24%) and buses (19%).

Figure 5.3 also presents a breakdown of crash type by road geometry. Whilst most crashes (60%) are reported to occur on 'straight and flat' sections of road, unsurprisingly, this overall percentage reduces for overturned (35%) and run-off road hitting an object (32%) type of crashes, with such crashes typically occurring on curved roads.

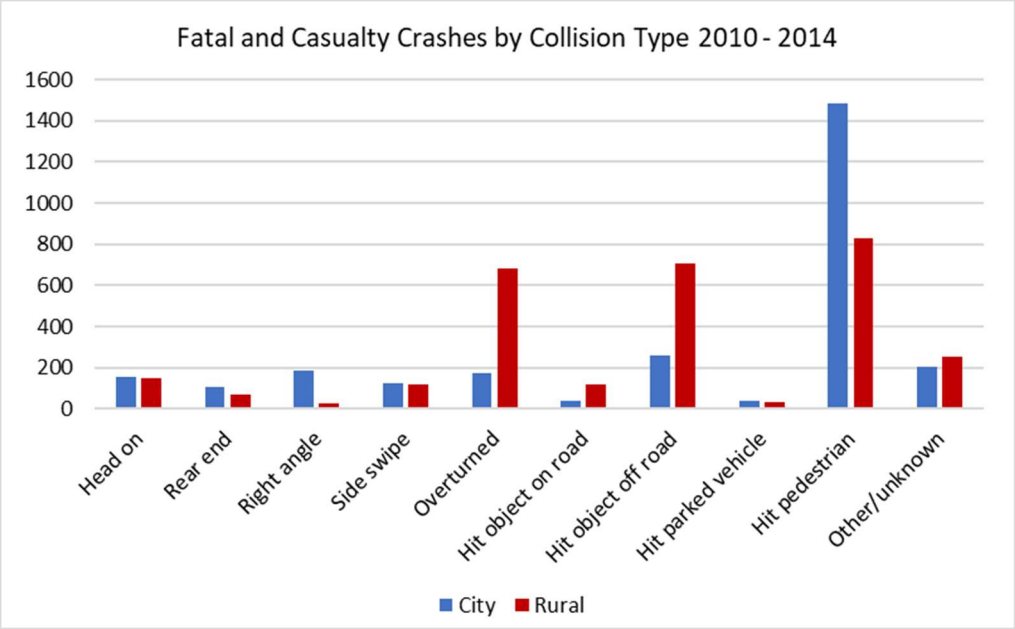


Figure 5.1 Fatal and Casualty Crash Types by Location

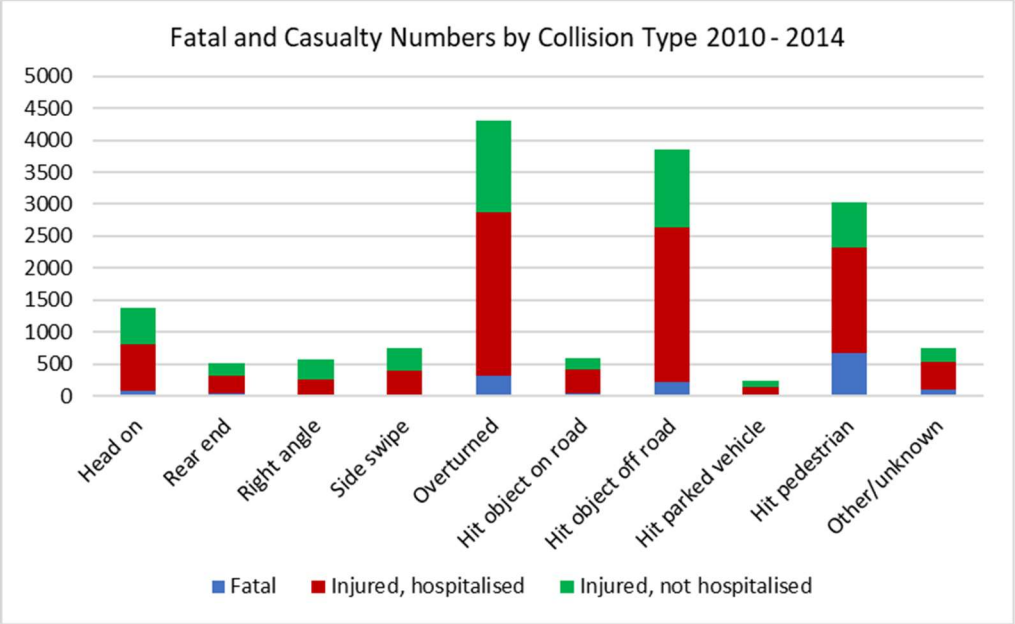


Figure 5.2 Casualty Severity by Collision Type

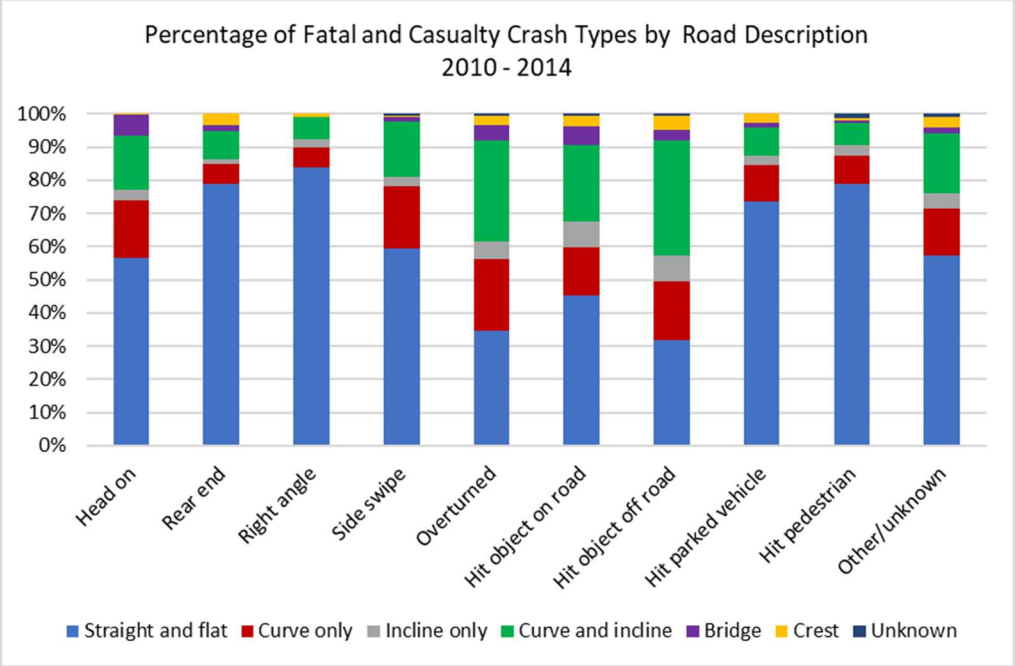


Figure 5.3 Fatal and Casualty Crashes by Collision Type and Road Geometry

6. Road User Factors

Figure 6.1 shows the percentage split in the types of fatal and injured road user casualties whilst Figure 6.2 shows the number of fatal and injured casualties by type of vehicle involved. Vehicle passengers on a bus (24%) or in the back of a truck or utility vehicle (31%) make up more than half of all killed and injured road users. Simply in terms of vehicle type, occupants of buses (drivers and passengers in the rear) made up the highest number of fatalities and casualties compared to occupants of other vehicles. It is assumed that this relates to the higher number of people typically carried by a bus compared to other types of vehicle even though the overall number of buses is less than the number of utility/pick-up vehicles involved fatal and injury crashes.

Figures 6.3 and 6.4 show similar information to that contained in Figures 6.1 and 6.2 except the data relates to fatal casualties only. As indicated, the proportion of pedestrians killed increases compared to those 'killed and injured' (from 17% to 43%), reflecting the vulnerability of such road users. Twenty four percent of pedestrians injured in a road crash die as a result of the collision. Similarly, whilst cyclists form only a very small proportion of total casualties, of those that do get injured, over a quarter of them die as a result of the conflict. This compares with 10% of all injured casualties (regardless of their type or class) dying.

The age and gender of fatal and injured road user casualties are shown in Figure 6.5 whilst the details for fatal casualties only are shown in Figure 6.6. Approximately 70% of all road user casualties are male, with the majority of casualties (58%) being road users aged between 21 and 40 years of age regardless of gender. This age range tends to be one of the most productive from an economic perspective in terms of such road users forming the majority of the workforce. Whilst acknowledging that the overall number of injured female road users is relatively small, it is noted that 30% of all female road deaths involve children aged 15 years or younger (this compares to 18% for males. Overall, 21% of all road deaths involved children aged 15 years or younger – over 70% of which were pedestrians.

Figures 6.7 to 6.11 provide the details of those drivers involved in a crash. It should be noted that the information relates to all drivers involved in a crash – rather than for instance just the driver deemed at fault.

As shown in Figure 6.7, 98% of drivers involved in a fatal or injury crash are male (i.e. 2% are female). Care should be taken however with simply suggesting females are safer drivers than men, as observations would suggest that the vast majority of drivers are male. As such, gender issues associated driver involvement in crashes needs to be carefully considered in terms of exposure to risk – i.e. if, for instance, 99% of all drivers are typically male, then their 99% involvement in crashes is perhaps unsurprising. Unfortunately, general surveys of driver gender have not yet been carried out to date to help to better understand this risk.

Figures 6.8 and 6.9 show the number and percentage of drivers reported by the police as having committed a driver error. Of particular note is the number of drivers reported as not having committed an error – which may in turn reflect the level of non-attendance

at a crash site and/or self-reporting at a Police Station with drivers unlikely to admit their fault or blame. It is also acknowledged that the data includes those drivers that may not have been at fault – for instance in a two car collision where only 1 driver has committed an error. Research from elsewhere in the world however suggests that road users (either as a single contributory factor, or as one of multiple factors) are at fault in 95% of fatal crashes. This would suggest that the Police are perhaps currently unable to best determine driver error, perhaps as a result of the lack of attended and fully investigated crashes. Notwithstanding the above concerns, a review of driver error figures excluding those reported as being 'unknown' or 'none' indicates that speed, along with loss of control and inattention are the main driver errors reported by the police.

Figure 6.10 provides details relating to drink-driving, with police either being suspicious of a driver having been drinking or the driver testing positive in 13% of drivers involved in fatal and injury crashes (including those rated as 'unknown'). For Saturdays however, this percentage increases to 21% - see Figure 6.11 for numbers of drivers involved in crashes suspected or tested positive of drinking by day of week.

When excluding those Police Road Accident reports indicating 'unknown' with respect to drink-driving and reviewing crash severity, Figure 6.12 shows that for fatal crashes, 23% of drivers involved were suspected or tested positive for alcohol compared to 12% and 13% respectively for serious and minor severity crashes. This suggests that over a fifth of all drivers involved in fatal crashes were suspected or proven to be under the influence of alcohol.

With respect to pedestrian road user casualties, Figure 6.13 provides details concerning age and gender. Over 35% of all pedestrians killed and/or injured were aged 15 years or younger. It should be noted that whilst over a third (36%) of pedestrian fatalities and injuries (all severity) occurred in rural areas, this increases to 47% for pedestrian fatalities only. In addition, Figure 6.14 shows the actions of pedestrians when they were involved in a crash. Pedestrians crossing the road account for 36% of all pedestrian casualties. However, of particular interest is that pedestrians walking along the road, walking along the edge of the road or on a footpath account for 7%, 22% and 21% respectively of all pedestrian casualties. As such, half of all pedestrian casualties occur whilst travelling along a road rather than crossing it. In terms of such crashes, a higher proportion of pedestrian casualties in urban areas are injured on footpaths, whilst in rural areas, unsurprisingly given the lack of pedestrian facilities such as footpaths, a higher prortion of pedestrian casualties occur whilst walking along the road/at the edge of the road.

Figures 6.15 and 6.16 provide a more detailed breakdown of pedestrian casualties with respect to the time of day that they occur as well as how this breaksdown by day of the week (weekday average, Saturday and Sunday). As indicated, when considered as total pedestrian casualties, clear morning and afternoon peaks occur. When broken down by type of day, whilst clear weekday peaks occur (with child pedestrians between 0-15 years of age being significantly involved in such peaks), pedestrian casualties during the weekend are much more variable throughout the day, albeit with a noticeable increase on Saturday evenings.

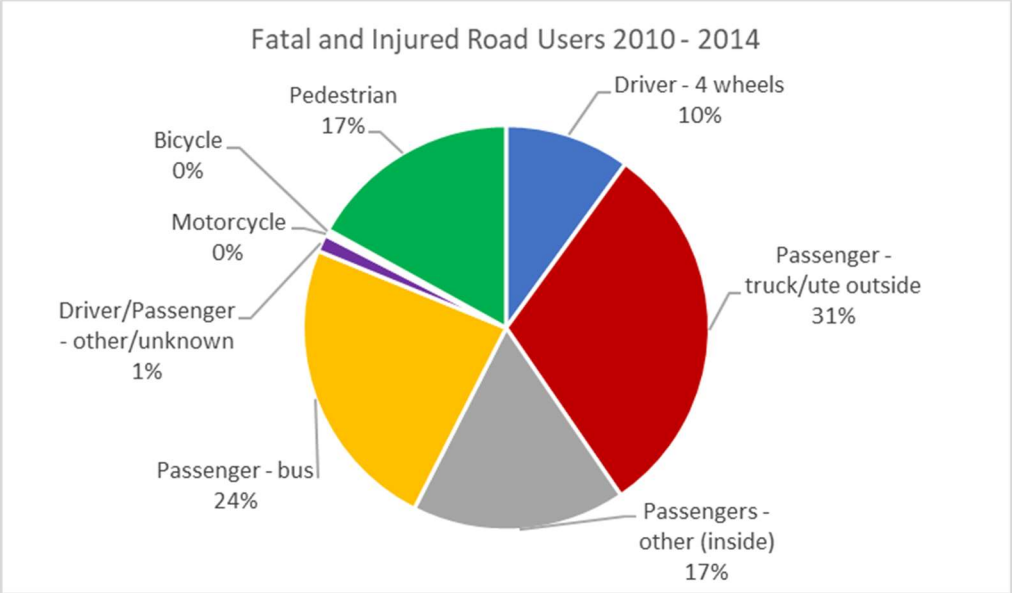


Figure 6.1 Fatal and Injured Casualty Road User Types

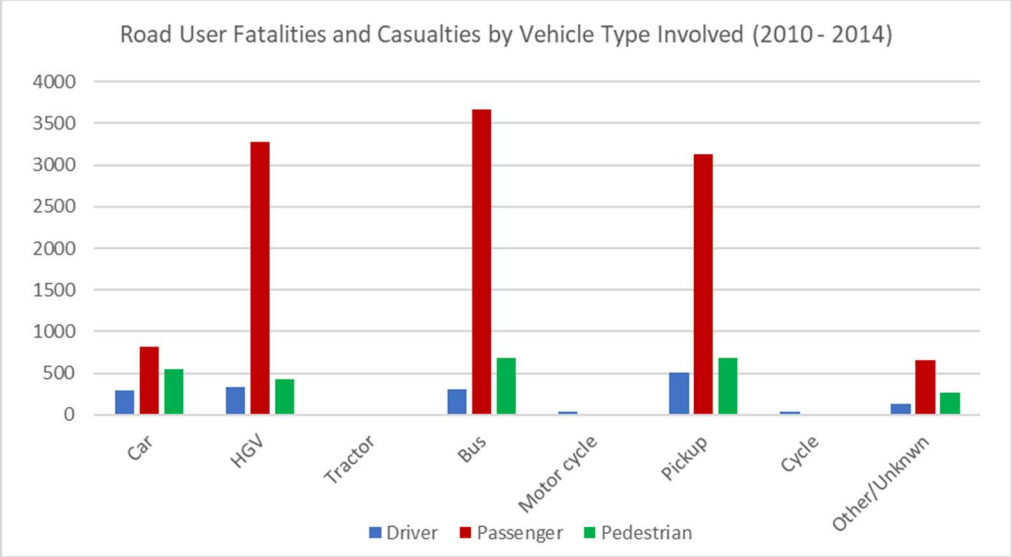


Figure 6.2 Fatal and Injured Casualties by Vehicle Type Involvement

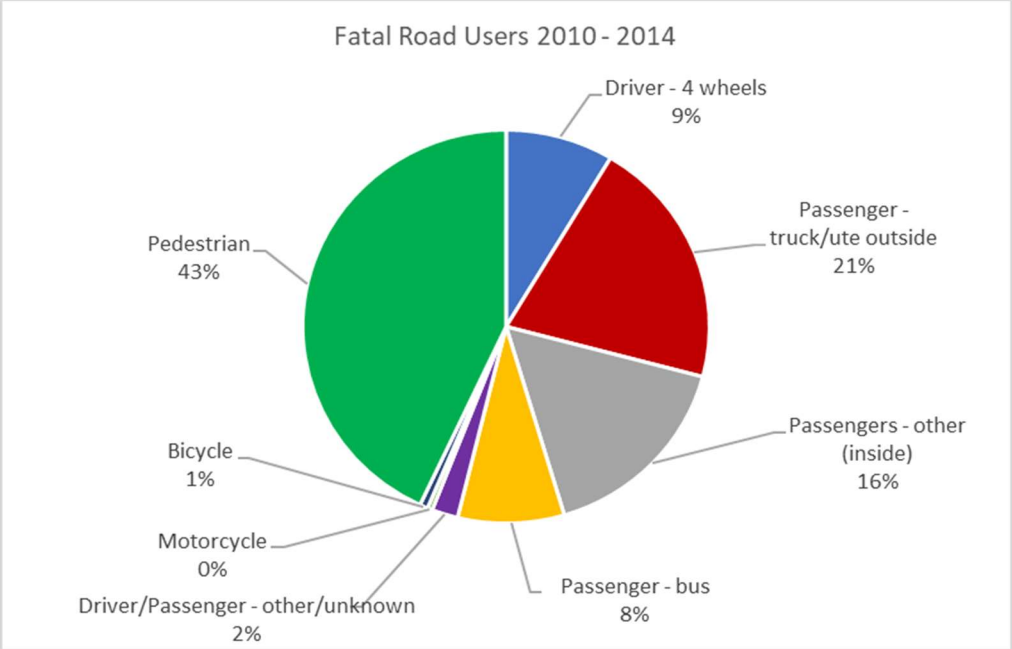


Figure 6.3 Fatally Injured Road User Types

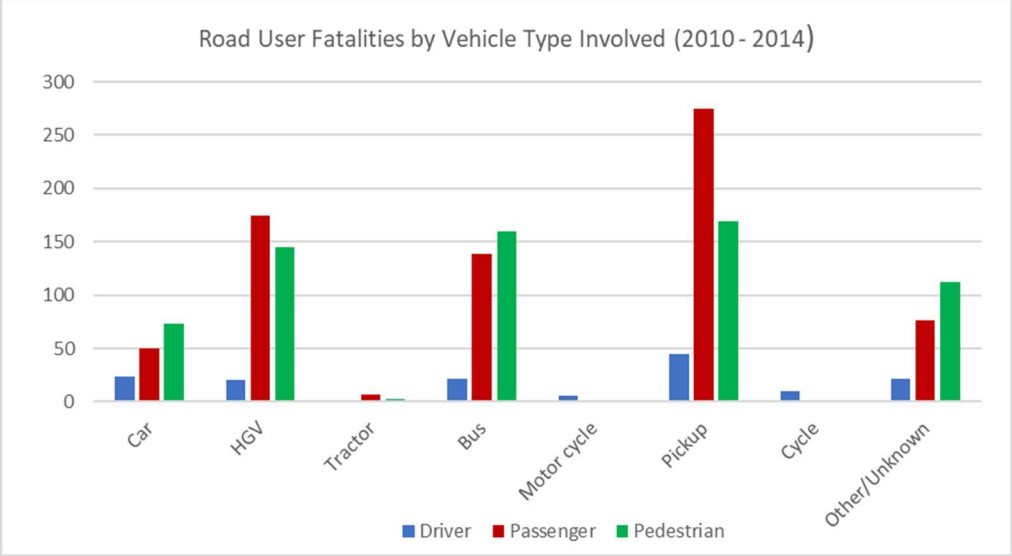


Figure 6.4 Fatal Casualties by Vehicle Type Involvment

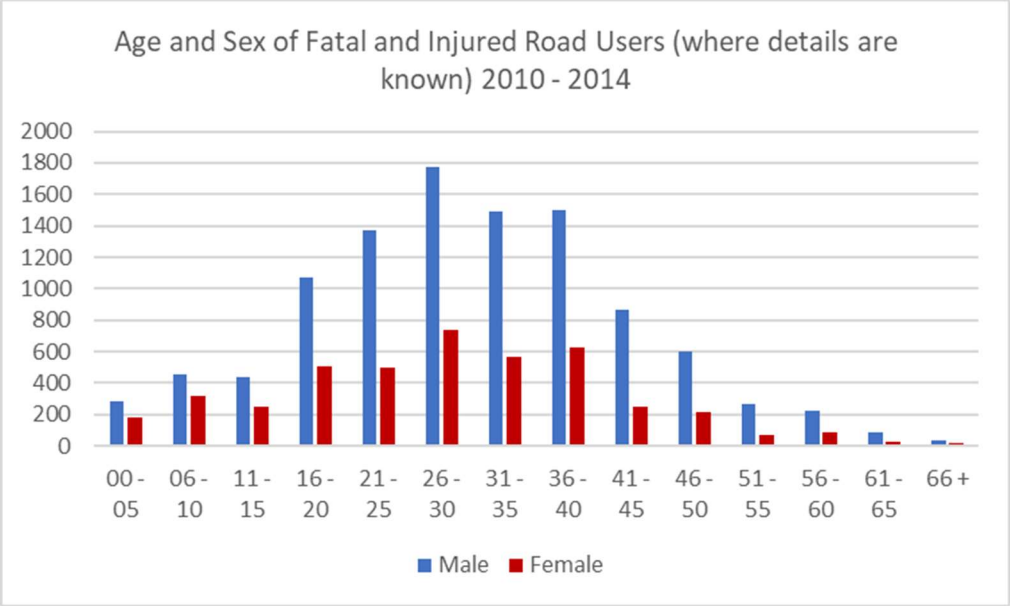


Figure 6.5 Fatal and Injured Casualties by Age and Gender

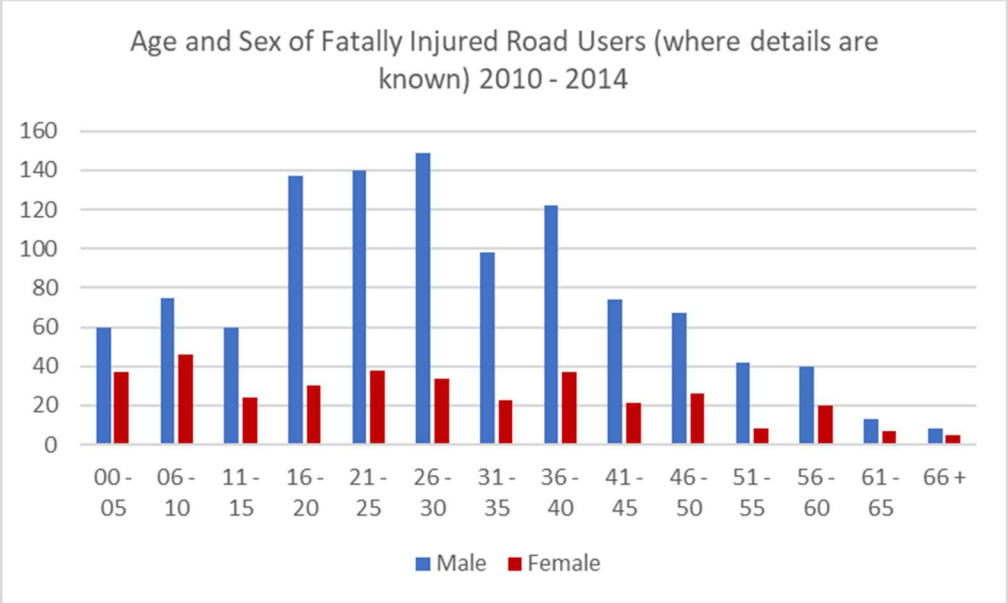


Figure 6.6 Fatal Casualties by Age and Gender

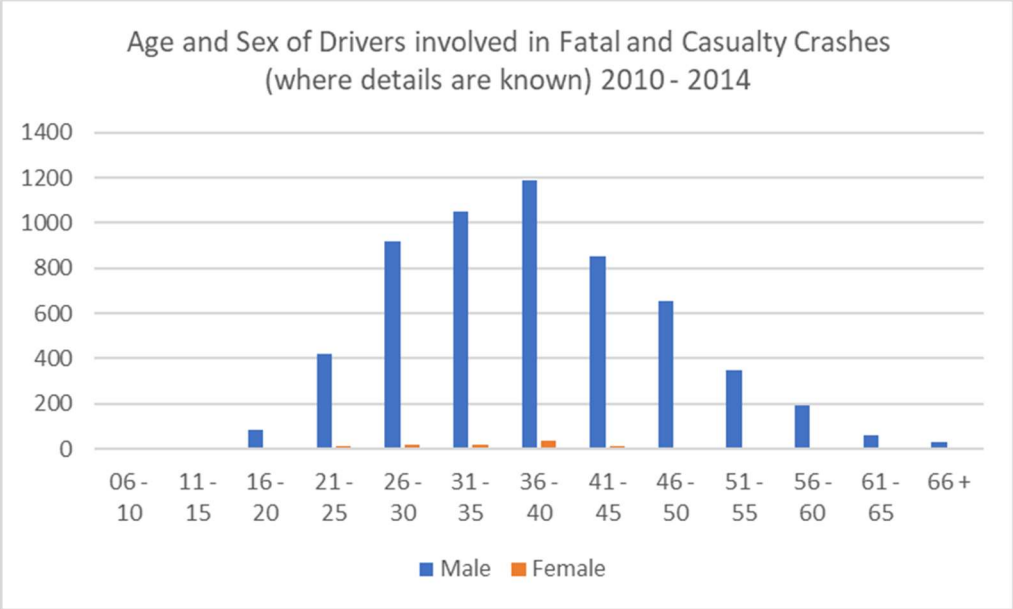


Figure 6.7 Age and Gender of Drivers involved in Fatal and Injury Crashes

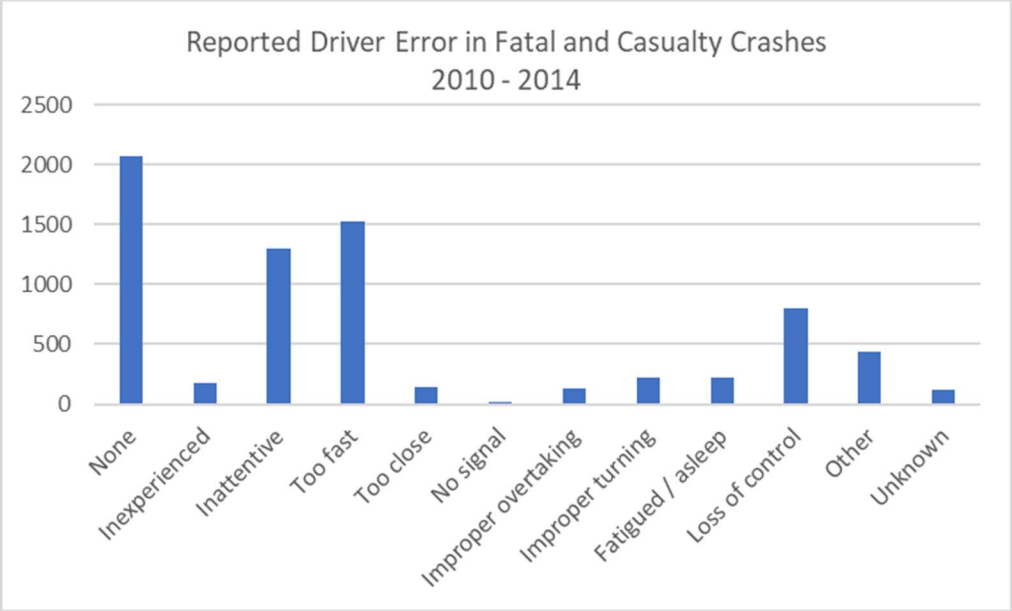


Figure 6.8 Number of Reported Driver Errors in Fatal and Injury Crashes

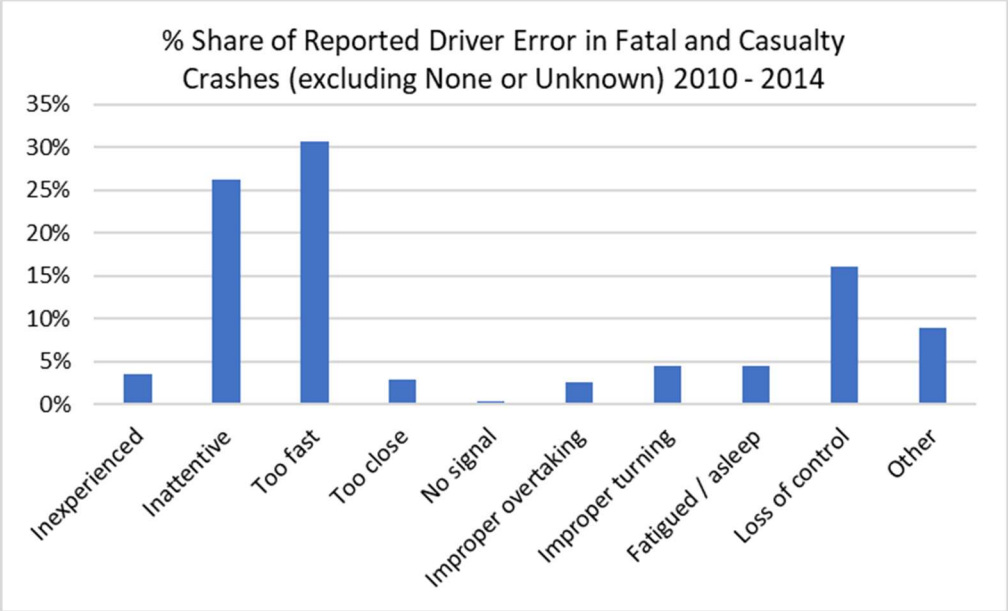


Figure 6.9 Percentage of Types of Reported Driver Error (excluding none/ unknown)

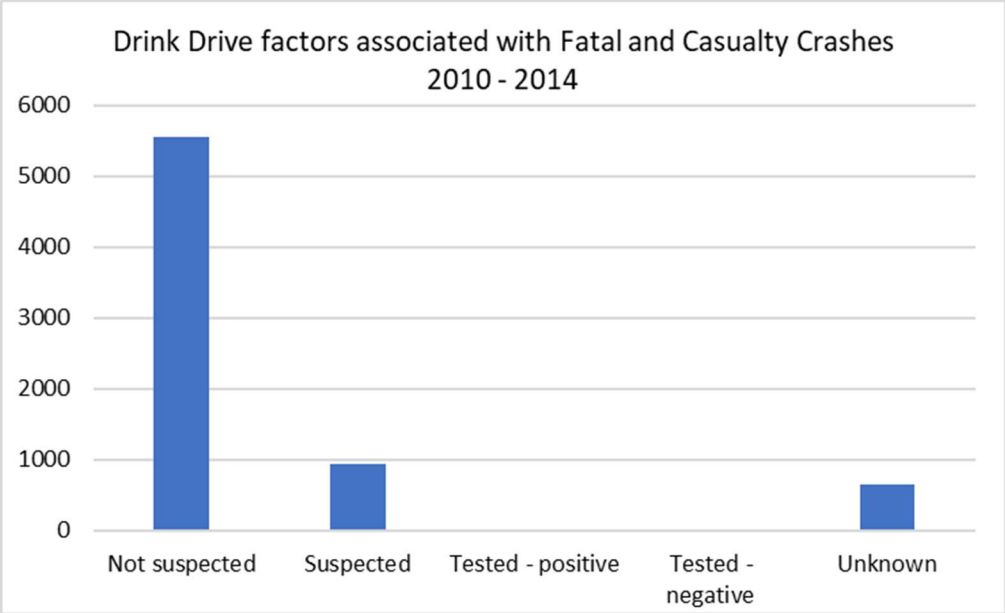


Figure 6.10 Number of Drivers involved in Fatal and Injury Crashes by Reported Drink-Driving Factor

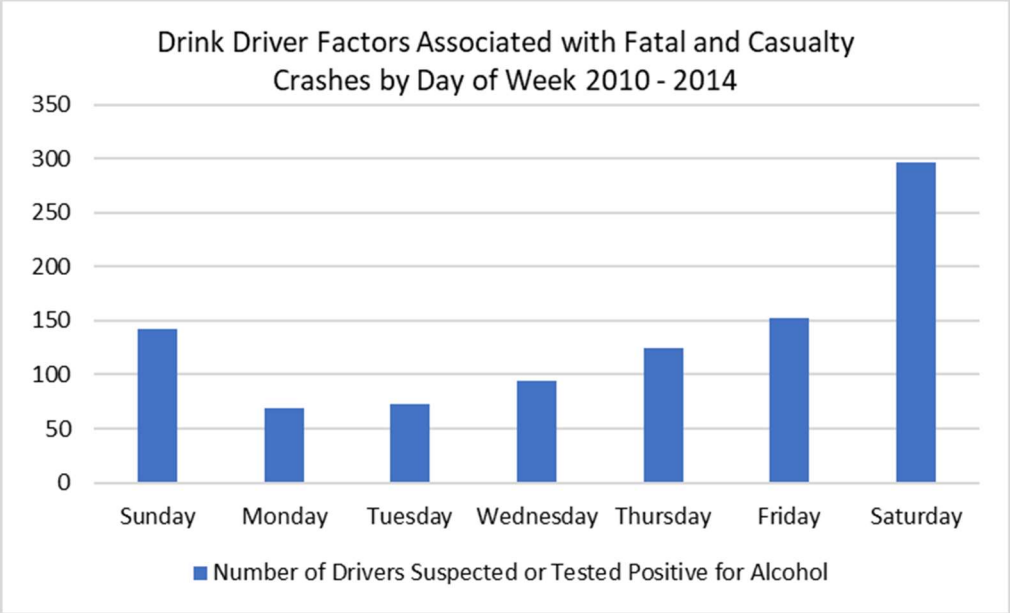


Figure 6.11 Number of Drivers Suspected of and/or Tested Positive for Drink Driving involved in Fatal and Injury Crashes

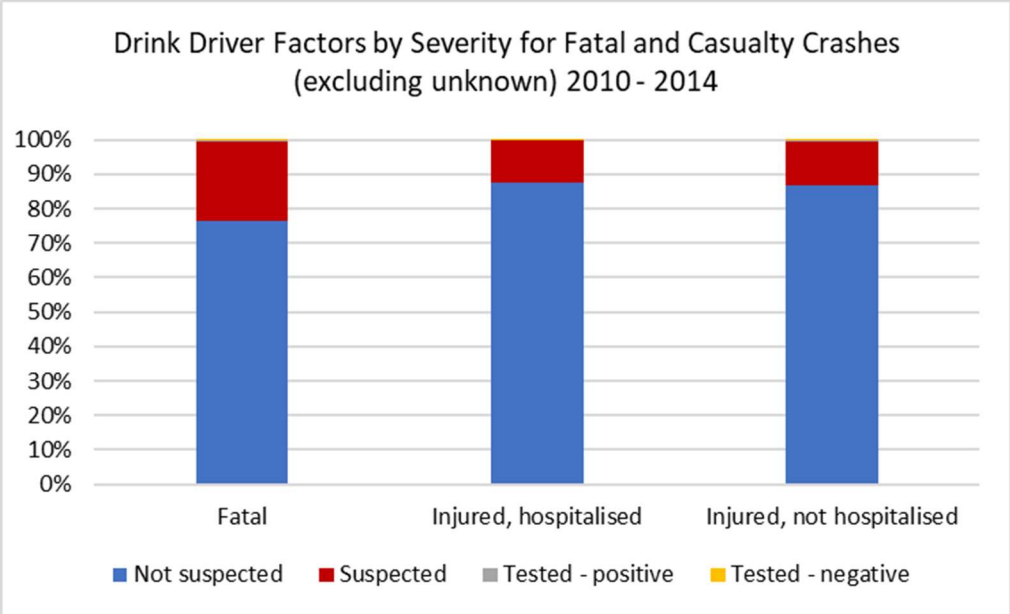


Figure 6.12 Percentage of Drivers involved in Fatal and Injury Crashes by Drink-Drive Factor

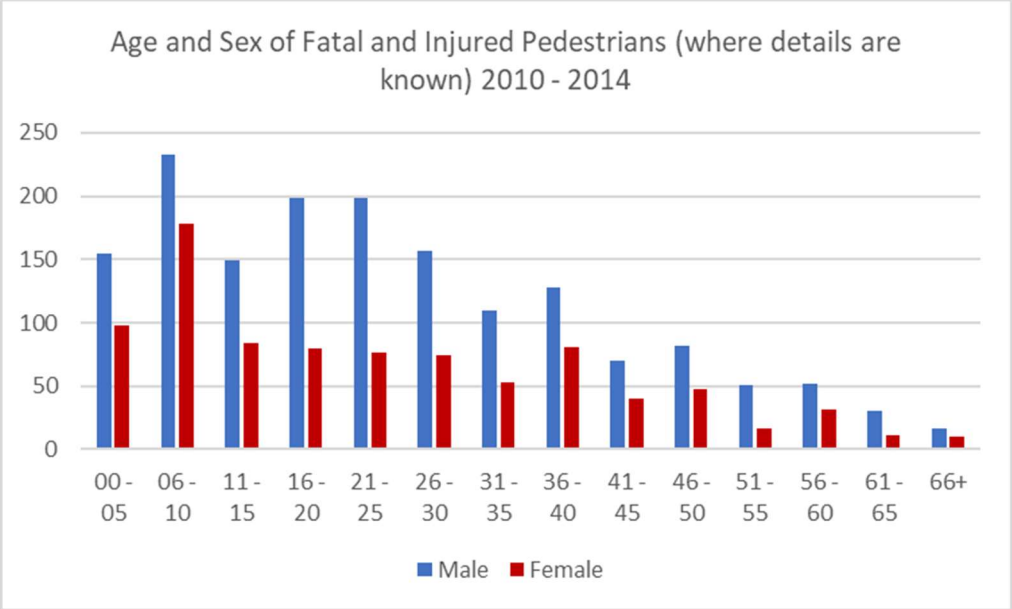


Figure 6.13 Known Age and Gender of Pedestrians involved in Fatal and Injury Crashes

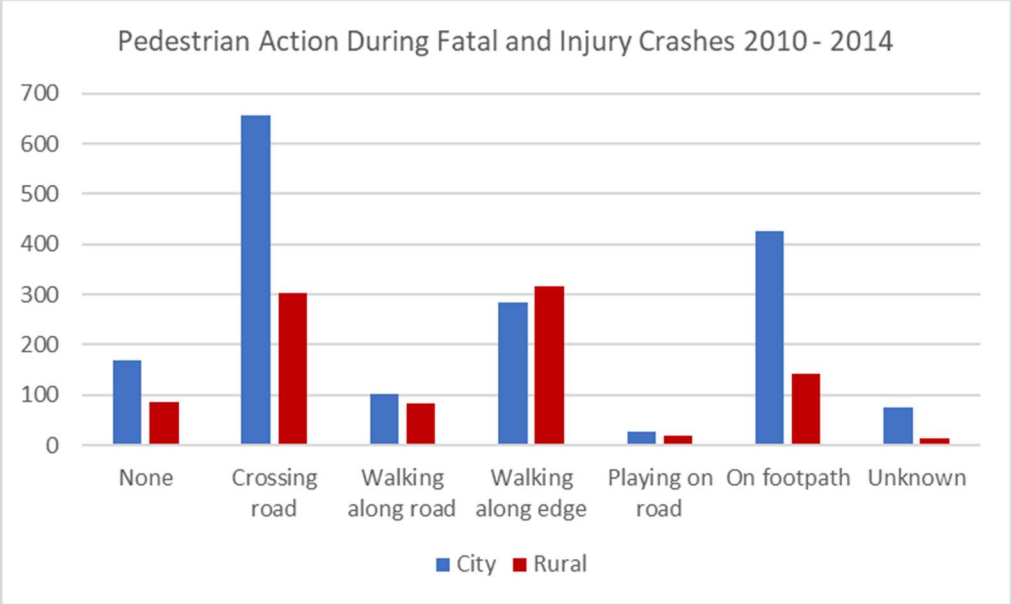


Figure 6.14 Pedestrian Actions during Fatal and Injury Crashes involving Pedestrians

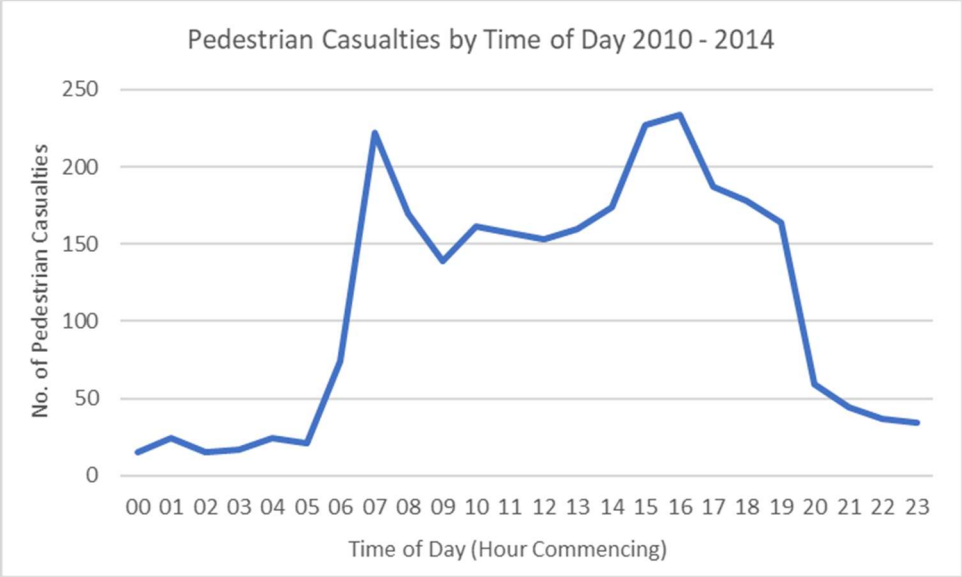


Figure 6.15 Pedestrian Casualties (Total) by Time of Day

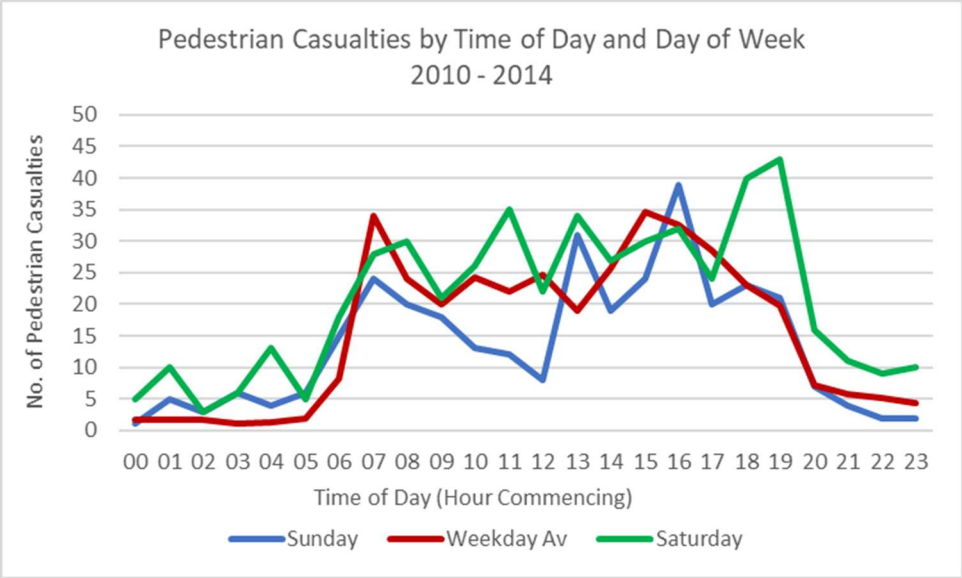


Figure 6.16 Pedestrians Casualties by Day of Week and Time of Day

7. Vehicle Factors

Figure 7.1 identifies the types of vehicles involved in a fatal or casualty crash. As indicated, heavy goods vehicles (HGVs - i.e. trucks), buses (PMVs) and pick-ups/utes are the major types of vehicles involved in crashes. This however, for instance in the case of pick-ups/utes may simply reflect the high numbers of such vehicles (and hence increased exposure to risk) along with the lack of protection/restraints when sitting in the rear of such vehicles with respect to casualty numbers/severity. Vehicle fleet data for PNG set out in the World Health Organisation (WHO) Global Status Report (2018) does not break down vehicle types into those shown in Figure 7.1. However, it indicates that in 2016, buses accounted for 12% of the vehicle fleet and trucks 22%. In comparison, 24% of known vehicles involved in fatal and casualty crashes were buses, and 23% of vehicles were trucks.

It should be noted that a review of crash reports also indicated that Officers typically indicated the presence of a 4-wheel drive Sport Utility Vehicles (SUVs) and/or other similar types of vehicles (in particular Toyota Land Cruisers) in the crash as being 'other', but in some instances, also recorded them as being 'cars' and/or 'pick-ups'. In addition, HGVs can act as buses and as such, care should be taken when interpreting this data. Furthermore, whilst the Police Road Accident Report Forms indicate the reported vehicle manoeuvres, a review of the data shows a significant number of suspicious responses when compared to other information on the Forms. As such, vehicle manoeuvre data is not considered reliable enough to report back on at this stage.

Figures 7.2 and 7.3 show the types of vehicle faults that have been reported as being factors in fatal and casualty crashes. Such faults include lighting problems and 'other' faults such as brake failure or bald tyres. Ten percent of vehicles involved in a crash were reported as having a known defect, with brake failure being the most common problem, especially for trucks.

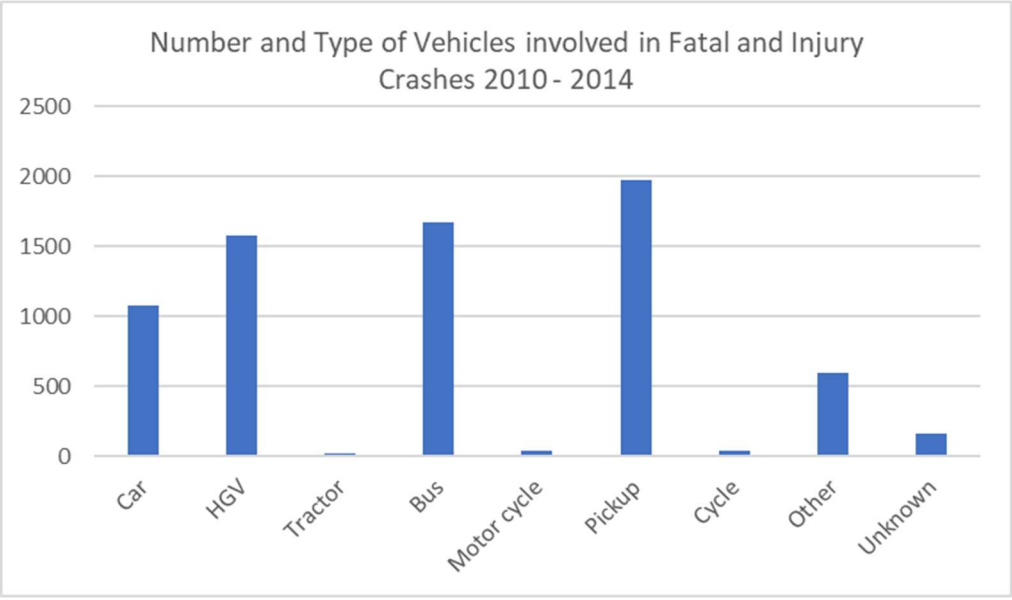


Figure 7.1 Types of Vehicles involved in Fatal and Injury Crashes

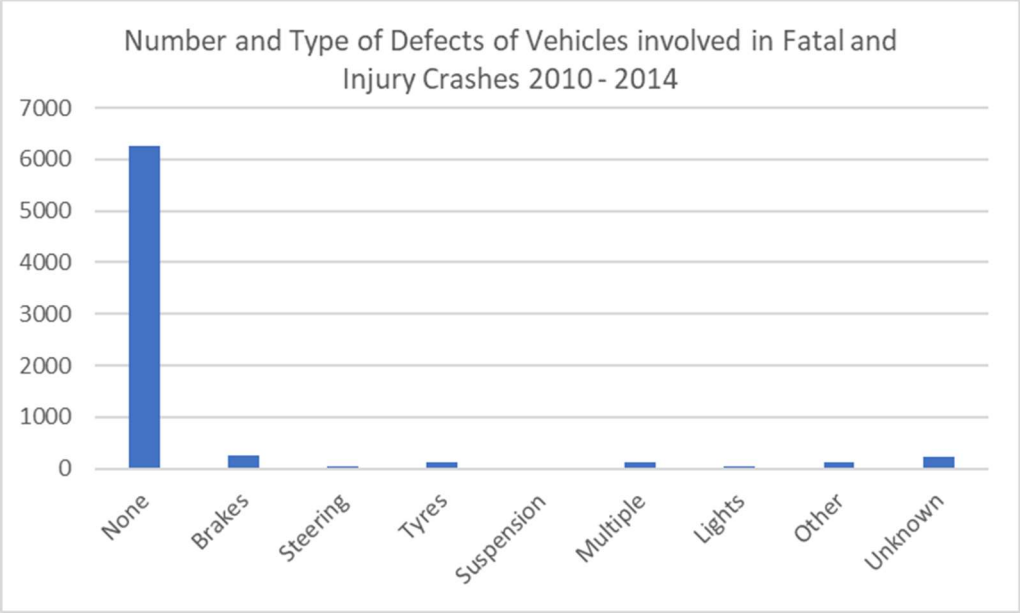


Figure 7.2 Reported Vehicle Defects/Factors involved in Fatal and Injury Crashes

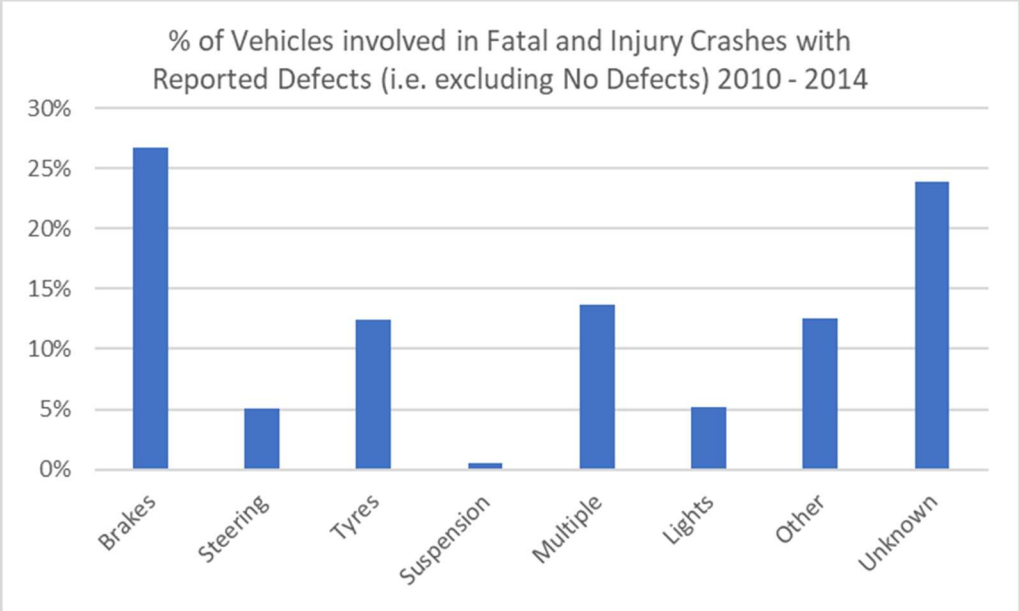


Figure 7.3 Percentage of Vehicles involved in Fatal and Injury Crashes with Reported Defects (excluding 'no defects')

8. Road Environment Factors

The road environment such as alignment/geometry, surface condition and visibility can all contribute to a crash. Figures 8.1 to 8.7 set out the general road environment for reported fatal and casualty crashes – whilst noting that these are the prevailing elements only and may not have specifically contributed to an individual crash. As with other elements of the crash data reported upon, caution should be taken with respect to the accuracy of the information provided.

Over 90% of crashes occur at mid-block locations (i.e. away from intersections), albeit as indicated in Figure 8.1, with a slightly lower proportion in urban areas due to the increased number of intersections in towns and cities. For those that did occur at intersections, as indicated in Figure 8.2, the most common type involved were T-intersections. It should be noted that 'other' intersection type typically includes driveways/accesses.

Figure 8.3 indicates that well over half (59%) occurred on flat, straight sections of road, albeit with crashes on curves and/or inclines being much more prevalent in rural areas. Whilst the number of injury crashes at road bridges is relatively low, 28% of them result in one or more fatalities; this compares with 21% of all injury crashes regardless of the crash location resulting in one or more fatalities.

Figures 8.4 and 8.5 provide information related to road surface. Over three-quarters of crashes occurred on sealed roads reported as being with or without a 'few' potholes – this percentage decreases however for rural roads compared to urban roads with 7% of the fatal and injury crashes on rural roads reported as occurring on sealed roads with 'many' potholes and 17% on earth/gravel roads. Similarly, over 80% of crashes occurred on dry roads – albeit with crashes on rural roads having a lower proportion of crashes on dry roads. As part of this, as indicated in Figure 8.6, 87% of crashes where the weather was known were reported as occurring in fine weather.

Figure 8.7 indicates that almost three quarters (74%) of fatal and casualty crashes occurred during daylight hours – with similar proportions for both urban and rural roads. Whilst this crash data also provides information regarding whether street lights were present and/or switched on for crashes during dawn/dusk/night, a review of the information indicates concerns with regards to the accuracy of the reports. For example, a review of the data indicates a number of Accident Reports indicating crashes occurring in rural areas with gravel roads which have been reported as being at 'night with lights on'. It seems highly unlikely that street lights would be provided in such instances, and it is presumed that mis-understandings may exist with respect to this particular question on the Police Accident Report Form – for instance, some Police Officers may interpret the 'lights on' aspect as relating to the vehicle lights rather than street lights.

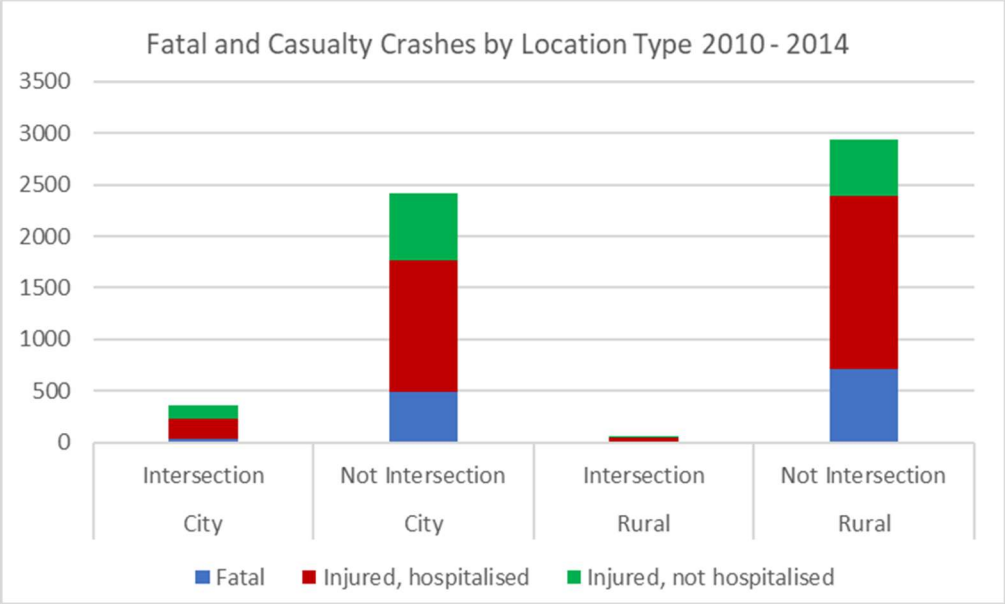


Figure 8.1 Fatal and Injury Crashes by Location

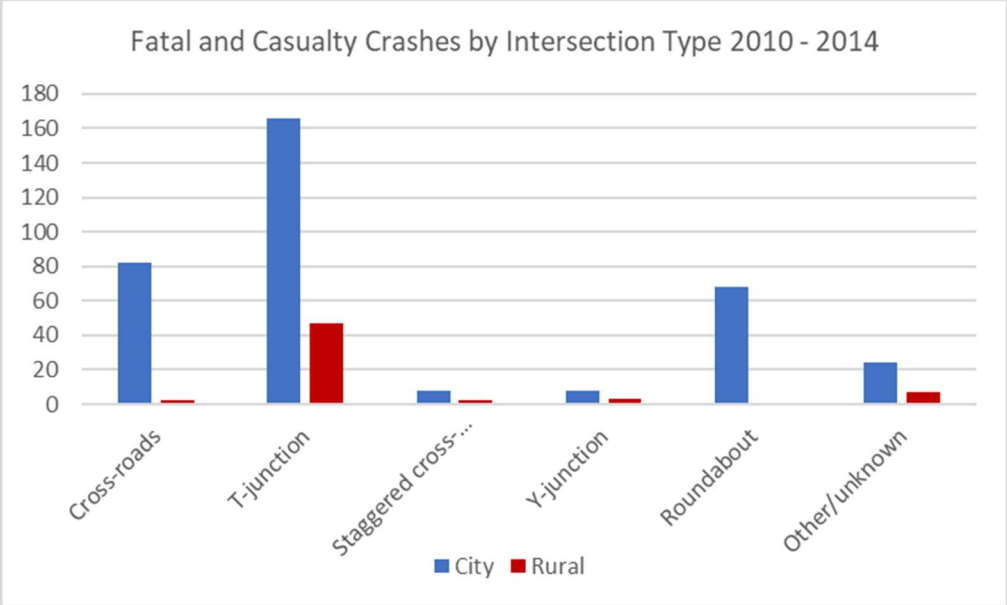


Figure 8.2 Fatal and Injury Crashes by Intersection Type

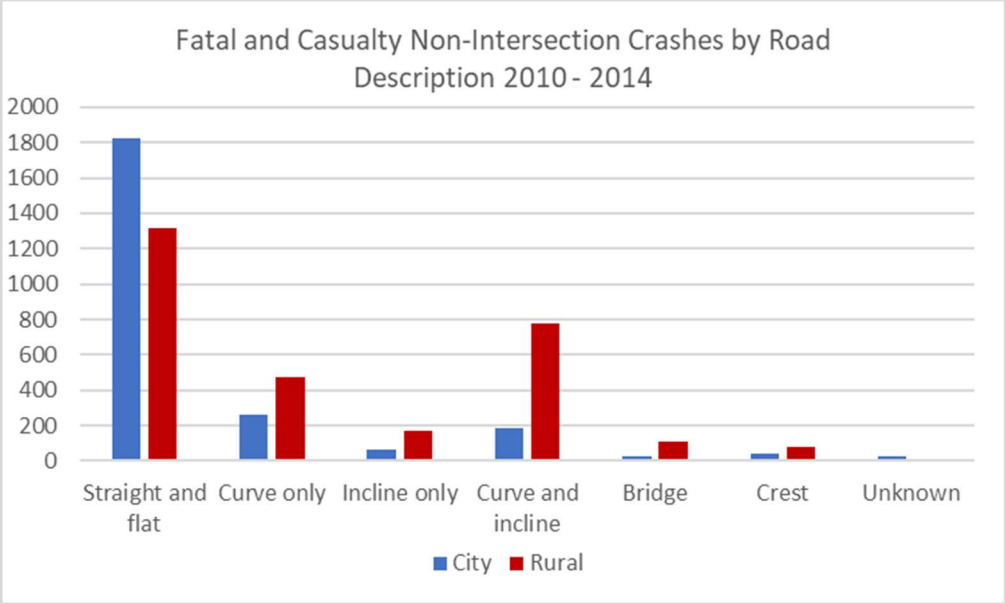


Figure 8.3 Fatal and Injury Crashes by Road Geometry and Alignment

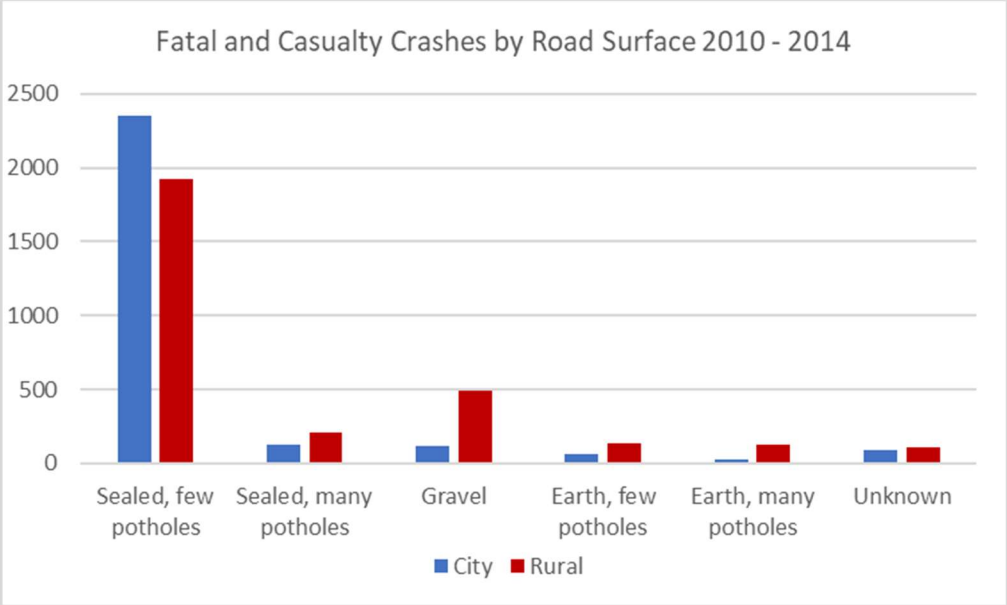


Figure 8.4 Fatal and Injury Crashes by Road Condition/Surface Type

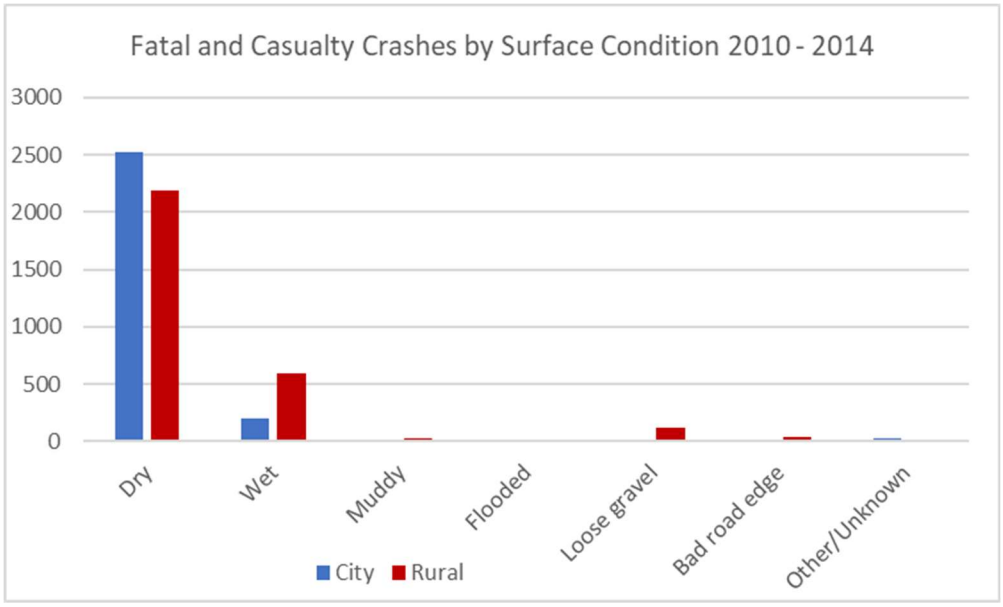


Figure 8.5 Fatal and Injury Crashes by Road Surface Condition

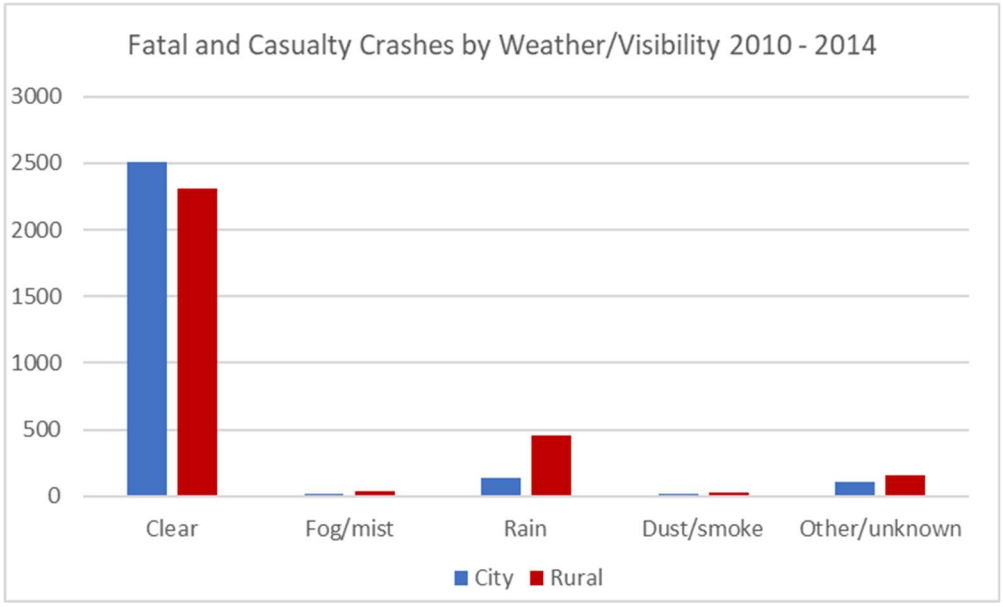


Figure 8.6 Fatal and Injury Crashes by Weather/Visibility

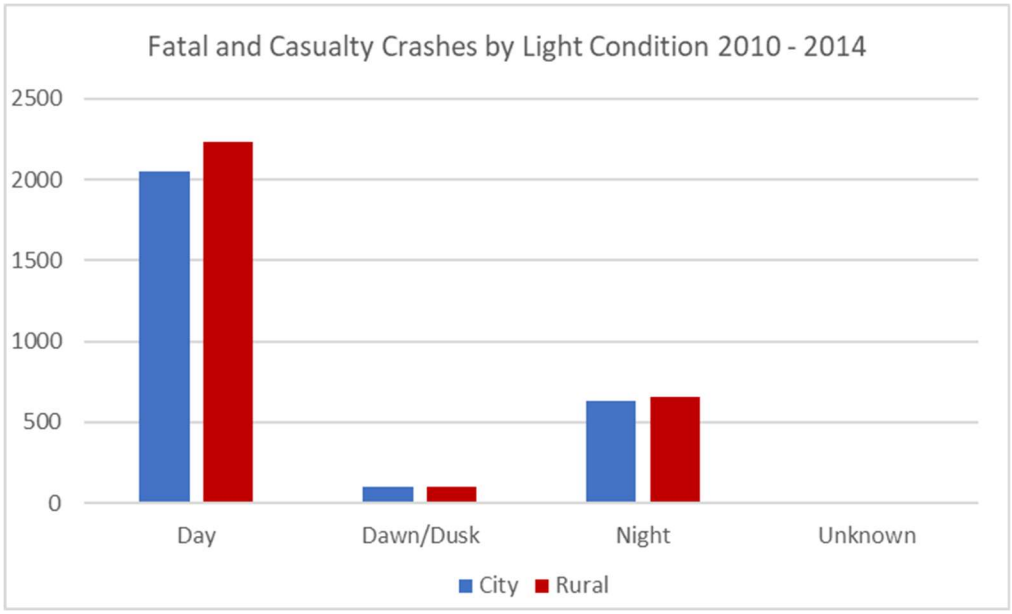
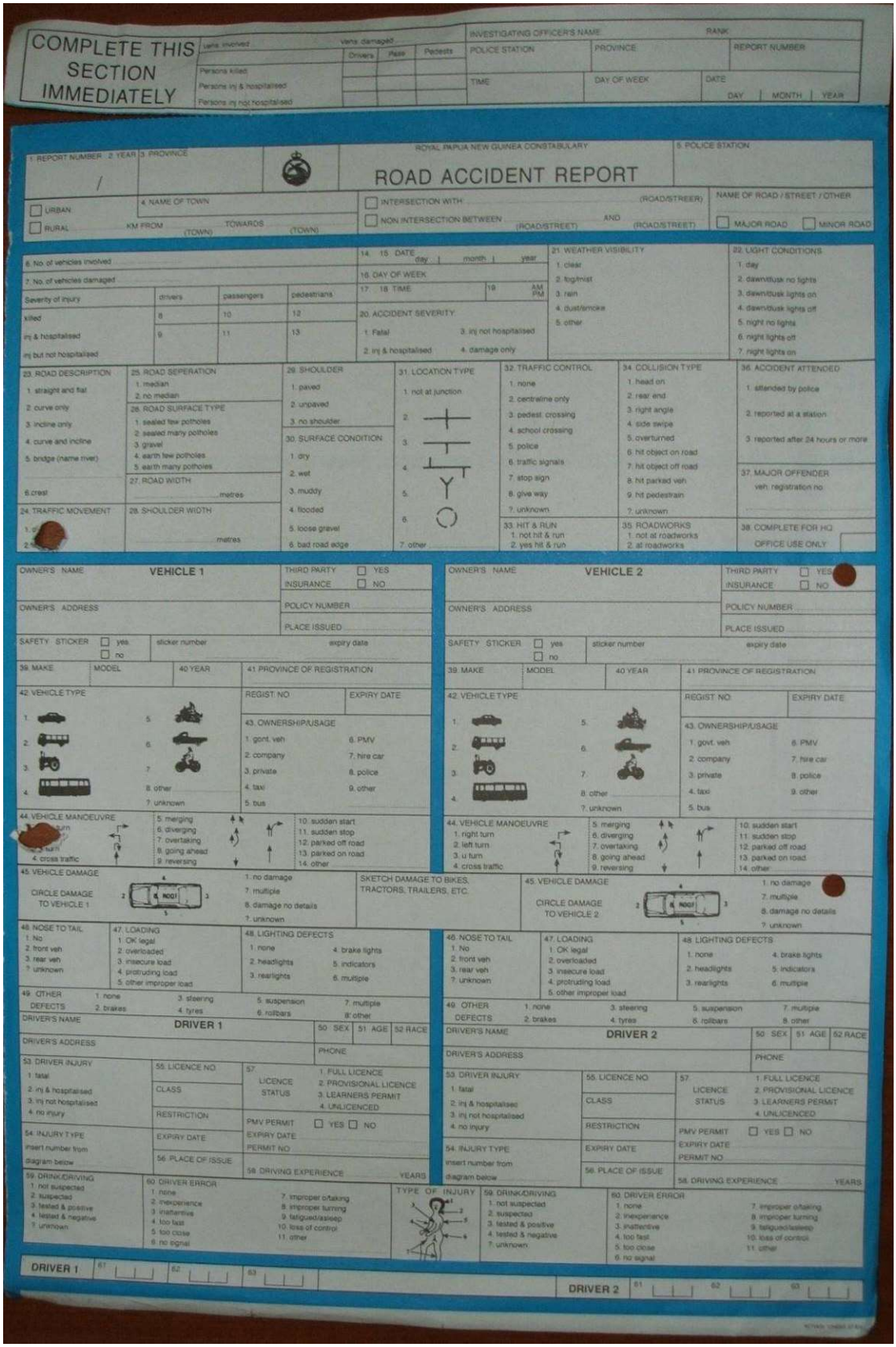


Figure 8.7 Fatal and Injury Crashes by Light Conditions

Appendix A: Police Road Accident Report Form



COMPLETE THIS SECTION IMMEDIATELY

ROAD ACCIDENT REPORT

ROYAL PAPUA NEW GUINEA CONSTABULARY

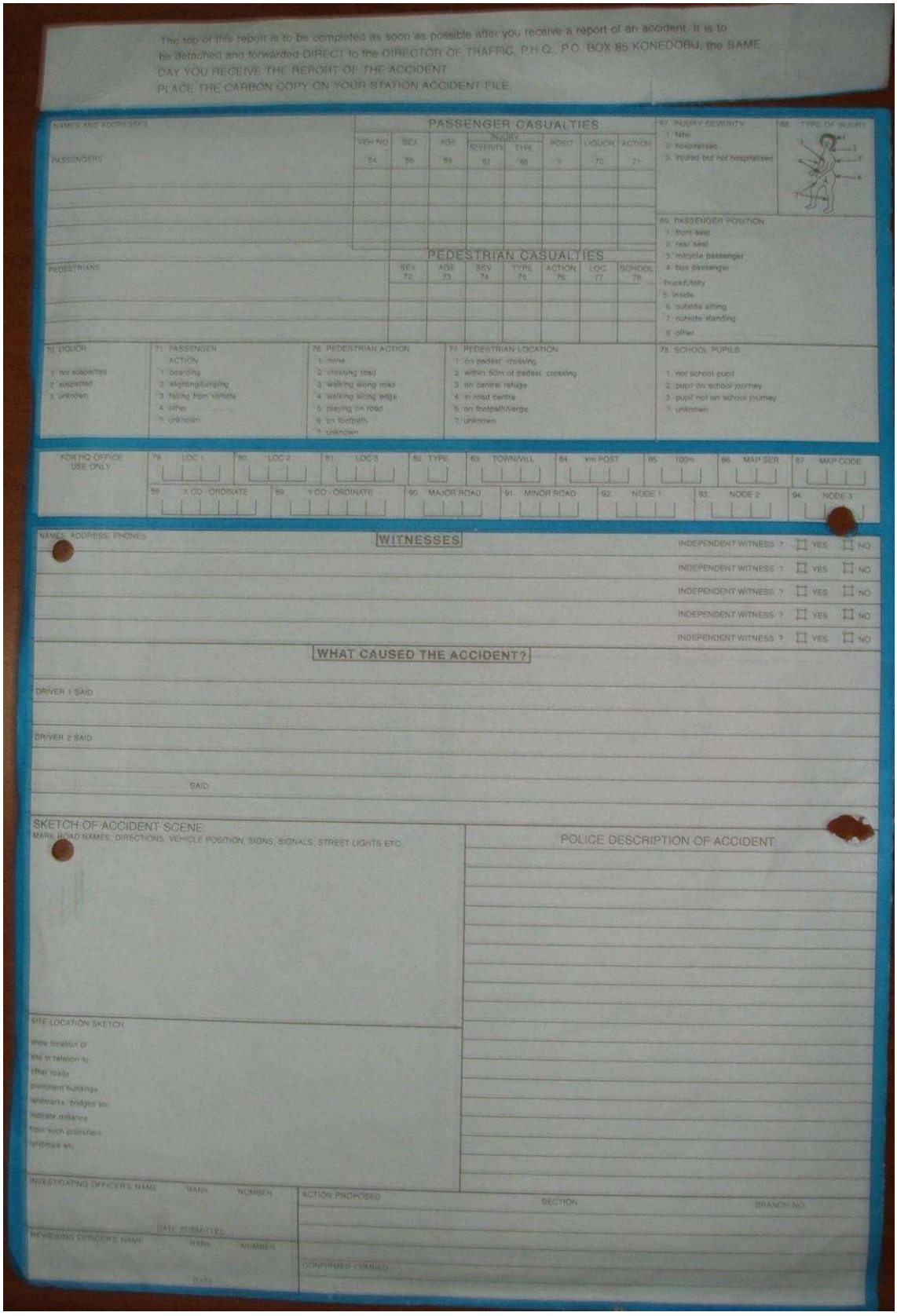
VEHICLE 1

VEHICLE 2

DRIVER 1

DRIVER 2

.


The top of this report is to be completed as soon as possible after you receive a report of an accident. It is to be detached and forwarded DIRECT to the DIRECTOR OF TRAFFIC, P.H.Q., P.O. BOX 85 KONEDOBU, the SAME DAY YOU RECEIVE THE REPORT OF THE ACCIDENT.
PLACE THE CARBON COPY ON YOUR STATION ACCIDENT FILE.

NAMES AND ADDRESSES

PASSENGER CASUALTIES

PASSENGERS | VEH NO 54 | SEX 55 | AGE 56 | INJURY SEVERITY 57 | INJURY TYPE 58 | POST 59 | LIQUOR 70 | ACTION 71

67. INJURY SEVERITY
1. fatal
2. hospitalised
3. injured but not hospitalised

68. TYPE OF INJURY

69. PASSENGER POSITION
1. front seat
2. rear seat
3. motorcycle passenger
4. bus passenger
Truck/Utility
5. inside
6. outside sitting
7. outside standing
8. other

PEDESTRIAN CASUALTIES

PEDESTRIANS | SEX 72 | AGE 73 | SEV 74 | TYPE 75 | ACTION 76 | LOC 77 | SCHOOL 78

70. LIQUOR
1. not suspected
2. suspected
3. unknown

71. PASSENGER ACTION
1. boarding
2. alighting/jumping
3. falling from vehicle
4. other
?. unknown

76. PEDESTRIAN ACTION
1. none
2. crossing road
3. walking along road
4. walking along edge
5. playing on road
6. on footpath
?. unknown

77. PEDESTRIAN LOCATION
1. on pedest. crossing
2. within 50m of pedest. crossing
3. on central refuge
4. in road centre
5. on footpath/verge
?. unknown

78. SCHOOL PUPILS
1. not school pupil
2. pupil on school journey
3. pupil not on school journey
?. unknown

FOR HQ OFFICE USE ONLY

79. LOC 1 | 80. LOC 2 | 81. LOC 3 | 82. TYPE | 83. TOWN/VILL | 84. km POST | 85. 100m | 86. MAP SER | 87. MAP CODE

88. X CO-ORDINATE | 89. Y CO-ORDINATE | 90. MAJOR ROAD | 91. MINOR ROAD | 92. NODE 1 | 93. NODE 2 | 94. NODE 3

NAMES, ADDRESS, PHONES

WITNESSES

INDEPENDENT WITNESS ? ☐ YES ☐ NO
INDEPENDENT WITNESS ? ☐ YES ☐ NO
INDEPENDENT WITNESS ? ☐ YES ☐ NO
INDEPENDENT WITNESS ? ☐ YES ☐ NO
INDEPENDENT WITNESS ? ☐ YES ☐ NO

WHAT CAUSED THE ACCIDENT?

DRIVER 1 SAID

DRIVER 2 SAID

SAID

SKETCH OF ACCIDENT SCENE:
MARK ROAD NAMES, DIRECTIONS, VEHICLE POSITION, SIGNS, SIGNALS, STREET LIGHTS ETC.

POLICE DESCRIPTION OF ACCIDENT:

SITE LOCATION SKETCH
show location of
this in relation to
other roads
prominent buildings
landmarks, bridges etc.
indicate distance
from such prominent
landmark etc.

INVESTIGATING OFFICER'S NAME | RANK | NUMBER
DATE SUBMITTED
REVIEWING OFFICER'S NAME | RANK | NUMBER
DATE

ACTION PROPOSED | SECTION | BRANCH NO.
CONFIRMED / AMENDED

Appendix B: Provincial Breakdown

An overview of the number of reported crashes by severity for the 2010-2014 period is shown in Table B1.

Table B1 Crash Severity by Province Overview (2010-2014) – Total Reported Crashes

Province	Severity					Total
	Fatal	Injured, hospitalised	Injured, not hospitalised	Damage only	Unknown	
ABG	1	0	0	0	0	1
Central	86	134	56	109	1	386
Chimbu	39	97	24	112	0	272
Enga	82	357	12	128	0	579
East New Britain	32	45	76	385	0	538
East Sepik	40	79	15	90	0	224
Eastern Highlands	105	483	123	243	0	954
Gulf	4	5	3	6	0	18
Madang	91	164	88	341	0	684
Manus	1	5	5	13	0	24
Milne Bay	13	21	24	53	0	111
Morobe	119	344	157	1170	0	1790
NCD	230	670	440	3203	1	4544
New Ireland	43	61	36	166	0	306
Northern	17	30	22	21	0	90
Southern Highlands	41	128	16	65	0	250
Sundaun	39	24	25	48	0	136
West New Britain	58	65	24	165	0	312
Western	1	7	11	67	0	86
Western Highlands	202	487	197	366	1	1253
Total	1,244	3,206	1,354	6,751	3	12,558

As part of the above, the low number of reported minor crashes (i.e. Injured, Not Hospitalised) compared to fatal and serious crashes, particularly in some provinces (for example in Enga, Southern Highlands and West New Britain) is highlighted and noted for Police consideration. Such low numbers suggest that they are being greatly under-reported in line with earlier comments, injury crashes are being incorrectly coded with respect to their severity and/or any crash that occurs in those Provinces result in much greater trauma than elsewhere.

In addition to the above, Table B2 breaks down the crashes by severity and year for each Province to allow a comparison of reporting trends over the five-year period to occur. Of note is the decreasing trend in total reported crashes in the NCD (potentially due to a decrease in reporting rates, particularly for Damage Only crashes) compared to elsewhere such as the continuous increase for Eastern Highlands. Low reported crash numbers in other Provinces are also an area of concern regarding under-reporting issues.

Table B2 Reported Crashes by Severity, Province and Year (2010-2014)

Province	Fatal						Injured, hospitalised						Injured, not hospitalised					
	2010	2011	2012	2013	2014	Total	2010	2011	2012	2013	2014	Total	2010	2011	2012	2013	2014	Total
ABG	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Central	26	17	10	14	19	86	37	30	19	21	27	134	17	10	9	8	12	56
Chimbu	7	11	6	6	9	39	23	23	14	16	21	97	9	7	3	5	0	24
Enga	14	25	20	9	14	82	72	67	77	60	81	357	4	2	0	4	2	12
East New Britain	11	5	8	4	4	32	13	8	5	7	12	45	16	15	13	14	18	76
East Sepik	9	4	6	13	8	40	17	5	16	18	23	79	5	0	4	1	5	15
Eastern Highlands	14	17	20	30	24	105	55	74	85	118	151	483	23	17	20	34	29	123
Gulf	0	3	1	0	0	4	2	1	1	0	1	5	0	0	0	3	0	3
Madang	22	24	16	11	18	91	27	40	48	19	30	164	22	25	15	8	18	88
Manus	0	0	0	0	1	1	0	4	0	1	0	5	0	1	3	0	1	5
Milne Bay	1	3	4	2	3	13	7	2	6	2	4	21	5	3	5	7	4	24
Morobe	28	23	26	23	19	119	83	72	69	56	64	344	40	26	42	29	20	157
NCD	41	48	54	42	45	230	145	132	118	132	143	670	122	89	93	78	58	440
New Ireland	8	10	8	13	4	43	9	11	25	8	8	61	9	3	7	8	9	36
Northern	3	1	6	2	5	17	3	5	6	9	7	30	6	3	5	3	5	22
Southern Highlands	9	11	6	9	6	41	20	33	27	26	22	128	4	5	3	4	0	16
Sundaun	8	11	6	8	6	39	6	3	3	5	7	24	3	4	5	9	4	25
West New Britain	8	18	8	12	12	58	12	12	12	14	15	65	9	3	1	8	3	24
Western	1	0	0	0	0	1	1	4	0	0	2	7	3	1	4	1	2	11
Western Highlands	37	49	36	39	41	202	109	92	87	88	111	487	40	30	40	34	53	197
TOTAL	247	281	241	237	238	1244	641	618	618	600	729	3206	337	244	272	258	243	1354

Table B2 (cont.) Reported Crashes by Severity, Province and Year (2010-2014)

PROVINCE	Damage only						Unknown			Total					
	2010	2011	2012	2013	2014	Total	2010	2011	Total	2010	2011	2012	2013	2014	Total
ABG	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Central	34	21	20	15	19	109	0	1	1	114	79	58	58	77	386
Chimbu	24	30	18	27	13	112	0	0	0	63	71	41	54	43	272
Enga	29	27	22	21	29	128	0	0	0	119	121	119	94	126	579
East New Britain	68	91	95	58	73	385	0	0	0	108	119	121	83	107	538
East Sepik	23	13	20	14	20	90	0	0	0	54	22	46	46	56	224
Eastern Highlands	20	37	55	57	74	243	0	0	0	112	145	180	239	278	954
Gulf	0	1	2	2	1	6	0	0	0	2	5	4	5	2	18
Madang	70	81	55	79	56	341	0	0	0	141	170	134	117	122	684
Manus	0	7	1	5	0	13	0	0	0	0	12	4	6	2	24
Milne Bay	14	8	8	8	15	53	0	0	0	27	16	23	19	26	111
Morobe	213	197	269	257	234	1170	0	0	0	364	318	406	365	337	1790
NCD	736	668	660	588	551	3203	1	0	1	1045	937	925	840	797	4544
New Ireland	21	24	58	33	30	166	0	0	0	47	48	98	62	51	306
Northern	5	4	6	4	2	21	0	0	0	17	13	23	18	19	90
Southern Highlands	15	16	10	15	9	65	0	0	0	48	65	46	54	37	250
Sundaun	16	10	10	5	7	48	0	0	0	33	28	24	27	24	136
West New Britain	31	36	36	43	19	165	0	0	0	60	69	57	77	49	312
Western	39	15	6	0	7	67	0	0	0	44	20	10	1	11	86
Western Highlands	86	55	85	79	61	366	1	0	1	273	226	248	240	266	1253
TOTAL	1444	1341	1436	1310	1220	6751	2	1	3	2671	2485	2567	2405	2430	12558

Appendix C: Hazardous Roads

Tables C1 to C19 sets out the number of crashes between 2010 and 2014, broken down by severity, for various roads in each province (for which data has been sent to Police HQ). The data makes no attempt to rationalise crash numbers relative to the amount of traffic using those roads (due to a lack of data), nor does it make any allowance for length of road. As such, the exposure to risk is unfortunately unable to be considered at present. Crash numbers however typically reflect, as expected, those roads that can be expected to be the busiest.

In due course, as the crash database develops, it will be able to identify specific hazardous locations (black spots) to allow targeting of remedial treatments. At present however, the naming of roads only allows us to narrow down investigations into the general whereabouts of hazardous locations. Furthermore, road names are based on those provided on the Police Accident Report forms. In some instances therefore, depending upon the local naming convention as reported by the Police Officer, the same road may have been listed twice, albeit with different names. Alternatively, where the Okuk Highway passes through a town or city, it may have a different local road name (e.g. Edwards Street in Goroka or Wahgi Parade in Mt Hagen). In such instances where this is known, the road has been defined as the Okuk Highway – however, it is unlikely that this has been fully captured. Feedback to the RTA on the above and/or any incorrect naming convention is welcomed, as is feedback with respect to the helpfulness or otherwise of these Tables and the other information set out in the Data Report.

As highlighted in the main report, the high level of under-reporting can be expected to have an impact on the number of crashes able to be reported upon. The roads shown in each list also simply reflects the main reported fatal and injury crash roads/locations for 2010 to 2014 rather than all roads with crashes reported as occurring in each individual province. Where negligible crashes have been reported, for instance in Bougainville, no Table has been prepared.

Table C1 Roads in Central with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Hiritano Highway	27	45	14	86
Magi Highway	29	36	15	80
Sogeri Rd	7	13	12	32
Hula Rd	5	4	1	10
Boregaina Road	1	3	0	4
Tapini Highway	1	2	1	4
Tubusereia Rd	1	3	0	4

Table C2 Roads in Chimbu with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Okuk Highway	17	46	18	81
Gumine Rd	3	10	1	14
Siane Rd	0	4	0	4

Table C3 Roads in East New Britain with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Williams Rd	8	9	15	32
Kokopo/Rabaul Rd	4	4	15	23
Toma Rd	2	5	13	20
Warangoi Rd	3	3	2	8
Malaguna Rd	4	1	2	7
Takubar Rd	0	3	3	6
Tokua Rd	0	2	3	5

Table C4 Roads in East Sepik with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Sepik Highway	9	19	5	33
Boram Rd	3	8	1	12
Dagua Road	2	7	3	12
West Coast Highway	3	6	2	11
Wewak/Maprik Highway	1	7	0	8
Angoram Highway	3	2	1	6

Table C5 Roads in Eastern Highlands with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Okuk Highway	71	250	80	401
Okapa Rd	3	32	4	39
Lufa Rd	0	26	5	31
Bena Rd	3	14	2	19
Unggai Rd	4	9	0	13
Greathead Dr	0	10	1	11
Lufa/Okapa Rd	1	6	1	8
Airport Road	1	5	2	8
Elizabeth St	0	3	4	7
Leigh Vial St	2	5	0	7
Rothmans Rd	0	6	0	6
Aiyura Rd	0	4	1	5

Table C6 Roads in Enga with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Okuk Highway	39	163	5	207
Wabag/Pogera Rd	2	8	0	10
Pawas Road	1	9	0	10
Aipanda Road	0	9	0	9
Walya Road	1	8	0	9
Teremanda Road	4	5	0	9
Kuimamanda Rd	0	8	0	8
Tsaka Valley Road	1	7	0	8
Wabag Town Rd	0	6	1	7
Kompiam Rd	3	3	0	6
Yakananda Rd	0	5	1	6
Lenki Rd	1	5	0	6
Pausa Road	0	5	0	5
Wapenamanda Hwy - Wabag	1	4	0	5
Keas Rd	1	4	0	5

Table C7 Roads in Gulf with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Hiritano Highway	3	5	3	11

Table C8 Roads in Madang with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Bruce Jephcott (Ramu) Hwy	36	43	31	110
North Coast Rd (Madang/Bogia Hwy)	19	47	19	85
Modilon Road	4	17	7	28
Baidal Rd	4	5	2	11
Mawan Rd	0	7	3	10
Lae/Madang Highway (unknown section)	2	3	2	7

Table C9 Roads in Manus with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Lorengau-Momote Rd	1	2	3	6

Table C10 Roads in Milne Bay Highlands with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Charles Abel Highway	7	10	11	28
East Cape Highway	1	4	6	11
Magi Highway	2	2	3	7

Table C11 Roads in Morobe with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Okuk Highway	62	125	52	239
Independence Drive	12	25	7	44
Busu Rd	8	24	10	42
Butibum Rd	4	17	11	32
Wau/Bulolo Rd	3	17	12	32
Bumbu Rd	2	15	6	23
Markham Rd	3	7	11	21
Huon Rd	0	10	5	15
Mangola St	1	6	6	13
Aircorps Rd	1	10	1	12
Milfordhaven Rd	1	5	5	11
Coronation Dr	1	6	1	8

Table C12 Roads in NCD with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Hubert Murray Highway	27	74	54	155
Waigani Dr	24	72	53	149
Poreporena Freeway	30	40	23	93
Wards Rd	5	24	19	48
Hiritano Highway	4	18	13	35
Scratchley Rd	7	16	8	31
Taurama Rd	5	10	13	28
Sogeri Rd	6	14	5	25
Koura Way	9	13	3	25
Gerehu Dr	2	15	6	23
Geauta Dr	5	9	8	22
Gavamani Rd	3	10	7	20
Baruni Rd	9	9	2	20
Morea Tobo Rd	2	10	8	20
Dogura Rd	2	7	10	19
Pitpit St	2	12	5	19
Boroko Dr	1	8	5	14
Lawes Rd	1	7	5	13
Spoonbill Dr	2	7	4	13
Kennedy Rd	0	5	7	12
Sir John Guise Dr	3	6	3	12
Wildlife Rd	3	3	4	10
Kamarere St	2	7	1	10
Kanage St	1	5	4	10
Bava St	1	7	2	10

Table C13 Roads in New Ireland Province with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Bulominsky Hwy	33	39	24	96
Coronation Drive	0	5	1	6
Wharf Rd	0	3	1	4

Table C14 Roads in Northern with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Kokoda Highway	10	9	7	26
Oro Bay Highway	1	9	9	19
Arek Highway	0	4	1	5
Killerton Road	0	2	1	3

Table C15 Roads in Southern Highlands with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Okuk Highway	13	53	10	76
Posu Rd	3	10	1	14
Ialibu/Kisenepoi Rd	4	8	0	12
Ialibu/Pangia Rd	3	7	0	10
Tari Rd	4	3	1	8
Mendi/Munihu Rd	2	6	0	8

Table C16 Roads in Sundaun with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Vanimo/Wutung Rd	3	7	6	16
Works Road	2	3	3	8
Amanab Road	4	2	1	7
Vanimo/Amanab	4	1	0	5
Vanimo Town Rd	2	1	2	5
Wara Stone Rd	0	1	3	4

Table C17 Roads in West New Britain with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Kimbe/Hoskins Highway	7	12	3	22
Kimbe/Bialla Highway	7	9	5	21
Talasea Rd	5	5	3	13
Kimbe Town Rd	2	2	2	6
Kumbango Rd	2	4	0	6
Sarakolok Road	2	2	1	5
Nahavio Rd	4	0	1	5
San Remi Drive	0	2	2	4
Buvussi Rd	2	1	1	4
Haella Rd	1	2	1	4

Table C18 Roads in Western with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Kiunga/Tabubil Highway	0	4	6	10
Dukum Rd	1	0	3	4
Mine Access Rd	0	2	1	3

Table C19 Roads in Western Highlands with Largest Number of Fatal and Injury Crashes (2010-2014)

Road Name	Fatal	Injured, hospitalised	Injured, not hospitalised	Total
Okuk Highway	122	282	95	499
Baiyer Rd	14	35	21	70
Tomba/Wabag Rd	6	23	0	29
Kum Rd	1	14	4	19
Dei Rd	2	9	5	16
Kelua Rd	0	7	6	13
Bukapena Rd	2	7	2	11
Dei Council Rd	3	7	0	10
Moka Pl	0	8	2	10
Ramba Rd	2	3	4	9
Tambul Rd	3	5	1	9
Kuminiga Rd	2	3	2	7
Kondopina Rd	2	0	4	6
Ninji Drive	1	2	2	5
Dei Pl	2	1	2	5
Airport Road	0	4	1	5
Wurup Rd	2	3	0	5