MONASH UNIVERSITY

ACCIDENT RESEARCH CENTRE

# VEHICLE SAFETY RATINGS ESTIMATED FROM COMBINED AUSTRALIAN AND NEW ZEALAND REAL CRASH DATA
# PILOT STUDY: STAGE 5

by

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**Abstract:**

Crashworthiness ratings measure the relative safety of vehicles in preventing severe injury to their own drivers in crashes whilst aggressivity ratings measure the serious injury risk vehicles pose to drivers of other vehicles with which they collide. Analysis presented in this report has been successful in producing a set of vehicle safety ratings based on combined Australian and New Zealand mass crash data sources suitable for publishing as consumer information in both countries. The study has also demonstrated the consistency of ratings estimated from combined Australian and New Zealand data with those estimated from Australian data only as well as quantifying the improvement in the ratings resulting from addition of the New Zealand data. Crashworthiness and aggressivity ratings for 1982-2000 model vehicles appearing in both the Australian and New Zealand vehicle fleet were developed based on data on crashes in Victoria and New South Wales during 1987-2000 and in Queensland, Western Australia and New Zealand during 1991-2000. Crashworthiness and aggressivity were measured by a combination of injury severity (of injured drivers) and injury risk (of drivers involved in crashes). The ratings were adjusted for the driver sex and age, the speed limit at the crash location, the number of vehicles involved, the state or country in which the crash occurred and the year in which the crash occurred. These factors were strongly related to injury risk and/or severity for both aggressivity and crashworthiness. Both ratings estimate, with the appropriate focus, the risk of a driver being killed or admitted to hospital when involved in a tow-away crash, to a degree of accuracy represented by the confidence limits of the rating in each case.

The results of this report are based on a number of assumptions and warrant a number of qualifications that should be noted. Recommendations for further research have been made.



**Key Words: (IRRD except when marked*)**
Injury, Vehicle Occupant, Collision, Passenger Car Unit, Passive Safety System, Statistics





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# EXECUTIVE SUMMARY

Stages 1 to 4 of the New Zealand vehicle safety ratings pilot study, completed previously, established the availability and suitability of New Zealand crash and registration data sources for estimating vehicle safety ratings using combined Australian and New Zealand crash data. They also confirmed the sufficient compatibility of the Australian and New Zealand vehicle fleets ensuring ratings based on the combined data will be of use to the New Zealand vehicle consumer population. Analysis presented in this report has been successful in realising the final stage of the pilot study in producing a set of vehicle safety ratings based on combined Australian and New Zealand mass crash data sources suitable for publishing as consumer information in both countries. The study has also demonstrated the consistency of ratings estimated from combined Australian and New Zealand data with those estimated from Australian data only as well as quantifying the improvement in the ratings resulting from the addition of New Zealand data.

The safety ratings calculated for 1982 to 2000 year of manufacture vehicles in the Australian and New Zealand passenger fleets cover both crashworthiness and aggressivity. Crashworthiness ratings measure the relative safety of vehicles in preventing severe injuries to their own drivers in crashes whilst aggressivity ratings measure the serious injury risk vehicles pose to drivers of other vehicles with which they collide. Both crashworthiness and aggressivity were measured as a product of injury severity (of injured drivers) and injury risk (of drivers involved in crashes). Crashworthiness injury severity was based on 217,502 drivers injured in crashes in Victoria during 1987-2000, in New South Wales during 1987-1998 and in Queensland, Western Australia and New Zealand during 1991-2000. Crashworthiness injury risk was based on 1,216,862 drivers involved in crashes in New South Wales during 1987-2000 and Western Australia and Queensland during 1991-2000 where a vehicle was towed away. Aggressivity injury risk was based on 585,397 drivers involved in crashes between two vehicles in New South Wales and Queensland and Western Australia where a vehicle was towed away. Aggressivity injury severity was based on 108,355 drivers injured in two-car crashes in Victoria during 1987-2000, in New South Wales during 1987-1998 and in Queensland, Western Australia and New Zealand during 1991-2000.

The crashworthiness and aggressivity ratings were adjusted for the driver sex and age, the speed limit at the crash location, the year in which the crash occurred and the state or country in which the crash occurred. Crashworthiness ratings were also adjusted for the number of vehicles involved in the crash. These factors were found to be strongly associated with injury risk and injury severity. Adjustments were made with the aim of measuring the effects of vehicle factors alone, uncontaminated by other factors available in the data that affected crash severity and injury susceptibility.

Addition of the New Zealand crash data to that used to calculate the Australian ratings has enabled the crashworthiness ratings to be obtained for 223 different vehicle models manufactured between 1982 and 2000. This is an increase of 10 vehicle models over the number rated using Australian data alone. The rating scores estimate the risk of a driver being killed or admitted to hospital when involved in a tow-away crash, to a degree of accuracy represented by the confidence limits of the rating in each case. The estimates and their associated confidence limits are sufficiently sensitive that they are able to identify 103 models of passenger cars, four-wheel drive vehicles, passenger vans and light commercial

vehicles that have superior or inferior crashworthiness characteristics compared with the average vehicle. This compares to only 95 vehicle models based on Australian data only. Further more, addition of the New Zealand crash data has reduced the average confidence limit width of the crashworthiness injury severity estimates by 8 percent and the average coefficient of variation (the ratio of ratings estimate the the width of the 95% confidence limit) by 7 percent.

Addition of the New Zealand crash data also resulted in estimates of vehicle aggressivity ratings towards drivers of other passenger vehicles for individual makes and models with both broader coverage and higher accuracy than obtained using Australian data alone. The aggressivity ratings measure the risk of serious injury a vehicle poses to drivers of other cars with which it impacts in crashes of tow-away or greater severity.

Aggressivity ratings calculated from combined Australian and New Zealand data covered 164 models of passenger vehicles (passenger cars, four-wheel drive vehicles, passenger vans and light commercial vehicles) manufactured between the years 1982-2000. This is an increase of 12 vehicle models over the ratings estimated using Australian data only. The estimates and their associated confidence limits are sufficiently sensitive that they are able to identify 58 models of passenger cars, four-wheel drive vehicles, passenger vans and light commercial vehicles that have superior or inferior aggressivity characteristics compared with the average vehicle. This represents an increase of 10 vehicle models over the ratings estimated using only Australian data. Addition of the New Zealand data to compute vehicle aggressivity ratings resulted in a average decrease of 7 percent and 10 percent in the aggressivity injury severity confidence limit widths and coefficient of variation respectively.

Estimated vehicle aggressivity towards drivers of other vehicles was found to have a proportional relationship with vehicle mass. It was also found to have little or no relationship with ratings of vehicle crashworthiness, demonstrating the independence of the two complementary measures.

Recommendations for further vehicle safety research using the assembled New Zealand crash data were made.

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# CONTENTS

**Page No.**

## APPENDICES

# VEHICLE SAFETY RATINGS ESTIMATED FROM COMBINED AUSTRALIAN AND NEW ZEALAND REAL CRASH DATA PILOT STUDY: STAGE 5

## 1. INTRODUCTION AND PROJECT HISTORY

For over a decade, the Monash University Accident Research Centre (MUARC) has been involved in a program of research examining issues relating to vehicle safety in Australia through the analysis of mass crash data. Data on which the research is based comes from reports compiled by Police in various states across Australia, augmented by data on injury compensation claims resulting from transportation crashes compiled by the Victorian Transport Accident Commission (TAC).

Work in the area initially commenced as two separate projects undertaken independently by different research groups. In response to recommendations in a report by the Victorian Parliamentary Social Development Committee (SDC 1990) on its inquiry into vehicle occupant protection, MUARC commenced a project in 1990 to develop consumer advice on vehicle safety performance from mass accident data. Independently in 1990, the NSW Roads and Traffic Authority (RTA) and the NRMA set out on a joint project to develop a 'car safety rating' system based on Police records of crash and injury involvement. The objective was to use vehicle crash records and injury data to develop ratings for the relative safety of vehicles. The NRMA and RTA entered into discussions with the CSIRO to conduct the necessary analysis, and by early 1991 had produced a relative ranking of vehicles.

In mid 1991, the NSW and Victorian groups became aware of each others activities and, following discussions, agreed to proceed jointly rather than have two competing vehicle safety rating systems: one based on Victorian data and the other on NSW data. Later, the NSW RTA and NRMA agreed that MUARC should undertake the analysis of the joint NSW and Victorian data sets. The NSW RTA and NRMA performed preliminary work on the NSW database to, as far as possible, provide a clean set of data with accurately inscribed models for each vehicle. The data were then handed over to MUARC for analysis.

### 1.1 Crashworthiness Ratings

Initially, development of vehicle safety ratings focussed on vehicle crashworthiness. Crashworthiness ratings rate the relative safety of vehicles by examining injury outcomes to drivers in real crashes. The crashworthiness rating of a vehicle is a measure of the risk of serious injury to a driver of that vehicle when it is involved in a crash. This risk is estimated from large numbers of records of injury to drivers of that vehicle type involved in real crashes on the road.

In 1994, MUARC produced vehicle crashworthiness ratings based on crash data from Victoria and New South Wales during 1987-92 (Cameron et al, 1994a,b). These ratings updated an earlier MUARC set produced by Cameron et al (1992b). Crashworthiness was measured in two components:

1. Rate of injury for drivers involved in tow-away crashes (injury risk)
2. Rate of serious injury (death or hospital admission) for injured drivers (injury severity).

Multiplying these two rates together formed the crashworthiness rating. This is a measure of the risk of serious injury for drivers involved in crashes. Measuring crashworthiness in two components reflecting risk and severity of injury was first developed by Folksam Insurance, which publishes the well-known Swedish ratings (Gustafsson et al 1989).

The results of these ratings are summarised in Cameron et al (1994a) with a full technical description of the analysis methods appearing in Cameron et al (1994b). These ratings use an analysis method that was developed to maximise the reliability and sensitivity of the results from the available data. In addition to the speed zone and driver sex, the method of analysis adjusts for the effects of driver age and the number of vehicles involved, producing results with all those factors taken into account.

Subsequent to the ratings of Cameron et al (1994a,b), five further updated sets of crashworthiness ratings were produced during 1996, 1997, 1998, 1999, 2000, 2003 (Newstead et al 1996, Newstead et al 1997, Newstead et al 1998, Newstead et al 1999, Newstead et al 2000, Newstead et al 2003). These covered vehicles manufactured over the period 1982-94, 1982-95, 1982-96, 1982-97 and 1982-98 respectively, and crashing during 1987-94, 1987-95, 1987-96, 1987-97, 1987-98 and 1987-2000 respectively, incorporating some enhancements to the methods of statistical analysis. The 1999 and 2000 ratings incorporated police reported crash data from Queensland whilst the 2003 ratings incorporated data from Western Australia. Previously only crash data from New South Wales and Victoria had been used. The crashworthiness ratings covered individual models of sedans, station wagons, four wheel drives, passenger vans and light commercial vehicles and were given as estimates of risk of severe injury for each model along with 90% and 95% confidence limits on each estimate. For each update, the rating figures were widely distributed in the form of a "Used Car Safety Ratings" brochure.

## 1.2 Aggressivity Ratings

When crashworthiness ratings were first presented internationally, at the 1992 IRCOBI Conference in Italy (Cameron et al 1992a), the authors were encouraged to expand the analysis to measure the risk of injury that each individual model represents to other road users, in addition to the occupants of the subject model. It was suggested that MUARC were in a unique position to consider this issue since its ratings were based on tow-away crashes.

A reviewer's comments on the paper presenting the first update of the ratings, to the 1995 IRCOBI Conference in Switzerland, emphasised the same issue. The reviewer wrote, "partner protection and collision compatibility are very important for overall road safety and they can no longer be omitted in the discussion about 'car safety'". He recommended that this "shortcoming" should be addressed in the introduction and conclusion of the paper, and this was done in the published version (Cameron et al 1995).

Together, these international reactions to MUARC's work in this area indicated that the crashworthiness ratings should be extended to add a measure of the "aggressivity" of individual car models when they crash. Aggressivity ratings measure the risk of injury that a vehicle poses to occupants of other vehicles it impacts, and to other unprotected road users such as pedestrians, bicyclists and motorcyclists. The addition of aggressivity ratings represents further consumer advice, which purchasers of cars could take into account when choosing a specific model.

Cameron, Newstead and Le (1998) completed an initial study that reviewed methods of rating vehicle aggressivity developed internationally, such as those by Broughton (1994, 1996) and Hollowell and Gabler (1996). Concepts from this review were then taken to develop a methodology for rating the aggressivity of Australian passenger vehicles making appropriate uses of the real crash data available in Australia. The methods developed were then successfully applied to estimate aggressivity ratings for a selection of Australian passenger vehicles that had accumulated sufficient real crash history.

The original study of Cameron et al (1998) investigated the feasibility and methods of providing aggressivity ratings for Australian passenger vehicles in terms of the threat that each subject model represented to:

1. Occupants of other cars colliding with the subject model cars, and
2. Pedestrians, bicyclists and motorcyclists (if possible, separately) impacted by the subject model cars.

Although Cameron et al (1998) considered the second type of aggressivity rating, ratings of this type are problematic. In general, crashes involving pedestrians, bicyclists and motorcyclists are seldom reported to the Police unless someone is killed or injured (usually the unprotected road user). This means that an estimate of the risk of injury cannot be calculated for the unprotected road users for inclusion in the second type of aggressivity rating. Consequently, the measure of aggressivity towards unprotected road users, described by Cameron et al (1998), is a measure of injury severity only (ie the risk of serious injury given some injury was sustained). As such, this aggressivity measure is less able to discriminate between the performances of individual vehicle models as it is based on relatively small quantities of data. These problems made the measure of aggressivity towards unprotected road users of limited practical value and it has not been further considered after the initial work.

This problem described in estimating aggressivity for unprotected road users did not occur for measuring aggressivity towards drivers of other cars, for whom the available data allowed estimates of both the risk of injury and of their injury severity in a manner analogous to the crashworthiness rating described above. As in Europe and the United States, the aggressivity rating towards drivers of other vehicles (Cameron et al, 1998) considered in this study has been based on two-car crashes between light vehicles (ie. heavy vehicle collisions have been excluded). The NSW, Western Australia and Queensland data on two-car crashes used in this study covers all Police reported crashes where at least one vehicle was towed or a pre-defined minimum damage level was attained. Consequently, the number of crashes in which neither driver was injured was available, at least so far as tow-away crashes are concerned. The measure of the aggressivity risk of injury (RO) of the other drivers colliding with the subject model, unadjusted for any other factors, is defined as:

Injury risk of other drivers = RO = proportion of drivers involved in crashes of tow away or greater severity who were injured

The injury severity of other drivers could be measured in a number of ways from the information on injury recorded on NSW, Western Australia and Queensland Police reports and TAC claims (viz. killed; admitted to hospital; or injury requiring medical treatment). The measure of aggressivity injury severity (SO), used here is:

Injury severity of other drivers = SO = proportion of injured drivers who were killed or admitted to hospital.

Based on the definition of RO and SO above, an aggressivity measure for each subject car model was then calculated as:

Aggressivity to other car occupants = AO = RO x SO.

This measures the risk of the driver of other cars being killed or admitted to hospital when involved in collisions with the subject model cars.

Before this aggressivity measure was calculated, consideration was given to taking into account likely differences between the crash circumstances of the subject car models, which may result in a distorted view of its aggressivity only partly related to the characteristics of the subject cars. Factors available in the data to consider such differences include:

- speed limit at the crash location
- subject vehicle driver age (younger drivers may be driving at relatively fast speeds not fully represented by the speed limit)
- subject vehicle driver sex (male drivers may be driving at relatively fast speeds or more aggressively)
- other car occupant age (older occupants are more susceptible to injury)
- other car occupant sex (female occupants are more susceptible to injury, but males appear to be associated with relatively high injury severity levels)

Logistic regression techniques have been used to adjust RO and SO, separately, for any major differences that emerge between models of the subject cars regarding these factors. The adjusted RO and SO have been multiplied together for each subject car model to provide the final measure of aggressivity, AO.

Cameron et al (1998) also considered adjusting the aggressivity ratings for the injury outcome of the drivers of the focus model vehicles, hence providing an indication of the crash severity. This was found to make little difference to the relative aggressivity ratings between vehicle models and has not been further considered here. Cameron et al (1998) also considered using the injury outcome of the most severely injured occupant of the vehicle colliding with the focus vehicle model in estimating the aggressivity index. Again, little difference was found in the estimated aggressivity ratings when considering all vehicle occupants than when considering drivers only so this method was not pursued here.

## 1.3 Preliminary Vehicle Safety Ratings Research in New Zealand

In order to assess the viability of producing vehicle safety ratings for New Zealand (NZ), the LTSA undertook a feasibility study that examined all aspects necessary to produce the ratings relevant to New Zealand motorists and ideally including New Zealand crash data in the analysis. Thomas Voyce (Voyce, 2000) and Tijs Robinson (Robinson, 2000a, 2000b) carried out the two study parts. MUARC completed a review of the LTSA feasibility study (Newstead, 2000) that made recommendations on the future directions of the project to produce crashworthiness ratings based on analysis of real crash data for New Zealand vehicles. One of the key recommendations

from the review of the feasibility study was to undertake a pilot study of the processes required to produce crashworthiness ratings for NZ passenger vehicles based on combined Australian and NZ crash data. The LTSA subsequently engaged MUARC to undertake the first four stages of a proposed 5-stage feasibility study.

A brief description of each of the four previously completed pilot study stages completed and reported in detail in Newstead (2002) is as follows.

**Stage 1: Obtain a sample of merged crash and registration data.**

The LTSA feasibility study showed all required data fields for producing vehicle safety ratings based on NZ data are present in the crash data in Crash Analysis System (CAS) and in the Transport Registry Centre (TRC) held registration data. There was a need to demonstrate the practical ability to merge the crash and registration data, and to be able to check the content and completeness of each of the required variables. The first stage of the pilot study demonstrated the ability to merge data with the required variables for a sample of crashed NZ vehicles. This component of the pilot study built on the work of Tijs Robinson. It enhanced the merged crash and registration files assembled for his first study with the additional data fields needed from CAS to check the content and consistency of a sample of the total data required for vehicle safety rating computation.

**Stage 2: Obtain a snapshot of the NZ vehicle register.**

In discussions with the LTSA and TRC there was some speculation as to the quality of the information in the make, model and year of manufacture fields of the registration data. The second phase of the pilot study obtained a snapshot at a point in time of the relevant fields for all passenger vehicles in the NZ vehicle register. Data was then assessed for quality, particularly in the vehicle make and model fields. The range of vehicles with valid VIN/ chassis numbers has been assessed, as was the year of manufacture fields, particularly for second hand imported vehicles. Work carried out in this phase again built on the work reported in Voyce (2000) and Robinson (2000a,b). The outcomes of this process were important in stage three of the pilot study.

**Stage 3: Establishment and automation of NZ vehicle model decoding procedures.**

Much of the vehicle clustering analysis completed in the LTSA feasibility study was carried out by hand. To use NZ data on a large scale for computation of vehicle safety ratings with regular updates, a mechanism of automatically decoding vehicle makes and models in the crash data and appropriately clustering these for analysis needed to be established. The third stage of the pilot study examined means to achieve automation of this task. Aspects examined included the use of the Australian VIN decoding procedures on NZ data and the use of the existing make and model registration fields for model identification.

**Stage 4: Establish ongoing review of NZ model clustering**:

As in the Australian crashworthiness study, ongoing monitoring of the vehicle fleet, particularly new vehicle model releases, is necessary to ensure defined vehicle clusters remain relevant and to identify new clusters to be formed. The work of Robinson (2000b) for the LTSA formed a sound basis on which to build an ongoing clustering methodology. This stage of the pilot study investigated the resources and methodologies necessary to achieve ongoing updates of the

clustering methodology with a view to the need to produce ongoing updates of the New Zealand vehicle safety ratings.

### 1.4 Aims of Pilot Study Stage 5

Stages 1 to 4 of the New Zealand vehicle safety ratings pilot study has established the availability and suitability of New Zealand crash and registration data sources for estimating vehicle safety ratings using combined Australian and New Zealand crash data. They also confirmed the sufficient compatibility of the Australian and New Zealand vehicle fleets to ensure ratings based on the combined data will be of use to the New Zealand vehicle consumer population. Finally, the initial study stages established techniques for initial and ongoing vehicle model identification and clustering.

The aim of the final stage of the pilot study was to develop and implement analysis methodology to compute the initial set of crashworthiness ratings for New Zealand passenger vehicles based on combined Australian and New Zealand real crash data. As such, this final stage aimed to produce a set of ratings for New Zealand passenger vehicles that could be published for consumer information. Preparation of the crash and registration data for this final stage, along with model identification and clustering utilised the techniques developed in Stages 1 to 4 of the pilot study. The study also aimed to demonstrate the consistency of ratings estimated from combined Australian and New Zealand data with those estimated from Australian data only through rigorous checking and comparison of ratings estimated with and without New Zealand data.

## 2. CRASH DATA

Producing wide covering and accurate vehicle safety ratings for New Zealand passenger vehicles requires use of Australian crash data for vehicles appearing in both the Australian and New Zealand fleets. This was determined in the MUARC review of the original LTSA crashworthiness feasibility study (Newstead, 2000). The Australian crash data used for the New Zealand ratings estimated here is that used to produce the Australian vehicle safety ratings described in Newstead et al (2003). A brief overview of the Australian data is given here. As this study is primarily concerned with the addition of the New Zealand crash data to the Australian crash data to estimate ratings for New Zealand, a detailed description of the New Zealand crash and registration data follows.

### 2.1 Australian Crash Data

The Australian crash data used in this study, along with its preparation for use in estimating vehicle safety ratings, is described in detail in Newstead et al (2003). Data in the Australian study (Newstead et al, 2002) was obtained from the states of Victoria, NSW, Western Australia and Queensland and covered vehicles manufactured over the period 1982-2000 and crashing during the years 1987-2000 in Victoria and New South Wales and 1991 to 2000 in Queensland and Western Australia. The data used for estimation of vehicle crashworthiness and aggressivity ratings covered drivers of passenger or light commercial vehicles involved in a crash required to be reported to Police in one of the four states. In Queensland, New South Wales and Western Australia, crashes are required to be reported to police when one or more vehicles are towed from the scene or when some minimum damage threshold is exceeded. In Victoria, crashes must be reported to police only when someone involved in the crash is injured. Injury severity of

drivers in crashes in Victoria occurring from 1987 to 1998 were verified by matching the police crash records with Transport Accident Commission (TAC) injury compensation claims data. The TAC is the sole traffic accident injury insurer in Victoria.

When the data on the injured drivers from the four states was combined for analysis, it covered 237,927 drivers of 1982-2000 model vehicles who were injured in crashes in Victoria or NSW during 1987-2000 or in Western Australia or Queensland during 1991-2000. Of these 217,502 had a valid injury severity code, with 20,425 drivers injured in crashes in NSW during 1999 and 2000 excluded because of missing injury severity. Information on the 217,502 injured drivers was used to assess the injury severity of the injured drivers of the different makes and models of vehicle when computing crashworthiness ratings. Information on 1,216,862 drivers involved in tow-away crashes in NSW during 1987-2000 or Western Australia and Queensland during 1991-2000 was available in the combined data. This was used to assess the injury rate of drivers of the different makes and models for computing crashworthiness ratings.

The combined data for estimation of vehicle aggressivity ratings covered 86,244 drivers of vehicles colliding with 1982-2000 model vehicles who were injured in two car crashes in Victoria or NSW during 1987-2000 or in Western Australia and Queensland during 1991-2000. Excluding the 8,147 injured drivers from NSW during 1999 and 2000 without a valid injury severity code left 78,097 cases for analysis. This information was used to assess the injury severity of the injured drivers colliding with the different makes and models of vehicles when computing aggressivity ratings. The aggressivity injury risk component was estimated from information on the 585,397 drivers involved in two-car tow-away crashes in NSW during 1987-2000 or Western Australia and Queensland during 1991-2000.

## 2.2 New Zealand Crash and Registration Data

Two sources of data from New Zealand were used in the calculation of vehicle crashworthiness and aggressivity ratings. The first data source provided was a crash file showing the registration, vehicle, driver and various crash characteristics for all police reported crashes in New Zealand for the years 1991 to 2000. The second data source was registration data giving details of all crash involved vehicles on the NZ register in each year from 1991 to 2000. Extracts from both data sources supplied for estimation of vehicle safety ratings are described below. After processing, these data were added to existing Australian data to produce ratings based on Australian and New Zealand real crash experience.

### 2.2.1 Crash Data

NZ has an established database of reported injury crashes covering crashes over many years. Amongst many other things, this data is used to produce the annual publication summarising injury crashes in NZ (LTSA, 1998, for example). The crash data are stored in the Crash Analysis System (CAS) database managed by the LTSA and covers both injury and non-injury crashes. Whilst non-injury crashes are available from CAS, the reporting coverage of non-injury crashes in NZ is not as clear. The problem is that it is not mandatory for a non-injury crash to be reported to the Police so the number, nature and degree of vehicle damage, if any, are not known. Because of this, and because of problems with vehicle model identification documented by Voyce (2000), only injury crash data from New Zealand was useful for estimating vehicle safety ratings.

To facilitate the use of NZ crash data in computing vehicle crashworthiness ratings, it was necessary to include a number of key variables in the crash data supplied. Because the NZ data must be finally integrated with the Australian data for analysis, it was important to match the data fields and levels within the data fields from the NZ data as closely as possible to those in the Australian data used to compute crashworthiness ratings. Extensive assessment of the content and compatibility of the New Zealand crash data in relation to that available from Australia is given in Newstead (2002). That study found the New Zealand injury crash data to be suitable for estimation of vehicle safety ratings in combination with the Australian data. The minimum key variables required in the New Zealand data to ensure compatibility with the Australian data, from those assessed in Newstead (2000), along with their coding levels were as follows.

- Year of crash (1991, 1992, …, 2000)
- Speed limit at crash location (<80km/h, >=80km/h)
- Number of vehicles involved (1, more than 1)
- Level of urbanisation of crash location (urban, rural)
- Driver age (<=25 years, 26-59 years, >=60 years)
- Driver gender (male, female)
- Injury level of driver (killed, hospitalised, other injury, not injured)

Data in CAS are stored as a relational database, comprising a series of linked tables with each covering a different theme related to a crash. The LTSA supplied details of the data fields available in the CAS system through a data dictionary of the database. Data from three tables, crash, person and vehicle, covered all the required data filed listed above. Linking data in the tables together was achieved using the crash identification number (crash_id), traffic unit identifier (ltsa_role) and person identifier (pers_id) fields.

Complete extracts of each data table for the years 1991 to 2000, without personal identifier information, were supplied for analysis. From these, it was possible to select the required data for analysis from the supplied tables. In total, 206,960 units were recorded in the crash file during this period. It is noted that each unit in the file did not necessarily represent a vehicle that could be rated. A unit also included a motorcycle, bicyclist, pedestrian or heavy vehicle.

### 2.2.2 Registration Data

Information from the vehicle register on vehicle make, model and year of manufacture were vital to enhance the crash data for estimation of vehicle crashworthiness ratings. The New Zealand Transport Registry Centre (TRC) held the required data. Data was requested covering all vehicles appearing in the 1991-2000 New Zealand crash data with current or historical (archived) registration records. Registration records for vehicles appearing in the crash data were selected based on registration plate number.

Variables required from the registration database were selected based on information from the Pre-registration Procedures Manual supplied by TRC with reference to information required for accurate vehicle model decoding. Variables requested were as follows (with reference to the Pre-Registration Procedures Manual section where available).

- Vehicle registration number (plate number)
- Vehicle Identification Number (VIN) (4-A-1)
- Vehicle Type (4-A-3)

- Registration Indicator (4-A-5)
- Date of first Registration anywhere
- De-registration date
- Date of First NZ Registration (4-A-6)
- Country of Previous Registration (4-A-7)
- Make (4-A-8)
- Model (4-A-8)
- Sub-model Name (4-A-8)
- Industry Model Code (4-A-8)
- Year of manufacture (4-A-8)
- Body Type (4-A-9)
- Country of Origin (4-A-10)
- Assembly Type (4-A-10)
- CC Rating (4-A-10)

Of the variables requested, a number were key for identifying and clustering model details for vehicles appearing in the New Zealand crash data. These were vehicle type, VIN, year of manufacture, registration number, the date of first registration, the date of first New Zealand registration and whether the vehicle was sold new in New Zealand, was a used import or re-registered.

One difficulty in retrieving vehicle registration information details for crashed vehicles based on only the registration plate number arose for registration plates that had been used on more than one vehicle model over time. It was not possible for the TRC to find the registration record that was current for a plate number just before the time the vehicle crashed. Instead, all records for the plate number of a crashed vehicle were retrieved from the registration system and archive. Where multiple records for a single plate number were provided, the most appropriate match based on the date of the crash and the date of first registration on the vehicle in New Zealand needed to be established. The process for doing so is described below. In some cases a registration record could not be found for a crashed vehicle. This was most likely because either the registration plate details had been recorded incorrectly in the crash data or the vehicle was not registered.

For the 206,960 units involved in crashes in the data supplied for 1991 to 2000, 156,953 registration records were extracted by the TRC from the New Zealand vehicle register. The total number of registration records is less than the number of units because registration records for some vehicle could not be identified as well as because some units were pedestrians and bicycles that, of course, are not registered.

### 2.2.3 Merging the Crash and Registration Data

In order to merge the Australian and New Zealand data for use in the analysis, the New Zealand registration and crash files had to be matched to provide full vehicle and crash information for each crash involved unit. This required the vehicle details obtained from the registration files to be matched with the crash files based on the registration number. This process raises some unique difficulties. First, in some instances the same vehicle may have crashed more than once between 1991 and 2000 causing multiple records for the same vehicle to appear in the registration file. Selecting those cases where the date of first NZ registration, vehicle make,

model and registration details were identical identified these cases. Multiple entries were then deleted from the registration file.

Second, it was possible that the same registration number may be associated with more than one vehicle over time. If any of these vehicles were involved in a crash during the relevant period, all vehicles on the NZ register between 1991 and 2000 with the relevant registration numbers appeared as unique entries in the registration data file. In cases of multiple entries with the same registration number, it was necessary to identify which of the vehicles on the registration file best matched the vehicle involved in the crash as shown in the crash file. To address this issue, additional entries for crashes with multiple matching registration file entries were created and the registration data was merged onto the crash file. Where the date of first NZ registration was after the date of the crash, the entry was removed. Remaining multiple records were sorted by the date of first New Zealand registration. The vehicle with the registration date falling closest in time to the crash date but prior to it was selected and the remaining multiple entries removed.

Finally, in cases where the registration number was unknown or incomplete the crash and registration data could not be matched. At the completion of the matching process, 157,976 entries remained in the merged file containing the relevant variables from both the crash and registration files. This process of matching used here is an enhancement of that described in Newstead (2002) for matching New Zealand crash and registration data.

After merging of the crash and registration data, vehicle model details were decoded using the process described below following which two final selection criteria were imposed. First, only vehicles manufactured after 1981 were to be included in the analysis. This led to the exclusion of 42,326 entries. Second it was necessary to exclude all entries not coded as cars, station wagons, vans, utilities or taxis. This further reduced the number of entries by 11,013. The final number of vehicles of appropriate type and year of manufacture was 104,637. Of the drivers of these vehicles 53,584 were not injured or had unknown injury status, whilst the remaining 51,053 were injured to some degree. The injury details of the 51,053 injured drivers were used for estimation of the crashworthiness injury severity measure in conjunction with the Australian data. Records on the uninjured drivers in the New Zealand injury crash data could not be used in the calculation of the injury risk component of the crashworthiness ratings. This was because non-injury crashes in New Zealand, and hence uninjured drivers from these crashes, were not suitable for use in the analysis and therefore records on all uninjured drivers in all crashes in New Zealand were incomplete.

A subset of the New Zealand data described above and used for estimation of crashworthiness injury severity formed the basis of the data used in the calculation of the aggressivity ratings. For calculation of aggressivity ratings, only vehicles involved in two vehicle crashes were included. Within the New Zealand data this reduced the number of available vehicles from 104,637 to 53,674. Of the drivers of vehicles colliding with the 53,674 vehicles identified, 30,238 were injured whilst 23,436 were uninjured. Information on the injury level of the 30,238 injured drivers was used in conjunction with the Australian data to estimate the injury severity component of the aggressivity ratings.

## 2.3 Combined Australian and New Zealand Data

The combined data on injured drivers from Australia and New Zealand covered 268,555 drivers of 1982-2000 model vehicles who were injured in crashes in Victoria or NSW during 1987-2000

or in Western Australia, Queensland or New Zealand during 1991-2000 with a valid injury severity code. Information on the 268,555 injured drivers was used to assess the injury severity of the injured drivers of the different makes and models when computing crashworthiness ratings. Information on 1,216,862 drivers involved in tow-away crashes in NSW during 1987-2000 or Western Australia and Queensland during 1991-2000 was available in the Australian data. This was used to assess the injury risk of drivers of the different makes and models of vehicle for computing crashworthiness ratings.

The combined Australian and New Zealand data for estimation of vehicle aggressivity ratings covered 108,355 drivers with a valid injury severity code. These drivers were in vehicles colliding with 1982-2000 model vehicles and were injured in two car crashes in Victoria or NSW during 1987-2000 or in Western Australia, Queensland or New Zealand during 1991-2000. This information was used to assess the injury severity of the injured drivers colliding with the different makes and models when computing aggressivity ratings. The aggressivity injury risk component was estimated from information on the 585,397 drivers involved in two-car tow-away crashes in Australia during 1987-2000.

# 3. MODELS OF VEHICLES

## 3.1 Australian Crash Data

A procedure developed by the NRMA located the crashed vehicles in NSW vehicle registration records after matching by registration number and vehicle make. The Vehicle Identification Number (VIN) or chassis number obtained from the register was decoded to determine the models of light passenger vehicles. The decoding identified some light truck and unusual commercial models that were not considered further. Of the vehicles manufactured during 1982-2000, all but around 4% had their model identified. Further details are given by Pappas (1993). The same VIN decoding procedure was used to identify vehicle models in the Queensland data, achieving a similar level of decoding accuracy to NSW.

The Victorian vehicle register provided the make and year of manufacture of the crashed vehicle but not the model. Models were initially derived for cars manufactured during 1982-88 using logic developed and supplied by the Royal Automobile Club of Victoria (RACV) based on the make, year and power-mass units. Power-mass units (PMU) are the sum of RAC horsepower units (PU) and the vehicle mass in units of 50kg (MU). Refined logic was developed by MUARC based on make, year, PMU, PU, MU and body type, and extended to cover 1989-93 models. The MUARC logic was applied to the combined Victorian data in conjunction with the RACV logic to derive passenger car models for the model years 1982-93.

For vehicles crashing in the years 1994 to 2000, where available, the Victorian vehicle register provided the VIN of each crashed vehicle along with the information described above. VINs are recorded on the Victorian vehicle register for most vehicles from 1989 year of manufacture onwards. Where a VIN was available for a vehicle appearing in the 1994 to 2000 crash data, the model information was decoded from the VIN using the methods of Pappas (1993). Where the VIN was not available, the RACV and MUARC logic, described above, was used to obtain model details.

Attempts were made to obtain VINs from the Western Australian vehicle register, managed by the WA Department of Transport, for vehicles appearing in the Western Australian crash data.

Due to an upgrade of the WA registration data system, however, VINs could not be obtained for this update of the vehicle safety ratings although it is possible they may become available for future updates. This meant the VIN decoding system used on data from the other three states to identify vehicle model details could not be used for WA.

Detailed vehicle make and model information along with year of manufacture have been merged onto the WA crash data by Main Roads WA as part of a regular interrogation of the WA vehicle register. The make and model codes proved to be of sufficient detail to be used, along with the year of manufacture, to assign vehicle model groupings to vehicles crashed in WA consistent with the vehicle model groupings that are derived from the VIN decoding system. Only a small number of vehicles, typically in model change over years, could not be accurately assigned a sufficiently accurate model code for use in the study.

RACV, NRMA and the Australian Transport Safety Bureau (ATSB, formerly FORS) provided advice on the particular models that had experienced substantial changes in design (and hence potential crashworthiness) during model years 1982-2000 and in which years the design was relatively constant. This resulted in certain models being split into ranges of years of manufacture. Where the new model was introduced near the beginning or end of a year (up to two months either way), this process was relatively straightforward (accepting a small mis-classification in some circumstances). However, when the model changed near the middle of the year, the model for that year was kept separate and potentially treated as a "mixed" model (eg. the Daihatsu Charade 1987 models). Where exact model decoding was possible from the VIN, without using year of vehicle manufacture, this was used.

VicRoads previously provided advice on vehicle models that could be combined with each other (sometimes only for specific years) because they were essentially the same design or construction but registered as having different manufacturers. This information was used in the analysis to combine some models, otherwise one or both members of each such pair of models would have been excluded and a crashworthiness rating would not have been produced (Section 4.1.3). Model sharing in the automotive industry has declined in recent years alleviating this as an ongoing problem to a large degree.

As in previous crashworthiness ratings, models were excluded with fewer than 20 injured drivers and/or fewer than 100 involved drivers appearing in the crash data. The same selection criteria were also used for aggressivity ratings except exclusion was based on the number of injured drivers in the vehicles colliding with the focus vehicle model. These selection criteria were used to ensure stability in fitting the logistic regression models along with suitably small confidence limits on the estimated crashworthiness ratings.

For the purpose of publication, the models were also categorised in market groups as follows:

- Passenger cars and station wagons: Large
  Medium
  Small
  Sports
  Luxury
- Four-wheel drive vehicles
- Passenger vans
- Commercial vehicles (less than 3500 kg GVM)

It should be noted that some of the vehicle models identified in the Victorian, NSW, Western Australia and Queensland crash data have optional safety equipment, such as air bags, which could significantly alter the crashworthiness rating of the vehicle model when fitted. Notable examples in local manufacture include the Holden Commodore VR/VS, Toyota Camry 1993-97 and Mitsubishi Magna TR/TS, and TE/TF/TH, all of which have optional air bag fitment. It is, however, generally not possible to identify which particular vehicles of a model series do and do not have such optional safety equipment installed using the model decoding procedures described above. Consequently, for those vehicle models with optional safety equipment, the estimated crashworthiness rating represents an average of the safety performance for vehicles with and without the optional safety equipment weighted by the number of each in the crash data.

## 3.2 New Zealand Crash Data

In order to integrate the New Zealand crash data with the Australian data for analysis, it was necessary to identify and classify the make and model type of each crash-involved vehicle in a way consistent with that carried out for the Australian data. A process of decoding vehicle model information in the New Zealand crash data was established and applied in Newstead (2002). The procedure developed is described here but broadly follows the principles outlined above for the Australian data.

Identifying vehicle models and establishing appropriate clustering relied on the use of external resources giving details of vehicle model release dates and specifications. A summary of the key resources used for the New Zealand model decoding process is as follows.

- **IDENTICAR. T**he principal resource on vehicle model specifications and release dates has been Identicar published by GCL in NZ. Identicar has model run dates and limited information on specifications for all new and used imported passenger vehicles and light commercial vehicles available for sale in NZ. It has either photographs or sketches of each vehicle model covered along with details on the manufacturers' chassis code that are broadly consistent with the industry model codes and chassis codes held on the NZ vehicle register. Information in the publication covers the period of vehicle manufacture from 1982 onwards which is the focus of the ratings system. It is recognised that the information presented in Identicar is not always completely accurate, particularly with respect to items of detail such as the manufacturer's chassis code and detailed specifications of the vehicle. However, despite the noted problems, it was considered that the information presented is of sufficient detail and accuracy for the publication to be used as an ongoing primary resource for vehicle model identification and clustering in the production of NZ crashworthiness ratings.

- **POLK AUTOSPEC.** Polk AutoSpec has proved a valuable resource in identifying new vehicle releases in the Australian market for use in producing the Australian vehicle crashworthiness ratings. It has highly detailed information on vehicle release dates, original specifications and specification changes. It also has detailed photographs of each vehicle model released. For a number of years, Polk also published an AutoSpec covering the NZ new vehicle market that represented a valuable source of information on NZ new vehicle releases. In the NZ crashworthiness feasibility study, the AutoSpec publication was a valuable source of information on new vehicle releases in NZ with the photographs and specifications allowing accurate comparison of vehicle model lines with those from

Australia thought to be similar. It was hoped AutoSpec could continue to be used as a primary resource for identification and clustering of new NZ vehicles in the process of producing crashworthiness ratings. Unfortunately, Polk are no longer producing the AutoSpec publication for NZ, a decision based on economic grounds perhaps reflecting the minority of total NZ vehicle sales that new vehicles now represent. Consequently, this resource was only useful for this research for the historical coverage of the publication whilst it was being produced.

- **REDBOOK.** A valuable source of on-line information on vehicle specifications and release dates is Red Book. The Red Book web site for Australia (www.redbook.com.au) covers an extremely wide range of vehicles currently existing in the Australian fleet. Detail is given on each model variant including a sketch of the vehicle for visual identification and a brief summary of specifications. Information in Red Book is useful in the safety ratings projects for determining build dates of vehicle model series, and broad specification of different model variants. It is the most valuable source of information available for vehicles manufactured pre 1990. Red Book also has a web site specific to the NZ vehicle market (www.redbook.co.nz). It includes most of the range information on the Australian Red Book site apart from the sketches of vehicle models useful for visual identification. Importantly, it covers not only vehicles sold new in NZ but also a wide range of second hand imported vehicles, particularly the most popular models. The lack of pictures or sketches of vehicle models on the NZ Red Book site was offset through the use of other NZ automotive web sites such as Auto (www.auto.co.nz) to access pictures of vehicles. On line sources such as Red Book NZ provided the next most important source of ongoing vehicle identification and clustering information after Identicar.

As noted, the New Zealand vehicle fleet is comprised fundamentally of two different types of vehicles. They are those sold new in New Zealand and used vehicles imported into New Zealand primarily from Japan. Because of differences in availability and quality of information in the registration data between new and used import vehicles, a different strategy for decoding model information for new and used import vehicle was used.

As in the Australian data, the final aim of the model decoding process is to assign a model code ('modelh') to each crashed vehicle in the New Zealand data code dependent on the make, model and year of manufacture of the vehicle. A vehicle safety rating is then calculated for each vehicle set defined by a 'modleh' code with sufficient real crash experience. A full list of the 'modelh' codes and associated vehicle details is provided in Appendix 1. The process for assigning the 'modelh' code for both new and used import vehicles in the New Zealand crash data follows.

### 3.2.1 New Vehicle Model Decoding and Clustering

The model decoding and clustering procedure used for passenger vehicles sold new in NZ is as follows.

1) Vehicles with a valid ISO standard 17 character VIN number were identified in the merged crash and registration data. The make, year of manufacture and VIN for these vehicles was then run through the VIN decoder developed for decoding vehicle model information in the Australian crashworthiness system. VINs beginning with a 7 (the world manufacturer code character for NZ) were identified and excluded from this process as the Australian VIN decoder does not contain the necessary data to be able to identify vehicle model details for

vehicles with a NZ assigned VIN. The result of the VIN decoding process, where successful, was a direct clustering of each vehicle into one of the clusters defined for the Australian crashworthiness ratings study. Vehicles that had no cluster assigned after the VIN decoding process were identified for further processing. Of the 157,976 unit entries matched with registration data, 9,418 had recorded vehicle identification numbers (VINs) not beginning with a 7. These entries were extracted and assigned a code according to their VIN. Of these, 2,956 entries did not decode properly and were added back to the remaining uncoded data.

2) Vehicles without an ISO standard VIN, those with ISO standard VINs issued in NZ (beginning with a 7) and those that failed the VIN decoding process were identified for the next processing phase. A total of 93,493 crashed vehicles that were sold new in New Zealand had vehicle model details identified in this way.

   a) Basic vehicle make and model details were identified from the vehicle make and model codes held on the vehicle register. These are equivalent to the make and model information contained in the NZ assigned ISO VIN were applicable and were found to be consistent with that in the crash data in comparisons made in Newstead (2002).

   b) Using "Identicar" and Polk "AutoSpec" to identify vehicle specifications and major model series changes, a process of clustering was developed. Definition of clusters used the vehicle make and model codes along with the vehicle year of manufacture. A translation table was developed that converted the vehicle make, model and year of manufacture combinations present in the crash data to the Australian equivalent model clusters. Development of the translation table was essentially carried out manually through necessity. One of the key difficulties encountered that necessitated manual development of the translation table was the numerous variations of the vehicle model codes in the registration data for the same vehicle. For example "Applause L" and "Applause X" for two different trim variants of the same Daihatsu vehicle (ideally the suffixes X and L should have been in the sub-model code field with only Applause in the model code). The model cluster translation table will need to be updated every time new data is added to the system, in a similar way in which the Australian VIN decoder is updated to reflect new model releases.

   c) In some cases, a broader range of body types and specifications of some NZ vehicle models was available than in Australia. Some of the different body types and specifications were likely to have differences significant enough to alter the crashworthiness of the vehicle. Identification of variants within a model range with body types and specification dissimilar enough to have likely different crashworthiness to the equivalent Australian model was made using the body type, industry model code and chassis number data fields. Vehicle model variants identified with incompatible specifications or body types were excluded from the defined comparable Australian data clusters.

### 3.2.2 Used Imported Vehicle Model Decoding and Clustering

Identification of vehicle make and model details and appropriate clusters for the used imported NZ vehicles, was carried out using an identical process to that in section 2 of the process used for new vehicles above (Section 3.2.1). This process was also used for vehicles identified in the registration records as re-registered or unknown. 58,021 vehicles in the matched crash and registration data were identified as used, re-registered or unknown. New car process (1) was not

available for the used imports as almost none of these vehicles had a valid ISO VIN assigned in any country apart from NZ. The available source of information on vehicle model specifications were the "Identicar" publication that has a whole section devoted to the used Japanese imported vehicles, including great detail on the associated industry model codes for each vehicle, and the on-line sources “Redbook” and “Auto”. Use of the industry model code and or chassis number (which generally contains the industry model code) proved useful for the second hand imported vehicles in some instances.

### 3.2.3 Final Decoded Data

The three sources of decoded data (VIN decoded, new and used decoded entries) were then merged together to enable the final selection of vehicles for use in the analysis. Where insufficient information was available for the ‘modelh’ code to be determined from any of the processes described above, the ‘modleh’ code was assigned a value of ‘Z’. Two final selection criteria were imposed. First, only vehicles manufactured after 1981 were to be included in the analysis. This led to the exclusion of 42,326 entries. Second, where no ‘modelh’ code had been assigned or a modelh code of ‘Z’ was assigned, it was necessary to exclude all entries not coded as cars, station wagons, vans, utes or taxis. This further reduced the number of entries by 11,013. The final file for use in the analysis contained 104,637 vehicles crashed in New Zealand with valid model details identified.

# 4. ANALYSIS

## 4.1 Overview of Analysis Methods: Crashworthiness

The crashworthiness rating (C) is a measure of the risk of serious injury to a driver of a car when it is involved in a crash. It is defined to be the product of two probabilities (Cameron et al, 1992):

i) the probability that a driver involved in a crash is injured (injury risk), denoted by R;

and

ii) the probability that an injured driver is hospitalised or killed (injury severity), denoted by S.

That is

$$C = R \times S.$$

Folksam Insurance, who publishes the well-known Swedish ratings, first measured crashworthiness in this way (Gustafsson et al, 1989).

In the present report, each of the two components of the crashworthiness rating was obtained by logistic regression modelling techniques. Such techniques are able to simultaneously adjust for the effect of a number of factors (such as driver age and sex, number of vehicles involved, etc.) on probabilities such as the injury risk and injury severity.

*The Logistic Model*

The logistic model of a probability, P, is of the form:

$$\log it(P) = \ln\left(\frac{P}{1-P}\right) = b_o + b_1 X_1 + \ldots + b_k X_k = f(X).$$

That is, the log of the odds ratio is expressed as a linear function of k associated variables or their interactions, $X_i, i = 1,\ldots,k$. Estimates of the parameter coefficients of the logit function, ie the $\hat{\beta}_i$ can be obtained by maximum likelihood estimation (Hosmer & Lemeshow, 1989).

*Logistic Confidence Limits for the Vehicle Models or Year of Manufacture*

Whilst it is possible to calculate the variance of $\hat{f}(X)$, in the context of crashworthiness ratings we are only interested in the component of variance due to one factor in $\hat{f}(X)$ with the variance due to the other factors in the model being of no interest. In practice, the component of variance due to the factor representing the vehicle model or year of manufacture is of interest, whilst the variance due to the remaining factors such as driver age and sex is common to all vehicle models or years of manufacture and hence of no interest.

To isolate the component of variance in the logistic model due to only one factor, say factor $X_i$, the remaining factors were fixed at a predetermined level (their mean value). The variance of $\hat{f}(X)$, considering all factors apart from $X_i$ to be fixed, is then given by

$$Var\left(\hat{f}(X_i)\right) = X_i^2 Var\left(\hat{b}_i\right)$$

In the logistic models of injury risk or injury severity, $X_i$ was a [0,1] indicator function of either a particular vehicle model or market group or year of manufacture, depending on the analysis being performed. Hence the variance function given above equalled the variance of the coefficient $\hat{b}_i$.

A 95% confidence interval for the logit function with respect to component $X_i$ is given by

$$\hat{f}(X) \pm 1.96\sqrt{Var\left(\hat{f}(X_i)\right)}\ .$$

Point estimates and confidence limits in the logistic space were transformed into probability estimates using the inverse logistic transform given by

$$\hat{P} = \frac{e^{\hat{f}(X)}}{1 + e^{\hat{f}(X)}}.$$

### 4.1.1 Logistic Models for Each Component

*Obtaining the Covariate Models*

Before adjusted crashworthiness ratings could be obtained it was necessary to consider logistic models of each of the crashworthiness components separately to identify possible factors, other than vehicle design, that might have influenced the crash outcomes in terms of driver injury severity. A stepwise procedure was used to identify which factors had an important influence. This was done without considering the type of car or year of manufacture in the model, as the aim was to determine which other factors were most likely to have had an influence across a broad spectrum of crashes. Furthermore, the car model variable had to be excluded from the logistic modelling process at this stage because of analysis convergence problems when the car model was competing against the other factors in the stepwise procedure. It was also not considered appropriate to interact vehicle model with other factors in the logistic model as this would imply that relative vehicle crashworthiness varied between models depending on the crash circumstance and occupant characteristics.

Logistic models were obtained separately for injury risk and injury severity because it was likely that the various factors would have different levels of influence on these two probabilities.

The factors considered during this stage of the analysis for both injury risk and injury severity were:

- **sex:** driver sex (male, female)
- **age:** driver age (≤25 years; 26-59 years; ≥60 years)
- **speedzone:** speed limit at the crash location (≤75 km/h; ≥80 km/h)
- **nveh:** the number of vehicles involved (one vehicle; >1 vehicle)
- **state:** state or country of crash (Victoria, NSW, Queensland, Western Australia or New Zealand)
- **year:** year of crash (1987, 1988, … ,2000)

These variables were chosen for consideration because they were part of the Victorian, Queensland, New South Wales, Western Australia and New Zealand databases. Other variables were only available from one source and their inclusion would have drastically reduced the number of cases that could have been included in the analysis.

State or country of crash was a necessary inclusion in the logistic model because each state or country in the analysis has different proportions of crashes at each severity level in their reported data. Factors tha may result in different proportions of crashes at each severity level between jurisdictions include different levels of driver compliance with safety related laws such as seat belt wearing, speed limits or blood alcohol limits or differences in general levels of safety in the road infrastructure. Including the state factor in the covariate model is necessary to adjust for rating bias towards those vehicle models that are sold and driven more in one state or country than another. Inclusion of a year of crash indicator and its interaction with jurisdiction in the model is necessary to adjust for the different trends in crash severity noted between each of the states or countries (see section 4.1.5 below).

All data was analysed using the Logistic Regression procedure of the SAS statistical package (SAS, 1989). Estimates of the coefficients of the logit function, $\hat{\beta}_i, i = 1, \ldots, k$, together with their associated standard errors, were obtained by maximum likelihood estimation. In the modelling process, design variables for the various factors were chosen in such a way that the estimated coefficients represented deviations of each of the variable levels from the mean. Each factor in the model, including year of crash, was treated as categorical to allow maximum flexibility in the relationship between each and the outcome measure.

For both injury risk and injury severity, a stepwise procedure was used to identify which factors and their interactions made a significant contribution to these probabilities. All possible first and higher order interactions were considered between all factors in the model. A hierarchical structure was imposed so that interaction between two variables was included in the model only when the corresponding main effects were also included. The resultant logistic regression models were referred to as the "covariate" models or equations.

The average value of the injury risk or injury severity was obtained directly from the outcome variable of interest averaging across all cases in the analysis.

*Assessing Car Model or Year of Manufacture Differences*

Injury risk and injury severity for individual cars were estimated after adding a variable representing car model or year of manufacture to the respective logistic "covariate" models. That is, the car model or year of manufacture variable was included in the logistic model along with those factors and their interactions that were found to be statistically significantly related to the outcome variable in the stepwise modelling procedure and the model re-estimated in a single step process. Coefficients for individual car models or years of manufacture were computed to represent deviations of that car or year from the average. As mentioned earlier, this was to avoid non-convergence problems in the analysis when car model or year of manufacture was allowed to compete with the other factors in the stepwise selection process.

It was important to ensure that the logistic model adequately described the data and did not yield individual car model coefficients that were imprecise or unstable. For this reason, individual car models with small frequencies were pooled with similar car models in the rare cases where this was appropriate (see Section 4.1.3) or, more typically, they were excluded from the analysis. Car models were excluded if, after pooling models, there were either:

i) less than 100 involved drivers; or
ii) less than 20 injured drivers.

Some further model exclusions were made for vehicle model classifications that had no practical interpretation. This included models in a particular year where there was a change from one series to the next and year of manufacture was necessary to determine the series break (such as Mitsubishi Pajero 1991). It also included some groups of highly aggregated models that would be of no intrinsic interest to consumers using the ratings (such as Jeep Others or Mazda Commercials).

After exclusion, the regression analyses were performed on 263 individual car models (or pooled similar models). A list of all vehicle models considered, with those with sufficient data for analysis indicated, is given in Appendix 1. The variable representing car model was therefore

categorical with 263 nominal levels. The choice of the design for the logistic model allowed the injury risk and injury severity estimates for each individual car model to be compared with the overall (average) rating for all cars. No such criteria were necessary for the year of manufacture analysis.

For each car model or year of manufacture, a 95% confidence interval for the logit functions of injury risk and injury severity was obtained after first adjusting for the average value in the data and then allowing for the deviation from average for that particular car model.

Estimates of injury risk and injury severity were obtained by de-transforming the logit functions as described above. A 95% confidence interval was determined after adjusting for the average values of the significant factors and their interactions. The precision of the estimates of injury risk and injury severity is measured by the width of these 95% confidence intervals.

*Assessing Market Group Averages*

A similar approach to that for individual car models was used to assess car market group averages. A variable with 8 nominal levels representing the different market groups (large, medium, small, luxury, sports, 4-wheel drive, passenger vans and commercial vehicles with GVM $\leq$ 3500 kg) was added to each of the "covariate" models. Deviations of each market group from the average were also assessed. Ninety-five percent confidence intervals for the estimates of both injury severity and injury risk were also obtained for each of the market groups.

### 4.1.2 Combining the Injury Risk and Injury Severity Components

The final combined ratings of vehicle crashworthiness are given by:

Crashworthiness Rating = Injury risk x Injury severity.

For a given model of car or year of manufacture, j, the crashworthiness rating, $C_j$, was therefore calculated as:

$$C_j = R_j \times S_j$$

where

$R_j$ denotes the injury risk for car model or year of manufacture j, and
$S_j$ denotes the injury severity for car model or year of manufacture j.

Noting the form of the logistic inverse transformation in section 4.1 above, we have

$$R_j = \frac{e^{a_j}}{1+e^{a_j}}, \qquad S_j = \frac{e^{b_j}}{1+e^{b_j}}$$

where $a_j$ and $b_j$ are the values of the logistic regression function $\hat{f}(X)$ for injury risk and injury severity respectively for vehicle model or year of manufacture *j*.

Taking the natural log of the crashworthiness rating and using asymptotic statistical theory, the asymptotic variance of the log of the crashworthiness rating is

$$Var(\log_e C_j) \approx \frac{Var(a_j)}{(1+e^{a_j})^2} + \frac{Var(b_j)}{(1+e^{b_j})^2}$$

where the variances of $a_j$ and $b_j$ are as given in section 4.1 and the estimates of $a_j$ and $b_j$ are considered independent.

The 95% confidence interval for the natural log of the crashworthiness rating is then

$$\log_e(C_j) \pm 1.96 \cdot \sqrt{Var\left(\log_e(C_j)\right)}.$$

The 95% confidence limit for the crashworthiness rating is obtained by taking the exponent of the confidence limit of the logged crashworthiness rating shown above.

Because each of the two estimated crashworthiness components have been adjusted for the effect of other factors by logistic regression prior to their incorporation into the combined ratings, the resultant crashworthiness rating is also adjusted for the influence of these factors. It should be noted that the confidence interval for the combined rate reflects the variability in the car model only and not the variability in the other factors included in the logistic models.

The same procedure was used to obtain crashworthiness ratings of each distinct market group and for each year of vehicle manufacture.

### 4.1.3 Pooled Car Models

Vehicle model sharing amongst manufacturers retailing in the Australian market has been relatively common. Because shared models are generally identical, particularly with respect to safety performance, it is possible to pool such models for safety rating, allowing a more precise estimate of the safety of models for which data is pooled rather than considering each separately. There are also some Ford Falcon models that expert advice has indicated did not change significantly from one series to the next that can also be pooled for the same reasons as the shared models. Both the pooled models and Falcon models combined are indicated in Table 2.

**Table 2:** Pooled Models of Cars

| | | |
|---|---|---|
| Ford Laser 82-89 | with | Mazda 323 / Familia 82-88 |
| Ford Laser 99-00 | with | Mazda 323 99-00 |
| Ford Telstar 83-87 | with | Mazda 626 / MX6 / Capella 83-86 |
| Ford Telstar 88-91 | with | Mazda 626 / MX6 / Capella 88-91 |
| Ford Telstar 92-97 | with | Mazda 626 / MX6 / Capella / Cronos 92-97 |
| Ford Falcon EA | with | Ford Falcon EB Series I |
| Ford Falcon ED | with | Ford Falcon EB Series II |
| Ford Corsair 89-92 | with | Nissan Pintara / Bluebird 89-92 |
| Holden Commodore VR/VS | with | Toyota Lexcen 93-97 |
| Holden Commodore VN-VP | with | Toyota Lexcen 89-93 |
| Holden Nova 89-92 | with | Toyota Corolla 88-92 |
| Holden Nova 93-96 | with | Toyota Corolla 93-97 |
| Holden Astra 84-86 | with | Nissan Pulsar / Langley 83-86 |

| | | |
|---|---|---|
| Holden Astra 88-90 | with | Nissan Pulsar / Sentra 87-91 |
| Holden Barina 85-88 | with | Suzuki Swift / Cultus 86-88 |
| Holden Barina 89-93 | with | Suzuki Swift / Cultus 89-00 |
| Holden Apollo JK/JL 89-92 | with | Toyota Camry / Vista 90-93 |
| Holden Apollo JM/JP 93-97 | with | Toyota Camry / Sceptor 94-97 |
| Ford Maverick 88-97 | with | Nissan Patrol 88-97 |
| Suzuki Scurry 85-87 | with | Holden Carry 85-90 |
| Suzuki Samurai / SJ410 / SJ413 82-99 | with | Holden Drover 85-87 |
| Nissan XFN Utility | with | Ford Falcon Utility |
| Ford Festiva WA 91-93 | with | Mazda 121 87-90 |

In addition to those vehicle models pooled above, a number of vehicle models in the New Zealand fleet that are sold both new and as second hand imports, for example the Subaru Legacy, have also been combined. Pooling of the new and second hand vehicle models is based on information in publications such as Identicar indicating that the new and second hand import vehicles are equivalent in safety specification. An indication of the pooled new and second hand import vehicle models can be seen in the vehicle lists in Appendix 1, particularly where the new and second hand import vehicles have different names, such as the Mazda 121 and Autozam Revue manufactured form 1991 to 1997.

### 4.1.4 Market Group Analyses

In addition to the individual car model analyses, logistic regression analyses were performed based on broad market groups as defined in Section 4.1.1. The market group analyses provided reference ratings for models in each group.

### 4.1.5 Trends in the Rating Criteria

In New Zealand and each of the four Australian states contributing crash data for analysis in this project, there have been changes in road safety during the late 1980s and 1990s that may have produced a change in both the risk of serious injury in crashes as well as the number of crashes occurring. Furthermore, trends in road safety have not been the same in each region. There was therefore some concern that there may have been a bias in the crashworthiness ratings given that a large number of vehicle models were not on sale, and hence involved in crashes, for the entire period covered by the crash data. If, for example, there had been a general reduction in crash severity over time, the crashworthiness rating of the later model cars would tend to be lower, irrespective of design improvements, than would be expected if the general improvements in road safety had not occurred. Sales profile of vehicle models also differs significantly between regions. Consequently, if a vehicle model is crashed more in a region with poor safety record it may appear to be less crashworthy if state effects are not adjusted for in the analysis.

This concern led to a need to investigate whether there were in fact, different trends in the risk of driver injury and/or driver injury severity between regions over time. If changes were found these would need to be taken into account in the crashworthiness ratings.

The file of drivers involved in crashes in NSW, Queensland and Western Australia used to measure the driver injury rate, the first component of the crashworthiness rating, was analysed by the year and state in which the crash occurred to assess any trends. Results are shown in Table 3.

Table 3 shows clear evidence of differential trends in injury rate between each of the three states whose data is used in this analysis component. It is also evident that the trends in injury rate are non-linear in each of the three states. These observations made it necessary to adjust the injury risk component of the crashworthiness ratings by both state of crash and year of crash as well as the interaction between the two to reflect differential trends across states. The non-linear nature of the trend also made it necessary to treat year as a categorical variable rather than a continuous measure.

**Table 3:** Numbers of drivers of light passenger vehicles manufactured in 1982-2000 and involved and injured in tow-away crashes in NSW during each of the years 1987-2000 and in Queensland and Western Australia during each of the years 1991-2000.

| YEAR | NSW | | | QLD | | | WA | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Injured | Total Involved | Injury rate (%) | Total Injured | Total Involved | Injury rate (%) | Total Injured | Total Involved | Injury rate (%) |
| **1987** | 4212 | 32980 | **12.8** | | | | | | |
| **1988** | 4788 | 32584 | **14.7** | | | | | | |
| **1989** | 5310 | 37018 | **14.3** | | | | | | |
| **1990** | 5596 | 40125 | **13.9** | | | | | | |
| **1991** | 5402 | 39231 | **13.8** | 1184 | 7069 | **16.7** | 2159 | 19429 | **11.1** |
| **1992** | 5819 | 40033 | **14.5** | 2171 | 9905 | **21.9** | 2509 | 20846 | **12.0** |
| **1993** | 5843 | 40859 | **14.3** | 2688 | 11323 | **23.7** | 2774 | 26341 | **10.5** |
| **1994** | 6135 | 42433 | **14.5** | 3464 | 13128 | **26.4** | 3652 | 33446 | **10.9** |
| **1995** | 6490 | 45477 | **14.3** | 4087 | 13797 | **29.6** | 4536 | 38934 | **11.7** |
| **1996** | 6971 | 51931 | **13.4** | 4329 | 14441 | **30.0** | 5380 | 45778 | **11.8** |
| **1997** | 7535 | 54550 | **13.8** | 6052 | 14778 | **41.0** | 6012 | 47915 | **12.5** |
| **1998** | 8577 | 60603 | **14.2** | 7131 | 16642 | **42.8** | 6413 | 51192 | **12.5** |
| **1999** | 9573 | 67180 | **14.2** | 5862 | 17807 | **32.9** | 5738 | 50613 | **11.3** |
| **2000** | 10852 | 66515 | **16.3** | 6140 | 17472 | **35.1** | 6262 | 50799 | **12.3** |

Table 4 shows analogous information to Table 3 for trends in injury severity across New Zealand and the four states contributing data to this component of the analysis. Table 4 shows there are also clear differential trends in injury severity between each of the five regions. This meant that adjustment for region and year of crash, as well as their interaction was also necessary for the injury severity analysis, with year of crash again treated as a categorical variable.

A further point illustrated by Table 3 is the difference in average injury risk between crashes in NSW and WA and crashes in Queensland. The raw injury rate observed in Queensland is of the order of two to three times higher than that observed in NSW and WA. As mentioned, whether this is because crashes in Queensland are actually more severe or because of a reporting bias towards more severe crashes in Queensland is unclear. Similarly, Table 4 shows average injury severity in WA is much lower than the other three states. This is possibly due to a different definition of severe injury in WA compared to the other states although the definition given in the WA crash data coding manual does not reflect this. Regardless, neither of these differences is considered problematic in computing the ratings provided adjustment for state of crash is made in the covariate models of injury risk and severity. The important point for ratings computation is that relative injury risk or severity between vehicle models is consistent across states, regardless of the average risk or severity in each state. Interrogation of the data suggested this was the case.

**Table 4:** Numbers of drivers of light passenger vehicles manufactured in 1982-2000 and injured in crashes in NSW and Victoria during each of the years 1987-2000 and in Western Australia, Queensland and New Zealand during the years 1991-2000.

| Year | NSW | | | VIC | | | QLD | | |
|---|---|---|---|---|---|---|---|---|---|
| | Killed or Seriously Injured | Injured | Severe Injury Rate (%) | Killed or Seriously Injured | Injured | Severe Injury Rate (%) | Killed or Seriously Injured | Injured | Severe Injury Rate (%) |
| **1987** | 920 | 4212 | **21.8** | 519 | 2119 | **24.5** | | | |
| **1988** | 1047 | 4788 | **21.9** | 508 | 2513 | **20.2** | | | |
| **1989** | 1099 | 5310 | **20.7** | 629 | 2999 | **21.0** | | | |
| **1990** | 1211 | 5596 | **21.6** | 511 | 2334 | **21.9** | | | |
| **1991** | 1195 | 5402 | **22.1** | 528 | 2315 | **22.8** | 380 | 1184 | **32.1** |
| **1992** | 1297 | 5819 | **22.3** | 518 | 2537 | **20.4** | 640 | 2171 | **29.5** |
| **1993** | 1254 | 5843 | **21.5** | 792 | 2772 | **28.6** | 739 | 2688 | **27.5** |
| **1994** | 1263 | 6135 | **20.6** | 956 | 3225 | **29.6** | 1010 | 3464 | **29.2** |
| **1995** | 1380 | 6490 | **21.3** | 1165 | 3878 | **30.0** | 1153 | 4087 | **28.2** |
| **1996** | 1470 | 6971 | **21.1** | 1228 | 4327 | **28.4** | 1108 | 4329 | **25.6** |
| **1997** | 1798 | 7535 | **23.9** | 1203 | 4215 | **28.5** | 1491 | 6052 | **24.6** |
| **1998** | 2404 | 8577 | **28.0** | 403 | 1339 | **30.1** | 1905 | 7131 | **26.7** |
| **1999** | | | | 2351 | 10473 | **22.4** | 1627 | 5862 | **27.8** |
| **2000** | | | | 2682 | 11235 | **23.9** | 1653 | 6140 | **26.9** |

| Year | New Zealand | | | WA | | |
|---|---|---|---|---|---|---|
| | Killed or Seriously Injured | Injured | Severe Injury Rate (%) | Killed or Seriously Injured | Injured | Severe Injury Rate (%) |
| **1987** | | | | | | |
| **1988** | | | | | | |
| **1989** | | | | | | |
| **1990** | | | | | | |
| **1991** | 898 | 4021 | **22.3** | 202 | 2159 | **9.4** |
| **1992** | 778 | 4534 | **17.2** | 179 | 2509 | **7.1** |
| **1993** | 851 | 4571 | **18.6** | 196 | 2774 | **7.1** |
| **1994** | 913 | 5177 | **17.6** | 356 | 3652 | **9.7** |
| **1995** | 933 | 5848 | **16.0** | 690 | 4536 | **15.2** |
| **1996** | 1043 | 5556 | **18.8** | 713 | 5380 | **13.3** |
| **1997** | 1016 | 5302 | **19.2** | 954 | 6012 | **15.9** |
| **1998** | 1007 | 5264 | **19.1** | 1011 | 6413 | **15.8** |
| **1999** | 1155 | 5583 | **20.7** | 599 | 5738 | **10.4** |
| **2000** | 1118 | 5197 | **21.5** | 651 | 6262 | **10.4** |

## 4.2 Overview of the Analysis Methods: Aggressivity

As described above, the measure of aggressivity to drivers of other cars (AO) being considered here is:

$$AO = RO \times SO$$

where

RO = Injury risk of other drivers

that is, the probability that the other driver sustains some injury given their vehicle is involved in a crash of tow-away severity or greater with the subject vehicle type, and

SO = Injury severity of other drivers

where SO is the probability that the other driver is killed or seriously injured given they sustain some injury in the crash where their vehicle is impacted by a vehicle of the subject vehicle type. The subject vehicle, described by its make and model or market group, is the specific type of vehicle whose aggressivity is being measured in terms of its threat of injury to the driver of the other vehicle with which it impacts.

Each of the two components of the aggressivity rating, RO and SO, were obtained by logistic regression modelling techniques. In the same manner as for the crashworthiness ratings, such techniques are able to simultaneously adjust for the effect of a number of factors, which will be discussed below, on the aggressivity injury risk and injury severity probabilities.

### 4.2.1 Logistic Models, Confidence Limits and Assessment of Aggressivity of Specific Vehicle Models and Market Groups

A logistic model of the same form used for estimation of vehicle crashworthiness ratings was used for estimation of vehicle aggressivity ratings. The key difference in the logistic models for vehicle aggressivity was that the response variables being modelled were not the injury risk or injury severity of the driver of the focus vehicle, as for crashworthiness. Rather, the injury risk and injury severity of the driver of the other vehicle with which the focus vehicle model collided were modelled as the response variables. Given the similarity of the structure of the aggressivity injury risk, RO, and injury severity, SO, with their crashworthiness parallels, the method of computing confidence limits on each RO and SO was the same as given for the corresponding crashworthiness measures above.

Before adjusted aggressivity ratings could be obtained it was necessary to consider logistic models of each of the aggressivity components, RO or SO separately, to identify possible factors, other than vehicle design, that might have influenced injury outcome to the other driver. As for crashworthiness rating estimation, a stepwise procedure was used to identify which factors had an important influence. This was done without considering the type of car (make/model or market group) in the model, as the aim was to determine which other factors were most likely to have an influence across a broad spectrum of crashes. Logistic models were obtained separately for injury risk, RO, and injury severity, SO, because it was likely that the various factors would have different levels of influence on these two component probabilities of the aggressivity measure.

The factors considered in the covariate models for both aggressivity injury risk and injury severity were

- **speedzone** : speed limit at the crash location ( <80km/h, >= 80 km/h)
- **agefcd** : age of driver of subject car (<=25 years, 26-59 years, >=60 years)
- **sexfcd** : sex of driver of subject car

- **ageoo** : other car driver age (<=25 years, 26-59 years, >=60 years)
- **sexoo** : other car driver sex (male, female)
- **state** : state or country in which the vehicle crashed (VIC, NSW, WA, QLD, NZ)
- **year** : year in which the vehicle crashed (1987, ..,2000)

These variables were chosen for consideration because they were available in each of the New South Wales, Victorian, Western Australia, Queensland and New Zealand crash databases. Logistic regressions were again carried out using the Logistic Regression procedure of the SAS statistical package (SAS, 1989) using maximum likelihood estimation, the marginal method for forming design variables and a hierarchical structure considering all possible interactions in a stepwise procedure.

Aggressivity injury risk and injury severity for individual vehicle models was estimated after adding a variable representing the subject car model to the respective logistic "covariate" models. The car model variable was forced into the logistic equation and individual car model coefficients were computed to represent deviations of that car from the average. In a similar manner to the calculation of crashworthiness ratings, car models were excluded for the calculation of the aggressivity ratings if there were less than 100 vehicles with which they had crashed or there were less than 20 injured drivers in other vehicles with which they had crashed.

After exclusion, the regression analyses were performed on 212 individual car models for calculation of aggressivity ratings. The variable representing car model was therefore categorical with 212 nominal levels. The choice of the design for the logistic model allowed the injury risk and injury severity estimates for each individual car model to be compared with the overall (average) rating for all cars. For each car model in each aggressivity measure, a 95% confidence interval for the logit functions of aggressivity injury risk, and injury severity was obtained after first adjusting for the average value of the "covariate" model and then allowing for the deviation from average for that particular car model. Estimates of injury risk and injury severity were obtained by the reverse logistic transform. A 95% confidence interval was determined after adjusting for the average values of the significant factors and their interactions. Aggressivity by 8 broad market groups, as defined for crashworthiness ratings, was also computed along with 95% confidence limits.

The final combined aggressivity ratings for occupants of other vehicles are given by:

$$AO = RO \times SO$$

For a given model of focus car, j, the aggressivity rating, $AO_j$, was therefore calculated as:

$$AO_j = RO_j \times SO_j$$

where $RO_j$ denotes the aggressivity injury risk for car model j and $SO_j$ denotes the aggressivity injury severity for car model j. Computation of the variance and hence confidence limits on the quantity AO are carried out in the same way as for the crashworthiness measure, C.

# 5. RESULTS

## 5.1 Vehicle Crashworthiness Ratings

### 5.1.1 Injury Risk

Injury risk was estimated from the data on 1,216,862 drivers involved in tow-away crashes in NSW, Queensland and Western Australia (as described in Section 2.4). This data set is referred to as the "involved drivers". Because of missing values amongst the 1,216,862 involved drivers in one or more of the covariates driver sex and age, speedzone and number of vehicles involved in the crash, the final file used for analysis consisted of the 1,001,854 drivers for which all the covariate data was complete. The "covariate" model for injury risk was determined from the variables described in Section 4.1.1.

The following terms were significantly associated with injury risk and were included in the logistic model:

| Base effect terms | First order interactions | Second order interactions |
|---|---|---|
| Age | Age*Sex | Sex*Speedzone*Nveh |
| Sex | Age*Speedzone | Age*Speedzone*Nveh |
| Speedzone | Age*Nveh | |
| Nveh | Speedzone*Nveh | |
| State | State*Year | |
| Year | Sex*Nveh | |
| | Sex*Speedzone | |

No other term significantly improved the fit of the logistic model.

The overall (average) injury risk for involved drivers in tow-away crashes in NSW, Western Australia and Queensland was 16.24 per 100 drivers. In other words, the probability that a driver involved in a tow-away crash in NSW, Western Australia or Queensland was injured was 16.24%.

Appendix 2 gives the estimates of injury risk derived by logistic regression for 223 individual car models that had a sufficiently accurate crashworthiness rating after post analysis exclusions for wide confidence limits or high coefficient of variation (the ratio of the rating point estimate to the widthof the 95% confidence limit). Injury risk ranged from 9.61 % for the Jeep Cherokee to 34.61% for the Subaru Justy/Sherpa/Fiori.

An estimate of the variability in the injury risk estimates was calculated from the width of the corresponding 95% confidence intervals. Individual confidence interval widths ranged from 0.76% (Falcon XE-XF) to 14.64 for the 1987-90 Toyota MR2. The small variability for the Falcon X series Sedan is not surprising since there were more cars of this model than any other in the data set and precision is known to improve with increasing sample size.

The estimated injury risk for each market group is also given in Appendix 2. The luxury vehicles had the lowest injury risk (13.35%) and the passenger vans market group had the highest (19.08%).

### 5.1.2 Injury Severity

The data on "injured drivers" covered 268,555 drivers of 1982-2000 model vehicles who were injured in crashes in New Zealand, Victoria, NSW, Western Australia or Queensland during 1987-2000 (as described in Section 2.3). Because of missing values in one or more of the covariates amongst the 268,555 injured drivers, the final file used for analysis consisted of the 226,198 drivers for which all the covariate data was complete. The "covariate" model for injury severity was determined from the variables described in Section 4.1.1.

The following terms were significantly associated with injury severity and were included in the logistic model:

| Base effect terms | First order interactions | Second order interaction |
|---|---|---|
| Speedzone | Nveh*State | Speedzone*Nveh*State |
| Nveh | Speedzone*Nveh | Age*Speedone*Nveh |
| State | State*Year | Speedzone*State*Year |
| Age | Age*Sex | |
| Sex | Age*Nveh | |
| Year | Speedzone*State | |
| | Speedzone*Year | |
| | Age*State | |
| | Sex*State | |
| | Age*Speedzone | |

No other term significantly improved the fit of the logistic model.

The overall (average) injury severity for injured drivers in the data analysed was 21.86 per 100 drivers. In other words, the probability that a driver injured in a crash was severely injured was 21.86 %.

Appendix 3 gives the estimates of injury severity derived by logistic regression for 223 individual car models, or sets of combined models. One vehicle model, the Kia Ceres, had to be excluded from the injury severity analysis, although it met the criteria for minimum case numbers. This was because there were no killed or seriously injured drivers in the data, which caused a problem with convergence of the logistic model. Of the cars analysed, injury severity ranged from 10.97% for the 1994-2000 Peugeot 306 to 43.74% for the 1982-85 Holden Statesman/Caprice WB.

An estimate of the variability in the estimates of injury severity was calculated from the width of the corresponding 95% confidence intervals. Individual confidence interval widths ranged from 2.05% for the 1982-88 Ford Laser/Mazda 323/Familia to 36.34% for the 1984-89 Fiat Regata.

The estimated injury severity for each market group is also given in Appendix 3. Luxury vehicles performed best with respect to injury severity, having the lowest average injury severity of 20.63%. The passenger vans market group had the highest average injury severity of 23.00%.

### 5.1.3 Crashworthiness Ratings

The crashworthiness ratings for each car model and market group were obtained by multiplying the individual injury risk and injury severity estimates. Because each of the two components had been adjusted for the confounding factors, the resultant crashworthiness rating was also adjusted for the influence of these factors.

Crashworthiness ratings were obtained for each individual model and market group after adjusting for the confounding factors.

Appendix 4 gives the crashworthiness ratings and the associated 95% confidence intervals for each of the 223 car models included in the analyses. Appendix 4 also gives the crashworthiness ratings with 90% confidence limits for each of the 223 vehicle models. Each rating is expressed as a percentage, representing the number of drivers killed or admitted to hospital per 100 drivers involved in a tow-away crash. Overall ratings for the market groups are also given.

Each crashworthiness rating is an *estimate* of the true risk of a driver being killed or admitted to hospital in a tow-away crash and, as such, each estimate has a level of uncertainty about it. This uncertainty is indicated by the confidence limits in Appendix 4. There is 95% probability that the confidence interval will cover the true risk of serious injury (death or hospital admission) to the driver of the particular model of vehicle.

The ratings in Appendix 4 exclude those models where:

- the width of the confidence interval exceeded 7, or

- the ratio of the confidence interval width to the rating score exceeded 1.6 (this criterion was also necessary because smaller confidence intervals tended to occur for the lower rating scores, but the confidence intervals were relatively wide in proportionate terms). This exclusion criterion is more stringent than that used by Cameron et al (1994a,b) reflecting the greater accuracy afforded in the current ratings as a result of larger quantities of data.

### 5.1.4 Comparisons with the All Model Average Rating

Based on the average injury risk and injury severity values in the data used to compute the ratings estimate, the average crashworthiness of all vehicles appearing in the data was 3.55% (3.55 serious driver injuries per 100 crash involvements). Computing the all model average in this way gives more weight to vehicles with greater representation in the crash data. Another way of computing the all model average rating is to simply take an un-weighted numerical average of the 223 vehicles with a sufficiently accurate crashworthiness rating to be published. This method gives equal weight to each vehicle in the average. For the 223 vehicles rated in this study, the un-weighted numerical average crashworthiness is 3.85 (3.85 serious driver injuries per 100 crash involvements).

Ultimately the point against which ratings for individual vehicles are compared is arbitrary, whether it is either of the averages described above or some other point. For the purpose of comparing the crashworthiness ratings to an average value in this study, the un-weighted numerical average (3.85) was used. This was chosen as it gave better distribution of the vehicles into the five rating categories used for presentation of the ratings for consumer information (see Section 5.3). Any other comparison value could be used with equal legitimacy.

Confidence limits were used to judge whether the true risk of death or hospitalisation for a driver of a specific model car involved in a tow-away crash is really different from the defined average for all models, ie. 3.85 per 100 involved drivers. An upper limit below the average is indicative of superior crashworthiness, whereas a lower limit above the average suggests inferior crashworthiness. Other models also have crashworthiness ratings at the low or high end of the scale, but their confidence limits overlap the all model average. Although such models may also have superior or inferior crashworthiness characteristics, the database did not contain sufficient numbers of these models for the data to represent scientific evidence that this is the case.

In terms of statistical significance, it should be noted that classifying vehicles as having inferior or superior crashworthiness compared to the defined average means only that vehicle models with 'superior' crashworthiness have statistically significantly better crashworthiness than vehicles in the defined 'inferior' group. It is possible that vehicles within the inferior and superior crashworthiness categories also had statistically significant differences in crashworthiness. This could be assessed by examining overlap in the statistical confidence limits for any pair wise comparison of two vehicles. One of the main points in defining groups of vehicles with inferior and superior crashworthiness is to show that the analysis can differentiate with statistical precision crashworthiness between groups of vehicles within the rated vehicle population.

Fifty-seven models had ratings representing evidence of superior crashworthiness because their upper confidence limits were less than the average rating. Twelve of these were large cars, sixteen were luxury models, eight were classified as medium cars, ten were four-wheel drives, six were commercial vehicles, 3 were small cars and there was one passenger van and one sports car. The specific models were (in order of estimated risk of serious driver injury in a crash, from lowest to highest):

- Saab 9000 (1986-98)
- Peugeot 306 (1994-2000)
- Toyota Corolla (1998-2000)
- Land Rover Discovery (1991-2000)
- Honda Integra (1993-2000)
- Honda Legend (1986-95)
- Jeep Cherokee (1982-2000)
- Volvo 700/900 Series (1984-92)
- Volkswagen Caravelle / Transporter (1988-2000)
- Range Rover (1982-94)
- Ford Falcon AU (1998-2000)
- Holden Astra TR (1996-98)
- Volvo 850/S70/V70/C70 (1992-2000)
- Ford Mondeo (1995-2000)
- Mercedes Benz E-Class W124 (1986-95)
- BMW 5 Series (1982-88)
- Toyota RAV4 (1994-2000)
- Nissan Patrol / Ford Maverick (1988-97)
- Mercedes Benz C-Class W202 (1995-2000)
- BMW 5 Series (1989-95)
- Honda Accord (1991-93)

- Toyota Cressida / Mark II (1989-92)
- Holden / Opel Vectra (1997-2000)
- Peugeot 505 (1982-93)
- Volvo 200 Series (1982-93)
- Mitsubishi Pajero (1992-99)
- Honda Accord (1986-90)
- Ford Fairlane N & LTD D (1988-95)
- Ford Falcon Ute (1996-99)
- BMW 3 Series (1992-98)
- Nissan Bluebird (1992-97)
- Holden Jackaroo / Isuzu Bighorn (1982-91)
- Holden Commodore VT/VX (1997-2000)
- Mitsubishi Verada KR/KS / Magna TR/TS (1991-96)
- Nissan Patrol (1982-87)
- Nissan Navara (1992-98)
- Toyota Previa / Estima (1991-99)
- Holden Commodore VR/VS / Toyota Lexcen (1993-97)
- Ford Falcon EF/EL (1994-98)
- Toyota Landcruiser (1990-97)
- Ford Fairlane N & LTD D (1996-2000)
- Holden Rodeo (1996-98)
- Ford Falcon EB Series II / Falcon ED (Apr 1992-94)
- BMW 3 Series (1982-91)
- Ford Falcon Panel Van (1982-95)
- Ford Falcon EA / Falcon EB Series I (1988-Mar 92)
- Subaru Legacy (1989-94)
- Ford Telstar / Mazda 626 / Capella /MX6 (1988-92)
- Mitsubishi Magna TE/TF/TH/TJ / Verada KE/KF/KH/KJ (1996-2000)
- Holden Apollo JM / JP / Toyota Camry / Sceptor (1994-97)
- Ford Telstar / Mazda 626 / Capella / MX6 / Cronos (1992-97)
- Ford Falcon Ute / Nissan XFN Ute (1982-95 / 1988-90)
- Holden Commodore VN/VP / Toyota Lexcen (1989-93 / 1989-93)
- Ford Falcon XE/XF (1982-88)
- Toyota 4Runner / Hilux (1990-97)
- Mitsubishi Magna TM/TN/TP (1985-90)
- Holden Apollo JK / JL / Toyota Camry / Vista (1990-93)

Forty-six models had ratings representing evidence of inferior crashworthiness because their lower confidence limits were greater than the average rating. Twenty-seven were small cars, seven were light commercial vehicles, three were passenger vans, three were medium cars, four were sports cars and two were four-wheel drives. The specific models were (in order of estimated risk of serious driver injury in a crash, from highest to lowest):

- Holden Scurry / Suzuki Carry (1982-2000)
- Subaru 700 / Rex (1989-92)
- Suzuki Mighty Boy (1985-88)
- Daihatsu Mira (1990-98)
- Suzuki Alto (1982-84)
- Toyota MR2 (1985-89)

- Nissan NX/NX-R (1993-95)
- Daihatsu Handivan (1982-90)
- Honda City (1984-89)
- Daihatsu Charade (1982-87)
- Holden Barina / Suzuki Swift / Cultus (1986-88)
- Mitsubishi Starwagon / L300 (1983-86)
- Nissan Exa (1983-86)
- Subaru Brumby (1982-92)
- Daihatsu Rocky / Rugger (1985-98)
- Holden WFR Van (1992-98)
- Honda Civic / Ballade / Shuttle (1986-88)
- Honda CRX (1987-91)
- Nissan Micra (1993-95)
- Daihatsu Charade (1988-93)
- Daihatsu Charade (1993-2000)
- Ford Festiva WA / Mazda 121 (1987-94)
- Hyundai Excel (1986-90)
- Ford Festiva WD/WD/WH/WF (1994-2000)
- Mitsubishi Cordia (1983-87)
- Holden Astra / Nissan Pulsar / Langley (1983-86)
- Mitsubishi Colt / Mirage (1982-88)
- Holden Gemini RB (1986-89)
- Toyota Hiace / Liteace (1982-86)
- Suzuki Samurai / SJ410 / SJ413 (1982-1999)
- Holden WB Series (1982-84)
- Toyota Tarago (1985-90)
- Holden Barina / Suzuki Swift (1989-2000)
- Ford Laser / Mazda 323 / Familia (1982-89)
- Hyundai Excel (1990-95)
- Mitsubishi / Delica Starwagon (1987-93)
- Honda Civic / Shuttle (1989-92)
- Holden Camira (1982-89)
- Holden Barina SB (1995-2000)
- Holden / Isuzu Gemini (1982-84)
- Nissan Bluebird (1983-88)
- Toyota Corolla (1982-84)
- Hyundai Accent (1995-2000)
- Holden Astra / Nissan Sentra / Pulsar (1987-91)
- Toyota Corolla (1986-88)
- Subaru Omega / Leone / 4WD Wagon (1988-93)

### 5.1.6 Comparison of Crashworthiness Ratings with and Without New Zealand Data

A key assessment required in adding new data sources to those previously existing to estimate vehicle safety ratings is how the additional data affects the estimated ratings. Ideally, addition of new data in estimating the ratings will not alter rating point estimates beyond the bounds of statistical confidence, but serve only to reduce confidence limit width. Any significant movement in the point estimates of vehicle safety would suggest either an incompatibility in the new crash data with the existing data or that the safety performance of particular vehicles in the New

Zealand fleet is different to that of the same models in the Australian fleet. As well as assessing consistency, it is to also of interest to assess the benefits to the rating system of adding New Zealand data in terms of vehicle model coverage and average rating accuracy.

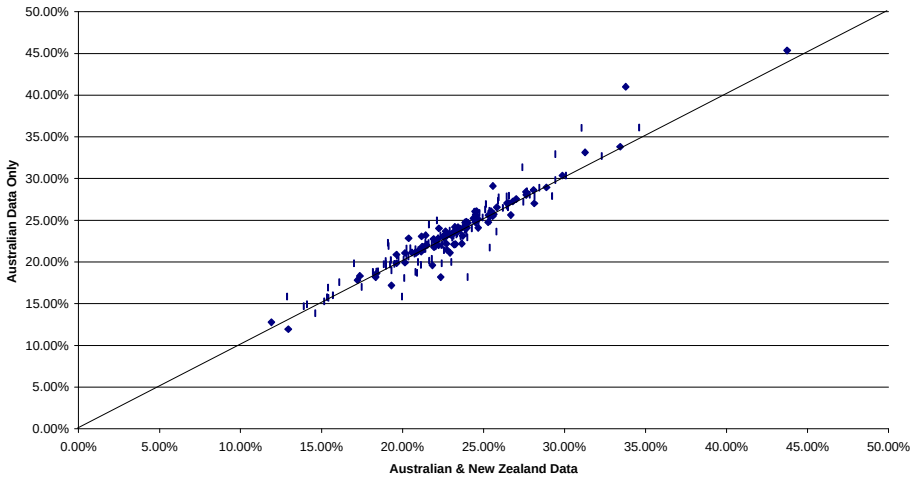
To assess the impact of adding the New Zealand crash data to the vehicle safety ratings system, the ratings estimated with combined Australian and New Zealand crash data have been compared with those estimated from Australian data only for those vehicle models with ratings estimated from each data set. A number of aspects have been examined. These include the number of vehicle models with reliable ratings, the effect on the average confidence limit width and coefficient of variation and subsequently the number of vehicle models with ratings statistically significantly different from average.

Comparison of coverage of the crashworthiness ratings based on Australian data only and Australian and New Zealand data shows addition of the New Zealand data allows ten additional vehicle models to have a reliable crashworthiness rating estimated. The New Zealand data increases the crashworthiness rating coverage from 213 to 223 vehicle models. The ten additional vehicle models rated are as follows.

- Daihatsu Terios (1997-2000)
- Audi A4 (1995-2000)
- Mazda 626 (1998-2000)
- Daihatsu Sirion (2000)
- Fiat Regata (1984-88)
- Ford Laser / Mazda 323 (1999-2000)
- Peugeot 306 (1993-2000)
- Mazda RX7 (1986-91)
- Honda Integra (1993-2000)
- Toyota MR2 (1985-89)

As the New Zealand data is only used in estimation of the injury severity component of the crashworthiness rating, comparison of consistency and accuracy of the crashworthiness ratings with and without the New Zealand data is confined to the severity measure from here on. Figure 1 shows the crashworthiness rating injury severity measure computed with Australian data only plotted against that computed with both Australian and New Zealand data. It shows a high degree of consistency in the severity index calculated with and without the New Zealand data. This is indicated by the high degree of clustering of the data in Figure 1 about the 45-degree line of perfect ratings concordance shown on Figure 1. The correlation between the injury severity index calculated with and without New Zealand data was 0.95, further illustrating the high degree of consistency in the ratings.

**Figure 1:** Comparison of crashworthiness injury severity estimates with and without New




Zealand crash data.

A further measure of the consistency between the crashworthiness injury severity ratings with and without New Zealand crash data was to examine the rating point estimate when New Zealand data was included with the confidence limit of the rating calculated from Australian data only. The point estimate calculated including New Zealand data did not move outside the 95 percent confidence limit on the severity ratings estimated from Australian data only. This result suggests adding the New Zealand data did not result in a statistically significant change in any of the crashworthiness injury severity estimates.

A more formal method of testing differences in injury severity between the Australian and New Zealand crash data for the same vehicle models, utilising logistic regression analysis, was also undertaken. An indicator variable was calculated with two levels: one level indicating data from New Zealand and the other data from Australia. An interaction between the indicator variable and the vehicle make and model variable was then included as an additional term in the final logistic regression model for injury severity. The interaction term measures the difference in average injury severity by vehicle model between the Australian and New Zealand data, with the logistic regression output allowing formal statistical testing of the significance of the measured difference in the standard way. To ensure convergence of the logistic regression model including the interaction term, analysis had to be limited to those vehicle models with sufficient crash history in both the Australian and New Zealand data.

Analysis was carried out on those vehicle models with more than 200 injured divers in the crash data from each country resulting in 34 vehicle models that could be tested for differences in injury severity outcome between the two countries. Only one vehicle model of the 34 tested showed a significant difference in injury severity measured between data from Australia and New Zealand. This was the 1989 to 1997 Toyota Hilux/4 Runner (chi-squared(1)=7.53, p=0.0061). This vehicle model represents a significant number of second hand Japanese imports into New Zealand. It is possible that the Japanese second hand import vehicle is different to the one sold in Australia in terms of safety specification, explaining the difference measured. However this could not be verified using the available information. Whilst this vehicle has not been deleted from the table of injury severity estimates presented in Appendix 3, the result has

been flagged to indicate the New Zealand model may have a different safety performance to the Australian model.

Two measures of the increase in accuracy of the injury severity component of the crashworthiness ratings, after addition of the New Zealand crash data, were examined. They are the narrowing of the average confidence limit width and the reduction in the average coefficient of variation on the ratings. The coefficient of variation is defined as the confidence limit width divided by the rating point estimate and represents a scale independent measure of rating accuracy. Addition of the New Zealand crash data to the ratings system resulted in a reduction in average crashworthiness injury severity confidence limit width from 12.8 to 11.7 deaths or serious injuries per 100 injured drivers, a reduction of 8 percent. Similarly, the average coefficient of variation in the severity index reduced from .57 to .53, a reduction of 7 percent.

As observed, both the average confidence limit width and coefficient of variation on the crashworthiness severity index reduced when New Zealand crash data was added. There was also increased model coverage resulting from addition of the New Zealand crash data. Consequently, it was expected that the number of vehicle models with crashworthiness ratings statistically significantly different from average would increase. This was the case with 57 and 46 vehicle models having a crashworthiness rating statistically significantly better (numerically lower) and worse (numerically higher) respectively than the overall average. This compares with 51 and 44 vehicle models respectively in the crashworthiness ratings based on Australian data only.

## 5.2 Aggressivity Towards Other Car Drivers

Using the methods described above, logistic regression models of the injury risk and injury severity of the subject driver (ie. the driver of the “other” vehicle) were built separately as functions of both vehicle model and market group of the vehicle colliding with the vehicle of the focus driver. Variations in the other factors listed in Section 4.2.1 were adjusted in the model by including them as predictors of the injury risk or injury severity of the focus driver, along with the subject vehicle model or market group.

The logistic regression models of the injury risk of focus drivers showed a number of factors to statistically significantly predict injury risk. These were year of crash, along with the interactions between focus driver age and state, focus driver sex and state, speedzone and state, state and year of crash and focus driver age, sex and state. In addition, the make and model of the subject vehicle was also a statistically significant predictor of focus driver injury risk when added to the logistic model. This indicated that there is differential performance between vehicle models in terms of their aggressivity towards drivers of other vehicles so far as injury risk is concerned. In the same manner, when vehicle market group was substituted for vehicle model in the logistic regression equation, it was also a significant predictor of focus driver injury risk. The average aggressivity injury risk in the data was 14.65%.

The logistic regression models of the injury severity of focus drivers showed a number of factors to be statistically significant. They were focus driver age, sex, state, speedzone and year, along with the interactions between focus driver age and state, state and year of crash, speed zone and state, focus driver sex and state and focus driver age and sex. The model of the subject vehicle was also a statistically significant predictor of injury severity, as was the vehicle market group when substituted for vehicle model in the logistic regression equation. The average aggressivity injury severity in the data was 16.81%.

Final estimates of vehicle aggressivity towards the drivers of other vehicles were obtained by multiplying the estimated injury risk and injury severity components, described above, for each vehicle. Confidence limits on each of the estimated aggressivity ratings were calculated using the methods described in Section 4.2.1 above. The average aggressivity rating in the data, used for comparisons against aggressivity of individual vehicle models was 2.46%.

Accurate aggressivity ratings were obtained for 165 of the 212 different vehicle models that satisfied the inclusion criteria described above. Of the 212 vehicle models satisfying the inclusion criteria for analysis described above, 47 vehicle models were excluded from presentation because of the criteria described immediately below. The estimated aggressivity ratings and their injury risk and injury severity components for individual vehicle models are given in Appendix 5 along with 95% confidence limits on the estimated aggressivity ratings.

The ratings in Appendix 5 exclude those models where:

- the width of the confidence interval exceeded 7, or

- the ratio of the confidence interval width to the rating score exceeded 1.6 (this criterion was also necessary because smaller confidence intervals tended to occur for the lower rating scores, but the confidence intervals were relatively wide in proportionate terms).

- But not those satisfying the above criteria where the aggressivity rating confidence interval did not overlap the average aggressivity value (only one vehicle model fell into this category and had an aggressivity rating statistically significantly worse than the overall average).

These exclusion criteria, apart from the third one, are the same as that used in calculating crashworthiness ratings to ensure a minimum level of accuracy in the published aggressivity ratings. The third criterion was introduced as it allowed identification of vehicle models with aggressivity significantly worse than average, even though the confidence limits may be wide. It was considered to be worth identifying such vehicles.

### 5.2.1 Analysis by Market Groups

Table 6 summarises the estimated injury risk, injury severity and aggressivity ratings by the 8 broad market groups along with the estimated confidence limits on the aggressivity ratings. The estimated aggressivity rating is the expected number of vehicle drivers killed or seriously injured per 100 involved in two-car tow-away collisions where their vehicle impacts with one of the designated models or market groups. Table 6 shows four-wheel-drive vehicles to be the most aggressive towards drivers of other vehicles, with an average of 3.42 drivers being killed or seriously injured for every 100 tow-away crashes with a four-wheel-drive. Similarly, Table 6 shows small cars to be the least aggressive towards drivers of other vehicles, with an average aggressivity rating of 1.86.

**Table 6:** Estimated Vehicle Aggressivity Towards Other Drivers by Market Grouping

| Market Group | Other Driver Injury Risk (%) | Other Driver Injury Severity (%) | Aggressivity Rating * | Overall rank order | Lower 95% Confidence limit | Upper 95% Confidence limit | Width of Confidence interval |
|---|---|---|---|---|---|---|---|
| **Overall Average** | **14.65** | **16.81** | **2.46** | | | | |
| 4 WHEEL DRIVE | 17.46 | 19.57 | 3.42% | 8 | 3.22% | 3.62% | 0.41% |
| COMMERCIAL | 16.18 | 18.17 | 2.94% | 7 | 2.75% | 3.14% | 0.39% |
| LARGE | 14.45 | 17.26 | 2.49% | 5 | 2.40% | 2.59% | 0.20% |
| LUXURY | 13.36 | 17.01 | 2.27% | 4 | 2.09% | 2.47% | 0.38% |
| MEDIUM | 13.67 | 15.68 | 2.14% | 2 | 2.04% | 2.26% | 0.22% |
| PASSENGER VANS | 16.55 | 16.22 | 2.68% | 6 | 2.34% | 3.08% | 0.75% |
| SMALL | 12.58 | 14.76 | 1.86% | 1 | 1.78% | 1.94% | 0.17% |
| SPORTS | 13.67 | 16.36 | 2.24% | 3 | 1.98% | 2.53% | 0.56% |

* Serious injury rate per 100 drivers of other vehicles involved in collisions with vehicles from the given market group

### 5.2.2 Statistically Significant Makes and Models

Appendix 5 shows the estimated aggressivity ratings towards drivers of other vehicles for the 164 individual vehicle models rated. Ratings ranged from a minimum of 1.28 serious injuries per 100 tow-away crashes for the 1996-2000 Honda Civic to a maximum of 6.79 serious injuries per 100 tow-away crashes for the 1982-90 Toyota Supra. Of the 164 individual vehicle models for which an aggressivity rating was calculated, 20 models had an aggressivity rating which was significantly less (better) than the overall average of 2.46 serious driver injuries per 100 tow-away crashes. These twenty vehicle models comprised fifteen small car models, three medium car models, one sports car model and one four-wheel drive vehicle. The models were, in order of increasing aggressivity:

- Honda Civic (1996-2000)
- Holden Barina / Suzuki Swift / Cultus (1986-88)
- Holden Drover / Suzuki Samurai / SJ410 / SJ413 (1985-87 / 1982-2000)
- Nissan Bluebird (1992-97)
- Daihatsu Charade (1988-93)
- Toyota Corolla (1982-84)
- Subaru Omega / Leone / 4WD Wagon (1988-93)
- Honda Prelude (1983-91)
- Mazda 323 / Familia / Lantis (1990-93)
- Holden Barina / Suzuki Swift / Cultus (1989-2000)
- Holden / Isuzu Gemini (1982-84)
- Daihatsu Charade (1993-2000)
- Mitsubishi Lancer CC (1993-95)
- Holden Astra / Nissan Pulsar / Langley (1983-86)
- Hyundai Excel (1990-95)
- Ford Laser / Mazda 323 / Familia (1982-89)
- Mitsubishi Lancer CA (1989-90)
- Nissan Bluebird (1983-88)
- Toyota Corolla / Holden Nova (1988-92)
- Toyota Corolla (1986-88)

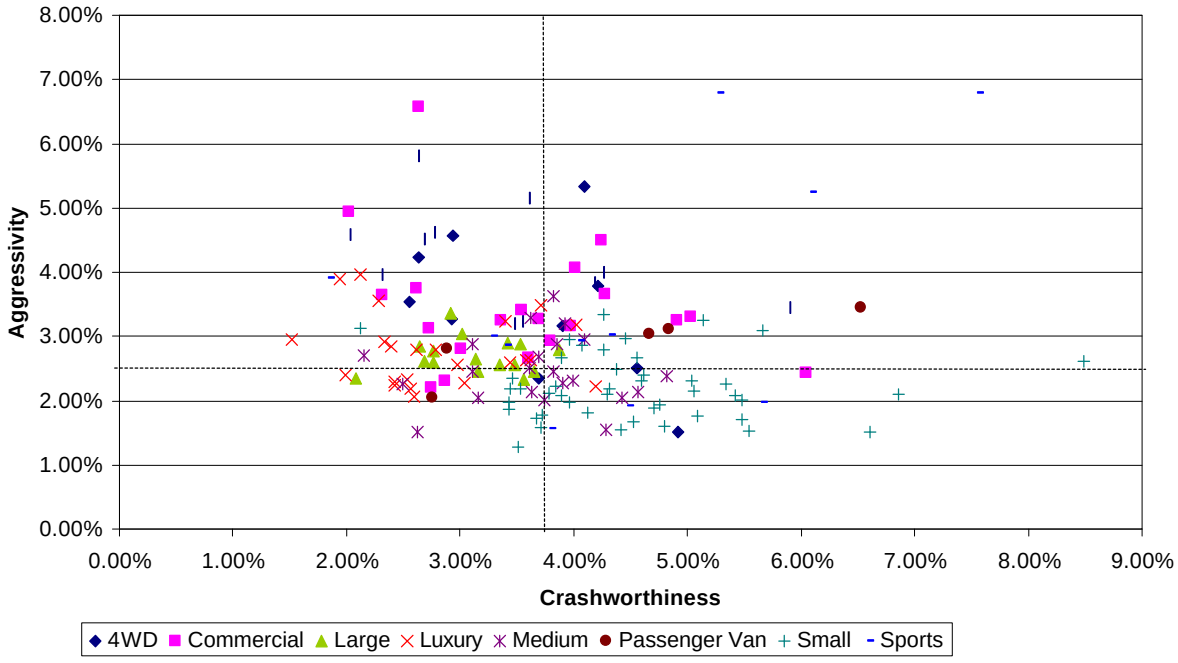
Similarly 38 models had an aggressivity rating which was significantly greater (worse) than the overall average of 2.46 serious driver injuries per 100 tow away crashes. These thirty-eight vehicle models comprised five large car models, fourteen four-wheel drives models, ten commercial vehicle models, one medium car model, one passenger van model, two small car models, three sports car models and two luxury car models. The models were, in order of decreasing aggressivity:

- Nissan NX/NX-R (1993-95)
- Toyota Supra (1986-92)
- Ford F-Series (1982-92)
- Nissan Patrol (1999-2000)
- Nissan Pathfinder / Terrano (1996-2000)
- Nissan Exa (1983-86)
- Toyota Landcruiser (1982-89)
- Volkswagon Caravelle / Transporter (1997-2000)
- Toyota Landcruiser (1990-97)
- Land Rover Range Rover (1982-94)
- Toyota Landcruiser (1998-2000)
- Nissan Patrol (1982-87)
- Isuzu Pickup (1984-88)
- Holden Jackaroo / Isuzu Bighorn (1982-91)
- Holden Rodeo / Isuzu Pickup (1989-95)
- Volvo 850/S70/V70/C70 (1993-2000)
- Nissan Patrol / Ford Maverick (1988-98)
- Mitsubishi Pajero (1984-91)
- Toyota 4Runner / Hilux (1982-85)
- Ford Falcon Ute (1994-99)
- Toyota Hiace / Liteace (1987-92)
- Mitsubishi Pajero (1992-99)
- Toyota Crown / Cressida / Mark II (1982-85)
- Mitsubishi Starwagon / L300 (1983-86)
- Holden Commodore Ute VR/VS (1994-2000)
- Ford Falcon EB Series II / Falcon ED Apr (1992-94)
- Ford Laser (1995-97)
- Toyota Hiace / Liteace (1982-86)
- Mitsubishi Cordia (1983-87)
- Ford Falcon Ute / Nissan XFN Ute (1985-93)
- Toyota 4Runner / Hilux (1990-97)
- Toyota 4Runner/Hilux (1985-89)
- Toyota Hiace / Liteace (1990-2000)
- Ford Falcon EA / Falcon EB Series I(1988-Mar 92)
- Nissan Bluebird (1989-92)
- Ford Falcon XE/XF (1982-88)
- Holden Commodore VB-VL (1982-88)
- Ford Falcon EF/EL (1994-98)

### 5.2.3 Relationships Between Aggressivity and Crashworthiness

In assessing the British vehicle safety indices, Broughton (1996) found a strong inverse relationship between the indices for crashworthiness and aggressivity. Figure 2 shows aggressivity plotted against crashworthiness for those vehicle models with both ratings. As Figure 2 shows, the inverse relationship between the two measures is not particularly strong. The dotted line in Figure 2 represents the nominal inverse relationship between aggressivity and crashworthiness ratings. Points above the line represent vehicles with relatively high aggressivity for their level of crashworthiness and points below the line represent vehicles with relatively low aggressivity for their crashworthiness performance. Four-wheel-drives, passenger vans and commercial vehicles are the groups of vehicles that generally show relatively high levels of aggressivity for their level of crashworthiness.

**Figure 2:** Estimated Vehicle Aggressivity Towards Other Drivers vs. Crashworthiness Rating




Absence of a strong relationship between the measures of aggressivity and crashworthiness suggests that the two quantities considered here are measuring two different aspects of a vehicle's safety performance. Whilst one would expect some relationship between the two measures given their common but opposite relationships with mass (Broughton, 1996; Cameron et al 1998), the lack of a strong relationship suggests vehicle mass is only playing a small part in aggressivity rating relative to vehicle total safety design. The independence of these two measures does not seem to have been achieved to the same degree under other systems (UK Department of Transport 1995, Broughton 1996).

### 5.2.4 Discussion on Aggressivity Ratings

The methods applied in this report have allowed estimation of updated vehicle aggressivity ratings for Australian and New Zealand passenger vehicles with respect to drivers of other

vehicles based on crash data from both countries. Aggressivity is an important measure as, in conjunction with crashworthiness ratings, it enables assessment of the total safety of the vehicle fleet from the perspective of the vehicle protecting not only its own occupants in a crash but also the occupants of other vehicles with which it may collide.

Whilst similar in concept to the aggressivity ratings developed overseas, the ratings estimated here appear to be superior in a number of areas. One of the major advantages of the aggressivity ratings developed here, particularly in comparison to those described in Broughton (1994, 1996) is their apparent independence from the crashworthiness ratings. A high level of inverse correlation between crashworthiness and aggressivity ratings would diminish the additional information on safety provided by the aggressivity measure. The aggressivity ratings developed here, however, appear to provide largely independent information on vehicle safety. The reason for the independence of the two measures found in this study is possibly linked to the availability of non-injury crash data due to the tow-away crash reporting criteria in NSW, Western Australia and Queensland. Non-injury crash data allows the estimation of the injury risk components of crashworthiness and aggressivity, a measure not available from the data on injury crashes only, as used by Broughton (1994, 1996). Detailed examination of the crashworthiness and aggressivity analysis results here shows the injury risk measure to be a more powerful discriminator of relative vehicle safety than the injury severity measure based on injury crash data alone.

A slight drawback aggressivity ratings have in comparison to the crashworthiness ratings is that they cover fewer individual vehicle models. Aggressivity ratings estimated here cover only 165 vehicle models, whilst crashworthiness ratings based on the same data cover 223 individual vehicle models. The reason for the reduced model coverage in comparison to crashworthiness ratings stems from the fact that the aggressivity ratings, for reasons described above, are calculated from subsets of the total data used for crashworthiness calculation, namely crashes between two passenger vehicles. To a certain degree, smaller quantities of data also compromise the precision of the aggressivity measures resulting in fewer vehicles that can be differentiated as better or worse than the overall average in comparison to crashworthiness ratings. In comparison to the crashworthiness ratings where 103 of the 223 vehicle models rated (46%) were significantly better or worse than average, of the 164 vehicle models with an aggressivity rating, only 58 (35%) had a rating significantly better or worse than average. This is a substantial improvement over the original ratings for Australian vehicles of Cameron et al (1998) where only 11 of the 56 vehicles rated for aggressivity towards other drivers (20%) had a rating significantly better or worse than average. It also improves on the ratings of Newstead et al (2000) where only 23 of the 96 vehicles rated for aggressivity towards other drivers (24%) had a rating significantly better or worse than average.

As with crashworthiness ratings, there is an ongoing need for further updates of the aggressivity ratings with additional years' data, as it becomes available. This will enable a greater number of individual vehicle models to be covered with increased accuracy of estimation, thus allowing greater differentiation of safety performance between vehicle models. Updates of aggressivity ratings can parallel those of crashworthiness ratings that are estimated from the same data.

This report has considered only the measure of aggressivity towards drivers of other vehicles. Whilst a measure of aggressivity towards unprotected road users has been developed and estimated in previous work, it was not used here because it was based only on an injury severity index that was felt not to offer sufficient discrimination between the performances of different

vehicle models. It may be possible to develop an aggressivity severity index that estimates simultaneously the combined aggressivity of a vehicle towards both unprotected road users and the drivers of other vehicles. Combined with the aggressivity injury risk measure for drivers of other vehicles only, this would give a single aggressivity measure for a vehicle towards both drivers of other vehicles and unprotected road users. Further research is planned to develop this combined measure of aggressivity towards all other road users.

### 5.2.5 Comparison of Aggressivity Ratings with and Without New Zealand Data

As was carried out for the crashworthiness ratings above, the benefits of including New Zealand crash data for estimation of vehicle aggressivity ratings in terms of vehicle model coverage and ratings accuracy has been assessed. As before, rating accuracy has been measured in terms of average confidence limit width and average coefficient of variation.

Comparison of coverage of the aggressivity ratings based on Australian data only and Australian and New Zealand data shows addition of the New Zealand data allows ten additional vehicle models to have a reliable aggressivity rating estimated. The New Zealand data increases the crashworthiness rating coverage from 152 to 164 vehicle models. This coverage increase is a result of thirteen extra vehicle models being rated whilst one vehicle model was removed because the coefficient of variation no longer met the defined criteria for acceptable accuracy. It should be noted that the coefficient of variation for a vehicle model would not necessarily decrease with the addition of extra crash data because it is a function of the point estimate of the severity index, which may increase. In contrast, the confidence limit width will almost always decrease with the addition of crash data.

The thirteen additional vehicle models rated are as follows.

- Daihatsu Rocky / Rugger (1985-98)
- Holden Jackaroo / Isuzu Bighorn (1992-98)
- Lada Niva (1984-99)
- BMW 5 series (1989-95)
- Jaguar XJ6 (1987-94)
- Mercedes Benz C-Class W202 (1994-2000)
- Nissan Maxima (1991-94)
- Saab 9000 (1986-98)
- Mitsubishi Chariot / Spacewagon (1985-91)
- Nissan Stanza (1982-83)
- Nissan Silvia (1984-86)
- Nissan Bluebird (1992-97)
- Subaru 700 / Rex (1989-92)

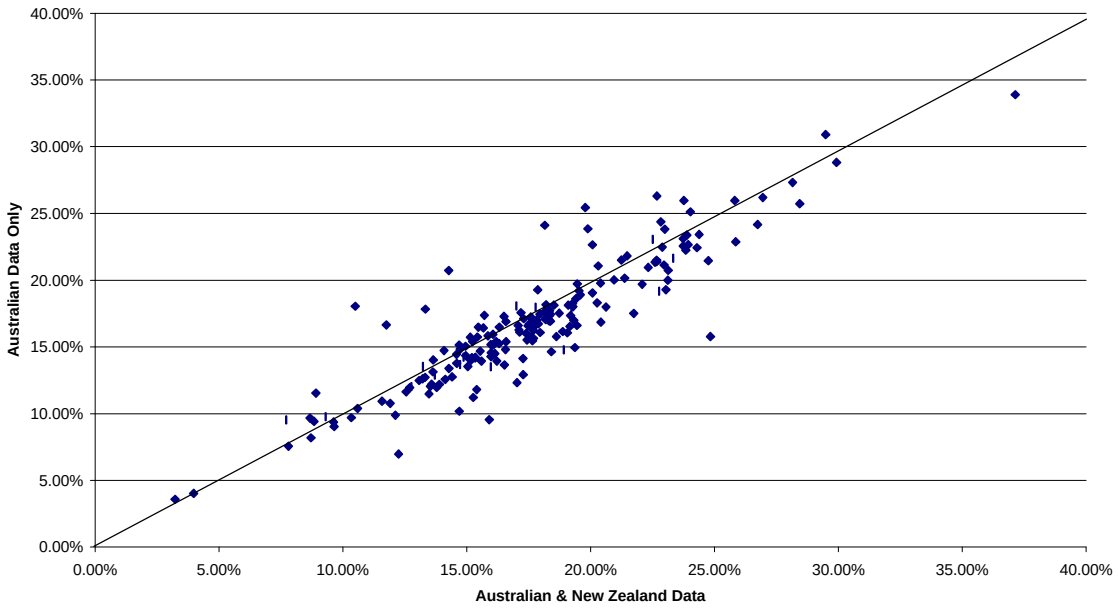
The vehicle model that no longer met the accuracy criteria was as follows.

- Jeep Cherokee (1996-00)

For the same reasons as given when comparing accuracy of the crashworthiness ratings, comparison of consistency and accuracy of the aggressivity ratings with and without the New Zealand data is confined to the severity measure from here on. Figure 3 shows the aggressivity

ratings injury severity measure computed with Australian data only plotted against that computed with both Australian and New Zealand data. It shows a high degree of consistency in the severity index calculated with and without the New Zealand data, indicated by the high degree of clustering of the data in Figure 3 about the 45-degree line of perfect ratings concordance shown on the chart. The greater degree of spread in the data points in Figure 3 is indicative of the smaller quantities of data on which the aggressivity ratings are estimated when compared to crashworthiness ratings. The correlation between the injury severity index calculated with and without New Zealand data was 0.91, further illustrating the high degree of consistency in the ratings.

**Figure 3:** Comparison of aggressivity injury severity estimates with and without New Zealand crash data.




Consistency between the aggressivity injury severity ratings with and without New Zealand crash data was further examined through comparing the rating point estimate when New Zealand data was included with the confidence limit of the rating calculated from Australian data only. The point estimate calculated including New Zealand data moved outside the 95 percent confidence limit on the severity ratings estimated from Australian data only for only 6 of the 164 vehicles rated, or 1 in 27 of the vehicles rated. The definition of the 95 percent confidence limit suggests that, on average, 1 in 20 vehicles will have a rating that moves outside the statistical confidence limit on analysis of a further data sample. The significant movement of 6 of the point estimates of the vehicles rated is not considered problematic. Overall, the results suggest adding the New Zealand data did not result in a statistically significant change in the aggressivity injury severity estimates.

Formal statistical testing of the difference in injury severity between the Australia and New Zealand data using logistic regression analysis was carried out in the same way as for the crashworthiness injury severity comparison. Twenty-seven vehicle models had sufficient data to undergo this test. Of these, five showed statistically significant differences in estimated injury severity between the Australian and New Zealand crash data. These were the 1983-87 and 1988-92 Mazda 626/MX6/Capella/Ford Telstar, the 1987-91 Nissan Pulsar/Sentra, the 1983-88 Nissan

Bluebird and the 1988-92 Toyota Corolla. All of these vehicles are again imported to New Zealand second hand from Japan in large numbers with the Japanese specification vehicle possibly being different to the Australian specification vehicle. It is interesting to note that none of these five vehicles showed a significant difference in crashworthiness injury severity between the two countries even though they were all assessed. This suggests that the differences between the Japanese and Australian specification vehicles are external and hence only affect aggressivity rather than crashworthiness or, more likely, that the result is a statistical aberration due to the smaller quantities of data from which aggressivity is estimated. Again, these vehicle models have been flagged in the aggressivity injury severity ratings presented in Appendix 5 as possibly having different safety performance in New Zealand compared to Australia.

Measures of the increase in accuracy of the injury severity component of the aggressivity ratings upon addition of the New Zealand crash data are again the narrowing of the average confidence limit width and the reduction in the average coefficient of variation on the ratings. Addition of the New Zealand crash data to the ratings system resulted in a reduction in average aggressivity injury severity confidence limit width from 15.8 to 14.7 deaths or serious injuries per 100 injured drivers, a reduction of 7 percent. Similarly, the average coefficient of variation in the severity index reduced from 1.0 to .90, a reduction of 10 percent. Including New Zealand data in the analysis, 20 and 38 vehicle models had an aggressivity rating statistically significantly better (numerically lower) and worse (numerically higher) respectively than the overall average. This compares with 22 and 26 vehicle models respectively in the aggressivity ratings based on Australian data only.

## 5.3 Presentation of Crashworthiness and Aggressivity Ratings for Consumer Information

Discussion in the previous work of Cameron et al (1998) noted, for simplicity of presentation and interpretation, particularly in the area of consumer safety advice, effort needed to be made to find a method of simultaneously using the information on vehicle crashworthiness and aggressivity. Possible solutions discussed included development of a single measure of total vehicle safety or, alternatively, development of some other cohesive method of summary presentation that reflects overall vehicle safety. In Newstead et al (2000), a method of presentation of the estimated crashworthiness ratings for Australian vehicles was devised that is similar in philosophy to the presentation method devised by Folksam Insurance for presentation of Swedish ratings. The method takes into account both the rating point estimate and confidence limits, but removes the emphasis from the point estimate.

An identical approach to presenting ratings has been taken here. Rated vehicles have been classified into five categories based on the range in which the confidence limits on the estimated ratings lie. The five categories are defined as follows.

- At least 20% safer than average: if the upper confidence limit on the estimated rating is less than 0.8 times the average crashworthiness rating for the vehicle fleet.
- At least safer than average: if the upper confidence limit on the estimated rating is less than the average crashworthiness rating for the vehicle fleet.
- Average: if the confidence interval on the estimated rating overlaps the average crashworthiness rating for the vehicle fleet.
- At least less safe than average: if the lower confidence limit on the estimated rating is greater than the average crashworthiness rating for the vehicle fleet.

- At least 20% less safe than average: if the lower confidence limit on the estimated rating is greater than 1.2 times the average crashworthiness rating for the vehicle fleet.

Presentation of the estimated crashworthiness ratings in this way is shown in Appendix 6. This presentation style has the advantage that it combines information about both the rating point estimate and confidence limit to classify the safety performance of the vehicle. This method of presentation takes the potential emphasis of the consumer off comparison of only the point estimate ratings, an emphasis that can be potentially misleading from the point of view of statistical confidence. Rather, the presentation method categorises vehicles according to the statistical significance of the difference of their estimated safety rating from defined points. Colour coding of the categories would typically be used with green depicting the safest category through blue, yellow and brown to red depicting the least safe category. 90% two-sided confidence limits have been used to categorise the crashworthiness ratings in Appendix 6. These are equivalent to 95% one-sided confidence limits if a directional hypothesis of crashworthiness greater or less than the average is being assumed.

A single column at the right of the table in Appendix 6 summarises the aggressivity ratings for each vehicle. In a manner similar to the classification of crashworthiness ratings, the estimated aggressivity ratings have been classified into five categories with each represented by a symbol in the final column of the table. These are:

- xx: Much more aggressive than average – if the lower confidence limit on the estimated rating is less than 0.8 times the average aggressivity rating for the vehicle fleet.
- x: More aggressive than average - if the lower confidence limit on the estimated aggressivity rating is greater than the average aggressivity rating for the vehicle fleet.
- **o**: Average - if the confidence interval on the estimated rating overlaps the average aggressivity rating for the vehicle fleet.
- ✓: Less aggressive than average - if the upper confidence limit on the estimated rating is less than the average aggressivity rating for the vehicle fleet.
- ✓✓: At least 20% less aggressive than average – if the upper confidence limit on the estimated rating is greater than 1.2 times the average aggressivity rating for the vehicle fleet.

Some vehicle models in Appendix 6 have no symbol in the aggressivity rating column. These vehicles have been involved in an insufficient number of two-car crashes to have an aggressivity rating estimated for them. Assignment of vehicle aggressivity ratings to categories in Appendix 6 is based on the 90% two-sided (95% one-sided) confidence limits on the ratings to be consistent with the assignment of crashworthiness ratings to categories.

# 6. CONCLUSIONS

Stages 1 to 4 of the New Zealand vehicle safety ratings pilot study established the availability and suitability of New Zealand crash and registration data sources for estimating vehicle safety ratings using combined Australian and New Zealand crash data. They also confirmed the sufficient compatibility of the Australian and New Zealand vehicle fleets ensuring ratings based on the combined data will be of use to the New Zealand vehicle consumer population. Analysis presented in this report has been successful in realising the final stage of the pilot study in producing a set of vehicle safety ratings for New Zealand passenger vehicles based on combined Australian and New Zealand mass crash data sources suitable for publishing as consumer information. The study also demonstrated the consistency of ratings estimated from combined

Australian and New Zealand data with those estimated from Australian data only as well as quantifying the improvement in the ratings resulting from addition of the New Zealand data.

Addition of the New Zealand crash data to that used to calculate the Australian ratings has enabled the crashworthiness ratings to be obtained for 223 different vehicle models manufactured between 1982 and 2000. This is an increase of 10 vehicle models over the number rated using Australian data alone. The rating scores estimate the risk of a driver being killed or admitted to hospital when involved in a tow-away crash, to a degree of accuracy represented by the confidence limits of the rating in each case. The estimates and their associated confidence limits are sufficiently sensitive that they are able to identify 103 models of passenger cars, four-wheel drive vehicles, passenger vans and light commercial vehicles that have superior or inferior crashworthiness characteristics compared with the average vehicle. This compares to only 95 vehicle models based on Australian data only. Further more, addition of the New Zealand crash data has reduced the average confidence limit width of the crashworthiness injury severity estimates by 8 percent and the average coefficient of variation by 7 percent.

Addition of the New Zealand crash data also resulted in estimates of vehicle aggressivity ratings towards drivers of other passenger vehicles for individual makes and models with both broader coverage and higher accuracy than obtained using Australian data alone. The aggressivity ratings measure the risk of serious injury a vehicle poses to drivers of other cars with which it impacts in crashes of tow-away or greater severity.

Aggressivity ratings calculated from combined Australian and New Zealand data covered 164 models of passenger vehicles (passenger cars, four-wheel drive vehicles, passenger vans and light commercial vehicles) manufactured between the years 1982-2000. This is an increase of 12 vehicle models from those covered using Australian data only. The estimates and their associated confidence limits are sufficiently sensitive that they are able to identify 58 models of passenger cars, four-wheel drive vehicles, passenger vans and light commercial vehicles that have superior or inferior aggressivity characteristics compared with the average vehicle. This is an increase of 10 vehicle models over the ratings using only Australian data. Addition of the New Zealand data to compute vehicle aggressivity ratings resulted in a average decrease of 7 percent and 10 percent in the aggressivity injury severity confidence limit widths and coefficient of variation respectively.

Estimated vehicle aggressivity towards drivers of other vehicles was found to have a proportional relationship with vehicle mass. It was also found to have little or no relationship with ratings of vehicle crashworthiness, demonstrating the independence of the two complementary measures.

Recommendations for further vehicle safety research using the assembled New Zealand crash data follow.

# 7. FURTHER RESEARCH RECOMMENDED

## 7.1 Integration of Australian and New Zealand Crashworthiness and Aggressivity Ratings Systems

The focus of the research presented in this report has been to develop a vehicle safety ratings system for New Zealand Passenger vehicles as an adjunct to the main Australian system. The successful completion of the pilot study has established the suitability of the New Zealand data

for computing vehicle safety ratings in conjunction with the Australian. Importantly, it has also established the high degree of compatibility between ratings with and without the New Zealand crash data. These results confirm that vehicle models rated in the system have the same safety performance in the forms sold in Australia and New Zealand, a point assumed in pooling the crash data for each model rated in the system. It also confirms that crash data in New Zealand is representing the same levels of injury outcome in crashes involving these vehicle models as represented in the Australian data.

As a consequence of the above, it is recommended that the current Australian vehicle safety ratings system be extended with the regular addition of New Zealand crash data to establish a single Australian and New Zealand vehicle safety ratings system. Ratings from the combined system would be published simultaneously in both countries, albeit with appropriate vehicle model naming for each country. The sponsors of the Australian vehicle safety ratings project have indicated their support of a combined Australian and New Zealand system with the LTSA joining the five Australian sponsor organisations as an equal funding partner in the project. Annual updates in line with the current Australian system are recommended to ensure the most accurate and up to date ratings are available for consumers.

## 7.2 Investigation of Techniques to Rate Vehicle Models Only Sold in New Zealand

Use of the Australian ratings system and associated crash data was necessary in producing a vehicle safety ratings system for the New Zealand passenger fleet that had high coverage and reasonable precision. This was noted and accepted by the LTSA in the initial review by MUARC into the LTSA feasibility study of producing vehicle safety ratings for New Zealand. A key draw back with this approach was that a number of popular vehicle models in the New Zealand fleet not found in the Australian fleet could not be rated. Such vehicle models include the Nissan Primera and later model Toyota Coronas.

As part of its recent involvement in the European Commission funded SARAC projects, MUARC has developed methods for rating vehicle safety from injury only crash data, such as available in New Zealand. The new methods produce ratings that are consistent with ratings obtained from injury and non-injury crash data as used in this report. These methods would not be suitable for developing a vehicle safety ratings system based on New Zealand data alone because of the lack of sufficient crash data in New Zealand. However, the new methods may be useful in obtaining ratings for the currently unrated key New Zealand vehicle models.

It is recommended that use of the new ratings method based on injury only crash data is investigated to obtain ratings for the key New Zealand vehicle models currently not rated. Success would enhance the credibility and usefulness of the New Zealand ratings system for New Zealand vehicle consumers. Whilst the method of estimating the ratings for these vehicle models is clear, it may be necessary to develop a means of scaling the ratings produced from the injury only methodology with those produced in the main system.

## 7.3 Monitoring Trends In Safety of the New Zealand Vehicle Fleet

A useful extension of the Australian crashworthiness and aggressivity ratings project has been an analysis of trends in crashworthiness of the Australian vehicle fleet by year of vehicle manufacture. The latest update of results of this analysis has quantified gains in the

crashworthiness of the Australian vehicle fleet from 1964 to 2000, relating the gains to the introduction of a number of Australian design rules concerned with vehicle safety and the introduction of vehicle safety consumer advice programs.

One subtlety in interpreting the results of the Australian crashworthiness by year of manufacture analysis is that, to a large degree, they reflect the composition of the vehicle fleet being analysed in terms of mix of vehicles. Consequently, the results obtained from analysis of the Australian fleet may have little relevance to what has taken place in the New Zealand fleet. This is particularly likely given the New Zealand fleet has quite a different mix of vehicles to the Australian fleet in terms of vehicle size. The high proportion of used Japanese imports in the New Zealand fleet may also have a bearing on safety trends in the New Zealand fleet.

Whilst it is not possible to estimate vehicle safety ratings for individual vehicle models using only New Zealand injury crash data, analysis of crashworthiness trends by year of manufacture should be feasible. The ability to investigate trends in vehicle crashworthiness by year of manufacture using only New Zealand data would rely on the use of the new analysis methods for injury only crash data developed by MUARC for use in vehicle safety ratings as part of the EC funded SARAC projects.

It is recommended that analysis of trends in vehicle crashworthiness in the New Zealand fleet based on New Zealand crash data is undertaken. Analysis could focus on the fleet as a whole as well as the fleet broken down into vehicles sold new in New Zealand and second hand imported vehicles. Analysis of the second hand imported vehicles could also be carried out by year of first registration in New Zealand, the date when the introduction of the vehicle into the New Zealand fleet would have an influence on fleet safety in New Zealand. This latter analysis would be particularly useful in the longer term in quantifying the benefits of the recently introduced mandatory compliance with frontal impact standards required for all second hand vehicle imports into New Zealand.

## 7.4 Crash Risk Ratings for New Zealand Vehicles

One area of vehicle safety rating that has been poorly investigated in the past is that of rating primary vehicle safety or crash risk associated with particular vehicle model types. The ratings presented in this report give the risk of injury given crash involvement but do not reflect the risk of crashing per unit of exposure on the road. One of the primary reasons crash risk ratings have not successfully been undertaken in the past is due to a lack of suitable exposure data. Some research has developed crash risk ratings using years of registration or insurance as an exposure measure. This is, however, considered a flawed approach, particularly when considering an analysis by vehicle model. This is because it does not take into account some vehicle models being driven more than others due to differences in the primary use of the vehicle. For example a commercial vehicle used for deliveries in country areas in comparison to a small car primarily used for private commuting in urban areas.

Data collected as part of the annual New Zealand Warrant of Fitness (WoF) tests and held by the Transport Registry Centre may provide the necessary exposure data to enable the successful computation of vehicle crash risk ratings by make and model of vehicle. Analysis would capitalise on the vehicle model decoding and clustering methods as well as the crash and registration matching procedures developed as part of the study and presented in this report. It is

recommended a pilot study is undertaken to investigate the feasibility of and issues related to producing crash risk ratings for New Zealand passenger vehicles.

# 8. ASSUMPTIONS AND QUALIFICATIONS

The results and conclusions presented in this report are based on a number of assumptions and warrant a number of qualifications that the reader should note. These are listed in the following sections.

## 8.1 Assumptions

It has been assumed that:

- TAC claims records and, New Zealand, Victorian, NSW, Western Australian and Queensland Police crash reports accurately recorded driver injury, hospitalisation and death.
- There was no bias in the merging of TAC claims and Victorian Police crash reports related to the model of car and factors affecting the severity of the crash.
- Crashed vehicle registration numbers were recorded accurately on Police crash reports and that they correctly identified the crashed vehicles in the Victorian, NSW and Queensland vehicle registers.
- The adjustments for driver sex, age, speed zone, the number of vehicles involved and the state and year in which the crash occurred crash removed the influences of the other main factors available in the data that affected crash severity and injury susceptibility.
- The form of the logistic models used to relate injury risk and injury severity with the available factors influencing these outcomes (including the car models) was correct.
- Information contained in the Police crash records allowed accurate matching of both vehicles involved in crashes between two passenger cars for the purpose of calculating aggressivity ratings.
- The injury risk component of both the crashworthiness and aggressiviy ratings, calculated only from Australian crash data, is representative of injury risk in rated vehicle models in the New Zealand vehicle fleet.

## 8.2 Qualifications

The results and conclusions warrant at least the following qualifications:

- Only driver crash involvements and injuries have been considered. Passengers occupying the same model cars may have had different injury outcomes. However, in the vast majority of cases, the driver is the most seriously injured occupant in a crashed vehicle. This is often because the driver is the sole vehicle occupant but also because the dirver has the largest number of potential contact sources including the steering wheel. Noting this, both the crashworthiness and aggressivity ratings presented here can be considered to apply to the

most severe injury outcome in the vehicle. Assessment of average injury outcome across all occupants of the vehicle may produce different ratings although it would be difficult to calculate this measure, as uninjured vehicle occupants are typically not reliably recorded in police crash data.

- Some models with the same name through the 1982-2000 years of manufacture may have varied substantially in their construction and mass. Although there should be few such models in these updated results, the rating score calculated for these models may give a misleading impression and should be interpreted with caution.

- Other factors not collected in the data (eg. crash speed) may differ between the models and may affect the results. However, earlier analysis has suggested that the different rating scores are predominantly due to vehicle factors alone (Cameron et al 1992).

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**APPENDIX 1**

# MAKES AND MODELS OF CARS INVOLVED IN VICTORIAN AND NSW CRASHES DURING 1987-2000 AND NEW ZEALAND, WESTERN AUSTRALIA AND QUEENSLAND CRASHES DURING 1991-2000

## *FREQUENCY FOR EACH MODEL FOR ALL TYPES OF CRASHES (NZ/NSW/VIC/QLD/WA)*

| MAKE/MODEL | | | MODEL CODE | No. of uninjured drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of injured drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of involved drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of injured (but not severely) drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | No. of severely injured drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | No. of injured drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | ANALYSIS INCLUSION CRITERIA<br><br>INV=100<br>INJ=20 | MARKET GROUP |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Alfa Romeo | 164 | 89-98 | AL01Z | 46 | 5 | 51 | 6 | 4 | 10 | 0 | |
| Alfa Romeo | 33 | 83-95 | AL02Z | 458 | 82 | 540 | 87 | 25 | 112 | 1 | Small |
| Alfa Romeo | 75 | 88-91 | AL03Z | 119 | 15 | 134 | 13 | 4 | 17 | 0 | |
| Alfa Romeo | 90 | 85-86 | AL04Z | 59 | 7 | 66 | 6 | 3 | 9 | 0 | |
| Alfa Romeo | GTV | 80-87 | AL05Z | 121 | 13 | 134 | 10 | 8 | 18 | 0 | |
| Alfa Romeo | Sprint | 82-89 | AL06Z | 98 | 18 | 116 | 24 | 4 | 28 | 0 | |
| Alfa Romeo | Alfasud | 78-88 | AL07Z | 95 | 20 | 115 | 17 | 4 | 21 | 0 | |
| Alfa Romeo | Alfetta | 75-87 | AL08Z | 45 | 10 | 55 | 4 | 5 | 9 | 0 | |
| Alfa Romeo | Guilietta | 79-85 | AL09Z | 56 | 5 | 61 | 5 | 2 | 7 | 0 | |
| Alfa Romeo | 156 | 98-00 | AL13Z | 25 | 4 | 29 | 3 | 0 | 3 | 0 | |
| Alfa Romeo | 166 | 99-00 | AL14Z | 4 | 3 | 7 | 1 | 1 | 2 | 0 | |
| Alfa Romeo | GTV | 96-00 | AL15Z | 11 | 0 | 11 | . | . | . | 0 | |
| Audi | A6/S6 | 94-00 | AUD1Z | 16 | 2 | 18 | 3 | 0 | 3 | 0 | |
| Audi | A8 | 95-00 | AUD2Z | 1 | 0 | 1 | . | . | . | 0 | |
| Audi | A4 | 95-00 | AUD3Z | 181 | 23 | 204 | 30 | 10 | 40 | 1 | Luxury |
| Audi | A3/S3 | 97-00 | AUD5Z | 31 | 2 | 33 | 2 | 0 | 2 | 0 | |
| Audi | TT | 99-00 | AUD6Z | 3 | 0 | 3 | 1 | 0 | 1 | 0 | |
| BMW | Z3 | 97-00 | BM10Z | 48 | 8 | 56 | 6 | 1 | 7 | 0 | |
| BMW | 3 Series | 82-91 | BM3 A | 2150 | 314 | 2464 | 366 | 81 | 447 | 1 | Luxury |
| BMW | 3 Series | 92-98 | BM3 B | 1854 | 275 | 2129 | 250 | 54 | 304 | 1 | Luxury |
| BMW | 3 Series | 99-00 | BM3 C | 95 | 19 | 114 | 20 | 3 | 23 | 1 | |
| BMW | 5 Series | 81-88 | BM5 A | 625 | 62 | 687 | 76 | 19 | 95 | 1 | Luxury |
| BMW | 5 Series | 89-95 | BM5 B | 387 | 43 | 430 | 51 | 14 | 65 | 1 | Luxury |
| BMW | 5 Series | 96-00 | BM5 C | 152 | 17 | 169 | 14 | 3 | 17 | 0 | |
| BMW | 6 Series | 82-89 | BM6 Z | 5 | 0 | 5 | . | . | . | 0 | |
| BMW | 7 Series | 82-86 | BM7 A | 182 | 16 | 198 | 19 | 6 | 25 | 0 | |
| BMW | 7 Series | 87-94 | BM7 B | 100 | 13 | 113 | 17 | 5 | 22 | 0 | |
| BMW | 7 Series | 95-00 | BM7 C | 38 | 3 | 41 | 3 | 1 | 4 | 0 | |
| BMW | 8 Series | 90-99 | BM8 Z | 10 | 1 | 11 | 1 | 0 | 1 | 0 | |
| Chrysler | Voyager | 97-00 | CHR1Z | 86 | 11 | 97 | 13 | 1 | 14 | 0 | |

| MAKE/MODEL | | | MODEL CODE | No. of uninjured drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of injured drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of involved drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of injured (but not severely) drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | No. of severely injured drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | No. of injured drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | ANALYSIS INCLUSION CRITERIA<br><br>INV=100<br>INJ=20 | MARKET GROUP |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chrysler | Neon | 97-99 | CHR2Z | 165 | 32 | 197 | 30 | 3 | 33 | 0 | |
| Chrysler | Neon | 00-00 | CHR3Z | . | . | . | 1 | 0 | 1 | 0 | |
| Citroen | BX | 88-93 | CI1 Z | 65 | 4 | 69 | 25 | 5 | 30 | 0 | |
| Citroen | XM | 90-99 | CI2 Z | 3 | 0 | 3 | . | . | . | 0 | |
| Citroen | AX | 88-97 | CI3 Z | 4 | 1 | 5 | 12 | 3 | 15 | 0 | |
| Citroen | Xanitia | 93-99 | CI4 Z | 21 | 4 | 25 | 10 | 2 | 12 | 0 | |
| Citroen | Berlingo | 99-00 | CI5 Z | 2 | 0 | 2 | . | . | . | 0 | |
| Citroen | Xsara | 98-00 | CI6 Z | 6 | 2 | 8 | 2 | 0 | 2 | 0 | |
| Citroen | XM | 90-99 | CI7 Z | 2 | 0 | 2 | 1 | 1 | 2 | 0 | |
| Daihatsu | Charade | 82-87 | D1 A | 1551 | 472 | 2023 | 446 | 137 | 583 | 1 | Small |
| Daihatsu | Charade | 88-93 | D1 C | 4322 | 1144 | 5466 | 886 | 267 | 1153 | 1 | Small |
| Daihatsu | Charade | 93-00 | D1 D | 3059 | 761 | 3820 | 532 | 165 | 697 | 1 | Small |
| Daihatsu | Feroza / Rocky | 89-97 | D11 Z | 536 | 109 | 645 | 98 | 31 | 129 | 1 | 4WD |
| Daihatsu | Handivan | 82-90 | D12 Z | 488 | 208 | 696 | 175 | 41 | 216 | 1 | Commercial |
| Daihatsu | Hi-Jet | 83-95 | D13 Z | 116 | 67 | 183 | 60 | 21 | 81 | 0 | |
| Daihatsu | Rocky / Rugger | 85-98 | D14 Z | 377 | 114 | 491 | 77 | 43 | 120 | 1 | 4WD |
| Daihatsu | Pyzar | 96-00 | D15 Z | 98 | 21 | 119 | 17 | 2 | 19 | 0 | |
| Daihatsu | Move | 96-00 | D16 Z | 29 | 9 | 38 | 5 | 2 | 7 | 0 | |
| Daihatsu | Sirion | 00-00 | D17 Z | 158 | 54 | 212 | 33 | 8 | 41 | 1 | Small |
| Daihatsu | Terios | 97-00 | D18 Z | 78 | 32 | 110 | 30 | 10 | 40 | 1 | 4WD |
| Daihatsu | Handivan / Cuore | 99-00 | D19 Z | 8 | 1 | 9 | 3 | 0 | 3 | 0 | |
| Daihatsu | Applause | 89-98 | D2 Z | 1620 | 380 | 2000 | 293 | 74 | 367 | 1 | Small |
| Daihatsu | Mira | 90-98 | D3 Z | 384 | 185 | 569 | 134 | 44 | 178 | 1 | Small |
| Daewoo | 1.5i | 94-95 | DA01Z | 250 | 62 | 312 | 55 | 7 | 62 | 1 | Small |
| Daewoo | Cielo | 95-97 | DA03Z | 989 | 309 | 1298 | 284 | 63 | 347 | 1 | Small |
| Daewoo | Espero | 95-97 | DA05Z | 237 | 62 | 299 | 48 | 16 | 64 | 1 | Medium |
| Daewoo | Nubira | 97-00 | DA06Z | 380 | 81 | 461 | 69 | 20 | 89 | 1 | Medium |
| Daewoo | Lanos | 97-00 | DA07Z | 648 | 160 | 808 | 134 | 38 | 172 | 1 | Small |
| Daewoo | Leganza | 97-00 | DA08Z | 128 | 22 | 150 | 18 | 7 | 25 | 0 | |
| Daewoo | Musso | 95-00 | DA09Z | 41 | 5 | 46 | 9 | 3 | 12 | 0 | |
| Daewoo | Matiz | 00-00 | DA10Z | 23 | 11 | 34 | 10 | 2 | 12 | 0 | |
| Ford | Laser | 90-94 | F01 C | 7024 | 1547 | 8571 | 1739 | 431 | 2170 | 1 | Small |
| Ford | Laser | 95-97 | F01 D | 1318 | 285 | 1603 | 303 | 86 | 389 | 1 | Small |
| Ford | Cortina | 80-83 | F02 Z | 24 | 11 | 35 | 287 | 78 | 365 | 0 | |

| MAKE/MODEL | | | MODEL CODE | No. of uninjured drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of injured drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of involved drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of injured (but not severely) drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | No. of severely injured drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | No. of injured drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | ANALYSIS INCLUSION CRITERIA<br><br>INV=100<br>INJ=20 | MARKET GROUP |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ford | Escort | 82-82 | F05 Z | 18 | 1 | 19 | 1 | 1 | 2 | 0 | |
| Ford | Falcon XE/XF | 82-88 | F06 Z | 50483 | 7954 | 58437 | 7737 | 2373 | 10110 | 1 | Large |
| Ford | Fairlane Z & LTD F | 79-88 | F07 Z | 3397 | 571 | 3968 | 595 | 193 | 788 | 1 | Luxury |
| Ford | Falcon EA / Falcon EB Series I | 88-92 | F08 C | 29885 | 4600 | 34485 | 4551 | 1171 | 5722 | 1 | Large |
| Ford | Falcon EB Series II / Falcon ED | 92-94 | F08 D | 11614 | 1733 | 13347 | 1661 | 467 | 2128 | 1 | Large |
| Ford | Fairlane N & LTD D | 88-95 | F09 A | 3254 | 428 | 3682 | 436 | 137 | 573 | 1 | Luxury |
| Ford | Fairlane N & LTD D | 96-98 | F09 B | 712 | 99 | 811 | 103 | 35 | 138 | 1 | Luxury |
| Ford | Fairlane & LTD AU | 99-00 | F09 C | 69 | 12 | 81 | 7 | 3 | 10 | 0 | |
| Ford | Mondeo | 97-00 | F10 Z | 647 | 105 | 752 | 120 | 25 | 145 | 1 | Medium |
| Ford | Capri | 90-94 | F43 Z | 864 | 206 | 1070 | 209 | 47 | 256 | 1 | Sports |
| Ford | Festiva WD/WD/WH/WF | 94-00 | F44 B | 2526 | 891 | 3417 | 689 | 241 | 930 | 1 | Small |
| Ford | Falcon Panel Van | 85-95 | F45 A | 3408 | 420 | 3828 | 357 | 88 | 445 | 1 | Commercial |
| Ford | Falcon Panel Van | 96-00 | F45 B | 409 | 37 | 446 | 43 | 7 | 50 | 0 | |
| Ford / Nissan | Falcon Ute / XFN Ute | 85-93 | F46 A | 7604 | 1110 | 8714 | 808 | 269 | 1077 | 1 | Commercial |
| Ford | Falcon Ute | 94-99 | F46 B | 818 | 126 | 944 | 109 | 31 | 140 | 1 | Commercial |
| Ford | Falcon Ute AU | 00-00 | F46 D | 68 | 9 | 77 | 10 | 3 | 13 | 0 | |
| Ford | Ford F-Series | 79-92 | F47 Z | 646 | 93 | 739 | 73 | 19 | 92 | 1 | Commercial |
| Ford | Spectron | 86-90 | F52 Z | . | . | . | 14 | 1 | 15 | 0 | |
| Ford | Bronco | 82-87 | F56 Z | 112 | 17 | 129 | 13 | 6 | 19 | 0 | |
| Ford | Probe | 94-98 | F61 Z | 80 | 21 | 101 | 20 | 3 | 23 | 0 | |
| Ford | Falcon EF/EL | 94-98 | F62 Z | 17658 | 2840 | 20498 | 2638 | 717 | 3355 | 1 | Large |
| Ford | Transit | 95-00 | F64 Z | 286 | 40 | 326 | 62 | 14 | 76 | 1 | Commercial |
| Ford | Falcon AU | 98-00 | F66 Z | 2027 | 370 | 2397 | 309 | 65 | 374 | 1 | Large |
| Ford | Taurus | 96-98 | F67 Z | 170 | 31 | 201 | 26 | 7 | 33 | 0 | |
| Ford | Ka | 99-00 | F68 Z | 14 | 2 | 16 | 3 | 1 | 4 | 0 | |
| Ford | Cougar | 99-00 | F69 Z | 23 | 7 | 30 | 4 | 0 | 4 | 0 | |
| Ford | Courier | 99-00 | F70 Z | 43 | 11 | 54 | 10 | 3 | 13 | 0 | |
| Fiat | Argenta | 82-84 | FI01Z | 6 | 4 | 10 | 3 | 1 | 4 | 0 | |
| Fiat | Croma | 86-90 | FI02Z | 19 | 4 | 23 | 6 | 0 | 6 | 0 | |
| Fiat | Regata | 84-88 | FI03Z | 208 | 26 | 234 | 21 | 7 | 28 | 1 | Small |
| Fiat | Superbrava | 82-85 | FI04Z | 39 | 12 | 51 | 7 | 6 | 13 | 0 | |
| Fiat | X-1/9 | 83-85 | FI11Z | 2 | 0 | 2 | . | . | . | 0 | |
| Holden/Toyota | Commodore VN/VP / Lexcen | 89-93 | H1 Z | 32360 | 5773 | 38133 | 5238 | 1710 | 6948 | 0 | |
| Holden | Calibra | 91-97 | F12 Z | 190 | 24 | 214 | 44 | 6 | 50 | 0 | |

| MAKE/MODEL | | | MODEL CODE | No. of uninjured drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of injured drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of involved drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of injured (but not severely) drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | No. of severely injured drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | No. of injured drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | ANALYSIS INCLUSION CRITERIA<br><br>INV=100<br>INJ=20 | MARKET GROUP |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Holden | Statesman/Caprice WB | 81-84 | H14 A | 151 | 20 | 171 | 28 | 19 | 47 | 1 | Luxury |
| Holden | Stateman/Caprice VQ | 90-93 | H14 B | 683 | 95 | 778 | 91 | 38 | 129 | 1 | Luxury |
| Holden | Stateman/Caprice VR/VS | 94-99 | H14 C | 1095 | 174 | 1269 | 157 | 59 | 216 | 1 | Luxury |
| Holden | Commodore Ute VG/VP | 90-94 | H18 Z | 1011 | 177 | 1188 | 124 | 51 | 175 | 1 | Commercial |
| Holden | Camira | 82-89 | H2 Z | 11462 | 2677 | 14139 | 2718 | 740 | 3458 | 1 | Medium |
| Holden/Isuzu | Jackaroo/Bighorn | 82-91 | H21 A | 504 | 112 | 616 | 165 | 28 | 193 | 1 | 4WD |
| Holden/Isuzu | Jackaroo/Bighorn | 92-98 | H21 B | 272 | 54 | 326 | 64 | 17 | 81 | 1 | 4WD |
| Holden/Isuzu | Jackaroo/Bighorn | 99-00 | H21 C | 76 | 19 | 95 | 16 | 7 | 23 | 0 | |
| Isuzu | Piazza | 82-88 | H23 Z | 40 | 9 | 49 | 16 | 2 | 18 | 0 | |
| Isuzu | Pickup | 81-83 | H24 A | 631 | 108 | 739 | 100 | 30 | 130 | 1 | Commercial |
| Isuzu | Pickup | 84-88 | H24 B | 328 | 57 | 385 | 49 | 8 | 57 | 1 | Commercial |
| Isuzu / Holden | Pickup / Rodeo | 89-95 | H24 C | 3795 | 614 | 4409 | 442 | 176 | 618 | 1 | Commercial |
| Holden | Rodeo | 96-98 | H24 D | 908 | 194 | 1102 | 144 | 37 | 181 | 1 | Commercial |
| Holden | Rodeo | 99-00 | H24 E | 296 | 70 | 366 | 50 | 9 | 59 | 1 | Commercial |
| Holden | WFR Van | 92-98 | H26 Z | 440 | 95 | 535 | 69 | 26 | 95 | 1 | Commercial |
| Holden | WB Series | 80-84 | H27 Z | 1477 | 230 | 1707 | 139 | 80 | 219 | 1 | Commercial |
| Holden / Isuzu | Gemini | 82-84 | H3 A | 5713 | 1309 | 7022 | 1319 | 323 | 1642 | 1 | Small |
| Holden / Isuzu | Gemini RB | 86-89 | H3 C | 647 | 197 | 844 | 167 | 37 | 204 | 1 | Small |
| Holden / Toyota | Commodore VR/VS / Lexcen | 93-97 | H33 Z | 20472 | 3461 | 23933 | 3214 | 861 | 4075 | 1 | Large |
| Holden | Commodore Ute VR/VS | 96-00 | H34 Z | 2629 | 439 | 3068 | 323 | 134 | 457 | 1 | Commercial |
| Holden / Isuzu | Frontera / Mu | 99-00 | H35 Z | 39 | 5 | 44 | 2 | 7 | 9 | 0 | |
| Holden | Vectra | 96-00 | H36 Z | 440 | 86 | 526 | 106 | 19 | 125 | 1 | Medium |
| Holden | Commodore VT/VX | 97-00 | H37 Z | 5049 | 945 | 5994 | 829 | 189 | 1018 | 1 | Large |
| Holden | Suburban | 99-01 | H38 Z | 2 | 1 | 3 | 1 | 0 | 1 | 0 | |
| Holden | Statesman/Caprice WH | 99-00 | H39 Z | 101 | 27 | 128 | 20 | 3 | 23 | 0 | |
| Holden | Astra TR | 95-98 | H4 D | 384 | 75 | 459 | 89 | 12 | 101 | 1 | Small |
| Holden | Astra TS | 99-00 | H4 E | 164 | 47 | 211 | 24 | 10 | 34 | 0 | |
| Holden | Commodore VU Ute | 00-00 | H41 Z | 14 | 3 | 17 | 2 | 1 | 3 | 0 | |
| Holden | Barina SB | 95-00 | H5 D | 2041 | 573 | 2614 | 451 | 121 | 572 | 1 | Small |
| Holden | Commodore VB-VL | 82-89 | H6 Z | 43673 | 7699 | 51372 | 6633 | 2081 | 8714 | 1 | Large |
| Hyundai | Excel | 86-90 | HY1 A | 2174 | 599 | 2773 | 702 | 183 | 885 | 1 | Small |
| Hyundai | Excel | 90-95 | HY1 B | 5943 | 1591 | 7534 | 1421 | 351 | 1772 | 1 | Small |
| Hyundai | Accent | 95-00 | HY1 C | 8105 | 2323 | 10428 | 1893 | 439 | 2332 | 1 | Small |
| Hyundai | Elantra | 00-00 | HY11Z | 1 | 0 | 1 | . | . | . | 0 | |

| MAKE/MODEL | | | MODEL CODE | No. of uninjured drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of injured drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of involved drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of injured (but not severely) drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | No. of severely injured drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | No. of injured drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | ANALYSIS INCLUSION CRITERIA<br><br>INV=100<br>INJ=20 | MARKET GROUP |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hyundai | Sonata | 99-00 | HY15Z | 49 | 12 | 61 | 9 | 6 | 15 | 0 | |
| Hyundai | Sonata | 89-98 | HY2 Z | 1661 | 345 | 2006 | 315 | 71 | 386 | 1 | Large |
| Hyundai | S Coupe | 90-96 | HY4 Z | 608 | 173 | 781 | 151 | 38 | 189 | 1 | Small |
| Hyundai | Lantra | 91-93 | HY5 A | 1106 | 255 | 1361 | 230 | 57 | 287 | 1 | Small |
| Hyundai | Lantra | 94-00 | HY5 B | 1233 | 239 | 1472 | 221 | 47 | 268 | 1 | Small |
| Hyundai | Coupe | 96-00 | HY7 Z | 232 | 50 | 282 | 35 | 16 | 51 | 1 | Sports |
| Hyundai | XG | 00-00 | HY8 Z | 24 | 4 | 28 | 5 | 0 | 5 | 0 | |
| Hyundai | Accent | 00-00 | HY9 Z | 41 | 16 | 57 | 11 | 6 | 17 | 0 | |
| Mitsubishi | Mirage / Colt | 82-82 / 87-88 | I01 Z | 9845 | 2662 | 12507 | 2479 | 638 | 3117 | 1 | Small |
| Mitsubishi | Sigma / Galant / Sapporo / Lambda | 82-84 | I02 Z | 11585 | 2028 | 13613 | 2591 | 655 | 3246 | 1 | Medium |
| Mitsubishi | Magna / Sigma / V3000 | 85-90 | I04 Z | 16516 | 2869 | 19385 | 2954 | 886 | 3840 | 1 | Large |
| Mitsubishi | Magna / Verada / Diamante | 96-00 | I06 A | 11490 | 1868 | 13358 | 1786 | 308 | 2094 | 1 | Large |
| Mitsubishi | Starion | 83-88 | I07 Z | 131 | 31 | 162 | 44 | 23 | 67 | 0 | |
| Mitsubishi | Lancer / Mirage CA | 89-90 | I09 A | 3955 | 852 | 4807 | 1047 | 233 | 1280 | 1 | Small |
| Mitsubishi | Lancer / Mirage CB | 91-92 | I09 B | . | . | . | 79 | 21 | 100 | 0 | |
| Mitsubishi | Lancer / Mirage CC | 93-95 | I09 C | 2685 | 577 | 3262 | 633 | 170 | 803 | 1 | Small |
| Mitsubishi | Lancer / Mirage CE | 96-00 | I09 D | 3168 | 685 | 3853 | 565 | 142 | 707 | 1 | Small |
| Mitsubishi | Chariot / Spacewagon | 85-91 | I10 A | 426 | 84 | 510 | 185 | 36 | 221 | 1 | Medium |
| Mitsubishi | Chariot | 82-98 | I10 B | 286 | 54 | 340 | 50 | 8 | 58 | 1 | Medium |
| Mitsubishi | Nimbus | 99-00 | I10 C | 205 | 35 | 240 | 33 | 2 | 35 | 0 | |
| Mitsubishi | Cordia | 83-87 | I12 Z | 1476 | 291 | 1767 | 480 | 132 | 612 | 1 | Small |
| Mitsubishi | Magna / Verada / V3000 / Diamante | 91-96 | I15 Z | 8003 | 1318 | 9321 | 1474 | 398 | 1872 | 1 | Large |
| Mitsubishi | Galant | 89-93 | I16 A | 9 | 0 | 9 | 339 | 76 | 415 | 0 | |
| Mitsubishi | Galant | 94-97 | I16 B | 785 | 145 | 930 | 196 | 58 | 254 | 1 | Medium |
| Mitsubishi | Starwagon / L300 | 83-86 | I23 A | 2721 | 635 | 3356 | 523 | 179 | 702 | 1 | Passenger Van |
| Mitsubishi | Starwagon / Delica Starwagon | 87-93 | I23 B | 3158 | 664 | 3822 | 567 | 171 | 738 | 1 | Passenger Van |
| Mitsubishi | Starwagon / Delica Spacegear | 93-00 | I23 C | 859 | 130 | 989 | 108 | 24 | 132 | 1 | Passenger Van |
| Mitsubishi | Pajero | 84-91 | I25 A | 1291 | 245 | 1536 | 267 | 91 | 358 | 1 | 4WD |
| Mitsubishi | Pajero | 92-99 | I25 C | 1411 | 197 | 1608 | 197 | 61 | 258 | 1 | 4WD |
| Mitsubishi | 3000GT | 97-99 | I26 Z | 2 | 2 | 4 | 3 | 1 | 4 | 0 | |
| Mitsubishi | Challenger | 96-00 | I30 Z | 37 | 5 | 42 | 8 | 3 | 11 | 0 | |
| Mitsubishi | Pajero iO | 99-00 | I34 Z | 4 | 1 | 5 | 2 | 1 | 3 | 0 | |
| Mitsubishi | Pajero | 00-00 | I35 Z | 12 | 1 | 13 | 2 | 0 | 2 | 0 | |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Jaguar | XJ6 | 79-86 | J01 A | 231 | 28 | 259 | 24 | 12 | 36 | 1 | Luxury |
| Jaguar | XJ6 | 87-94 | J01 B | 270 | 26 | 296 | 26 | 7 | 33 | 0 | |
| Jaguar | XJ6 | 95-97 | J01 C | 41 | 2 | 43 | 1 | 2 | 3 | 0 | |
| Jaguar | XJ6 | 98-00 | J01 D | 6 | 0 | 6 | . | . | . | 0 | |
| Jaguar | XJS | 75-96 | J04 Z | 56 | 8 | 64 | 7 | 1 | 8 | 0 | |
| Jaguar | XJR | 95-00 | J05 Z | 3 | 0 | 3 | . | . | . | 0 | |
| Jaguar | XK8 | 97-00 | J07 Z | 11 | 1 | 12 | . | . | . | 0 | |
| Jaguar | S-Type | 99-00 | J08 Z | 5 | 1 | 6 | 1 | 0 | 1 | 0 | |
| Jeep | Cherokee | 96-00 | JE01Z | 423 | 49 | 472 | 65 | 16 | 81 | 1 | 4WD |
| Jeep | Grand Cherokee | 96-99 | JE02Z | 52 | 6 | 58 | 8 | 3 | 11 | 0 | |
| Jeep | Wrangler | 96-00 | JE03Z | 51 | 6 | 57 | 8 | 5 | 13 | 0 | |
| Jeep | Grand Cherokee | 99-00 | JE04Z | . | . | . | 4 | 0 | 4 | 0 | |
| Kia | Sportage | 96-00 | K01 Z | 72 | 8 | 80 | 9 | 0 | 9 | 0 | |
| Kia | Ceres | 96-99 | K02 Z | 111 | 30 | 141 | 31 | 0 | 31 | 0 | |
| Kia | Mentor | 96-00 | K03 Z | 2 | 0 | 2 | . | . | . | 0 | |
| Kia | Credos | 98-00 | K04 Z | 1 | 0 | 1 | . | . | . | 0 | |
| Kia | Rio | 00-00 | K05 Z | 3 | 1 | 4 | 1 | 0 | 1 | 0 | |
| Kia | Carnival | 01-01 | K07 Z | 4 | 0 | 4 | . | . | . | 0 | |
| Land Rover | Defender | 91-00 | LRO1Z | 65 | 21 | 86 | 18 | 9 | 27 | 0 | |
| Land Rover / Honda | Discovery / Crossroad | 91-00 | LRO2Z | 159 | 42 | 201 | 45 | 13 | 58 | 1 | 4WD |
| Ford / Mazda | Laser / 323 / Familia | 82-89 | M01 A | 32704 | 7898 | 40602 | 10270 | 2438 | 12708 | 1 | Small |
| Mazda | 323 / Familia / Lantis | 90-93 | M01 C | 2022 | 417 | 2439 | 814 | 186 | 1000 | 1 | Small |
| Mazda | 323 / Familia / Lantis | 95-98 | M01 E | 1555 | 310 | 1865 | 275 | 76 | 351 | 1 | Small |
| Ford / Mazda | Laser / 323 | 99-00 | M01 F | 269 | 64 | 333 | 40 | 7 | 47 | 1 | Small |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 83-87 | M02 B | 6797 | 1266 | 8063 | 2034 | 485 | 2519 | 1 | Medium |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 88-92 | M02 D | 2491 | 434 | 2925 | 884 | 201 | 1085 | 1 | Medium |
| Ford / Mazda | Telstar / 626 / MX6 / Capella / Cronos | 92-97 | M02 E | 2476 | 348 | 2824 | 549 | 160 | 709 | 1 | Medium |
| Mazda | 626 | 98-00 | M02 F | 161 | 29 | 190 | 32 | 10 | 42 | 1 | Medium |
| Mazda | 929 / Luce | 82-91 | M03 A | 2527 | 472 | 2999 | 536 | 150 | 686 | 1 | Luxury |
| Mazda | 929 / Sentia / Efini MS-9 | 92-96 | M03 C | 98 | 18 | 116 | 24 | 2 | 26 | 0 | |
| Ford / Mazda | Festiva WA / 121 | 90-94/87-91 | M09 A | 4793 | 1338 | 6131 | 1190 | 304 | 1494 | 1 | Small |
| Mazda | 121 / Autozam Review | 91-97 | M09 B | 1331 | 355 | 1686 | 294 | 63 | 357 | 1 | Small |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Mazda | Demio | 98-00 | M09 C | 467 | 123 | 590 | 108 | 28 | 136 | 1 | Small |
| Mazda | RX7 | 81-86 | M10 A | 460 | 75 | 535 | 90 | 27 | 117 | 1 | Sports |
| Mazda | RX7 | 86-91 | M10 B | 213 | 23 | 236 | 63 | 16 | 79 | 1 | Sports |
| Mazda | RX7 | 92-95 | M10 C | 33 | 7 | 40 | 14 | 3 | 17 | 0 | |
| Mazda | MX5 / Eunos Roadster | 89-97 | M11 A | 351 | 58 | 409 | 65 | 14 | 79 | 1 | Sports |
| Mazda | MX5 / Eunos Roadster | 98-00 | M11 B | 42 | 9 | 51 | 8 | 2 | 10 | 0 | |
| Mazda | MPV | 94-99 | M15 A | 114 | 9 | 123 | 8 | 1 | 9 | 0 | |
| Mazda | MPV | 00-00 | M15 B | 1 | 0 | 1 | . | . | . | 0 | |
| Mazda | Eunos Presso / MX-3 / Autozam AZ-3 | 90-95 | M16 Z | 141 | 32 | 173 | 30 | 5 | 35 | 0 | |
| Mazda | Eunos 500 | 93-95 | M17 Z | 69 | 20 | 89 | 21 | 4 | 25 | 0 | |
| Mazda | Eunos 800 | 94-00 | M18 Z | 20 | 2 | 22 | 5 | 1 | 6 | 0 | |
| Mercedes Benz | C-Class W201 | 87-93 | ME11Z | 286 | 53 | 339 | 61 | 21 | 82 | 1 | Luxury |
| Mercedes Benz | C-Class W202 | 94-00 | ME12Z | 398 | 52 | 450 | 44 | 12 | 56 | 1 | Luxury |
| Mercedes Benz | CLK C208 | 97-00 | ME13Z | 24 | 1 | 25 | 2 | 1 | 3 | 0 | |
| Mercedes Benz | E-Class W123 | 82-85 | ME14Z | 217 | 30 | 247 | 22 | 8 | 30 | 1 | Luxury |
| Mercedes Benz | E-Class W124 | 86-94 | ME15Z | 567 | 72 | 639 | 76 | 19 | 95 | 1 | Luxury |
| Mercedes Benz | E-Class W201 | 95-00 | ME16Z | 189 | 22 | 211 | 22 | 4 | 26 | 0 | |
| Mercedes Benz | S-Class W126 | 82-92 | ME18Z | 438 | 51 | 489 | 51 | 15 | 66 | 1 | Luxury |
| Mercedes Benz | S-Class R129 | 93-98 | ME19Z | 44 | 4 | 48 | 3 | 0 | 3 | 0 | |
| Mercedes Benz | S-Class C140 | 93-98 | ME20Z | 95 | 3 | 98 | 4 | 0 | 4 | 0 | |
| Mercedes Benz | SLK R170 | 97-00 | ME21Z | 39 | 6 | 45 | 3 | 0 | 3 | 0 | |
| Mercedes Benz | A-Class W168 | 98-00 | ME22Z | 13 | 3 | 16 | 2 | 3 | 5 | 0 | |
| Mercedes Benz | MB100 / MB140 | 97-00 | ME24Z | 5 | 1 | 6 | 2 | 0 | 2 | 0 | |
| Mercedes Benz | S-Class W220 | 99-00 | ME25Z | 5 | 0 | 5 | . | . | . | 0 | |
| Mercedes Benz | Vito | 99-00 | ME26Z | 47 | 6 | 53 | 2 | 1 | 3 | 0 | |
| Mercedes Benz | M-Class W163 | 98-00 | ME27Z | 10 | 1 | 11 | 1 | 0 | 1 | 0 | |
| Mercedes Benz | Sprinter | 98-00 | ME30Z | 14 | 5 | 19 | 11 | 0 | 11 | 0 | |
| Mercedes Benz | G-Class | 83-88 | ME31Z | 1 | 0 | 1 | . | . | . | 0 | |
| Nissan | Pulsar / Langley | 83-86 | N01 A | 8190 | 2003 | 10193 | 2324 | 594 | 2918 | 1 | Small |
| Nissan | Pulsar / Sentra | 87-91 | N01 C | 8371 | 1779 | 10150 | 1864 | 474 | 2338 | 1 | Small |
| Nissan | Pulsar / Sentra | 91-95 | N01 E | 3022 | 586 | 3608 | 733 | 182 | 915 | 1 | Small |
| Nissan | Pulsar / Sentra | 96-00 | N01 F | 1891 | 433 | 2324 | 349 | 106 | 455 | 1 | Small |
| Nissan | Pintara | 86-88 | N02 A | 3491 | 640 | 4131 | 590 | 164 | 754 | 1 | Medium |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Nissan | Bluebird | 89-92 | N02 B | 5653 | 1090 | 6743 | 1036 | 309 | 1345 | 1 | Medium |
| Nissan | Bluebird | 83-88 | N03 Z | 11028 | 2152 | 13180 | 2245 | 669 | 2914 | 1 | Medium |
| Nissan | Skyline | 83-88 | N04 Z | 3748 | 631 | 4379 | 757 | 223 | 980 | 1 | Large |
| Nissan | 300ZX / Fairlady Z | 90-95 | N09 Z | 306 | 42 | 348 | 46 | 17 | 63 | 1 | Sports |
| Nissan | Stanza | 82-83 | N10 Z | 481 | 99 | 580 | 87 | 21 | 108 | 1 | Medium |
| Nissan | Laurel | 82-84 | N11 Z | 56 | 9 | 65 | 8 | 3 | 11 | 0 | |
| Nissan | Silvia | 84-86 | N12 Z | 341 | 60 | 401 | 307 | 120 | 427 | 1 | Medium |
| Nissan | 280ZX | 79-83 | N13 Z | 74 | 13 | 87 | 15 | 6 | 21 | 0 | |
| Nissan | Prairie | 82-88 | N14 Z | 305 | 64 | 369 | 79 | 20 | 99 | 1 | Medium |
| Nissan | Maxima | 91-94 | N15 A | 404 | 60 | 464 | 124 | 34 | 158 | 1 | Luxury |
| Nissan | Maxima / Cefiro | 95-99 | N15 B | 302 | 59 | 361 | 73 | 18 | 91 | 1 | Luxury |
| Nissan | Maxima | 00-00 | N15 C | 13 | 3 | 16 | 3 | 0 | 3 | 0 | |
| Nissan | Exa | 83-86 | N16 A | 382 | 102 | 484 | 102 | 26 | 128 | 1 | Sports |
| Nissan | Exa | 86-91 | N16 B | 206 | 29 | 235 | 44 | 11 | 55 | 1 | Sports |
| Nissan | NX/NX-R | 93-95 | N17 Z | 325 | 90 | 415 | 65 | 31 | 96 | 1 | Sports |
| Nissan | Laurel | 85-87 | N20 Z | 79 | 16 | 95 | 12 | 4 | 16 | 0 | |
| Nissan | 720 Ute | 82-85 | N21 Z | 1320 | 243 | 1563 | 192 | 60 | 252 | 1 | Commercial |
| Nissan | Navara | 86-91 | N24 A | 2677 | 412 | 3089 | 399 | 140 | 539 | 1 | Commercial |
| Nissan | Navara | 92-98 | N24 B | 816 | 118 | 934 | 131 | 39 | 170 | 1 | Commercial |
| Nissan | Navara | 98-00 | N24 C | 154 | 13 | 167 | 25 | 1 | 26 | 0 | |
| Nissan | Patrol | 82-87 | N26 A | 1129 | 143 | 1272 | 148 | 43 | 191 | 1 | 4WD |
| Nissan / Ford | Patrol / Maverick | 88-98 | N26 B | 4015 | 547 | 4562 | 512 | 153 | 665 | 1 | 4WD |
| Nissan | Patrol | 99-00 | N26 C | 302 | 48 | 350 | 45 | 17 | 62 | 1 | 4WD |
| Nissan | Pathfinder / Terrano | 88-95 | N27 Z | 190 | 33 | 223 | 93 | 30 | 123 | 1 | 4WD |
| Nissan | Serena | 92-00 | N30 Z | 63 | 10 | 73 | 17 | 3 | 20 | 0 | |
| Nissan | Infiniti | 93-97 | N31 Z | 2 | 0 | 2 | . | . | . | 0 | |
| Nissan | Bluebird | 92-97 | N32 Z | 475 | 67 | 542 | 211 | 55 | 266 | 1 | Medium |
| Nissan | 200SX / Silvia | 94-99 | N33 Z | 202 | 36 | 238 | 17 | 8 | 25 | 1 | Sports |
| Nissan | Micra | 93-95 | N34 Z | 330 | 92 | 422 | 72 | 26 | 98 | 1 | Small |
| Nissan | Pathfinder / Terrano | 96-00 | N36 Z | 185 | 28 | 213 | 31 | 12 | 43 | 1 | 4WD |
| Nissan | Terrano II | 96-00 | N38 Z | 3 | 2 | 5 | 2 | 0 | 2 | 0 | |
| Nissan | Bluebird | 89-92 | N02 B | 5653 | 1090 | 6743 | 1036 | 309 | 1345 | 0 | |
| Nissan | Bluebird | 83-88 | N03 Z | 11028 | 2152 | 13180 | 2245 | 669 | 2914 | 1 | 4WD |
| Nissan | Skyline | 83-88 | N04 Z | 3748 | 631 | 4379 | 757 | 223 | 980 | 1 | Small |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Nissan | 300ZX / Fairlady Z | 90-95 | N09 Z | 306 | 42 | 348 | 46 | 17 | 63 | 1 | Small |
| Nissan | Stanza | 82-83 | N10 Z | 481 | 99 | 580 | 87 | 21 | 108 | 1 | Small |
| Nissan | Laurel | 82-84 | N11 Z | 56 | 9 | 65 | 8 | 3 | 11 | 1 | Small |
| Nissan | Pulsar | 0 | N39 Z | 24 | 4 | 28 | 2 | 3 | 5 | 1 | Small |
| Lada | Niva | 84-99 | NIVAZ | 225 | 51 | 276 | 57 | 16 | 73 | 1 | Sports |
| Honda | Civic | 82-84 | O1 A | 590 | 133 | 723 | 107 | 29 | 136 | 0 | |
| Honda | Civic / Ballade / Shuttle | 86-88 | O1 B | 2021 | 407 | 2428 | 349 | 115 | 464 | 0 | |
| Honda | Civic / Shuttle | 89-92 | O1 C | 2566 | 457 | 3023 | 400 | 136 | 536 | 0 | |
| Honda | Civic | 92-95 | O1 D | 2345 | 406 | 2751 | 363 | 85 | 448 | 1 | 4WD |
| Honda | Civic | 96-00 | O1 E | 1304 | 244 | 1548 | 188 | 39 | 227 | 0 | |
| Honda | CRX | 87-91 | O10 A | 242 | 49 | 291 | 222 | 66 | 288 | 0 | |
| Honda | CRX | 92-98 | O10 B | 100 | 16 | 116 | 23 | 11 | 34 | 1 | Luxury |
| Honda | Odyssey | 95-00 | O17 A | 121 | 14 | 135 | 6 | 0 | 6 | 0 | |
| Honda | Odyssey | 01-03 | O17 B | 10 | 1 | 11 | 1 | 0 | 1 | 0 | |
| Honda | CR-V | 96-00 | O18 Z | 197 | 27 | 224 | 58 | 13 | 71 | 0 | |
| Honda | HR-V | 99-00 | O19 Z | 59 | 9 | 68 | 9 | 4 | 13 | 0 | |
| Honda | Legend | 82-85 | O2 A | . | . | . | 1 | 0 | 1 | 1 | Luxury |
| Honda | Legend | 91-96 | O2 B | 500 | 50 | 550 | 59 | 13 | 72 | 1 | Luxury |
| Honda | Legend | 96-98 | O2 C | 24 | 1 | 25 | 2 | 0 | 2 | 1 | Luxury |
| Honda | Legend | 99-00 | O2 D | 5 | 1 | 6 | 1 | 0 | 1 | 1 | Luxury |
| Honda | S2000 | 99-00 | O20 Z | 9 | 0 | 9 | . | . | . | 0 | |
| Honda | Civic | 0 | O21 Z | 4 | 0 | 4 | . | . | . | 0 | |
| Honda | Accord | 82-86 | O3 A | 1564 | 323 | 1887 | 269 | 64 | 333 | 1 | Sports |
| Honda | Accord | 86-90 | O3 B | 1351 | 188 | 1539 | 188 | 36 | 224 | 1 | Sports |
| Honda | Accord | 90-93 | O3 C | 684 | 85 | 769 | 79 | 16 | 95 | 0 | |
| Honda | Accord | 94-97 | O3 D | 1098 | 140 | 1238 | 128 | 39 | 167 | 1 | Sports |
| Honda | Accord | 98-00 | O3 E | 51 | 9 | 60 | 12 | 0 | 12 | 1 | Sports |
| Honda | Prelude | 82-82 | O4 A | 180 | 31 | 211 | 25 | 5 | 30 | 1 | Sports |
| Honda | Prelude | 83-91 | O4 B | 2217 | 347 | 2564 | 327 | 85 | 412 | 1 | Small |
| Honda | Prelude | 92-96 | O4 C | 688 | 91 | 779 | 86 | 35 | 121 | 0 | |
| Honda | Prelude | 97-00 | O4 D | 126 | 22 | 148 | 21 | 2 | 23 | 1 | Commercial |
| Honda | Integra | 86-88 | O5 A | 463 | 71 | 534 | 64 | 16 | 80 | 1 | Small |
| Honda | Integra | 91-93 | O5 C | 348 | 52 | 400 | 62 | 13 | 75 | 0 | |
| Honda | Integra | 93-00 | O5 E | 328 | 34 | 362 | 42 | 8 | 50 | 1 | Medium |

| MAKE/MODEL | | | MODEL CODE | No. of uninjured drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of injured drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of involved drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of injured (but not severely) drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | No. of severely injured drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | No. of injured drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | ANALYSIS INCLUSION CRITERIA<br><br>INV=100<br>INJ=20 | MARKET GROUP |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Honda | Concerto | 89-93 | O6 Z | 290 | 56 | 346 | 62 | 18 | 80 | 1 | Medium |
| Honda | NSX | 91-00 | O7 Z | 8 | 0 | 8 | 1 | 0 | 1 | 1 | Small |
| Honda | Acty | 83-86 | O8 Z | 273 | 59 | 332 | 43 | 16 | 59 | 0 | |
| Honda | City | 84-89 | O9 Z | 264 | 97 | 361 | 74 | 22 | 96 | 0 | |
| Peugoet | 205 | 86-92 | PE1 Z | 150 | 22 | 172 | 30 | 7 | 37 | 0 | |
| Peugeot | 405 | 88-96 | PE2 Z | 273 | 47 | 320 | 80 | 23 | 103 | 0 | |
| Peugeot | 505 | 82-91 | PE3 Z | 516 | 60 | 576 | 77 | 29 | 106 | 0 | |
| Peugeot | 306 | 93-00 | PE4 Z | 362 | 61 | 423 | 74 | 10 | 84 | 0 | |
| Peugeot | 605 | 90-98 | PE5 Z | 34 | 4 | 38 | 5 | 2 | 7 | 0 | |
| Peugeot | 605 | 90-98 | PE5 Z | 34 | 4 | 38 | 5 | 2 | 7 | 0 | |
| Peugeot | 406 | 96-00 | PE7 Z | 50 | 4 | 54 | 5 | 2 | 7 | 0 | |
| Peugeot | 206 | 99-00 | PE8 Z | 15 | 1 | 16 | 1 | 3 | 4 | 0 | |
| Porsche | 944 | 82-91 | PO1 Z | 74 | 9 | 83 | 10 | 4 | 14 | 0 | |
| Porsche | 911 | 83-00 | PO2 Z | 14 | 1 | 15 | 5 | 3 | 8 | 1 | Sports |
| Porsche | 928 | 82-95 | PO3 Z | . | . | . | 2 | 0 | 2 | 0 | |
| Porsche | 968 | 91-95 | PO4 Z | 1 | 0 | 1 | . | . | . | 0 | |
| Proton | Wira | 95-96 | PRO1Z | 69 | 30 | 99 | 36 | 13 | 49 | 0 | |
| Proton | Satria | 97-00 | PRO2Z | 4 | 0 | 4 | 1 | 1 | 2 | 1 | |
| Renault | 18 | 81-83 | RE Z | . | . | . | 1 | 0 | 1 | 0 | |
| Renault | 20 | 78-83 | RE1 Z | 13 | 4 | 17 | 7 | 4 | 11 | 0 | Small |
| Renault | Feugo | 81-86 | RE2 Z | 285 | 41 | 326 | 57 | 13 | 70 | 0 | |
| Renault | 21 | 88-92 | RE3 Z | 10 | 1 | 11 | 4 | 0 | 4 | 1 | |
| Renault | 25 | 84-91 | RE4 Z | 28 | 7 | 35 | 15 | 2 | 17 | 1 | |
| Renault | 19 | 90-97 | RE5 Z | 104 | 20 | 124 | 25 | 5 | 30 | 0 | 4WD |
| Renault | Laguna | 95-99 | RE7 Z | 19 | 4 | 23 | 2 | 2 | 4 | 0 | |
| Rover | 3500 | 82-84 | RO Z | 127 | 25 | 152 | 29 | 2 | 31 | 0 | Luxury |
| Rover | Quintet | 82-86 | RO2 Z | 180 | 43 | 223 | 54 | 17 | 71 | 0 | |
| Rover | 825 | 87-88 | RO3 Z | 25 | 4 | 29 | 8 | 1 | 9 | 0 | Luxury |
| Rover | MGF | 96-00 | RO4 Z | 43 | 6 | 49 | 5 | 1 | 6 | 0 | |
| Landrover | Freelander | 98-00 | RO5 Z | 4 | 0 | 4 | 1 | 0 | 1 | 0 | |
| Land Rover | Range Rover | 82-94 | RROV1 | 674 | 70 | 744 | 109 | 35 | 144 | 1 | |
| Land Rover | Range Rover | 95-00 | RROV2 | 31 | 8 | 39 | 17 | 2 | 19 | 0 | |
| Saab | 900 Series | 84-92 | SA1 A | 632 | 94 | 726 | 105 | 29 | 134 | 0 | Medium |
| Saab | 900/9-3 | 94-00 | SA1 B | 387 | 43 | 430 | 45 | 6 | 51 | 0 | Medium |

| MAKE/MODEL | | | MODEL CODE | No. of uninjured drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of injured drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of involved drivers in NSW (87-2000) and QLD, WA (91-2000) | No. of injured (but not severely) drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | No. of severely injured drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | No. of injured drivers in NSW, Victoria (87-2000) and NZ, QLD, WA (91-2000) | ANALYSIS INCLUSION CRITERIA<br><br>INV=100<br>INJ=20 | MARKET GROUP |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Saab | 9000 | 86-97 | SA2 Z | 494 | 65 | 559 | 71 | 9 | 80 | 1 | Medium |
| Saab | 9-5 | 98-00 | SA3 Z | 31 | 9 | 40 | 7 | 1 | 8 | 1 | |
| Lada | Samara | 88-96 | SAMAZ | . | . | . | 1 | 0 | 1 | 1 | |
| Seat | Ibiza | 95-99 | SE01Z | 4 | 2 | 6 | 4 | 1 | 5 | 1 | Small |
| Seat | Cordoba | 00-00 | SE02Z | 3 | 3 | 6 | 3 | 1 | 4 | 1 | |
| Subaru | Leone / Omega / 4WD Wagon | 88-93 | SU1 Z | 4318 | 1053 | 5371 | 1005 | 343 | 1348 | 0 | Commercial |
| Subaru | Legacy | 89-93 | SU2 A | 2388 | 412 | 2800 | 605 | 162 | 767 | 0 | Small |
| Subaru | Legacy | 94-98 | SU2 B | 750 | 143 | 893 | 115 | 41 | 156 | 1 | |
| Subaru | Legacy | 99-00 | SU2 C | 138 | 31 | 169 | 24 | 7 | 31 | 1 | |
| Subaru | Vortex | 86-91 | SU3 Z | 45 | 12 | 57 | 12 | 4 | 16 | 0 | |
| Subaru | 700 / Rex | 89-92 | SU4 Z | 476 | 240 | 716 | 237 | 60 | 297 | 0 | Small |
| Subaru | SVX / Alcyone | 92-95 | SU5 Z | 14 | 2 | 16 | 1 | 0 | 1 | 0 | Small |
| Subaru | Brumby | 82-92 | SU6 Z | 1117 | 360 | 1477 | 228 | 131 | 359 | 1 | 4WD |
| Subaru | Impreza | 93-00 | SU7 A | 810 | 160 | 970 | 125 | 55 | 180 | 0 | |
| Subaru | Impreza | 01-01 | SU7 B | 4 | 1 | 5 | . | . | . | 0 | Small |
| Subaru | Forester | 97-00 | SU8 Z | 125 | 18 | 143 | 27 | 7 | 34 | 0 | Commercial |
| Suzuki | Swift | 85-86 | SZ01A | 162 | 53 | 215 | 40 | 13 | 53 | 0 | |
| Holden / Suzuki | Barina / Swift / Cultus | 86-88 | SZ01B | 2877 | 931 | 3808 | 979 | 262 | 1241 | 0 | Commercial |
| Holden / Suzuki | Barina / Swift / Cultus | 89-93/89-00 | SZ01C | 8237 | 2137 | 10374 | 1872 | 451 | 2323 | 0 | 4WD |
| Suzuki | Vitara / Escudo | 88-98 | SZ02A | 1067 | 267 | 1334 | 255 | 74 | 329 | 0 | Small |
| Suzuki | Grand Vitara | 98-00 | SZ02B | 18 | 4 | 22 | 5 | 1 | 6 | 0 | |
| Suzuki | Alto | 82-84 | SZ03Z | 670 | 318 | 988 | 238 | 73 | 311 | 1 | |
| Holden / Suzuki | Scurry / Carry | 82-00 | SZ04Z | 356 | 148 | 504 | 119 | 38 | 157 | 1 | Small |
| Suzuki | Alto | 85-00 | SZ05Z | 95 | 58 | 153 | 124 | 36 | 160 | 1 | Small |
| Suzuki | Mighty Boy | 85-88 | SZ06Z | 364 | 154 | 518 | 117 | 34 | 151 | 1 | Small |
| Suzuki | Samurai / SJ410 / SJ413 | 82-99 | SZ07Z | 2844 | 862 | 3706 | 666 | 184 | 850 | 1 | Small |
| Suzuki | Baleno / Cultus Crescent | 95-99 | SZ08Z | 376 | 100 | 476 | 78 | 14 | 92 | 1 | Small |
| Suzuki | Carry | 01-02 | SZ09Z | 8 | 1 | 9 | 1 | 0 | 1 | 1 | Medium |
| Suzuki | Jimny | 99-00 | SZ11Z | 10 | 6 | 16 | 8 | 1 | 9 | 0 | Medium |
| Toyota | Corolla | 82-84 | T01 A | 8003 | 1810 | 9813 | 2472 | 556 | 3028 | 0 | Medium |
| Toyota | Corolla | 86-88 | T01 C | 11228 | 2523 | 13751 | 2758 | 686 | 3444 | 1 | Large |
| Toyota / Holden | Corolla / Nova | 88-92 | T01 E | 12823 | 2876 | 15699 | 3137 | 852 | 3989 | 1 | Large |
| Toyota / Holden | Corolla / Nova | 93-97 | T01 F | 6541 | 1354 | 7895 | 1418 | 369 | 1787 | 0 | Sports |
| Toyota | Corolla | 98-00 | T01 G | 271 | 55 | 326 | 79 | 12 | 91 | 1 | Sports |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Toyota | Corona | 82-88 | T03 Z | 14578 | 2820 | 17398 | 2544 | 644 | 3188 | 1 | Sports |
| Toyota | Camry | 81-86 | T04 Z | 3487 | 593 | 4080 | 535 | 143 | 678 | 1 | Sports |
| Holden / Toyota | Apollo JK/JL / Camry / Vista | 90-93 | T05 A | 18216 | 3299 | 21515 | 2997 | 847 | 3844 | 1 | |
| Holden / Toyota | Apollo JM/JP / Camry / Sceptor | 94-97 | T05 B | 11502 | 2057 | 13559 | 1754 | 452 | 2206 | 1 | Luxury |
| Toyota | Camry | 98-00 | T05 C | 2105 | 366 | 2471 | 268 | 75 | 343 | 1 | Luxury |
| Toyota | Celica | 81-85 | T06 A | 2032 | 359 | 2391 | 449 | 91 | 540 | 1 | Luxury |
| Toyota | Celica | 86-89 | T06 B | 1476 | 249 | 1725 | 252 | 66 | 318 | 1 | Small |
| Toyota | Celica | 90-93 | T06 C | 1170 | 178 | 1348 | 217 | 54 | 271 | 0 | Sports |
| Toyota | Celica | 94-00 | T06 D | 419 | 85 | 504 | 82 | 18 | 100 | 0 | Sports |
| Toyota | Celica | 01-01 | T06 E | 15 | 5 | 20 | 1 | 1 | 2 | 1 | |
| Toyota | Crown / Cressida / Mark II | 81-85 | T07 A | 1752 | 311 | 2063 | 363 | 105 | 468 | 1 | Sports |
| Toyota | Crown / Cressida / Mark II | 85-88 | T07 B | 786 | 99 | 885 | 77 | 27 | 104 | 0 | Commercial |
| Toyota | Cressida / Mark II | 89-92 | T07 C | 1374 | 186 | 1560 | 168 | 47 | 215 | 0 | Commercial |
| Toyota | Tercel | 85-88 | T09 Z | 383 | 74 | 457 | 70 | 22 | 92 | 1 | Commercial |
| Toyota | Supra | 86-92 | T11 Z | 322 | 61 | 383 | 50 | 18 | 68 | 1 | 4WD |
| Toyota | MR2 | 85-89 | T12 A | 129 | 36 | 165 | 78 | 29 | 107 | 1 | 4WD |
| Toyota | MR2 | 90-99 | T12 B | 88 | 16 | 104 | 23 | 8 | 31 | 1 | 4WD |
| Toyota | Paseo / Cynos | 91-97 | T13 Z | 644 | 149 | 793 | 153 | 37 | 190 | 1 | 4WD |
| Toyota | Hiace/Liteace | 82-86 | T15 A | 3842 | 718 | 4560 | 797 | 229 | 1026 | 1 | |
| Toyota | Hiace/Liteace | 87-92 | T15 B | 1880 | 313 | 2193 | 437 | 106 | 543 | 0 | Passenger Van |
| Toyota | Hiace/Liteace | 93-00 | T15 C | 3589 | 541 | 4130 | 563 | 162 | 725 | 1 | Passenger Van |
| Toyota | 4Runner/Hilux | 79-83 | T16 A | 4002 | 790 | 4792 | 606 | 246 | 852 | 1 | |
| Toyota | 4Runner/Hilux | 85-89 | T16 B | 3116 | 564 | 3680 | 596 | 194 | 790 | 1 | 4WD |
| Toyota | 4Runner/Hilux | 90-97 | T16 C | 8713 | 1588 | 10301 | 1516 | 580 | 2096 | 1 | 4WD |
| Toyota | Hilux | 98-00 | T16 D | 525 | 118 | 643 | 86 | 33 | 119 | 1 | 4WD |
| Lexus | ES300 / Windom | 92-00 | T17 Z | 218 | 28 | 246 | 32 | 7 | 39 | 1 | 4WD |
| Toyota | Tarago | 85-90 | T18 A | 3735 | 905 | 4640 | 641 | 185 | 826 | 1 | |
| Toyota | Previa / Estima | 91-99 | T18 C | 1343 | 190 | 1533 | 156 | 42 | 198 | 0 | Small |
| Toyota | Previa / Estima | 00-00 | T18 D | 2 | 2 | 4 | 1 | 0 | 1 | 1 | |
| Toyota | Landcruiser | 82-89 | T20 A | 5373 | 867 | 6240 | 665 | 279 | 944 | 0 | |
| Toyota | Landcruiser | 90-97 | T20 B | 4878 | 682 | 5560 | 586 | 240 | 826 | 0 | |
| Toyota | Landcruiser | 98-00 | T20 C | 578 | 123 | 701 | 119 | 45 | 164 | 1 | |
| Toyota | RAV4 | 94-00 | T21 A | 466 | 72 | 538 | 105 | 19 | 124 | 1 | |
| Toyota | RAV4 | 01-01 | T21 B | 1 | 0 | 1 | . | . | . | 1 | |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| Toyota | Starlet | 96-98 | T22 Z | 1263 | 320 | 1583 | 253 | 73 | 326 | 1 | |
| Lexus | LS400 / Celsior | 91-00 | T25 Z | 42 | 8 | 50 | 8 | 1 | 9 | 1 | Luxury |
| Lexus | IS200 | 99-00 | T26 Z | 23 | 1 | 24 | . | . | . | 0 | Luxury |
| Toyota | Echo | 99-00 | T27 Z | 134 | 25 | 159 | 27 | 5 | 32 | 0 | |
| Lexus | GS300 | 98-00 | T28 Z | 21 | 2 | 23 | 3 | 0 | 3 | 0 | Luxury |
| Toyota | Avalon | 00-00 | T29 Z | 18 | 1 | 19 | 3 | 2 | 5 | 0 | |
| Toyota | Corolla 4WD Wagon | 88-92 | T32 Z | 44 | 15 | 59 | 10 | 3 | 13 | 0 | |
| Toyota | Spacia | 93-00 | T33 Z | 16 | 7 | 23 | 6 | 0 | 6 | 1 | |
| Volvo | 850/S70/V70/C70 | 93-00 | V877Z | 544 | 79 | 623 | 69 | 14 | 83 | 0 | Commercial |
| Volvo | 200 Series | 87-93 | VO02Z | 2392 | 293 | 2685 | 250 | 69 | 319 | 0 | |
| Volvo | 300 Series | 85-90 | VO03Z | 148 | 16 | 164 | 26 | 7 | 33 | 1 | Small |
| Volvo | 700/900 Series | 83-91 | VO07Z | 1334 | 184 | 1518 | 185 | 31 | 216 | 1 | |
| Volvo | 960/S90/V90 | 92-98 | VO10Z | 37 | 10 | 47 | 12 | 1 | 13 | 1 | |
| Volvo | S80 | 99-00 | VO11Z | 4 | 0 | 4 | . | . | . | 1 | |
| Volvo | S40/V40 | 97-00 | VO40Z | 128 | 17 | 145 | 16 | 5 | 21 | 1 | |
| Volkswagon | Caravelle / Transporter | 97-00 | VS01Z | 595 | 75 | 670 | 55 | 11 | 66 | 1 | |
| Volkswagen | Golf | 84-92 | VS02A | 107 | 15 | 122 | 31 | 10 | 41 | 1 | |
| Volkswagen | Golf | 95-98 | VS02B | 398 | 47 | 445 | 37 | 11 | 48 | 1 | Small |
| Volkswagen | Golf / Bora | 99-00 | VS02C | 79 | 5 | 84 | 5 | 3 | 8 | 1 | |
| Volkswagen | Passat | 95-97 | VS04A | 16 | 6 | 22 | 5 | 0 | 5 | 0 | |
| Volkswagen | Passat | 98-00 | VS04B | 37 | 6 | 43 | 8 | 0 | 8 | 0 | |
| Volkswagen | Polo | 95-00 | VS08A | 81 | 25 | 106 | 16 | 6 | 22 | 1 | |
| Volkswagen | New Beetle | 99-00 | VS10Z | 1 | 0 | 1 | 2 | 0 | 2 | 1 | |
| | | | **Total** | **752889** | **144759** | **897648** | **145794** | **40281** | **186075** | **264** | |

**APPENDIX 2**

# LOGISTIC REGRESSION ESTIMATES OF INJURY RISK BY MODEL AND MARKET GROUP

# CRASHWORTHINESS INJURY RISK RATINGS

## NSW Data (1997-2000), Queensland and Western Australia Data (1991-2000)

| Make | Model of Car | Years of Manufacture | Pr(Risk) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| **ALL MODEL AVERAGE** | | | **16.24%** | | | |
| **4-Wheel Drive Vehicles** | | | **14.67%** | **14.37%** | **14.97%** | **0.60%** |
| Daihatsu | Feroza / Rocky | 89-97 | 16.55% | 13.80% | 19.72% | 5.92% |
| Daihatsu | Rocky / Rugger | 85-98 | 20.44% | 17.09% | 24.25% | 7.16% |
| Daihatsu | Terios | 97-00 | 20.67% | 14.43% | 28.70% | 14.27% |
| Holden / Isuzu | Jackaroo / Bighorn | 82-91 | 18.07% | 15.14% | 21.42% | 6.28% |
| Holden / Isuzu | Jackaroo / Bighorn | 92-98 | 15.33% | 11.79% | 19.69% | 7.90% |
| Mitsubishi | Pajero | 84-91 | 16.43% | 14.58% | 18.46% | 3.88% |
| Mitsubishi | Pajero | 92-99 | 11.41% | 9.94% | 13.06% | 3.11% |
| Jeep | Cherokee | 96-00 | 9.61% | 7.27% | 12.61% | 5.34% |
| Land Rover | Discovery / Crossroad | 91-00 | 10.71% | 7.75% | 14.62% | 6.87% |
| Nissan | Patrol | 82-87 | 12.45% | 10.63% | 14.52% | 3.89% |
| Nissan / Ford | Patrol / Maverick | 88-98 | 11.25% | 10.35% | 12.22% | 1.87% |
| Nissan | Patrol | 99-00 | 11.41% | 8.60% | 14.98% | 6.38% |
| Nissan | Pathfinder / Terrano | 88-95 | 14.83% | 10.63% | 20.33% | 9.70% |
| Nissan | Pathfinder / Terrano | 96-00 | 13.19% | 9.18% | 18.60% | 9.42% |
| Lada | Niva | 84-99 | 17.78% | 13.61% | 22.90% | 9.29% |
| Honda | CR-V | 96-00 | 11.01% | 7.59% | 15.70% | 8.10% |
| Land Rover | Range Rover | 82-94 | 10.33% | 8.22% | 12.90% | 4.68% |
| Suzuki | Vitara / Escudo | 88-98 | 20.11% | 17.95% | 22.46% | 4.51% |
| Suzuki | Samurai / SJ410 / SJ413 | 82-99 | 23.60% | 22.17% | 25.10% | 2.93% |
| Toyota | 4Runner/Hilux | 79-83 | 17.59% | 16.45% | 18.80% | 2.35% |
| Toyota | 4Runner/Hilux | 85-89 | 16.34% | 15.09% | 17.67% | 2.58% |
| Toyota | 4Runner/Hilux | 90-97 | 15.25% | 14.52% | 16.01% | 1.49% |
| Toyota | Hilux | 98-00 | 16.68% | 13.97% | 19.79% | 5.82% |
| Toyota | Landcruiser | 82-89 | 14.27% | 13.37% | 15.22% | 1.85% |
| Toyota | Landcruiser | 90-97 | 11.54% | 10.71% | 12.42% | 1.72% |
| Toyota | Landcruiser | 98-00 | 13.40% | 11.21% | 15.95% | 4.74% |
| Toyota | RAV4 | 94-00 | 12.48% | 9.96% | 15.52% | 5.56% |
| **Commercial Vehicles** | | | **16.27%** | **15.94%** | **16.61%** | **0.67%** |
| Daihatsu | Handivan | 82-90 | 31.68% | 28.10% | 35.48% | 7.38% |
| Ford | Falcon Panel Van | 85-95 | 14.89% | 13.62% | 16.27% | 2.65% |
| Ford / Nissan | Falcon Ute / XFN Ute | 85-93 | 14.80% | 13.97% | 15.66% | 1.69% |
| Ford | Falcon Ute | 94-99 | 13.76% | 11.62% | 16.23% | 4.60% |
| Ford | Ford F-Series | 79-92 | 14.34% | 11.79% | 17.32% | 5.53% |
| Ford | Transit | 95-00 | 14.39% | 10.71% | 19.07% | 8.37% |
| Holden | Commodore Ute VG/VP | 90-94 | 15.23% | 13.21% | 17.51% | 4.30% |
| Isuzu | Pickup | 82-85 | 18.47% | 15.51% | 21.84% | 6.34% |
| Isuzu | Pickup | 86-88 | 18.92% | 14.89% | 23.73% | 8.84% |
| Isuzu / Holden | Pickup / Rodeo | 89-95 | 15.19% | 14.07% | 16.38% | 2.30% |
| Holden | Rodeo | 96-98 | 16.40% | 14.29% | 18.76% | 4.47% |
| Holden | Rodeo | 99-00 | 17.90% | 14.27% | 22.21% | 7.94% |
| Holden | WFR Van | 92-98 | 22.01% | 18.32% | 26.19% | 7.87% |
| Holden | WB Series | 80-84 | 15.21% | 13.45% | 17.15% | 3.70% |
| Holden | Commodore Ute VR/VS | 96-00 | 13.96% | 12.74% | 15.29% | 2.55% |
| Nissan | 720 Ute | 82-85 | 17.34% | 15.40% | 19.47% | 4.07% |

| Make | Model of Car | Years of Manufacture | Pr(Risk) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Nissan | Navara | 86-91 | 15.46% | 14.11% | 16.92% | 2.81% |
| Nissan | Navara | 92-98 | 13.11% | 11.01% | 15.54% | 4.53% |
| Honda | Acty | 83-86 | 14.43% | 11.22% | 18.36% | 7.14% |
| Subaru | Brumby | 82-92 | 20.23% | 18.28% | 22.33% | 4.04% |
| Holden / Suzuki | Scurry / Carry | 82-00 | 31.79% | 27.59% | 36.30% | 8.71% |
| Suzuki | Mighty Boy | 85-88 | 32.93% | 28.73% | 37.42% | 8.68% |
| Toyota | Hiace/Liteace | 82-86 | 20.52% | 19.19% | 21.92% | 2.72% |
| Toyota | Hiace/Liteace | 87-92 | 19.23% | 17.39% | 21.22% | 3.83% |
| Toyota | Hiace/Liteace | 93-00 | 16.97% | 15.69% | 18.33% | 2.64% |
| Volkswagon | Caravelle / Transporter | 97-00 | 13.38% | 10.78% | 16.49% | 5.71% |
| **Large Cars** | | | **14.53%** | **14.37%** | **14.69%** | **0.32%** |
| Ford | Falcon XE/XF | 82-88 | 15.21% | 14.83% | 15.60% | 0.76% |
| Ford | Falcon EA / Falcon EB Series I | 88-92 | 14.55% | 14.11% | 15.00% | 0.89% |
| Ford | Falcon EB Series II / Falcon ED | 92-94 | 13.38% | 12.76% | 14.02% | 1.26% |
| Ford | Falcon EF/EL | 94-98 | 13.59% | 13.08% | 14.12% | 1.04% |
| Ford | Falcon AU | 98-00 | 13.54% | 12.24% | 14.95% | 2.71% |
| Holden / Toyota | Commodore VN/VP / Lexcen | 89-92 | 15.09% | 14.67% | 15.52% | 0.85% |
| Holden / Toyota | Commodore VR/VS / Lexcen | 93-97 | 13.80% | 13.32% | 14.29% | 0.97% |
| Holden | Commodore VT/VX | 97-00 | 14.31% | 13.43% | 15.24% | 1.81% |
| Holden | Commodore VB-VL | 82-89 | 16.25% | 15.85% | 16.67% | 0.82% |
| Hyundai | Sonata | 89-98 | 16.63% | 15.03% | 18.36% | 3.33% |
| Mitsubishi | Magna / Sigma / V3000 | 85-90 | 15.84% | 15.26% | 16.44% | 1.17% |
| Mitsubishi | Magna / Verada / Diamante | 96-00 | 15.11% | 14.44% | 15.79% | 1.35% |
| Mitsubishi | Magna / Verada / V3000 / Diamante | 91-96 | 13.58% | 12.87% | 14.33% | 1.46% |
| Nissan | Skyline | 83-88 | 15.51% | 14.40% | 16.70% | 2.30% |
| Holden / Toyota | Apollo JM / JP / Camry / Sceptor | 94-97 | 14.88% | 14.25% | 15.53% | 1.29% |
| Toyota | Camry | 98-00 | 14.03% | 12.70% | 15.47% | 2.77% |
| **Luxury Cars** | | | **13.35%** | **13.03%** | **13.67%** | **0.64%** |
| Audi | A4 | 95-00 | 12.03% | 8.06% | 17.59% | 9.52% |
| BMW | 3 Series | 82-91 | 14.63% | 13.17% | 16.22% | 3.04% |
| BMW | 3 Series | 92-98 | 13.55% | 12.10% | 15.15% | 3.04% |
| BMW | 5 Series | 81-88 | 10.86% | 8.55% | 13.69% | 5.14% |
| BMW | 5 Series | 89-95 | 11.10% | 8.31% | 14.67% | 6.36% |
| Ford | Fairlane Z & LTD F | 79-88 | 16.00% | 14.80% | 17.28% | 2.49% |
| Ford | Fairlane N & LTD D | 88-95 | 11.70% | 10.67% | 12.83% | 2.16% |
| Ford | Fairlane N & LTD D | 96-98 | 11.95% | 9.85% | 14.41% | 4.56% |
| Holden | Statesman/Caprice WB | 81-84 | 12.45% | 8.14% | 18.59% | 10.45% |
| Holden | Stateman/Caprice VQ | 90-93 | 12.84% | 10.57% | 15.52% | 4.95% |
| Holden | Stateman/Caprice VR/VS | 94-99 | 13.27% | 11.48% | 15.28% | 3.80% |
| Jaguar | XJ6 | 79-86 | 13.07% | 9.14% | 18.33% | 9.19% |
| Mazda | 929 / Luce | 82-91 | 17.71% | 16.27% | 19.24% | 2.98% |
| Mercedes Benz | C-Class W201 | 87-93 | 14.50% | 11.16% | 18.63% | 7.47% |
| Mercedes Benz | C-Class W202 | 94-00 | 10.91% | 8.35% | 14.13% | 5.78% |
| Mercedes Benz | E-Class W123 | 82-85 | 11.10% | 7.79% | 15.56% | 7.77% |
| Mercedes Benz | E-Class W124 | 86-94 | 11.63% | 9.30% | 14.44% | 5.14% |
| Mercedes Benz | S-Class W126 | 82-92 | 11.35% | 8.70% | 14.67% | 5.97% |
| Nissan | Maxima | 91-94 | 14.04% | 11.01% | 17.72% | 6.71% |
| Nissan | Maxima / Cefiro | 95-99 | 16.57% | 12.98% | 20.93% | 7.95% |
| Honda | Legend | 91-96 | 10.25% | 7.83% | 13.30% | 5.46% |
| Honda | Accord | 82-86 | 19.20% | 17.34% | 21.19% | 3.85% |

| Make | Model of Car | Years of Manufacture | Pr(Risk) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Honda | Accord | 86-90 | 13.99% | 12.22% | 15.97% | 3.75% |
| Honda | Accord | 90-93 | 12.42% | 10.14% | 15.13% | 4.99% |
| Honda | Accord | 94-97 | 12.52% | 10.69% | 14.62% | 3.92% |
| Saab | 900 Series | 84-92 | 14.21% | 11.72% | 17.12% | 5.41% |
| Saab | 9000 | 86-97 | 12.77% | 10.11% | 16.00% | 5.89% |
| Toyota | Crown / Cressida / Mark II | 81-85 | 16.31% | 14.68% | 18.08% | 3.40% |
| Toyota | Crown / Cressida / Mark II | 85-88 | 12.54% | 10.38% | 15.07% | 4.69% |
| Toyota | Cressida / Mark II | 89-92 | 12.57% | 10.94% | 14.40% | 3.46% |
| Volvo | 850/S70/V70/C70 | 93-00 | 12.31% | 9.94% | 15.16% | 5.22% |
| Volvo | 200 Series | 87-93 | 11.44% | 10.24% | 12.77% | 2.52% |
| Volvo | 700/900 Series | 83-91 | 12.96% | 11.29% | 14.85% | 3.56% |
| **Medium Cars** | | | **16.50%** | **16.27%** | **16.72%** | **0.45%** |
| Daewoo | Espero | 95-97 | 17.08% | 13.37% | 21.56% | 8.19% |
| Daewoo | Nubira | 97-00 | 14.84% | 11.98% | 18.24% | 6.26% |
| Ford | Mondeo | 97-00 | 12.67% | 10.50% | 15.20% | 4.70% |
| Holden | Camira | 82-89 | 20.63% | 19.88% | 21.41% | 1.53% |
| Holden | Vectra | 96-00 | 15.49% | 12.64% | 18.85% | 6.21% |
| Mitsubishi | Sigma / Scorpion / Sapparo / Lambda | 82-84 | 17.70% | 16.96% | 18.45% | 1.49% |
| Mitsubishi | Chariot / Spacewagon | 85-91 | 18.62% | 15.29% | 22.49% | 7.21% |
| Mitsubishi | Chariot | 82-98 | 15.67% | 12.12% | 20.02% | 7.90% |
| Mitsubishi | Galant | 94-97 | 16.17% | 13.86% | 18.79% | 4.94% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 83-87 | 17.01% | 16.13% | 17.92% | 1.79% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 88-92 | 15.35% | 14.03% | 16.77% | 2.74% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella / Cronos | 92-97 | 12.87% | 11.63% | 14.21% | 2.59% |
| Mazda | 626 | 98-00 | 13.38% | 9.32% | 18.83% | 9.50% |
| Nissan | Pintara | 86-88 | 16.25% | 15.09% | 17.49% | 2.40% |
| Nissan | Bluebird | 89-92 | 16.80% | 15.86% | 17.78% | 1.91% |
| Nissan | Bluebird | 83-88 | 17.94% | 17.22% | 18.70% | 1.48% |
| Nissan | Stanza | 82-83 | 18.88% | 15.71% | 22.53% | 6.82% |
| Nissan | Silvia | 84-86 | 17.30% | 13.62% | 21.73% | 8.11% |
| Nissan | Prairie | 82-88 | 19.22% | 15.30% | 23.87% | 8.57% |
| Nissan | Bluebird | 92-97 | 11.43% | 9.03% | 14.35% | 5.32% |
| Peugeot | 405 | 88-96 | 13.60% | 10.27% | 17.79% | 7.52% |
| Peugeot | 505 | 82-91 | 10.78% | 8.42% | 13.69% | 5.26% |
| Subaru | Leone / Omega / 4WD Wagon | 88-93 | 18.30% | 17.25% | 19.40% | 2.15% |
| Subaru | Legacy | 89-93 | 14.82% | 13.50% | 16.24% | 2.73% |
| Subaru | Legacy | 94-98 | 14.30% | 12.18% | 16.71% | 4.53% |
| Toyota | Corona | 82-88 | 17.71% | 17.08% | 18.37% | 1.30% |
| Toyota | Camry | 81-86 | 16.22% | 15.03% | 17.49% | 2.45% |
| Holden / Toyota | Apollo JK/JL / Camry / Vista | 90-93 | 15.80% | 15.26% | 16.36% | 1.10% |
| **Passenger Vans** | | | **19.08%** | **18.47%** | **19.71%** | **1.24%** |
| Mitsubishi | Starwagon / L300 | 83-86 | 23.20% | 21.63% | 24.86% | 3.23% |
| Mitsubishi | Starwagon / Delica Starwagon | 87-93 | 20.91% | 19.49% | 22.40% | 2.91% |
| Mitsubishi | Starwagon / Delica Spacegear | 93-00 | 14.71% | 12.50% | 17.25% | 4.75% |
| Toyota | Tarago | 85-90 | 20.17% | 18.97% | 21.43% | 2.46% |
| Toyota | Previa / Estima | 91-99 | 12.22% | 10.65% | 13.99% | 3.34% |
| **Small Cars** | | | **18.84%** | **18.64%** | **19.04%** | **0.40%** |

| Make | Model of Car | Years of Manufacture | Pr(Risk) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Alfa Romeo | 33 | 83-95 | 17.66% | 14.40% | 21.46% | 7.06% |
| Daihatsu | Charade | 82-87 | 24.83% | 22.88% | 26.88% | 3.99% |
| Daihatsu | Charade | 88-93 | 20.88% | 19.77% | 22.04% | 2.27% |
| Daihatsu | Charade | 93-00 | 19.81% | 18.53% | 21.17% | 2.64% |
| Daihatsu | Applause | 89-98 | 18.17% | 16.51% | 19.96% | 3.45% |
| Daihatsu | Mira | 90-98 | 30.94% | 27.17% | 34.98% | 7.81% |
| Daihatsu | Sirion | 00-00 | 21.61% | 16.69% | 27.51% | 10.82% |
| Daewoo | 1.5i | 94-95 | 20.78% | 16.50% | 25.82% | 9.32% |
| Daewoo | Cielo | 95-97 | 18.88% | 16.91% | 21.02% | 4.11% |
| Daewoo | Lanos | 97-00 | 16.06% | 13.79% | 18.62% | 4.82% |
| Fiat | Regata | 84-88 | 13.55% | 9.38% | 19.19% | 9.81% |
| Ford | Laser | 90-94 | 17.26% | 16.44% | 18.12% | 1.68% |
| Ford | Laser | 95-97 | 16.80% | 15.03% | 18.72% | 3.69% |
| Ford | Festiva WD/WD/WH/WF | 94-00 | 21.10% | 19.78% | 22.49% | 2.70% |
| Holden | Gemini | 82-84 | 20.09% | 19.08% | 21.14% | 2.06% |
| Holden | Gemini RB | 86-89 | 24.04% | 21.16% | 27.17% | 6.01% |
| Holden | Astra TR | 95-98 | 15.05% | 12.08% | 18.59% | 6.52% |
| Holden | Barina SB | 95-00 | 19.54% | 18.05% | 21.12% | 3.06% |
| Hyundai | Excel | 86-90 | 21.59% | 20.04% | 23.23% | 3.19% |
| Hyundai | Excel | 90-95 | 20.11% | 19.17% | 21.08% | 1.91% |
| Hyundai | Excel | 95-00 | 20.37% | 19.56% | 21.20% | 1.64% |
| Hyundai | S Coupe | 90-96 | 21.22% | 18.44% | 24.30% | 5.85% |
| Hyundai | Lantra | 91-93 | 18.50% | 16.48% | 20.71% | 4.23% |
| Hyundai | Lantra | 94-00 | 15.73% | 13.93% | 17.71% | 3.78% |
| Mitsubishi | Mirage / Colt | 82-88 / 87-88 | 21.20% | 20.43% | 22.00% | 1.57% |
| Mitsubishi | Lancer / Mirage CA | 89-90 | 17.92% | 16.81% | 19.09% | 2.28% |
| Mitsubishi | Lancer / Mirage CC | 93-95 | 16.17% | 14.94% | 17.49% | 2.55% |
| Mitsubishi | Lancer / Mirage CE | 96-00 | 16.88% | 15.70% | 18.13% | 2.43% |
| Mitsubishi | Cordia | 83-87 | 19.94% | 17.95% | 22.09% | 4.15% |
| Ford / Mazda | Laser / 323 / Familia | 82-89 | 20.64% | 20.15% | 21.14% | 0.99% |
| Mazda | 323 / Familia / Lantis | 90-93 | 16.99% | 15.51% | 18.58% | 3.07% |
| Mazda | 323 / Familia / Lantis | 95-98 | 16.66% | 14.99% | 18.47% | 3.48% |
| Ford / Mazda | Laser / 323 | 99-00 | 17.50% | 13.86% | 21.87% | 8.01% |
| Ford / Mazda | Festiva WA / 121 | 90-94 / 87-91 | 21.20% | 20.15% | 22.30% | 2.15% |
| Mazda | 121 / Autozam Review | 91-97 | 19.36% | 17.54% | 21.33% | 3.78% |
| Mazda | Demio | 98-00 | 18.26% | 15.41% | 21.49% | 6.08% |
| Nissan | Pulsar / Langley | 83-86 | 20.76% | 19.91% | 21.65% | 1.74% |
| Nissan | Pulsar / Sentra | 87-91 | 18.36% | 17.55% | 19.20% | 1.65% |
| Nissan | Pulsar / Sentra | 91-95 | 16.01% | 14.81% | 17.28% | 2.48% |
| Nissan | Pulsar / Sentra | 96-00 | 16.79% | 15.32% | 18.36% | 3.04% |
| Nissan | Micra | 93-95 | 18.75% | 15.34% | 22.71% | 7.37% |
| Honda | Civic | 82-84 | 19.58% | 16.71% | 22.81% | 6.09% |
| Honda | Civic / Ballade / Shuttle | 86-88 | 19.25% | 17.60% | 21.01% | 3.41% |
| Honda | Civic / Shuttle | 89-92 | 16.25% | 14.90% | 17.70% | 2.80% |
| Honda | Civic | 92-95 | 15.70% | 14.32% | 17.19% | 2.88% |
| Honda | Civic | 96-00 | 16.40% | 14.57% | 18.42% | 3.85% |
| Honda | Concerto | 89-93 | 14.82% | 11.48% | 18.94% | 7.46% |
| Honda | City | 84-89 | 28.03% | 23.42% | 33.16% | 9.75% |
| Peugeot | 306 | 93-00 | 14.33% | 11.25% | 18.09% | 6.85% |
| Rover | Quintet | 82-86 | 19.00% | 14.28% | 24.84% | 10.57% |
| Subaru | 700 / Rex | 89-92 | 34.61% | 31.04% | 38.35% | 7.32% |
| Subaru | Impreza | 93-00 | 15.44% | 13.29% | 17.88% | 4.59% |
| Holden / Suzuki | Barina / Swift / Cultus | 86-88 | 25.52% | 24.07% | 27.02% | 2.96% |
| Holden / Suzuki | Barina / Swift / Cultus | 89-93 / 89-00 | 20.69% | 19.85% | 21.54% | 1.69% |
| Suzuki | Alto | 82-84 | 33.22% | 30.19% | 36.39% | 6.19% |

| Make | Model of Car | Years of Manufacture | Pr(Risk) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Suzuki | Baleno / Cultus Cresent | 95-99 | 19.56% | 16.23% | 23.38% | 7.15% |
| Toyota | Corolla | 82-84 | 19.66% | 18.81% | 20.55% | 1.73% |
| Toyota | Corolla | 86-88 | 18.76% | 18.05% | 19.49% | 1.45% |
| Toyota / Holden | Corolla / Nova | 88-92 | 17.13% | 16.50% | 17.77% | 1.27% |
| Toyota / Holden | Corolla / Nova | 93-97 | 15.94% | 15.12% | 16.79% | 1.67% |
| Toyota | Corolla | 98-00 | 12.81% | 9.83% | 16.53% | 6.70% |
| Toyota | Tercel | 85-88 | 17.12% | 13.79% | 21.04% | 7.25% |
| Toyota | Starlet | 96-98 | 17.94% | 16.14% | 19.89% | 3.75% |
| Volkswagen | Golf | 95-98 | 10.97% | 8.31% | 14.34% | 6.03% |
| **Sports Cars** | | | **16.48%** | **15.96%** | **17.01%** | **1.05%** |
| Ford | Capri | 90-94 | 20.91% | 18.43% | 23.61% | 5.18% |
| Hyundai | Coupe | 96-00 | 16.36% | 12.48% | 21.14% | 8.66% |
| Mazda | RX7 | 81-86 | 16.51% | 13.34% | 20.25% | 6.91% |
| Mazda | RX7 | 86-91 | 11.61% | 7.83% | 16.89% | 9.06% |
| Mazda | MX5 / Eunos Roadster | 89-97 | 16.11% | 12.64% | 20.32% | 7.69% |
| Nissan | 300ZX / Fairlady Z | 90-95 | 13.74% | 10.28% | 18.13% | 7.85% |
| Nissan | Exa | 83-86 | 25.37% | 21.32% | 29.89% | 8.57% |
| Nissan | Exa | 86-91 | 14.97% | 10.60% | 20.72% | 10.12% |
| Nissan | NX/NX-R | 93-95 | 22.60% | 18.65% | 27.10% | 8.44% |
| Nissan | 200SX / Silvia | 94-99 | 14.29% | 10.34% | 19.42% | 9.08% |
| Honda | CRX | 87-91 | 20.64% | 15.92% | 26.32% | 10.40% |
| Honda | Prelude | 83-91 | 16.23% | 14.71% | 17.88% | 3.17% |
| Honda | Prelude | 92-96 | 13.79% | 11.35% | 16.66% | 5.31% |
| Honda | Integra | 86-88 | 15.95% | 12.82% | 19.68% | 6.85% |
| Honda | Integra | 91-93 | 14.59% | 11.26% | 18.71% | 7.45% |
| Honda | Integra | 93-00 | 10.49% | 7.58% | 14.34% | 6.77% |
| Renault | Feugo | 81-86 | 15.43% | 11.55% | 20.31% | 8.77% |
| Toyota | Celica | 81-85 | 17.33% | 15.73% | 19.05% | 3.33% |
| Toyota | Celica | 86-89 | 16.91% | 15.06% | 18.94% | 3.88% |
| Toyota | Celica | 90-93 | 14.84% | 12.91% | 17.00% | 4.09% |
| Toyota | Celica | 94-00 | 17.71% | 14.50% | 21.46% | 6.97% |
| Toyota | Supra | 86-92 | 18.76% | 14.86% | 23.41% | 8.56% |
| Toyota | MR2 | 85-89 | 26.00% | 19.35% | 33.98% | 14.64% |
| Toyota | Paseo / Cynos | 91-97 | 18.67% | 16.04% | 21.61% | 5.57% |

**APPENDIX 3**

# LOGISTIC REGRESSION ESTIMATES OF INJURY SEVERITY BY MODEL AND MARKET GROUP

# CRASHWORTHINESS INJURY SEVERITY RATINGS

## Victoria and NSW Data (1997-2000), New Zealanda, Queensland and Western Australia Data (1991-2000)

| Make | Model of Car | Years of Manufacture | Pr(Severity) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| **ALL MODEL AVERAGE** | | | **21.86** | | | |
| **4-Wheel Drive Vehicles** | | | **21.63%** | **20.86%** | **22.42%** | **1.56** |
| Daihatsu | Feroza / Rocky | 89-97 | 23.56% | 16.81% | 31.97% | 15.17% |
| Daihatsu | Rocky / Rugger | 85-98 | 28.89% | 21.63% | 37.42% | 15.79% |
| Daihatsu | Terios | 97-00 | 22.79% | 12.25% | 38.43% | 26.18% |
| Holden / Isuzu | Jackaroo / Bighorn | 82-91 | 14.59% | 10.17% | 20.49% | 10.32% |
| Holden / Isuzu | Jackaroo / Bighorn | 92-98 | 19.12% | 11.90% | 29.27% | 17.37% |
| Mitsubishi | Pajero | 84-91 | 25.46% | 21.05% | 30.43% | 9.38% |
| Mitsubishi | Pajero | 92-99 | 22.39% | 17.60% | 28.05% | 10.45% |
| Jeep | Cherokee | 96-00 | 20.47% | 12.66% | 31.36% | 18.70% |
| Land Rover | Discovery / Crossroad | 91-00 | 15.68% | 9.04% | 25.83% | 16.79% |
| Nissan | Patrol | 82-87 | 21.60% | 16.23% | 28.16% | 11.93% |
| Nissan / Ford | Patrol / Maverick | 88-98 | 20.57% | 17.62% | 23.86% | 6.24% |
| Nissan | Patrol | 99-00 | 23.13% | 14.39% | 35.01% | 20.62% |
| Nissan | Pathfinder / Terrano | 88-95 | 22.36% | 15.90% | 30.49% | 14.60% |
| Nissan | Pathfinder / Terrano | 96-00 | 31.02% | 18.29% | 47.46% | 29.16% |
| Lada | Niva | 84-99 | 24.00% | 14.95% | 36.19% | 21.24% |
| Honda | CR-V | 96-00 | 22.11% | 13.23% | 34.56% | 21.32% |
| Land Rover | Range Rover | 82-94 | 19.63% | 14.10% | 26.65% | 12.56% |
| Suzuki | Vitara / Escudo | 88-98 | 22.66% | 18.32% | 27.68% | 9.36% |
| Suzuki | Samurai / SJ410 / SJ413 | 82-99 | 20.82% | 18.12% | 23.81% | 5.69% |
| Toyota | 4Runner/Hilux | 79-83 | 23.93% | 21.21% | 26.89% | 5.69% |
| Toyota | 4Runner/Hilux | 85-89 | 21.32% | 18.61% | 24.31% | 5.70% |
| Toyota | 4Runner/Hilux** | 90-97 | 23.26% | 21.44% | 25.19% | 3.75% |
| Toyota | Hilux | 98-00 | 22.13% | 15.71% | 30.23% | 14.53% |
| Toyota | Landcruiser | 82-89 | 25.29% | 22.56% | 28.22% | 5.66% |
| Toyota | Landcruiser | 90-97 | 24.04% | 21.22% | 27.11% | 5.89% |
| Toyota | Landcruiser | 98-00 | 21.94% | 16.43% | 28.66% | 12.22% |
| Toyota | RAV4 | 94-00 | 18.36% | 11.93% | 27.18% | 15.25% |
| **Commercial Vehicles** | | | | **21.54%** | **23.27%** | **1.73** |
| Daihatsu | Handivan | 82-90 | 22.25% | 16.76% | 28.91% | 12.14% |
| Ford | Falcon Panel Van | 85-95 | 20.16% | 16.53% | 24.35% | 7.82% |
| Ford / Nissan | Falcon Ute / XFN Ute | 85-93 | 22.69% | 20.23% | 25.35% | 5.13% |
| Ford | Falcon Ute | 94-99 | 18.97% | 13.41% | 26.13% | 12.72% |
| Ford | Ford F-Series | 79-92 | 18.41% | 11.83% | 27.50% | 15.67% |
| Ford | Transit | 95-00 | 19.08% | 11.47% | 30.03% | 18.56% |
| Holden | Commodore Ute VG/VP | 90-94 | 24.26% | 18.60% | 30.98% | 12.38% |
| Isuzu | Pickup | 82-85 | 22.98% | 16.36% | 31.27% | 14.90% |
| Isuzu | Pickup | 86-88 | 13.89% | 6.94% | 25.84% | 18.90% |
| Isuzu / Holden | Pickup / Rodeo | 89-95 | 26.41% | 22.97% | 30.17% | 7.21% |
| Holden | Rodeo | 96-98 | 17.46% | 12.69% | 23.53% | 10.84% |
| Holden | Rodeo | 99-00 | 12.95% | 6.71% | 23.52% | 16.80% |
| Holden | WFR Van | 92-98 | 26.68% | 18.56% | 36.75% | 18.19% |

| Make | Model of Car | Years of Manufacture | Pr(Severity) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Holden | WB Series | 80-84 | 32.27% | 26.36% | 38.80% | 12.45% |
| Holden | Commodore Ute VR/VS | 96-00 | 25.35% | 21.56% | 29.56% | 8.00% |
| Nissan | 720 Ute | 82-85 | 20.78% | 16.28% | 26.14% | 9.86% |
| Nissan | Navara | 86-91 | 24.50% | 20.95% | 28.44% | 7.49% |
| Nissan | Navara | 92-98 | 20.77% | 15.33% | 27.51% | 12.18% |
| Honda | Acty | 83-86 | 22.73% | 13.99% | 34.73% | 20.74% |
| Subaru | Brumby | 82-92 | 29.87% | 25.39% | 34.78% | 9.38% |
| Holden / Suzuki | Scurry / Carry | 82-00 | 28.13% | 21.12% | 36.40% | 15.27% |
| Suzuki | Mighty Boy | 85-88 | 25.57% | 18.81% | 33.75% | 14.93% |
| Toyota | Hiace/Liteace | 82-86 | 24.50% | 21.74% | 27.48% | 5.75% |
| Toyota | Hiace/Liteace | 87-92 | 22.22% | 18.64% | 26.27% | 7.63% |
| Toyota | Hiace/Liteace | 93-00 | 23.43% | 20.30% | 26.87% | 6.57% |
| Volkswagon | Caravelle / Transporter | 97-00 | 15.15% | 8.40% | 25.78% | 17.38% |
| **Large Cars** | | | | **20.54%** | **21.41%** | **0.86%** |
| Ford | Falcon XE/XF | 82-88 | 23.23% | 22.19% | 24.30% | 2.11% |
| Ford | Falcon EA / Falcon EB Series I | 88-92 | 20.73% | 19.52% | 21.98% | 2.46% |
| Ford | Falcon EB Series II / Falcon ED | 92-94 | 21.78% | 19.93% | 23.74% | 3.81% |
| Ford | Falcon EF/EL | 94-98 | 20.34% | 18.89% | 21.88% | 2.99% |
| Ford | Falcon AU | 98-00 | 15.40% | 12.12% | 19.36% | 7.23% |
| Holden / Toyota | Commodore VN/VP / Lexcen | 89-92 | 23.04% | 21.88% | 24.24% | 2.36% |
| Holden / Toyota | Commodore VR/VS / Lexcen | 93-97 | 20.04% | 18.71% | 21.44% | 2.73% |
| Holden | Commodore VT/VX | 97-00 | 18.46% | 16.08% | 21.11% | 5.03% |
| Holden | Commodore VB-VL | 82-89 | 23.83% | 22.72% | 24.98% | 2.26% |
| Hyundai | Sonata | 89-98 | 20.16% | 16.17% | 24.84% | 8.67% |
| Mitsubishi | Magna / Sigma / V3000 | 85-90 | 22.48% | 21.04% | 23.99% | 2.95% |
| Mitsubishi | Magna / Verada / Diamante | 96-00 | 20.75% | 18.66% | 23.01% | 4.35% |
| Mitsubishi | Magna / Verada / V3000 / Diamante | 91-96 | 19.74% | 17.93% | 21.69% | 3.76% |
| Nissan | Skyline | 83-88 | 23.53% | 20.80% | 26.50% | 5.70% |
| Holden / Toyota | Apollo JM / JP / Camry / Sceptor | 94-97 | 21.22% | 19.40% | 23.16% | 3.76% |
| Toyota | Camry | 98-00 | 24.38% | 19.78% | 29.67% | 9.89% |
| **Luxury Cars** | | | | **19.73%** | **21.55%** | **1.82%** |
| Audi | A4 | 95-00 | 24.52% | 13.45% | 40.44% | 27.00% |
| BMW | 3 Series | 82-91 | 20.38% | 16.65% | 24.69% | 8.05% |
| BMW | 3 Series | 92-98 | 19.29% | 14.99% | 24.46% | 9.47% |
| BMW | 5 Series | 81-88 | 21.11% | 13.73% | 31.01% | 17.28% |
| BMW | 5 Series | 89-95 | 21.59% | 13.05% | 33.57% | 20.52% |
| Ford | Fairlane Z & LTD F | 79-88 | 22.64% | 19.79% | 25.77% | 5.98% |
| Ford | Fairlane N & LTD D | 88-95 | 22.18% | 18.88% | 25.87% | 6.99% |
| Ford | Fairlane N & LTD D | 96-98 | 23.28% | 16.89% | 31.19% | 14.30% |
| Holden | Statesman/Caprice WB | 81-84 | 43.74% | 29.43% | 59.18% | 29.74% |
| Holden | Stateman/Caprice VQ | 90-93 | 26.44% | 19.47% | 34.83% | 15.36% |
| Holden | Stateman/Caprice VR/VS | 94-99 | 27.01% | 21.25% | 33.66% | 12.40% |
| Jaguar | XJ6 | 79-86 | 33.78% | 19.93% | 51.12% | 31.20% |
| Mazda | 929 / Luce | 82-91 | 23.70% | 20.44% | 27.31% | 6.87% |
| Mercedes Benz | C-Class W201 | 87-93 | 26.48% | 17.77% | 37.51% | 19.73% |
| Mercedes Benz | C-Class W202 | 94-00 | 21.43% | 12.35% | 34.55% | 22.20% |
| Mercedes Benz | E-Class W123 | 82-85 | 21.89% | 10.95% | 38.98% | 28.03% |
| Mercedes Benz | E-Class W124 | 86-94 | 19.63% | 12.68% | 29.12% | 16.44% |
| Mercedes Benz | S-Class W126 | 82-92 | 25.13% | 15.58% | 37.91% | 22.33% |
| Nissan | Maxima | 91-94 | 21.63% | 15.71% | 29.01% | 13.30% |

| Make | Model of Car | Years of Manufacture | Pr(Severity) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Nissan | Maxima / Cefiro | 95-99 | 19.95% | 12.73% | 29.86% | 17.12% |
| Honda | Legend | 91-96 | 18.94% | 11.21% | 30.20% | 18.99% |
| Honda | Accord | 82-86 | 20.95% | 16.64% | 26.01% | 9.37% |
| Honda | Accord | 86-90 | 18.33% | 13.44% | 24.50% | 11.06% |
| Honda | Accord | 90-93 | 19.47% | 12.11% | 29.78% | 17.66% |
| Honda | Accord | 94-97 | 27.43% | 20.59% | 35.51% | 14.92% |
| Saab | 900 Series | 84-92 | 21.01% | 14.80% | 28.95% | 14.14% |
| Saab | 9000 | 86-97 | 11.91% | 6.27% | 21.46% | 15.19% |
| Toyota | Crown / Cressida / Mark II | 81-85 | 22.74% | 18.99% | 26.98% | 7.99% |
| Toyota | Crown / Cressida / Mark II | 85-88 | 26.16% | 18.32% | 35.89% | 17.58% |
| Toyota | Cressida / Mark II | 89-92 | 19.26% | 14.55% | 25.04% | 10.48% |
| Volvo | 850/S70/V70/C70 | 93-00 | 17.23% | 10.37% | 27.24% | 16.87% |
| Volvo | 200 Series | 87-93 | 22.12% | 17.71% | 27.26% | 9.55% |
| Volvo | 700/900 Series | 83-91 | 15.32% | 10.93% | 21.07% | 10.15% |
| **Medium Cars** | | | | **20.97%** | **22.04%** | **1.07%** |
| Daewoo | Espero | 95-97 | 29.40% | 18.72% | 42.97% | 24.25% |
| Daewoo | Nubira | 97-00 | 26.40% | 17.45% | 37.85% | 20.40% |
| Ford | Mondeo | 97-00 | 16.99% | 11.61% | 24.19% | 12.58% |
| Holden | Camira | 82-89 | 22.10% | 20.57% | 23.71% | 3.14% |
| Holden | Vectra | 96-00 | 16.08% | 10.41% | 24.01% | 13.60% |
| Mitsubishi | Sigma / Scorpion / Sapparo / Lambda | 82-84 | 22.57% | 20.94% | 24.28% | 3.34% |
| Mitsubishi | Chariot / Spacewagon | 85-91 | 20.09% | 14.82% | 26.64% | 11.82% |
| Mitsubishi | Chariot | 82-98 | 15.38% | 7.83% | 27.99% | 20.16% |
| Mitsubishi | Galant | 94-97 | 23.63% | 18.57% | 29.57% | 11.00% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 83-87 | 21.35% | 19.59% | 23.22% | 3.63% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 88-92 | 20.23% | 17.75% | 22.97% | 5.21% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella / Cronos | 92-97 | 24.58% | 21.30% | 28.18% | 6.88% |
| Mazda | 626 | 98-00 | 23.48% | 12.68% | 39.34% | 26.66% |
| Nissan | Pintara | 86-88 | 22.73% | 19.68% | 26.09% | 6.41% |
| Nissan | Bluebird | 89-92 | 24.37% | 21.94% | 26.98% | 5.04% |
| Nissan | Bluebird | 83-88 | 24.66% | 22.92% | 26.48% | 3.56% |
| Nissan | Stanza | 82-83 | 20.22% | 13.45% | 29.25% | 15.81% |
| Nissan | Silvia | 84-86 | 27.83% | 23.57% | 32.54% | 8.98% |
| Nissan | Prairie | 82-88 | 23.66% | 15.79% | 33.88% | 18.09% |
| Nissan | Bluebird | 92-97 | 22.99% | 18.00% | 28.88% | 10.88% |
| Peugeot | 405 | 88-96 | 22.38% | 15.15% | 31.77% | 16.61% |
| Peugeot | 505 | 82-91 | 23.39% | 16.37% | 32.26% | 15.88% |
| Subaru | Leone / Omega / 4WD Wagon | 88-93 | 23.39% | 21.12% | 25.82% | 4.71% |
| Subaru | Legacy | 89-93 | 20.94% | 18.07% | 24.12% | 6.05% |
| Subaru | Legacy | 94-98 | 25.35% | 18.96% | 33.01% | 14.05% |
| Toyota | Corona | 82-88 | 22.00% | 20.40% | 23.69% | 3.30% |
| Toyota | Camry | 81-86 | 23.71% | 20.38% | 27.40% | 7.02% |
| Holden / Toyota | Apollo JK/JL / Camry / Vista | 90-93 | 22.86% | 21.37% | 24.42% | 3.05% |
| **Passenger Vans** | | | | 21.52% | 24.54% | 3.02% |
| Mitsubishi | Starwagon / L300 | 83-86 | 28.12% | 24.67% | 31.86% | 7.19% |
| Mitsubishi | Starwagon / Delica Starwagon | 87-93 | 22.32% | 19.37% | 25.57% | 6.20% |
| Mitsubishi | Starwagon / Delica Spacegear | 93-00 | 19.62% | 13.37% | 27.86% | 14.49% |
| Toyota | Tarago | 85-90 | 23.96% | 20.96% | 27.25% | 6.29% |
| Toyota | Previa / Estima | 91-99 | 22.54% | 16.95% | 29.33% | 12.39% |

| Make | Model of Car | Years of Manufacture | Pr(Severity) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| **Small Cars** | | | | **21.77%** | **22.66%** | **0.89%** |
| Alfa Romeo | 33 | 83-95 | 23.84% | 16.51% | 33.12% | 16.61% |
| Daihatsu | Charade | 82-87 | 27.62% | 23.79% | 31.81% | 8.01% |
| Daihatsu | Charade | 88-93 | 26.54% | 23.78% | 29.49% | 5.71% |
| Daihatsu | Charade | 93-00 | 27.66% | 24.10% | 31.52% | 7.42% |
| Daihatsu | Applause | 89-98 | 21.15% | 17.06% | 25.93% | 8.87% |
| Daihatsu | Mira | 90-98 | 26.82% | 20.43% | 34.33% | 13.90% |
| Daihatsu | Sirion | 00-00 | 17.72% | 8.83% | 32.40% | 23.58% |
| Daewoo | 1.5i | 94-95 | 21.33% | 10.67% | 38.09% | 27.43% |
| Daewoo | Cielo | 95-97 | 18.16% | 14.30% | 22.77% | 8.46% |
| Daewoo | Lanos | 97-00 | 24.65% | 18.35% | 32.25% | 13.90% |
| Fiat | Regata | 84-88 | 30.98% | 15.67% | 52.01% | 36.34% |
| Ford | Laser | 90-94 | 21.91% | 20.01% | 23.93% | 3.92% |
| Ford | Laser | 95-97 | 25.37% | 20.94% | 30.39% | 9.45% |
| Ford | Festiva WD/WD/WH/WF | 94-00 | 25.31% | 22.50% | 28.34% | 5.84% |
| Holden | Gemini | 82-84 | 22.53% | 20.32% | 24.90% | 4.58% |
| Holden | Gemini RB | 86-89 | 20.95% | 15.51% | 27.67% | 12.16% |
| Holden | Astra TR | 95-98 | 14.08% | 8.10% | 23.36% | 15.26% |
| Holden | Barina SB | 95-00 | 23.32% | 19.75% | 27.31% | 7.56% |
| Hyundai | Excel | 86-90 | 25.09% | 21.98% | 28.48% | 6.50% |
| Hyundai | Excel | 90-95 | 23.40% | 21.20% | 25.76% | 4.55% |
| Hyundai | Excel | 95-00 | 21.49% | 19.64% | 23.45% | 3.82% |
| Hyundai | S Coupe | 90-96 | 22.66% | 16.84% | 29.77% | 12.93% |
| Hyundai | Lantra | 91-93 | 22.02% | 17.28% | 27.63% | 10.35% |
| Hyundai | Lantra | 94-00 | 21.79% | 16.72% | 27.87% | 11.15% |
| Mitsubishi | Mirage / Colt | 82-88 / 87-88 | 23.85% | 22.13% | 25.66% | 3.52% |
| Mitsubishi | Lancer / Mirage CA | 89-90 | 22.11% | 19.62% | 24.82% | 5.20% |
| Mitsubishi | Lancer / Mirage CC | 93-95 | 22.70% | 19.72% | 25.98% | 6.26% |
| Mitsubishi | Lancer / Mirage CE | 96-00 | 23.04% | 19.80% | 26.64% | 6.84% |
| Mitsubishi | Cordia | 83-87 | 25.77% | 22.10% | 29.82% | 7.72% |
| Ford / Mazda | Laser / 323 / Familia | 82-89 | 23.05% | 22.04% | 24.09% | 2.05% |
| Mazda | 323 / Familia / Lantis | 90-93 | 21.85% | 19.12% | 24.85% | 5.73% |
| Mazda | 323 / Familia / Lantis | 95-98 | 24.73% | 20.12% | 29.99% | 9.87% |
| Ford / Mazda | Laser / 323 | 99-00 | 18.09% | 8.85% | 33.43% | 24.58% |
| Ford / Mazda | Festiva WA / 121 | 90-94 / 87-91 | 25.82% | 23.30% | 28.52% | 5.22% |
| Mazda | 121 / Autozam Review | 91-97 | 19.21% | 15.21% | 23.97% | 8.76% |
| Mazda | Demio | 98-00 | 23.23% | 16.39% | 31.85% | 15.46% |
| Nissan | Pulsar / Langley | 83-86 | 24.53% | 22.73% | 26.42% | 3.69% |
| Nissan | Pulsar / Sentra | 87-91 | 23.49% | 21.58% | 25.53% | 3.95% |
| Nissan | Pulsar / Sentra | 91-95 | 21.48% | 18.73% | 24.51% | 5.77% |
| Nissan | Pulsar / Sentra | 96-00 | 26.55% | 22.31% | 31.26% | 8.95% |
| Nissan | Micra | 93-95 | 30.07% | 21.15% | 40.79% | 19.64% |
| Honda | Civic | 82-84 | 23.57% | 16.81% | 32.00% | 15.19% |
| Honda | Civic / Ballade / Shuttle | 86-88 | 29.41% | 25.03% | 34.21% | 9.18% |
| Honda | Civic / Shuttle | 89-92 | 28.42% | 24.45% | 32.74% | 8.29% |
| Honda | Civic | 92-95 | 22.00% | 18.07% | 26.52% | 8.45% |
| Honda | Civic | 96-00 | 21.39% | 16.00% | 27.99% | 11.99% |
| Honda | Concerto | 89-93 | 21.98% | 14.03% | 32.72% | 18.69% |
| Honda | City | 84-89 | 24.67% | 16.69% | 34.87% | 18.18% |
| Peugeot | 306 | 93-00 | 10.97% | 5.90% | 19.51% | 13.61% |
| Rover | Quintet | 82-86 | 24.67% | 15.69% | 36.58% | 20.89% |
| Subaru | 700 / Rex | 89-92 | 24.51% | 19.48% | 30.35% | 10.87% |
| Subaru | Impreza | 93-00 | 27.63% | 21.57% | 34.63% | 13.06% |

| Make | Model of Car | Years of Manufacture | Pr(Severity) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Holden / Suzuki | Barina / Swift / Cultus | 86-88 | 25.88% | 23.19% | 28.77% | 5.58% |
| Holden / Suzuki | Barina / Swift / Cultus | 89-93 / 89-00 | 23.21% | 21.27% | 25.26% | 3.99% |
| Suzuki | Alto | 82-84 | 24.92% | 20.18% | 30.34% | 10.16% |
| Suzuki | Baleno / Cultus Cresent | 95-99 | 17.37% | 10.47% | 27.41% | 16.93% |
| Toyota | Corolla | 82-84 | 22.45% | 20.74% | 24.27% | 3.53% |
| Toyota | Corolla | 86-88 | 22.89% | 21.29% | 24.58% | 3.29% |
| Toyota / Holden | Corolla / Nova | 88-92 | 22.70% | 21.23% | 24.24% | 3.01% |
| Toyota / Holden | Corolla / Nova | 93-97 | 22.17% | 20.12% | 24.37% | 4.25% |
| Toyota | Corolla | 98-00 | 12.86% | 7.37% | 21.47% | 14.10% |
| Toyota | Tercel | 85-88 | 25.58% | 17.29% | 36.11% | 18.82% |
| Toyota | Starlet | 96-98 | 25.64% | 20.79% | 31.17% | 10.38% |
| Volkswagen | Golf | 95-98 | 23.18% | 13.06% | 37.72% | 24.66% |
| **Sports Cars** | | | | **21.04%** | **23.54%** | **2.50%** |
| Ford | Capri | 90-94 | 21.39% | 16.39% | 27.41% | 11.02% |
| Hyundai | Coupe | 96-00 | 34.59% | 22.16% | 49.56% | 27.40% |
| Mazda | RX7 | 81-86 | 23.85% | 16.72% | 32.82% | 16.10% |
| Mazda | RX7 | 86-91 | 21.99% | 13.84% | 33.09% | 19.26% |
| Mazda | MX5 / Eunos Roadster | 89-97 | 20.88% | 12.71% | 32.34% | 19.62% |
| Nissan | 300ZX / Fairlady Z | 90-95 | 24.47% | 15.42% | 36.55% | 21.13% |
| Nissan | Exa | 83-86 | 23.98% | 16.83% | 32.96% | 16.13% |
| Nissan | Exa | 86-91 | 25.91% | 14.88% | 41.17% | 26.29% |
| Nissan | NX/NX-R | 93-95 | 33.43% | 24.34% | 43.95% | 19.61% |
| Nissan | 200SX / Silvia | 94-99 | 29.21% | 14.91% | 49.28% | 34.37% |
| Honda | CRX | 87-91 | 27.38% | 22.07% | 33.42% | 11.36% |
| Honda | Prelude | 83-91 | 23.35% | 19.20% | 28.07% | 8.87% |
| Honda | Prelude | 92-96 | 31.26% | 23.16% | 40.68% | 17.52% |
| Honda | Integra | 86-88 | 23.61% | 14.90% | 35.29% | 20.38% |
| Honda | Integra | 91-93 | 18.82% | 11.14% | 30.01% | 18.87% |
| Honda | Integra | 93-00 | 17.55% | 8.93% | 31.61% | 22.68% |
| Renault | Feugo | 81-86 | 19.32% | 11.43% | 30.75% | 19.32% |
| Toyota | Celica | 81-85 | 18.94% | 15.61% | 22.79% | 7.18% |
| Toyota | Celica | 86-89 | 23.91% | 19.16% | 29.42% | 10.26% |
| Toyota | Celica | 90-93 | 22.93% | 17.91% | 28.87% | 10.96% |
| Toyota | Celica | 94-00 | 21.18% | 13.73% | 31.21% | 17.48% |
| Toyota | Supra | 86-92 | 28.09% | 18.26% | 40.57% | 22.31% |
| Toyota | MR2 | 85-89 | 29.73% | 21.46% | 39.57% | 18.11% |
| Toyota | Paseo / Cynos | 91-97 | 21.53% | 15.92% | 28.45% | 12.53% |

**: The injury severity performance of this vehicle may differ between Australian and New Zealand models

# CRASHWORTHINESS RATINGS OF 1982-2000 MODELS OF CARS INVOLVED IN CRASHES DURING 1987-2000 with (1) 95 % CONFIDENCE LIMITS (2) 90 % CONFIDENCE LIMITS

# CRASHWORTHINESS RATINGS
# (WITH 95% CONFIDENCE LIMITS)
# Victoria and NSW Data (1997-2000), New Zealand, Queensland and Western Australia Data (1991-2000)

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| **ALL MODEL AVERAGE** | | | **3.85** | | | |
| **4-Wheel Drive Vehicles** | | | **3.17%** | **3.04%** | **3.31%** | **0.26%** |
| Daihatsu | Feroza / Rocky | 89-97 | 3.90% | 2.70% | 5.64% | 2.94% |
| Daihatsu | Rocky / Rugger | 85-98 | 5.90% | 4.26% | 8.18% | 3.92% |
| Daihatsu | Terios | 97-00 | 4.71% | 2.40% | 9.24% | 6.83% |
| Holden / Isuzu | Jackaroo / Bighorn | 82-91 | 2.64% | 1.78% | 3.90% | 2.12% |
| Holden / Isuzu | Jackaroo / Bighorn | 92-98 | 2.93% | 1.74% | 4.93% | 3.19% |
| Mitsubishi | Pajero | 84-91 | 4.18% | 3.36% | 5.21% | 1.85% |
| Mitsubishi | Pajero | 92-99 | 2.55% | 1.95% | 3.35% | 1.40% |
| Jeep | Cherokee | 96-00 | 1.97% | 1.15% | 3.36% | 2.20% |
| Land Rover | Discovery / Crossroad | 91-00 | 1.68% | 0.91% | 3.11% | 2.21% |
| Nissan | Patrol | 82-87 | 2.69% | 1.96% | 3.69% | 1.74% |
| Nissan / Ford | Patrol / Maverick | 88-98 | 2.31% | 1.95% | 2.75% | 0.80% |
| Nissan | Patrol | 99-00 | 2.64% | 1.56% | 4.47% | 2.91% |
| Nissan | Pathfinder / Terrano | 88-95 | 3.32% | 2.09% | 5.26% | 3.17% |
| Nissan | Pathfinder / Terrano | 96-00 | 4.09% | 2.25% | 7.43% | 5.18% |
| Lada | Niva | 84-99 | 4.27% | 2.55% | 7.15% | 4.60% |
| Honda | CR-V | 96-00 | 2.43% | 1.33% | 4.46% | 3.13% |
| Land Rover | Range Rover | 82-94 | 2.03% | 1.37% | 3.00% | 1.63% |
| Suzuki | Vitara / Escudo | 88-98 | 4.56% | 3.60% | 5.76% | 2.16% |
| Suzuki | Samurai / SJ410 / SJ413 | 82-99 | 4.92% | 4.23% | 5.71% | 1.48% |
| Toyota | 4Runner/Hilux | 79-83 | 4.21% | 3.67% | 4.83% | 1.15% |
| Toyota | 4Runner/Hilux | 85-89 | 3.48% | 2.98% | 4.07% | 1.09% |
| Toyota | 4Runner/Hilux | 90-97 | 3.55% | 3.23% | 3.90% | 0.67% |
| Toyota | Hilux | 98-00 | 3.69% | 2.54% | 5.35% | 2.81% |
| Toyota | Landcruiser | 82-89 | 3.61% | 3.17% | 4.11% | 0.94% |
| Toyota | Landcruiser | 90-97 | 2.77% | 2.40% | 3.20% | 0.80% |
| Toyota | Landcruiser | 98-00 | 2.94% | 2.11% | 4.09% | 1.98% |
| Toyota | RAV4 | 94-00 | 2.29% | 1.43% | 3.66% | 2.23% |
| **Commercial Vehicles** | | | | **3.49%** | **3.81%** | **0.32%** |
| Daihatsu | Handivan | 82-90 | 7.05% | 5.24% | 9.48% | 4.25% |
| Ford | Falcon Panel Van | 85-95 | 3.00% | 2.42% | 3.72% | 1.29% |
| Ford / Nissan | Falcon Ute / XFN Ute | 85-93 | 3.36% | 2.96% | 3.81% | 0.85% |
| Ford | Falcon Ute | 94-99 | 2.61% | 1.80% | 3.79% | 2.00% |
| Ford | Ford F-Series | 79-92 | 2.64% | 1.66% | 4.20% | 2.55% |
| Ford | Transit | 95-00 | 2.75% | 1.56% | 4.83% | 3.27% |
| Holden | Commodore Ute VG/VP | 90-94 | 3.70% | 2.76% | 4.95% | 2.19% |
| Isuzu | Pickup | 82-85 | 4.24% | 2.94% | 6.13% | 3.19% |
| Isuzu | Pickup | 86-88 | 2.63% | 1.30% | 5.31% | 4.01% |

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Isuzu / Holden | Pickup / Rodeo | 89-95 | 4.01% | 3.43% | 4.69% | 1.26% |
| Holden | Rodeo | 96-98 | 2.86% | 2.04% | 4.02% | 1.97% |
| Holden | Rodeo | 99-00 | 2.32% | 1.19% | 4.53% | 3.34% |
| Holden | WFR Van | 92-98 | 5.87% | 3.99% | 8.65% | 4.66% |
| Holden | WB Series | 80-84 | 4.91% | 3.90% | 6.17% | 2.26% |
| Holden | Commodore Ute VR/VS | 96-00 | 3.54% | 2.95% | 4.25% | 1.30% |
| Nissan | 720 Ute | 82-85 | 3.60% | 2.76% | 4.69% | 1.93% |
| Nissan | Navara | 86-91 | 3.79% | 3.17% | 4.53% | 1.35% |
| Nissan | Navara | 92-98 | 2.72% | 1.94% | 3.83% | 1.89% |
| Honda | Acty | 83-86 | 3.28% | 1.95% | 5.52% | 3.57% |
| Subaru | Brumby | 82-92 | 6.04% | 5.02% | 7.28% | 2.27% |
| Holden / Suzuki | Scurry / Carry | 82-00 | 8.94% | 6.59% | 12.14% | 5.55% |
| Suzuki | Mighty Boy | 85-88 | 8.42% | 6.11% | 11.61% | 5.51% |
| Toyota | Hiace/Liteace | 82-86 | 5.03% | 4.39% | 5.75% | 1.36% |
| Toyota | Hiace/Liteace | 87-92 | 4.27% | 3.50% | 5.21% | 1.71% |
| Toyota | Hiace/Liteace | 93-00 | 3.98% | 3.39% | 4.67% | 1.28% |
| Volkswagon | Caravelle / Transporter | 97-00 | 2.03% | 1.11% | 3.71% | 2.60% |
| **Large Cars** | | | | **2.98%** | **3.12%** | **0.14%** |
| Ford | Falcon XE/XF | 82-88 | 3.53% | 3.35% | 3.72% | 0.37% |
| Ford | Falcon EA / Falcon EB Series I | 88-92 | 3.02% | 2.82% | 3.22% | 0.40% |
| Ford | Falcon EB Series II / Falcon ED | 92-94 | 2.91% | 2.64% | 3.22% | 0.58% |
| Ford | Falcon EF/EL | 94-98 | 2.77% | 2.55% | 3.00% | 0.46% |
| Ford | Falcon AU | 98-00 | 2.08% | 1.62% | 2.69% | 1.07% |
| Holden / Toyota | Commodore VN/VP / Lexcen | 89-92 | 3.48% | 3.28% | 3.69% | 0.41% |
| Holden / Toyota | Commodore VR/VS / Lexcen | 93-97 | 2.77% | 2.56% | 2.98% | 0.42% |
| Holden | Commodore VT/VX | 97-00 | 2.64% | 2.27% | 3.07% | 0.80% |
| Holden | Commodore VB-VL | 82-89 | 3.87% | 3.67% | 4.09% | 0.42% |
| Hyundai | Sonata | 89-98 | 3.35% | 2.64% | 4.25% | 1.60% |
| Mitsubishi | Magna / Sigma / V3000 | 85-90 | 3.56% | 3.30% | 3.84% | 0.54% |
| Mitsubishi | Magna / Verada / Diamante | 96-00 | 3.13% | 2.80% | 3.51% | 0.72% |
| Mitsubishi | Magna / Verada / V3000 / Diamante | 91-96 | 2.68% | 2.40% | 2.99% | 0.59% |
| Nissan | Skyline | 83-88 | 3.65% | 3.17% | 4.21% | 1.04% |
| Holden / Toyota | Apollo JM / JP / Camry / Sceptor | 94-97 | 3.16% | 2.86% | 3.49% | 0.62% |
| Toyota | Camry | 98-00 | 3.42% | 2.73% | 4.29% | 1.56% |
| **Luxury Cars** | | | | **2.62%** | **2.90%** | **0.28%** |
| Audi | A4 | 95-00 | 2.95% | 1.49% | 5.83% | 4.33% |
| BMW | 3 Series | 82-91 | 2.98% | 2.38% | 3.73% | 1.34% |
| BMW | 3 Series | 92-98 | 2.61% | 2.00% | 3.42% | 1.43% |
| BMW | 5 Series | 81-88 | 2.29% | 1.43% | 3.67% | 2.25% |
| BMW | 5 Series | 89-95 | 2.40% | 1.38% | 4.17% | 2.80% |
| Ford | Fairlane Z & LTD F | 79-88 | 3.62% | 3.11% | 4.22% | 1.11% |
| Ford | Fairlane N & LTD D | 88-95 | 2.60% | 2.16% | 3.12% | 0.95% |
| Ford | Fairlane N & LTD D | 96-98 | 2.78% | 1.94% | 3.99% | 2.06% |
| Holden | Statesman/Caprice WB | 81-84 | 5.45% | 3.17% | 9.37% | 6.21% |
| Holden | Stateman/Caprice VQ | 90-93 | 3.40% | 2.39% | 4.82% | 2.42% |
| Holden | Stateman/Caprice VR/VS | 94-99 | 3.58% | 2.73% | 4.70% | 1.97% |
| Jaguar | XJ6 | 79-86 | 4.41% | 2.45% | 7.96% | 5.51% |
| Mazda | 929 / Luce | 82-91 | 4.20% | 3.55% | 4.96% | 1.41% |
| Mercedes Benz | C-Class W201 | 87-93 | 3.84% | 2.44% | 6.05% | 3.61% |

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Mercedes Benz | C-Class W202 | 94-00 | 2.34% | 1.31% | 4.18% | 2.88% |
| Mercedes Benz | E-Class W123 | 82-85 | 2.43% | 1.17% | 5.04% | 3.87% |
| Mercedes Benz | E-Class W124 | 86-94 | 2.28% | 1.42% | 3.66% | 2.24% |
| Mercedes Benz | S-Class W126 | 82-92 | 2.85% | 1.70% | 4.79% | 3.09% |
| Nissan | Maxima | 91-94 | 3.04% | 2.06% | 4.48% | 2.42% |
| Nissan | Maxima / Cefiro | 95-99 | 3.31% | 2.02% | 5.40% | 3.38% |
| Honda | Legend | 91-96 | 1.94% | 1.10% | 3.42% | 2.31% |
| Honda | Accord | 82-86 | 4.02% | 3.15% | 5.14% | 1.99% |
| Honda | Accord | 86-90 | 2.56% | 1.84% | 3.57% | 1.72% |
| Honda | Accord | 90-93 | 2.42% | 1.47% | 3.97% | 2.49% |
| Honda | Accord | 94-97 | 3.43% | 2.51% | 4.71% | 2.20% |
| Saab | 900 Series | 84-92 | 2.99% | 2.03% | 4.39% | 2.36% |
| Saab | 9000 | 86-97 | 1.52% | 0.79% | 2.94% | 2.16% |
| Toyota | Crown / Cressida / Mark II | 81-85 | 3.71% | 3.02% | 4.55% | 1.53% |
| Toyota | Crown / Cressida / Mark II | 85-88 | 3.28% | 2.23% | 4.82% | 2.59% |
| Toyota | Cressida / Mark II | 89-92 | 2.42% | 1.78% | 3.28% | 1.50% |
| Volvo | 850/S70/V70/C70 | 93-00 | 2.12% | 1.25% | 3.60% | 2.35% |
| Volvo | 200 Series | 87-93 | 2.53% | 1.99% | 3.23% | 1.24% |
| Volvo | 700/900 Series | 83-91 | 1.99% | 1.39% | 2.84% | 1.45% |
| **Medium Cars** | | | | **3.45%** | **3.65%** | **0.20%** |
| Daewoo | Espero | 95-97 | 5.02% | 3.10% | 8.13% | 5.03% |
| Daewoo | Nubira | 97-00 | 3.92% | 2.52% | 6.10% | 3.58% |
| Ford | Mondeo | 97-00 | 2.15% | 1.42% | 3.25% | 1.83% |
| Holden | Camira | 82-89 | 4.56% | 4.21% | 4.94% | 0.73% |
| Holden | Vectra | 96-00 | 2.49% | 1.56% | 3.97% | 2.40% |
| Mitsubishi | Sigma / Scorpion / Sapparo / Lambda | 82-84 | 3.99% | 3.67% | 4.35% | 0.68% |
| Mitsubishi | Chariot / Spacewagon | 85-91 | 3.74% | 2.63% | 5.32% | 2.69% |
| Mitsubishi | Chariot | 82-98 | 2.41% | 1.21% | 4.81% | 3.60% |
| Mitsubishi | Galant | 94-97 | 3.82% | 2.89% | 5.05% | 2.16% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 83-87 | 3.63% | 3.29% | 4.01% | 0.73% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 88-92 | 3.11% | 2.66% | 3.63% | 0.98% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella / Cronos | 92-97 | 3.16% | 2.66% | 3.76% | 1.10% |
| Mazda | 626 | 98-00 | 3.14% | 1.60% | 6.15% | 4.55% |
| Nissan | Pintara | 86-88 | 3.69% | 3.15% | 4.33% | 1.18% |
| Nissan | Bluebird | 89-92 | 4.09% | 3.64% | 4.61% | 0.97% |
| Nissan | Bluebird | 83-88 | 4.43% | 4.07% | 4.81% | 0.74% |
| Nissan | Stanza | 82-83 | 3.82% | 2.48% | 5.87% | 3.39% |
| Nissan | Silvia | 84-86 | 4.82% | 3.62% | 6.40% | 2.78% |
| Nissan | Prairie | 82-88 | 4.55% | 2.92% | 7.09% | 4.17% |
| Nissan | Bluebird | 92-97 | 2.63% | 1.89% | 3.66% | 1.77% |
| Peugeot | 405 | 88-96 | 3.04% | 1.92% | 4.83% | 2.92% |
| Peugeot | 505 | 82-91 | 2.52% | 1.66% | 3.83% | 2.17% |
| Subaru | Leone / Omega / 4WD Wagon | 88-93 | 4.28% | 3.81% | 4.81% | 1.00% |
| Subaru | Legacy | 89-93 | 3.10% | 2.61% | 3.68% | 1.07% |
| Subaru | Legacy | 94-98 | 3.62% | 2.63% | 4.99% | 2.36% |
| Toyota | Corona | 82-88 | 3.90% | 3.59% | 4.24% | 0.65% |
| Toyota | Camry | 81-86 | 3.85% | 3.26% | 4.54% | 1.28% |
| Holden / Toyota | Apollo JK/JL / Camry / Vista | 90-93 | 3.61% | 3.35% | 3.89% | 0.54% |
| **Passenger Vans** | | | | **4.08%** | **4.72%** | **0.64%** |

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Mitsubishi | Starwagon / L300 | 83-86 | 6.53% | 5.64% | 7.55% | 1.91% |
| Mitsubishi | Starwagon / Delica Starwagon | 87-93 | 4.67% | 4.00% | 5.45% | 1.46% |
| Mitsubishi | Starwagon / Delica Spacegear | 93-00 | 2.89% | 1.93% | 4.32% | 2.39% |
| Toyota | Tarago | 85-90 | 4.83% | 4.18% | 5.59% | 1.40% |
| Toyota | Previa / Estima | 91-99 | 2.76% | 2.03% | 3.75% | 1.72% |
| **Small Cars** | | | | 4.09% | 4.28% | 0.19% |
| Alfa Romeo | 33 | 83-95 | 4.21% | 2.81% | 6.30% | 3.48% |
| Daihatsu | Charade | 82-87 | 6.86% | 5.81% | 8.10% | 2.29% |
| Daihatsu | Charade | 88-93 | 5.54% | 4.91% | 6.25% | 1.34% |
| Daihatsu | Charade | 93-00 | 5.48% | 4.72% | 6.37% | 1.65% |
| Daihatsu | Applause | 89-98 | 3.84% | 3.05% | 4.84% | 1.78% |
| Daihatsu | Mira | 90-98 | 8.30% | 6.21% | 11.08% | 4.87% |
| Daihatsu | Sirion | 00-00 | 3.83% | 1.89% | 7.74% | 5.85% |
| Daewoo | 1.5i | 94-95 | 4.43% | 2.24% | 8.77% | 6.53% |
| Daewoo | Cielo | 95-97 | 3.43% | 2.65% | 4.43% | 1.78% |
| Daewoo | Lanos | 97-00 | 3.96% | 2.87% | 5.45% | 2.58% |
| Fiat | Regata | 84-88 | 4.20% | 2.07% | 8.51% | 6.44% |
| Ford | Laser | 90-94 | 3.78% | 3.42% | 4.19% | 0.77% |
| Ford | Laser | 95-97 | 4.26% | 3.43% | 5.29% | 1.86% |
| Ford | Festiva WD/WD/WH/WF | 94-00 | 5.34% | 4.68% | 6.10% | 1.41% |
| Holden | Gemini | 82-84 | 4.53% | 4.04% | 5.07% | 1.03% |
| Holden | Gemini RB | 86-89 | 5.04% | 3.67% | 6.91% | 3.24% |
| Holden | Astra TR | 95-98 | 2.12% | 1.19% | 3.77% | 2.57% |
| Holden | Barina SB | 95-00 | 4.56% | 3.81% | 5.46% | 1.65% |
| Hyundai | Excel | 86-90 | 5.42% | 4.67% | 6.29% | 1.62% |
| Hyundai | Excel | 90-95 | 4.71% | 4.22% | 5.24% | 1.02% |
| Hyundai | Excel | 95-00 | 4.38% | 3.97% | 4.82% | 0.85% |
| Hyundai | S Coupe | 90-96 | 4.81% | 3.50% | 6.60% | 3.10% |
| Hyundai | Lantra | 91-93 | 4.07% | 3.14% | 5.29% | 2.16% |
| Hyundai | Lantra | 94-00 | 3.43% | 2.58% | 4.55% | 1.96% |
| Mitsubishi | Mirage / Colt | 82-88 / 87-88 | 5.06% | 4.66% | 5.49% | 0.84% |
| Mitsubishi | Lancer / Mirage CA | 89-90 | 3.96% | 3.47% | 4.53% | 1.06% |
| Mitsubishi | Lancer / Mirage CC | 93-95 | 3.67% | 3.13% | 4.30% | 1.17% |
| Mitsubishi | Lancer / Mirage CE | 96-00 | 3.89% | 3.30% | 4.59% | 1.29% |
| Mitsubishi | Cordia | 83-87 | 5.14% | 4.28% | 6.17% | 1.89% |
| Ford / Mazda | Laser / 323 / Familia | 82-89 | 4.76% | 4.52% | 5.00% | 0.48% |
| Mazda | 323 / Familia / Lantis | 90-93 | 3.71% | 3.17% | 4.35% | 1.19% |
| Mazda | 323 / Familia / Lantis | 95-98 | 4.12% | 3.29% | 5.16% | 1.87% |
| Ford / Mazda | Laser / 323 | 99-00 | 3.17% | 1.56% | 6.44% | 4.89% |
| Ford / Mazda | Festiva WA / 121 | 90-94 / 87-91 | 5.48% | 4.89% | 6.13% | 1.24% |
| Mazda | 121 / Autozam Review | 91-97 | 3.72% | 2.90% | 4.77% | 1.86% |
| Mazda | Demio | 98-00 | 4.24% | 2.92% | 6.16% | 3.23% |
| Nissan | Pulsar / Langley | 83-86 | 5.09% | 4.67% | 5.55% | 0.88% |
| Nissan | Pulsar / Sentra | 87-91 | 4.31% | 3.92% | 4.74% | 0.82% |
| Nissan | Pulsar / Sentra | 91-95 | 3.44% | 2.94% | 4.01% | 1.07% |
| Nissan | Pulsar / Sentra | 96-00 | 4.46% | 3.68% | 5.40% | 1.72% |
| Nissan | Micra | 93-95 | 5.64% | 3.84% | 8.28% | 4.43% |
| Honda | Civic | 82-84 | 4.62% | 3.23% | 6.61% | 3.38% |
| Honda | Civic / Ballade / Shuttle | 86-88 | 5.66% | 4.73% | 6.78% | 2.05% |
| Honda | Civic / Shuttle | 89-92 | 4.62% | 3.90% | 5.47% | 1.57% |
| Honda | Civic | 92-95 | 3.46% | 2.79% | 4.27% | 1.48% |

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Honda | Civic | 96-00 | 3.51% | 2.59% | 4.75% | 2.17% |
| Honda | Concerto | 89-93 | 3.26% | 1.99% | 5.34% | 3.35% |
| Honda | City | 84-89 | 6.92% | 4.59% | 10.41% | 5.82% |
| Peugeot | 306 | 93-00 | 1.57% | 0.82% | 3.00% | 2.18% |
| Rover | Quintet | 82-86 | 4.69% | 2.82% | 7.80% | 4.98% |
| Subaru | 700 / Rex | 89-92 | 8.48% | 6.63% | 10.85% | 4.22% |
| Subaru | Impreza | 93-00 | 4.27% | 3.23% | 5.64% | 2.42% |
| Holden / Suzuki | Barina / Swift / Cultus | 86-88 | 6.60% | 5.84% | 7.46% | 1.62% |
| Holden / Suzuki | Barina / Swift / Cultus | 89-93 / 89-00 | 4.80% | 4.37% | 5.28% | 0.92% |
| Suzuki | Alto | 82-84 | 8.28% | 6.61% | 10.36% | 3.75% |
| Suzuki | Baleno / Cultus Cresent | 95-99 | 3.40% | 2.02% | 5.70% | 3.67% |
| Toyota | Corolla | 82-84 | 4.41% | 4.03% | 4.83% | 0.80% |
| Toyota | Corolla | 86-88 | 4.29% | 3.96% | 4.66% | 0.70% |
| Toyota / Holden | Corolla / Nova | 88-92 | 3.89% | 3.60% | 4.19% | 0.59% |
| Toyota / Holden | Corolla / Nova | 93-97 | 3.53% | 3.17% | 3.94% | 0.77% |
| Toyota | Corolla | 98-00 | 1.65% | 0.91% | 2.99% | 2.09% |
| Toyota | Tercel | 85-88 | 4.38% | 2.86% | 6.71% | 3.85% |
| Toyota | Starlet | 96-98 | 4.60% | 3.66% | 5.78% | 2.12% |
| Volkswagen | Golf | 95-98 | 2.54% | 1.39% | 4.64% | 3.24% |
| **Sports Cars** | | | | **3.44%** | **3.91%** | **0.47%** |
| Ford | Capri | 90-94 | 4.47% | 3.36% | 5.95% | 2.59% |
| Hyundai | Coupe | 96-00 | 5.66% | 3.49% | 9.18% | 5.69% |
| Mazda | RX7 | 81-86 | 3.94% | 2.65% | 5.86% | 3.22% |
| Mazda | RX7 | 86-91 | 2.55% | 1.42% | 4.58% | 3.16% |
| Mazda | MX5 / Eunos Roadster | 89-97 | 3.36% | 1.99% | 5.70% | 3.71% |
| Nissan | 300ZX / Fairlady Z | 90-95 | 3.36% | 2.00% | 5.65% | 3.65% |
| Nissan | Exa | 83-86 | 6.08% | 4.17% | 8.87% | 4.70% |
| Nissan | Exa | 86-91 | 3.88% | 2.10% | 7.17% | 5.07% |
| Nissan | NX/NX-R | 93-95 | 7.55% | 5.32% | 10.73% | 5.41% |
| Nissan | 200SX / Silvia | 94-99 | 4.17% | 2.11% | 8.27% | 6.16% |
| Honda | CRX | 87-91 | 5.65% | 4.08% | 7.83% | 3.76% |
| Honda | Prelude | 83-91 | 3.79% | 3.06% | 4.69% | 1.63% |
| Honda | Prelude | 92-96 | 4.31% | 3.06% | 6.07% | 3.00% |
| Honda | Integra | 86-88 | 3.77% | 2.32% | 6.11% | 3.79% |
| Honda | Integra | 91-93 | 2.75% | 1.57% | 4.81% | 3.24% |
| Honda | Integra | 93-00 | 1.84% | 0.90% | 3.76% | 2.86% |
| Renault | Feugo | 81-86 | 2.98% | 1.68% | 5.29% | 3.61% |
| Toyota | Celica | 81-85 | 3.28% | 2.65% | 4.06% | 1.40% |
| Toyota | Celica | 86-89 | 4.04% | 3.17% | 5.16% | 1.99% |
| Toyota | Celica | 90-93 | 3.40% | 2.58% | 4.48% | 1.90% |
| Toyota | Celica | 94-00 | 3.75% | 2.37% | 5.93% | 3.55% |
| Toyota | Supra | 86-92 | 5.27% | 3.32% | 8.36% | 5.04% |
| Toyota | MR2 | 85-89 | 7.73% | 5.09% | 11.73% | 6.64% |
| Toyota | Paseo / Cynos | 91-97 | 4.02% | 2.90% | 5.57% | 2.68% |

# CRASHWORTHINESS RATINGS
## (WITH 90% CONFIDENCE LIMITS)
## Victoria and NSW Data (1997-2000), New Zealand, Queensland and Western Australia Data (1991-2000)

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 90% Confidence Limit | Upper 90% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| **ALL MODEL AVERAGE** | | | **3.85** | | | |
| **4-Wheel Drive Vehicles** | | | **3.17%** | **3.07%** | **3.29%** | **0.22%** |
| Daihatsu | Feroza / Rocky | 89-97 | 3.90% | 2.86% | 5.31% | 2.45% |
| Daihatsu | Rocky / Rugger | 85-98 | 5.90% | 4.50% | 7.76% | 3.26% |
| Daihatsu | Terios | 97-00 | 4.71% | 2.68% | 8.28% | 5.59% |
| Holden / Isuzu | Jackaroo / Bighorn | 82-91 | 2.64% | 1.90% | 3.66% | 1.76% |
| Holden / Isuzu | Jackaroo / Bighorn | 92-98 | 2.93% | 1.90% | 4.53% | 2.63% |
| Mitsubishi | Pajero | 84-91 | 4.18% | 3.48% | 5.02% | 1.54% |
| Mitsubishi | Pajero | 92-99 | 2.55% | 2.04% | 3.20% | 1.17% |
| Jeep | Cherokee | 96-00 | 1.97% | 1.26% | 3.08% | 1.82% |
| Land Rover | Discovery / Crossroad | 91-00 | 1.68% | 1.00% | 2.81% | 1.81% |
| Nissan | Patrol | 82-87 | 2.69% | 2.06% | 3.51% | 1.44% |
| Nissan / Ford | Patrol / Maverick | 88-98 | 2.31% | 2.00% | 2.68% | 0.67% |
| Nissan | Patrol | 99-00 | 2.64% | 1.70% | 4.10% | 2.40% |
| Nissan | Pathfinder / Terrano | 88-95 | 3.32% | 2.25% | 4.88% | 2.62% |
| Nissan | Pathfinder / Terrano | 96-00 | 4.09% | 2.48% | 6.74% | 4.26% |
| Lada | Niva | 84-99 | 4.27% | 2.77% | 6.57% | 3.80% |
| Honda | CR-V | 96-00 | 2.43% | 1.47% | 4.04% | 2.57% |
| Land Rover | Range Rover | 82-94 | 2.03% | 1.46% | 2.81% | 1.35% |
| Suzuki | Vitara / Escudo | 88-98 | 4.56% | 3.74% | 5.55% | 1.81% |
| Suzuki | Samurai / SJ410 / SJ413 | 82-99 | 4.92% | 4.33% | 5.57% | 1.24% |
| Toyota | 4Runner/Hilux | 79-83 | 4.21% | 3.76% | 4.72% | 0.96% |
| Toyota | 4Runner/Hilux | 85-89 | 3.48% | 3.06% | 3.97% | 0.91% |
| Toyota | 4Runner/Hilux | 90-97 | 3.55% | 3.28% | 3.84% | 0.56% |
| Toyota | Hilux | 98-00 | 3.69% | 2.70% | 5.04% | 2.33% |
| Toyota | Landcruiser | 82-89 | 3.61% | 3.24% | 4.02% | 0.78% |
| Toyota | Landcruiser | 90-97 | 2.77% | 2.46% | 3.13% | 0.67% |
| Toyota | Landcruiser | 98-00 | 2.94% | 2.23% | 3.87% | 1.64% |
| Toyota | RAV4 | 94-00 | 2.29% | 1.55% | 3.39% | 1.85% |
| **Commercial Vehicles** | | | | **3.51%** | **3.78%** | **0.27%** |
| Daihatsu | Handivan | 82-90 | 7.05% | 5.50% | 9.04% | 3.54% |
| Ford | Falcon Panel Van | 85-95 | 3.00% | 2.51% | 3.59% | 1.08% |
| Ford / Nissan | Falcon Ute / XFN Ute | 85-93 | 3.36% | 3.02% | 3.73% | 0.71% |
| Ford | Falcon Ute | 94-99 | 2.61% | 1.91% | 3.57% | 1.66% |
| Ford | Ford F-Series | 79-92 | 2.64% | 1.79% | 3.90% | 2.11% |
| Ford | Transit | 95-00 | 2.75% | 1.71% | 4.40% | 2.69% |
| Holden | Commodore Ute VG/VP | 90-94 | 3.70% | 2.89% | 4.72% | 1.82% |
| Isuzu | Pickup | 82-85 | 4.24% | 3.12% | 5.77% | 2.65% |
| Isuzu | Pickup | 86-88 | 2.63% | 1.46% | 4.73% | 3.27% |
| Isuzu / Holden | Pickup / Rodeo | 89-95 | 4.01% | 3.52% | 4.57% | 1.05% |
| Holden | Rodeo | 96-98 | 2.86% | 2.16% | 3.80% | 1.64% |
| Holden | Rodeo | 99-00 | 2.32% | 1.32% | 4.06% | 2.74% |

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 90% Confidence Limit | Upper 90% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Holden | WFR Van | 92-98 | 5.87% | 4.25% | 8.12% | 3.87% |
| Holden | WB Series | 80-84 | 4.91% | 4.05% | 5.94% | 1.89% |
| Holden | Commodore Ute VR/VS | 96-00 | 3.54% | 3.04% | 4.12% | 1.09% |
| Nissan | 720 Ute | 82-85 | 3.60% | 2.89% | 4.50% | 1.61% |
| Nissan | Navara | 86-91 | 3.79% | 3.26% | 4.40% | 1.13% |
| Nissan | Navara | 92-98 | 2.72% | 2.05% | 3.62% | 1.57% |
| Honda | Acty | 83-86 | 3.28% | 2.12% | 5.07% | 2.95% |
| Subaru | Brumby | 82-92 | 6.04% | 5.17% | 7.06% | 1.89% |
| Holden / Suzuki | Scurry / Carry | 82-00 | 8.94% | 6.93% | 11.55% | 4.62% |
| Suzuki | Mighty Boy | 85-88 | 8.42% | 6.43% | 11.02% | 4.58% |
| Toyota | Hiace/Liteace | 82-86 | 5.03% | 4.49% | 5.63% | 1.14% |
| Toyota | Hiace/Liteace | 87-92 | 4.27% | 3.62% | 5.05% | 1.43% |
| Toyota | Hiace/Liteace | 93-00 | 3.98% | 3.48% | 4.55% | 1.07% |
| Volkswagon | Caravelle / Transporter | 97-00 | 2.03% | 1.22% | 3.36% | 2.14% |
| **Large Cars** | | | | **2.99%** | **3.11%** | **0.12%** |
| Ford | Falcon XE/XF | 82-88 | 3.53% | 3.38% | 3.69% | 0.31% |
| Ford | Falcon EA / Falcon EB Series I | 88-92 | 3.02% | 2.85% | 3.19% | 0.34% |
| Ford | Falcon EB Series II / Falcon ED | 92-94 | 2.91% | 2.68% | 3.17% | 0.49% |
| Ford | Falcon EF/EL | 94-98 | 2.77% | 2.58% | 2.96% | 0.38% |
| Ford | Falcon AU | 98-00 | 2.08% | 1.68% | 2.58% | 0.90% |
| Holden / Toyota | Commodore VN/VP / Lexcen | 89-92 | 3.48% | 3.31% | 3.65% | 0.34% |
| Holden / Toyota | Commodore VR/VS / Lexcen | 93-97 | 2.77% | 2.59% | 2.95% | 0.35% |
| Holden | Commodore VT/VX | 97-00 | 2.64% | 2.33% | 3.00% | 0.67% |
| Holden | Commodore VB-VL | 82-89 | 3.87% | 3.70% | 4.05% | 0.35% |
| Hyundai | Sonata | 89-98 | 3.35% | 2.75% | 4.09% | 1.34% |
| Mitsubishi | Magna / Sigma / V3000 | 85-90 | 3.56% | 3.34% | 3.79% | 0.45% |
| Mitsubishi | Magna / Verada / Diamante | 96-00 | 3.13% | 2.85% | 3.45% | 0.60% |
| Mitsubishi | Magna / Verada / V3000 / Diamante | 91-96 | 2.68% | 2.45% | 2.94% | 0.49% |
| Nissan | Skyline | 83-88 | 3.65% | 3.24% | 4.11% | 0.87% |
| Holden / Toyota | Apollo JM / JP / Camry / Sceptor | 94-97 | 3.16% | 2.91% | 3.43% | 0.52% |
| Toyota | Camry | 98-00 | 3.42% | 2.83% | 4.13% | 1.30% |
| **Luxury Cars** | | | | **2.64%** | **2.87%** | **0.23%** |
| Audi | A4 | 95-00 | 2.95% | 1.67% | 5.21% | 3.54% |
| BMW | 3 Series | 82-91 | 2.98% | 2.47% | 3.59% | 1.12% |
| BMW | 3 Series | 92-98 | 2.61% | 2.09% | 3.28% | 1.19% |
| BMW | 5 Series | 81-88 | 2.29% | 1.54% | 3.40% | 1.86% |
| BMW | 5 Series | 89-95 | 2.40% | 1.51% | 3.81% | 2.30% |
| Ford | Fairlane Z & LTD F | 79-88 | 3.62% | 3.19% | 4.12% | 0.93% |
| Ford | Fairlane N & LTD D | 88-95 | 2.60% | 2.23% | 3.02% | 0.80% |
| Ford | Fairlane N & LTD D | 96-98 | 2.78% | 2.05% | 3.76% | 1.71% |
| Holden | Statesman/Caprice WB | 81-84 | 5.45% | 3.46% | 8.58% | 5.12% |
| Holden | Stateman/Caprice VQ | 90-93 | 3.40% | 2.53% | 4.55% | 2.01% |
| Holden | Stateman/Caprice VR/VS | 94-99 | 3.58% | 2.86% | 4.50% | 1.64% |
| Jaguar | XJ6 | 79-86 | 4.41% | 2.70% | 7.23% | 4.53% |
| Mazda | 929 / Luce | 82-91 | 4.20% | 3.65% | 4.83% | 1.18% |
| Mercedes Benz | C-Class W201 | 87-93 | 3.84% | 2.62% | 5.62% | 2.99% |
| Mercedes Benz | C-Class W202 | 94-00 | 2.34% | 1.44% | 3.80% | 2.37% |
| Mercedes Benz | E-Class W123 | 82-85 | 2.43% | 1.32% | 4.48% | 3.16% |
| Mercedes Benz | E-Class W124 | 86-94 | 2.28% | 1.54% | 3.39% | 1.85% |

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 90% Confidence Limit | Upper 90% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Mercedes Benz | S-Class W126 | 82-92 | 2.85% | 1.85% | 4.40% | 2.55% |
| Nissan | Maxima | 91-94 | 3.04% | 2.19% | 4.20% | 2.01% |
| Nissan | Maxima / Cefiro | 95-99 | 3.31% | 2.19% | 4.99% | 2.79% |
| Honda | Legend | 91-96 | 1.94% | 1.21% | 3.11% | 1.90% |
| Honda | Accord | 82-86 | 4.02% | 3.28% | 4.94% | 1.66% |
| Honda | Accord | 86-90 | 2.56% | 1.95% | 3.38% | 1.43% |
| Honda | Accord | 90-93 | 2.42% | 1.60% | 3.66% | 2.06% |
| Honda | Accord | 94-97 | 3.43% | 2.64% | 4.47% | 1.83% |
| Saab | 900 Series | 84-92 | 2.99% | 2.16% | 4.12% | 1.96% |
| Saab | 9000 | 86-97 | 1.52% | 0.87% | 2.64% | 1.77% |
| Toyota | Crown / Cressida / Mark II | 81-85 | 3.71% | 3.13% | 4.40% | 1.27% |
| Toyota | Crown / Cressida / Mark II | 85-88 | 3.28% | 2.37% | 4.53% | 2.16% |
| Toyota | Cressida / Mark II | 89-92 | 2.42% | 1.88% | 3.12% | 1.25% |
| Volvo | 850/S70/V70/C70 | 93-00 | 2.12% | 1.36% | 3.30% | 1.94% |
| Volvo | 200 Series | 87-93 | 2.53% | 2.07% | 3.10% | 1.03% |
| Volvo | 700/900 Series | 83-91 | 1.99% | 1.47% | 2.68% | 1.20% |
| **Medium Cars** | | | | **3.46%** | **3.63%** | **0.17%** |
| Daewoo | Espero | 95-97 | 5.02% | 3.36% | 7.52% | 4.16% |
| Daewoo | Nubira | 97-00 | 3.92% | 2.71% | 5.67% | 2.97% |
| Ford | Mondeo | 97-00 | 2.15% | 1.52% | 3.04% | 1.51% |
| Holden | Camira | 82-89 | 4.56% | 4.27% | 4.88% | 0.61% |
| Holden | Vectra | 96-00 | 2.49% | 1.69% | 3.68% | 1.99% |
| Mitsubishi | Sigma / Scorpion / Sapparo / Lambda | 82-84 | 3.99% | 3.72% | 4.29% | 0.57% |
| Mitsubishi | Chariot / Spacewagon | 85-91 | 3.74% | 2.79% | 5.02% | 2.23% |
| Mitsubishi | Chariot | 82-98 | 2.41% | 1.35% | 4.29% | 2.94% |
| Mitsubishi | Galant | 94-97 | 3.82% | 3.03% | 4.82% | 1.80% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 83-87 | 3.63% | 3.34% | 3.95% | 0.61% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 88-92 | 3.11% | 2.72% | 3.54% | 0.82% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella / Cronos | 92-97 | 3.16% | 2.74% | 3.65% | 0.91% |
| Mazda | 626 | 98-00 | 3.14% | 1.79% | 5.51% | 3.72% |
| Nissan | Pintara | 86-88 | 3.69% | 3.23% | 4.22% | 0.99% |
| Nissan | Bluebird | 89-92 | 4.09% | 3.71% | 4.52% | 0.81% |
| Nissan | Bluebird | 83-88 | 4.43% | 4.13% | 4.74% | 0.62% |
| Nissan | Stanza | 82-83 | 3.82% | 2.66% | 5.47% | 2.81% |
| Nissan | Silvia | 84-86 | 4.82% | 3.80% | 6.11% | 2.31% |
| Nissan | Prairie | 82-88 | 4.55% | 3.14% | 6.59% | 3.45% |
| Nissan | Bluebird | 92-97 | 2.63% | 1.99% | 3.47% | 1.47% |
| Peugeot | 405 | 88-96 | 3.04% | 2.07% | 4.48% | 2.42% |
| Peugeot | 505 | 82-91 | 2.52% | 1.78% | 3.58% | 1.80% |
| Subaru | Leone / Omega / 4WD Wagon | 88-93 | 4.28% | 3.88% | 4.72% | 0.84% |
| Subaru | Legacy | 89-93 | 3.10% | 2.69% | 3.58% | 0.89% |
| Subaru | Legacy | 94-98 | 3.62% | 2.77% | 4.74% | 1.96% |
| Toyota | Corona | 82-88 | 3.90% | 3.63% | 4.18% | 0.54% |
| Toyota | Camry | 81-86 | 3.85% | 3.35% | 4.42% | 1.07% |
| Holden / Toyota | Apollo JK/JL / Camry / Vista | 90-93 | 3.61% | 3.39% | 3.85% | 0.46% |
| **Passenger Vans** | | | | **4.13%** | **4.67%** | **0.54%** |
| Mitsubishi | Starwagon / L300 | 83-86 | 6.53% | 5.78% | 7.37% | 1.60% |
| Mitsubishi | Starwagon / Delica Starwagon | 87-93 | 4.67% | 4.10% | 5.31% | 1.22% |

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 90% Confidence Limit | Upper 90% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Mitsubishi | Starwagon / Delica Spacegear | 93-00 | 2.89% | 2.06% | 4.04% | 1.98% |
| Toyota | Tarago | 85-90 | 4.83% | 4.28% | 5.46% | 1.17% |
| Toyota | Previa / Estima | 91-99 | 2.76% | 2.13% | 3.56% | 1.43% |
| **Small Cars** | | | | **4.10%** | **4.26%** | **0.16%** |
| Alfa Romeo | 33 | 83-95 | 4.21% | 3.00% | 5.89% | 2.89% |
| Daihatsu | Charade | 82-87 | 6.86% | 5.97% | 7.88% | 1.91% |
| Daihatsu | Charade | 88-93 | 5.54% | 5.01% | 6.13% | 1.12% |
| Daihatsu | Charade | 93-00 | 5.48% | 4.83% | 6.21% | 1.38% |
| Daihatsu | Applause | 89-98 | 3.84% | 3.17% | 4.66% | 1.49% |
| Daihatsu | Mira | 90-98 | 8.30% | 6.51% | 10.57% | 4.06% |
| Daihatsu | Sirion | 00-00 | 3.83% | 2.12% | 6.90% | 4.78% |
| Daewoo | 1.5i | 94-95 | 4.43% | 2.50% | 7.85% | 5.34% |
| Daewoo | Cielo | 95-97 | 3.43% | 2.76% | 4.25% | 1.49% |
| Daewoo | Lanos | 97-00 | 3.96% | 3.03% | 5.17% | 2.15% |
| Fiat | Regata | 84-88 | 4.20% | 2.32% | 7.58% | 5.26% |
| Ford | Laser | 90-94 | 3.78% | 3.47% | 4.12% | 0.64% |
| Ford | Laser | 95-97 | 4.26% | 3.56% | 5.11% | 1.55% |
| Ford | Festiva WD/WD/WH/WF | 94-00 | 5.34% | 4.78% | 5.97% | 1.18% |
| Holden | Gemini | 82-84 | 4.53% | 4.12% | 4.98% | 0.86% |
| Holden | Gemini RB | 86-89 | 5.04% | 3.87% | 6.56% | 2.69% |
| Holden | Astra TR | 95-98 | 2.12% | 1.31% | 3.43% | 2.12% |
| Holden | Barina SB | 95-00 | 4.56% | 3.92% | 5.30% | 1.38% |
| Hyundai | Excel | 86-90 | 5.42% | 4.78% | 6.14% | 1.36% |
| Hyundai | Excel | 90-95 | 4.71% | 4.30% | 5.15% | 0.85% |
| Hyundai | Excel | 95-00 | 4.38% | 4.03% | 4.75% | 0.71% |
| Hyundai | S Coupe | 90-96 | 4.81% | 3.69% | 6.27% | 2.58% |
| Hyundai | Lantra | 91-93 | 4.07% | 3.27% | 5.07% | 1.80% |
| Hyundai | Lantra | 94-00 | 3.43% | 2.70% | 4.34% | 1.64% |
| Mitsubishi | Mirage / Colt | 82-88 / 87-88 | 5.06% | 4.72% | 5.42% | 0.70% |
| Mitsubishi | Lancer / Mirage CA | 89-90 | 3.96% | 3.54% | 4.43% | 0.89% |
| Mitsubishi | Lancer / Mirage CC | 93-95 | 3.67% | 3.21% | 4.19% | 0.98% |
| Mitsubishi | Lancer / Mirage CE | 96-00 | 3.89% | 3.39% | 4.46% | 1.08% |
| Mitsubishi | Cordia | 83-87 | 5.14% | 4.41% | 5.99% | 1.58% |
| Ford / Mazda | Laser / 323 / Familia | 82-89 | 4.76% | 4.56% | 4.96% | 0.40% |
| Mazda | 323 / Familia / Lantis | 90-93 | 3.71% | 3.25% | 4.24% | 0.99% |
| Mazda | 323 / Familia / Lantis | 95-98 | 4.12% | 3.41% | 4.97% | 1.56% |
| Ford / Mazda | Laser / 323 | 99-00 | 3.17% | 1.75% | 5.74% | 3.99% |
| Ford / Mazda | Festiva WA / 121 | 90-94 / 87-91 | 5.48% | 4.98% | 6.02% | 1.04% |
| Mazda | 121 / Autozam Review | 91-97 | 3.72% | 3.02% | 4.58% | 1.55% |
| Mazda | Demio | 98-00 | 4.24% | 3.11% | 5.79% | 2.69% |
| Nissan | Pulsar / Langley | 83-86 | 5.09% | 4.74% | 5.47% | 0.74% |
| Nissan | Pulsar / Sentra | 87-91 | 4.31% | 3.98% | 4.67% | 0.69% |
| Nissan | Pulsar / Sentra | 91-95 | 3.44% | 3.02% | 3.91% | 0.89% |
| Nissan | Pulsar / Sentra | 96-00 | 4.46% | 3.80% | 5.23% | 1.43% |
| Nissan | Micra | 93-95 | 5.64% | 4.09% | 7.77% | 3.68% |
| Honda | Civic | 82-84 | 4.62% | 3.42% | 6.23% | 2.81% |
| Honda | Civic / Ballade / Shuttle | 86-88 | 5.66% | 4.87% | 6.58% | 1.71% |
| Honda | Civic / Shuttle | 89-92 | 4.62% | 4.01% | 5.32% | 1.31% |
| Honda | Civic | 92-95 | 3.46% | 2.89% | 4.13% | 1.24% |
| Honda | Civic | 96-00 | 3.51% | 2.72% | 4.52% | 1.80% |
| Honda | Concerto | 89-93 | 3.26% | 2.15% | 4.93% | 2.77% |
| Honda | City | 84-89 | 6.92% | 4.91% | 9.74% | 4.83% |

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 90% Confidence Limit | Upper 90% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Peugeot | 306 | 93-00 | 1.57% | 0.91% | 2.70% | 1.79% |
| Rover | Quintet | 82-86 | 4.69% | 3.06% | 7.18% | 4.11% |
| Subaru | 700 / Rex | 89-92 | 8.48% | 6.90% | 10.42% | 3.52% |
| Subaru | Impreza | 93-00 | 4.27% | 3.38% | 5.39% | 2.02% |
| Holden / Suzuki | Barina / Swift / Cultus | 86-88 | 6.60% | 5.96% | 7.32% | 1.35% |
| Holden / Suzuki | Barina / Swift / Cultus | 89-93 / 89-00 | 4.80% | 4.43% | 5.20% | 0.77% |
| Suzuki | Alto | 82-84 | 8.28% | 6.86% | 9.99% | 3.13% |
| Suzuki | Baleno / Cultus Cresent | 95-99 | 3.40% | 2.20% | 5.24% | 3.03% |
| Toyota | Corolla | 82-84 | 4.41% | 4.09% | 4.76% | 0.67% |
| Toyota | Corolla | 86-88 | 4.29% | 4.01% | 4.60% | 0.59% |
| Toyota / Holden | Corolla / Nova | 88-92 | 3.89% | 3.65% | 4.14% | 0.49% |
| Toyota / Holden | Corolla / Nova | 93-97 | 3.53% | 3.22% | 3.87% | 0.65% |
| Toyota | Corolla | 98-00 | 1.65% | 1.00% | 2.71% | 1.72% |
| Toyota | Tercel | 85-88 | 4.38% | 3.07% | 6.26% | 3.19% |
| Toyota | Starlet | 96-98 | 4.60% | 3.80% | 5.57% | 1.77% |
| Volkswagen | Golf | 95-98 | 2.54% | 1.54% | 4.20% | 2.67% |
| **Sports Cars** | | | | **3.48%** | **3.87%** | **0.40%** |
| Ford | Capri | 90-94 | 4.47% | 3.52% | 5.68% | 2.16% |
| Hyundai | Coupe | 96-00 | 5.66% | 3.78% | 8.48% | 4.70% |
| Mazda | RX7 | 81-86 | 3.94% | 2.82% | 5.49% | 2.67% |
| Mazda | RX7 | 86-91 | 2.55% | 1.57% | 4.16% | 2.60% |
| Mazda | MX5 / Eunos Roadster | 89-97 | 3.36% | 2.16% | 5.23% | 3.06% |
| Nissan | 300ZX / Fairlady Z | 90-95 | 3.36% | 2.18% | 5.19% | 3.01% |
| Nissan | Exa | 83-86 | 6.08% | 4.44% | 8.34% | 3.91% |
| Nissan | Exa | 86-91 | 3.88% | 2.32% | 6.48% | 4.16% |
| Nissan | NX/NX-R | 93-95 | 7.55% | 5.63% | 10.13% | 4.50% |
| Nissan | 200SX / Silvia | 94-99 | 4.17% | 2.36% | 7.40% | 5.04% |
| Honda | CRX | 87-91 | 5.65% | 4.30% | 7.43% | 3.13% |
| Honda | Prelude | 83-91 | 3.79% | 3.17% | 4.53% | 1.36% |
| Honda | Prelude | 92-96 | 4.31% | 3.24% | 5.74% | 2.50% |
| Honda | Integra | 86-88 | 3.77% | 2.51% | 5.65% | 3.13% |
| Honda | Integra | 91-93 | 2.75% | 1.72% | 4.39% | 2.67% |
| Honda | Integra | 93-00 | 1.84% | 1.01% | 3.35% | 2.33% |
| Renault | Feugo | 81-86 | 2.98% | 1.84% | 4.81% | 2.97% |
| Toyota | Celica | 81-85 | 3.28% | 2.75% | 3.92% | 1.17% |
| Toyota | Celica | 86-89 | 4.04% | 3.30% | 4.96% | 1.66% |
| Toyota | Celica | 90-93 | 3.40% | 2.70% | 4.29% | 1.59% |
| Toyota | Celica | 94-00 | 3.75% | 2.56% | 5.50% | 2.94% |
| Toyota | Supra | 86-92 | 5.27% | 3.58% | 7.75% | 4.17% |
| Toyota | MR2 | 85-89 | 7.73% | 5.45% | 10.96% | 5.51% |
| Toyota | Paseo / Cynos | 91-97 | 4.02% | 3.06% | 5.28% | 2.23% |

# AGGRESSIVITY INJURY RISK
# AGGRESSIVITY INJURY SEVERITY AND
# RATINGS OF VEHICLE AGGRESSIVITY
# (with 95% and 90% CONFIDENCE LIMITS),
# TOWARDS OTHER VEHICLE DRIVERS

# AGGRESSIVITY INJURY RISK RATINGS

## NSW Data (1997-2000), New Zealand, Queensland and Western Australia Data (1991-2000)

| Make | Model of Car | Years of Manufacture | Pr(Risk) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| **ALL MODEL AVERAGE** | | | **14.65** | | | |
| **4-Wheel Drive Vehicles** | | | **17.46%** | **16.98%** | **17.94%** | **0.95%** |
| Daihatsu | Feroza / Rocky | 89-97 | 17.18% | 13.28% | 21.94% | 8.66% |
| Daihatsu | Rocky / Rugger | 85-98 | 14.52% | 9.94% | 20.72% | 10.78% |
| Holden / Isuzu | Jackaroo / Bighorn | 82-91 | 21.38% | 16.90% | 26.65% | 9.75% |
| Holden / Isuzu | Jackaroo / Bighorn | 92-98 | 20.60% | 15.43% | 26.97% | 11.54% |
| Mitsubishi | Pajero | 84-91 | 20.02% | 17.07% | 23.33% | 6.26% |
| Mitsubishi | Pajero | 92-99 | 17.48% | 15.14% | 20.11% | 4.97% |
| Nissan | Patrol | 82-87 | 19.52% | 16.49% | 22.97% | 6.48% |
| Nissan / Ford | Patrol / Maverick | 88-98 | 18.53% | 17.02% | 20.15% | 3.13% |
| Nissan | Patrol | 99-00 | 21.56% | 16.79% | 27.24% | 10.45% |
| Nissan | Pathfinder / Terrano | 96-00 | 22.40% | 16.06% | 30.34% | 14.28% |
| Lada | Niva | 84-99 | 16.10% | 11.46% | 22.15% | 10.68% |
| Land Rover | Range Rover | 82-94 | 20.20% | 16.15% | 24.97% | 8.82% |
| Suzuki | Vitara / Escudo | 88-98 | 16.81% | 13.55% | 20.67% | 7.12% |
| Suzuki | Samurai / SJ410 / SJ413 | 82-99 | 14.65% | 12.84% | 16.66% | 3.82% |
| Toyota | 4Runner/Hilux | 79-83 | 18.58% | 16.62% | 20.71% | 4.09% |
| Toyota | 4Runner/Hilux | 85-89 | 17.45% | 15.46% | 19.63% | 4.17% |
| Toyota | 4Runner/Hilux | 90-97 | 16.63% | 15.52% | 17.79% | 2.27% |
| Toyota | Hilux | 98-00 | 15.16% | 11.74% | 19.36% | 7.62% |
| Toyota | Landcruiser | 82-89 | 21.24% | 19.73% | 22.82% | 3.09% |
| Toyota | Landcruiser | 90-97 | 20.41% | 18.98% | 21.92% | 2.94% |
| Toyota | Landcruiser | 98-00 | 19.27% | 15.64% | 23.51% | 7.87% |
| **Commercial Vehicles** | | | **16.18%** | **15.70%** | **16.67%** | **0.98%** |
| Ford | Falcon Panel Van | 85-95 | 15.69% | 13.93% | 17.63% | 3.70% |
| Ford / Nissan | Falcon Ute / XFN Ute | 85-93 | 17.03% | 15.73% | 18.40% | 2.67% |
| Ford | Falcon Ute | 94-99 | 16.33% | 13.27% | 19.94% | 6.66% |
| Ford | Ford F-Series | 79-92 | 23.38% | 19.04% | 28.35% | 9.31% |
| Ford | Transit | 95-00 | 15.43% | 11.67% | 20.14% | 8.48% |
| Holden | Commodore Ute VG/VP | 90-94 | 14.37% | 11.32% | 18.07% | 6.76% |
| Isuzu | Pickup | 82-85 | 18.17% | 13.69% | 23.71% | 10.02% |
| Isuzu / Holden | Pickup / Rodeo | 89-95 | 17.00% | 15.41% | 18.72% | 3.31% |
| Holden | Rodeo | 96-98 | 16.87% | 13.96% | 20.25% | 6.29% |
| Holden | Rodeo | 99-00 | 17.69% | 12.84% | 23.87% | 11.03% |
| Holden | WB Series | 80-84 | 18.51% | 15.64% | 21.76% | 6.12% |
| Holden | Commodore Ute VR/VS | 96-00 | 14.74% | 12.99% | 16.68% | 3.69% |
| Nissan | 720 Ute | 82-85 | 18.15% | 14.93% | 21.89% | 6.96% |
| Nissan | Navara | 86-91 | 16.55% | 14.58% | 18.72% | 4.14% |
| Nissan | Navara | 92-98 | 16.51% | 13.51% | 20.03% | 6.52% |
| Subaru | Brumby | 82-92 | 14.13% | 11.11% | 17.81% | 6.70% |
| Toyota | Hiace/Liteace | 82-86 | 19.17% | 17.19% | 21.33% | 4.14% |
| Toyota | Hiace/Liteace | 87-92 | 19.08% | 16.46% | 22.00% | 5.54% |
| Toyota | Hiace/Liteace | 93-00 | 19.54% | 17.74% | 21.47% | 3.73% |
| Volkswagon | Caravelle / Transporter | 97-00 | 16.50% | 12.67% | 21.21% | 8.54% |

| Make | Model of Car | Years of Manufacture | Pr(Risk) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| **Large Cars** | | | **14.45%** | **14.21%** | **14.69%** | **0.48%** |
| Ford | Falcon XE/XF | 82-88 | 16.09% | 15.51% | 16.68% | 1.16% |
| Ford | Falcon EA / Falcon EB Series I | 88-92 | 15.76% | 15.12% | 16.43% | 1.31% |
| Ford | Falcon EB Series II / Falcon ED | 92-94 | 16.45% | 15.50% | 17.45% | 1.96% |
| Ford | Falcon EF/EL | 94-98 | 15.05% | 14.31% | 15.82% | 1.51% |
| Ford | Falcon AU | 98-00 | 15.37% | 13.42% | 17.53% | 4.11% |
| Holden / Toyota | Commodore VN/VP / Lexcen | 89-92 | 14.66% | 14.05% | 15.29% | 1.24% |
| Holden / Toyota | Commodore VR/VS / Lexcen | 93-97 | 14.12% | 13.43% | 14.84% | 1.41% |
| Holden | Commodore VT/VX | 97-00 | 15.53% | 14.23% | 16.93% | 2.70% |
| Holden | Commodore VB-VL | 82-89 | 15.26% | 14.69% | 15.86% | 1.17% |
| Hyundai | Sonata | 89-98 | 14.70% | 12.62% | 17.06% | 4.43% |
| Mitsubishi | Magna / Sigma / V3000 | 85-90 | 14.49% | 13.61% | 15.41% | 1.80% |
| Mitsubishi | Magna / Verada / Diamante | 96-00 | 15.16% | 14.33% | 16.02% | 1.69% |
| Mitsubishi | Magna / Verada / V3000 / Diamante | 91-96 | 15.30% | 14.18% | 16.49% | 2.32% |
| Nissan | Skyline | 83-88 | 15.65% | 13.98% | 17.48% | 3.50% |
| Holden / Toyota | Apollo JM / JP / Camry / Sceptor | 94-97 | 15.12% | 14.24% | 16.05% | 1.81% |
| Toyota | Camry | 98-00 | 13.81% | 12.06% | 15.77% | 3.71% |
| **Luxury Cars** | | | **13.36%** | **12.87%** | **13.86%** | **0.99%** |
| BMW | 3 Series | 82-91 | 13.46% | 11.29% | 15.97% | 4.68% |
| BMW | 3 Series | 92-98 | 12.39% | 10.36% | 14.75% | 4.39% |
| BMW | 5 Series | 81-88 | 15.96% | 11.30% | 22.07% | 10.77% |
| BMW | 5 Series | 89-95 | 15.31% | 13.34% | 17.51% | 4.18% |
| Ford | Fairlane Z & LTD F | 79-88 | 13.15% | 11.56% | 14.93% | 3.37% |
| Ford | Fairlane N & LTD D | 88-95 | 15.38% | 12.19% | 19.21% | 7.02% |
| Holden | Stateman/Caprice VQ | 90-93 | 14.26% | 10.76% | 18.66% | 7.90% |
| Holden | Stateman/Caprice VR/VS | 94-99 | 13.65% | 11.09% | 16.68% | 5.59% |
| Jaguar | XJ6 | 79-86 | 18.01% | 14.13% | 22.68% | 8.55% |
| Mazda | 929 / Luce | 82-91 | 15.69% | 13.66% | 17.97% | 4.31% |
| Mercedes Benz | C-Class W202 | 94-00 | 12.17% | 8.56% | 17.02% | 8.45% |
| Mercedes Benz | E-Class W124 | 86-94 | 14.78% | 11.08% | 19.43% | 8.34% |
| Nissan | Maxima | 91-94 | 13.41% | 9.21% | 19.12% | 9.91% |
| Honda | Legend | 91-96 | 20.66% | 15.89% | 26.42% | 10.53% |
| Honda | Accord | 82-86 | 14.09% | 11.63% | 16.97% | 5.34% |
| Honda | Accord | 86-90 | 12.36% | 9.98% | 15.21% | 5.22% |
| Honda | Accord | 90-93 | 11.75% | 8.88% | 15.41% | 6.53% |
| Honda | Accord | 94-97 | 15.21% | 12.55% | 18.32% | 5.77% |
| Saab | 9000 | 86-97 | 18.52% | 14.09% | 23.95% | 9.86% |
| Toyota | Crown / Cressida / Mark II | 81-85 | 15.14% | 12.78% | 17.84% | 5.07% |
| Toyota | Cressida / Mark II | 89-92 | 14.06% | 11.54% | 17.02% | 5.48% |
| Volvo | 850/S70/V70/C70 | 93-00 | 13.94% | 10.27% | 18.66% | 8.39% |
| Volvo | 200 Series | 87-93 | 13.39% | 11.34% | 15.75% | 4.41% |
| Volvo | 700/900 Series | 83-91 | 13.53% | 10.95% | 16.61% | 5.66% |
| **Medium Cars** | | | **13.67%** | **13.37%** | **13.97%** | **0.61%** |
| Daewoo | Nubira | 97-00 | 15.08% | 11.21% | 19.98% | 8.77% |
| Ford | Cortina | 82-82 | 15.61% | 13.92% | 17.45% | 3.53% |
| Ford | Mondeo | 97-00 | 15.61% | 12.33% | 19.57% | 7.23% |
| Holden | Camira | 82-89 | 15.61% | 14.52% | 16.76% | 2.25% |
| Holden | Vectra | 96-00 | 16.62% | 12.69% | 21.46% | 8.78% |
| Mitsubishi | Sigma / Scorpion / Sapparo / | 82-84 | 14.00% | 13.16% | 14.88% | 1.73% |

| Make | Model of Car | Years of Manufacture | Pr(Risk) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| | Lambda | | | | | |
| Mitsubishi | Chariot / Spacewagon | 85-91 | 12.83% | 8.05% | 19.83% | 11.78% |
| Mitsubishi | Galant | 94-97 | 12.72% | 9.73% | 16.46% | 6.73% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 83-87 | 14.09% | 12.86% | 15.42% | 2.55% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 88-92 | 14.51% | 12.64% | 16.61% | 3.97% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella / Cronos | 92-97 | 13.46% | 11.69% | 15.47% | 3.78% |
| Nissan | Pintara | 86-88 | 15.11% | 13.44% | 16.95% | 3.51% |
| Nissan | Bluebird | 89-92 | 15.39% | 14.09% | 16.79% | 2.70% |
| Nissan | Bluebird | 83-88 | 13.86% | 12.87% | 14.91% | 2.04% |
| Nissan | Stanza | 82-83 | 14.01% | 9.86% | 19.52% | 9.65% |
| Nissan | Silvia | 84-86 | 15.48% | 10.34% | 22.52% | 12.17% |
| Nissan | Bluebird | 92-97 | 11.38% | 7.92% | 16.10% | 8.18% |
| Subaru | Leone / Omega / 4WD Wagon | 88-93 | 13.05% | 11.52% | 14.76% | 3.24% |
| Subaru | Legacy | 89-93 | 13.91% | 12.05% | 16.02% | 3.97% |
| Subaru | Legacy | 94-98 | 14.35% | 11.34% | 18.00% | 6.66% |
| Toyota | Corona | 82-88 | 14.21% | 13.45% | 15.00% | 1.56% |
| Toyota | Camry | 81-86 | 14.34% | 12.70% | 16.15% | 3.44% |
| Holden / Toyota | Apollo JK/JL / Camry / Vista | 90-93 | 15.08% | 14.33% | 15.88% | 1.55% |
| **Passenger Van** | | | **16.55%** | **15.65%** | **17.48%** | **1.83%** |
| Mitsubishi | Starwagon / L300 | 83-86 | 19.53% | 17.11% | 22.21% | 5.10% |
| Mitsubishi | Starwagon / Delica Starwagon | 87-93 | 18.62% | 16.54% | 20.90% | 4.36% |
| Mitsubishi | Starwagon / Delica Spacegear | 93-00 | 16.97% | 13.91% | 20.55% | 6.64% |
| Toyota | Tarago | 85-90 | 16.62% | 14.86% | 18.55% | 3.69% |
| Toyota | Previa / Estima | 91-99 | 14.80% | 12.35% | 17.64% | 5.29% |
| **Small Cars** | | | **12.58%** | **12.35%** | **12.81%** | **0.47%** |
| Daihatsu | Charade | 82-87 | 12.33% | 10.01% | 15.10% | 5.09% |
| Daihatsu | Charade | 88-93 | 12.03% | 10.73% | 13.46% | 2.73% |
| Daihatsu | Charade | 93-00 | 13.41% | 11.83% | 15.16% | 3.33% |
| Daihatsu | Applause | 89-98 | 14.65% | 12.48% | 17.13% | 4.65% |
| Daewoo | Cielo | 95-97 | 13.15% | 10.89% | 15.78% | 4.89% |
| Daewoo | Lanos | 97-00 | 16.47% | 13.35% | 20.16% | 6.81% |
| Ford | Laser | 90-94 | 12.81% | 11.76% | 13.93% | 2.17% |
| Ford | Laser | 95-97 | 13.68% | 11.43% | 16.29% | 4.86% |
| Ford | Festiva WD/WD/WH/WF | 94-00 | 14.75% | 13.11% | 16.54% | 3.43% |
| Holden | Gemini | 82-84 | 11.49% | 10.30% | 12.80% | 2.50% |
| Holden | Gemini RB | 86-89 | 12.75% | 9.71% | 16.55% | 6.84% |
| Holden | Astra TR | 95-98 | 13.67% | 9.94% | 18.52% | 8.57% |
| Holden | Barina SB | 95-00 | 14.44% | 12.61% | 16.49% | 3.88% |
| Hyundai | Excel | 86-90 | 14.95% | 13.05% | 17.07% | 4.02% |
| Hyundai | Excel | 90-95 | 13.24% | 12.17% | 14.40% | 2.23% |
| Hyundai | Excel | 95-00 | 13.98% | 13.03% | 14.98% | 1.95% |
| Hyundai | Lantra | 91-93 | 14.62% | 12.03% | 17.65% | 5.62% |
| Hyundai | Lantra | 94-00 | 13.72% | 11.46% | 16.35% | 4.90% |
| Mitsubishi | Mirage / Colt | 82-88 / 87-88 | 13.36% | 12.41% | 14.37% | 1.97% |
| Mitsubishi | Lancer / Mirage CA | 89-90 | 12.25% | 10.93% | 13.71% | 2.78% |
| Mitsubishi | Lancer / Mirage CC | 93-95 | 12.70% | 11.12% | 14.46% | 3.34% |
| Mitsubishi | Lancer / Mirage CE | 96-00 | 14.32% | 12.83% | 15.95% | 3.12% |
| Mitsubishi | Cordia | 83-87 | 15.16% | 12.52% | 18.24% | 5.72% |
| Ford / Mazda | Laser / 323 / Familia | 82-89 | 13.46% | 12.87% | 14.07% | 1.20% |
| Mazda | 323 / Familia / Lantis | 90-93 | 12.87% | 10.95% | 15.06% | 4.11% |

| Make | Model of Car | Years of Manufacture | Pr(Risk) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Mazda | 323 / Familia / Lantis | 95-98 | 12.83% | 10.80% | 15.18% | 4.39% |
| Ford / Mazda | Festiva WA / 121 | 90-94 / 87-91 | 13.63% | 12.41% | 14.94% | 2.54% |
| Mazda | 121 / Autozam Review | 91-97 | 11.22% | 9.19% | 13.62% | 4.43% |
| Nissan | Pulsar / Langley | 83-86 | 12.02% | 11.01% | 13.11% | 2.10% |
| Nissan | Pulsar / Sentra | 87-91 | 13.21% | 12.20% | 14.30% | 2.09% |
| Nissan | Pulsar / Sentra | 91-95 | 13.40% | 11.81% | 15.17% | 3.37% |
| Nissan | Pulsar / Sentra | 96-00 | 14.65% | 12.73% | 16.80% | 4.07% |
| Honda | Civic / Ballade / Shuttle | 86-88 | 13.83% | 11.60% | 16.40% | 4.81% |
| Honda | Civic / Shuttle | 89-92 | 13.15% | 11.39% | 15.15% | 3.76% |
| Honda | Civic | 92-95 | 13.15% | 11.33% | 15.21% | 3.88% |
| Honda | Civic | 96-00 | 16.41% | 13.99% | 19.16% | 5.17% |
| Subaru | 700 / Rex | 89-92 | 13.47% | 9.68% | 18.44% | 8.76% |
| Subaru | Impreza | 93-00 | 15.82% | 12.58% | 19.70% | 7.13% |
| Holden / Suzuki | Barina / Swift / Cultus | 86-88 | 12.79% | 11.13% | 14.65% | 3.52% |
| Holden / Suzuki | Barina / Swift / Cultus | 89-93 / 89-00 | 12.11% | 11.16% | 13.13% | 1.97% |
| Toyota | Corolla | 82-84 | 12.34% | 11.37% | 13.39% | 2.02% |
| Toyota | Corolla | 86-88 | 13.15% | 12.23% | 14.12% | 1.89% |
| Toyota / Holden | Corolla / Nova | 88-92 | 13.42% | 12.60% | 14.28% | 1.68% |
| Toyota / Holden | Corolla / Nova | 93-97 | 14.55% | 13.42% | 15.75% | 2.33% |
| Toyota | Starlet | 96-98 | 15.27% | 12.97% | 17.90% | 4.94% |
| **Sports Cars** | | | **13.67%** | **12.96%** | **14.42%** | **1.46%** |
| Ford | Capri | 90-94 | 13.05% | 10.33% | 16.36% | 6.04% |
| Nissan | Exa | 83-86 | 20.31% | 14.72% | 27.35% | 12.63% |
| Nissan | NX/NX-R | 93-95 | 18.28% | 13.31% | 24.58% | 11.27% |
| Honda | Prelude | 83-91 | 12.89% | 10.88% | 15.20% | 4.33% |
| Honda | Prelude | 92-96 | 12.75% | 9.45% | 16.98% | 7.52% |
| Honda | Integra | 93-00 | 13.28% | 8.80% | 19.55% | 10.75% |
| Honda | CRX | 87-91 | 13.54% | 8.05% | 21.89% | 13.84% |
| Toyota | Celica | 81-85 | 17.05% | 14.85% | 19.49% | 4.64% |
| Toyota | Celica | 86-89 | 15.08% | 12.46% | 18.14% | 5.68% |
| Toyota | Celica | 90-93 | 12.98% | 10.37% | 16.12% | 5.75% |
| Toyota | Supra | 86-92 | 29.09% | 21.24% | 38.42% | 17.18% |

# AGGRESSIVITY INJURY SEVERITY RATINGS
## Victoria and NSW Data (1997-2000), New Zealand, Queensland and Western Australia Data (1991-2000)

| Make | Model of Car | Years of Manufacture | Pr(Severe) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| **ALL MODEL AVERAGE** | | | **16.81%** | | | |
| **4-Wheel Drive Vehicles** | | | **19.57%** | **18.55%** | **20.62%** | **2.07%** |
| Daihatsu | Feroza / Rocky | 89-97 | 18.38% | 9.78% | 31.86% | 22.08% |
| Daihatsu | Rocky / Rugger | 85-98 | 23.76% | 12.09% | 41.41% | 29.33% |
| Holden / Isuzu | Jackaroo / Bighorn | 82-91 | 19.79% | 13.46% | 28.12% | 14.65% |
| Holden / Isuzu | Jackaroo / Bighorn | 92-98 | 15.91% | 9.06% | 26.44% | 17.39% |
| Mitsubishi | Pajero | 84-91 | 19.19% | 14.60% | 24.79% | 10.19% |
| Mitsubishi | Pajero | 92-99 | 20.26% | 15.11% | 26.63% | 11.52% |
| Nissan | Patrol | 82-87 | 23.11% | 17.26% | 30.23% | 12.97% |
| Nissan / Ford | Patrol / Maverick | 88-98 | 21.38% | 18.05% | 25.13% | 7.08% |
| Nissan | Patrol | 99-00 | 26.95% | 17.51% | 39.07% | 21.56% |
| Nissan | Pathfinder / Terrano | 96-00 | 23.84% | 13.33% | 38.92% | 25.59% |
| Lada | Niva | 84-99 | 24.84% | 13.84% | 40.46% | 26.62% |
| Land Rover | Range Rover | 82-94 | 22.67% | 14.73% | 33.23% | 18.50% |
| Suzuki | Vitara / Escudo | 88-98 | 14.95% | 9.29% | 23.17% | 13.88% |
| Suzuki | Samurai / SJ410 / SJ413 | 82-99 | 10.34% | 6.51% | 16.04% | 9.53% |
| Toyota | 4Runner/Hilux | 79-83 | 20.41% | 16.45% | 25.05% | 8.61% |
| Toyota | 4Runner/Hilux | 85-89 | 18.32% | 14.79% | 22.47% | 7.68% |
| Toyota | 4Runner/Hilux | 90-97 | 19.45% | 17.22% | 21.89% | 4.67% |
| Toyota | Hilux | 98-00 | 15.47% | 8.66% | 26.11% | 17.45% |
| Toyota | Landcruiser | 82-89 | 24.29% | 20.99% | 27.92% | 6.93% |
| Toyota | Landcruiser | 90-97 | 22.67% | 19.64% | 26.01% | 6.38% |
| Toyota | Landcruiser | 98-00 | 23.74% | 17.28% | 31.69% | 14.41% |
| **Commercial Vehicles** | | | | **17.11%** | **19.28%** | **2.17%** |
| Ford | Falcon Panel Van | 85-95 | 17.95% | 13.53% | 23.42% | 9.89% |
| Ford / Nissan | Falcon Ute / XFN Ute | 85-93 | 19.10% | 15.96% | 22.70% | 6.74% |
| Ford | Falcon Ute | 94-99 | 22.96% | 15.83% | 32.08% | 16.25% |
| Ford | Ford F-Series | 79-92 | 28.16% | 19.23% | 39.21% | 19.98% |
| Ford | Transit | 95-00 | 14.27% | 8.36% | 23.29% | 14.93% |
| Holden | Commodore Ute VG/VP | 90-94 | 22.75% | 14.38% | 34.06% | 19.68% |
| Isuzu | Pickup | 82-85 | 24.75% | 15.67% | 36.80% | 21.13% |
| Isuzu / Holden | Pickup / Rodeo | 89-95 | 23.94% | 19.85% | 28.57% | 8.71% |
| Holden | Rodeo | 96-98 | 13.65% | 8.73% | 20.71% | 11.98% |
| Holden | Rodeo | 99-00 | 20.62% | 10.85% | 35.67% | 24.82% |
| Holden | WB Series | 80-84 | 17.57% | 11.65% | 25.61% | 13.96% |
| Holden | Commodore Ute VR/VS | 96-00 | 23.13% | 18.30% | 28.80% | 10.50% |
| Nissan | 720 Ute | 82-85 | 14.70% | 9.54% | 21.97% | 12.44% |
| Nissan | Navara | 86-91 | 17.67% | 13.99% | 22.08% | 8.09% |
| Nissan | Navara | 92-98 | 18.90% | 13.34% | 26.09% | 12.75% |
| Subaru | Brumby | 82-92 | 17.19% | 10.06% | 27.80% | 17.75% |
| Toyota | Hiace/Liteace | 82-86 | 17.28% | 14.18% | 20.89% | 6.71% |
| Toyota | Hiace/Liteace | 87-92 | 19.21% | 15.26% | 23.91% | 8.65% |

| Make | Model of Car | Years of Manufacture | Pr(Severe) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Toyota | Hiace/Liteace | 93-00 | 16.22% | 13.44% | 19.44% | 6.00% |
| Volkswagon | Caravelle / Transporter | 97-00 | 29.92% | 19.13% | 43.54% | 24.41% |
| **Large Cars** | | | | **16.64%** | **17.89%** | **1.24%** |
| Ford | Falcon XE/XF | 82-88 | 17.89% | 16.51% | 19.36% | 2.85% |
| Ford | Falcon EA / Falcon EB Series I | 88-92 | 19.27% | 17.66% | 21.00% | 3.34% |
| Ford | Falcon EB Series II / Falcon ED | 92-94 | 20.40% | 18.03% | 23.00% | 4.97% |
| Ford | Falcon EF/EL | 94-98 | 18.37% | 16.56% | 20.33% | 3.77% |
| Ford | Falcon AU | 98-00 | 15.23% | 11.41% | 20.04% | 8.63% |
| Holden / Toyota | Commodore VN/VP / Lexcen | 89-92 | 17.52% | 15.96% | 19.21% | 3.25% |
| Holden / Toyota | Commodore VR/VS / Lexcen | 93-97 | 18.34% | 16.54% | 20.29% | 3.75% |
| Holden | Commodore VT/VX | 97-00 | 18.32% | 15.31% | 21.77% | 6.46% |
| Holden | Commodore VB-VL | 82-89 | 18.34% | 16.73% | 20.06% | 3.33% |
| Hyundai | Sonata | 89-98 | 17.43% | 12.27% | 24.16% | 11.90% |
| Mitsubishi | Magna / Sigma / V3000 | 85-90 | 16.07% | 14.09% | 18.27% | 4.18% |
| Mitsubishi | Magna / Verada / Diamante | 96-00 | 17.48% | 15.15% | 20.07% | 4.92% |
| Mitsubishi | Magna / Verada / V3000 / Diamante | 91-96 | 17.07% | 14.83% | 19.58% | 4.75% |
| Nissan | Skyline | 83-88 | 15.72% | 12.45% | 19.65% | 7.20% |
| Holden / Toyota | Apollo JM / JP / Camry / Sceptor | 94-97 | 16.19% | 14.01% | 18.62% | 4.61% |
| Toyota | Camry | 98-00 | 20.95% | 16.04% | 26.87% | 10.83% |
| **Luxury Cars** | | | | **15.77%** | **18.33%** | **2.56%** |
| BMW | 3 Series | 82-91 | 19.06% | 13.76% | 25.79% | 12.03% |
| BMW | 3 Series | 92-98 | 22.49% | 15.99% | 30.67% | 14.68% |
| BMW | 5 Series | 81-88 | 17.77% | 9.33% | 31.23% | 21.90% |
| BMW | 5 Series | 89-95 | 17.14% | 12.80% | 22.56% | 9.76% |
| Ford | Fairlane Z & LTD F | 79-88 | 15.66% | 11.86% | 20.40% | 8.54% |
| Ford | Fairlane N & LTD D | 88-95 | 18.20% | 11.66% | 27.29% | 15.63% |
| Holden | Stateman/Caprice VQ | 90-93 | 22.67% | 12.47% | 37.62% | 25.15% |
| Holden | Stateman/Caprice VR/VS | 94-99 | 19.29% | 13.16% | 27.38% | 14.22% |
| Jaguar | XJ6 | 79-86 | 17.59% | 10.28% | 28.45% | 18.17% |
| Mazda | 929 / Luce | 82-91 | 14.13% | 10.47% | 18.79% | 8.32% |
| Mercedes Benz | C-Class W202 | 94-00 | 23.89% | 12.30% | 41.24% | 28.94% |
| Mercedes Benz | E-Class W124 | 86-94 | 24.03% | 15.11% | 35.99% | 20.88% |
| Nissan | Maxima | 91-94 | 16.99% | 10.64% | 26.04% | 15.40% |
| Honda | Legend | 91-96 | 18.87% | 10.07% | 32.58% | 22.51% |
| Honda | Accord | 82-86 | 22.60% | 14.27% | 33.88% | 19.61% |
| Honda | Accord | 86-90 | 17.63% | 10.84% | 27.38% | 16.54% |
| Honda | Accord | 90-93 | 19.58% | 10.23% | 34.24% | 24.01% |
| Honda | Accord | 94-97 | 17.10% | 10.57% | 26.48% | 15.92% |
| Saab | 9000 | 86-97 | 15.98% | 8.05% | 29.24% | 21.19% |
| Toyota | Crown / Cressida / Mark II | 81-85 | 22.99% | 17.49% | 29.60% | 12.11% |
| Toyota | Cressida / Mark II | 89-92 | 15.96% | 10.09% | 24.31% | 14.21% |
| Volvo | 850/S70/V70/C70 | 93-00 | 28.44% | 17.67% | 42.40% | 24.73% |
| Volvo | 200 Series | 87-93 | 17.40% | 11.43% | 25.59% | 14.16% |
| Volvo | 700/900 Series | 83-91 | 17.68% | 11.29% | 26.62% | 15.33% |
| **Medium Cars** | | | | **14.97%** | **16.43%** | **1.46%** |
| Daewoo | Nubira | 97-00 | 21.24% | 11.63% | 35.60% | 23.97% |
| Ford | Cortina | 82-82 | 15.34% | 11.98% | 19.43% | 7.45% |
| Ford | Mondeo | 97-00 | 17.29% | 10.82% | 26.48% | 15.66% |

| Make | Model of Car | Years of Manufacture | Pr(Severe) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Holden | Camira | 82-89 | 13.70% | 11.34% | 16.45% | 5.11% |
| Holden | Vectra | 96-00 | 13.64% | 7.94% | 22.42% | 14.48% |
| Mitsubishi | Sigma / Scorpion / Sapparo / Lambda | 82-84 | 16.57% | 14.41% | 18.98% | 4.57% |
| Mitsubishi | Chariot / Spacewagon | 85-91 | 15.71% | 9.39% | 25.11% | 15.72% |
| Mitsubishi | Galant | 94-97 | 19.33% | 13.30% | 27.23% | 13.94% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella** | 83-87 | 15.14% | 13.03% | 17.52% | 4.48% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella** | 88-92 | 19.89% | 16.75% | 23.46% | 6.72% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella / Cronos | 92-97 | 15.17% | 12.14% | 18.78% | 6.64% |
| Nissan | Pintara | 86-88 | 17.77% | 13.52% | 23.01% | 9.49% |
| Nissan | Bluebird | 89-92 | 19.17% | 16.00% | 22.80% | 6.80% |
| Nissan | Bluebird** | 83-88 | 14.73% | 12.52% | 17.26% | 4.74% |
| Nissan | Stanza | 82-83 | 25.86% | 12.86% | 45.18% | 32.32% |
| Nissan | Silvia | 84-86 | 15.40% | 9.00% | 25.10% | 16.10% |
| Nissan | Bluebird | 92-97 | 13.33% | 9.28% | 18.78% | 9.50% |
| Subaru | Leone / Omega / 4WD Wagon | 88-93 | 11.91% | 9.02% | 15.56% | 6.54% |
| Subaru | Legacy | 89-93 | 17.59% | 14.10% | 21.72% | 7.62% |
| Subaru | Legacy | 94-98 | 22.88% | 15.25% | 32.86% | 17.61% |
| Toyota | Corona | 82-88 | 15.97% | 13.75% | 18.46% | 4.71% |
| Toyota | Camry | 81-86 | 20.07% | 15.22% | 26.00% | 10.77% |
| Holden / Toyota | Apollo JK/JL / Camry / Vista | 90-93 | 16.59% | 14.73% | 18.64% | 3.91% |
| **Passenger Van** | | | | **14.25%** | **18.39%** | **4.14%** |
| Mitsubishi | Starwagon / L300 | 83-86 | 17.65% | 13.28% | 23.08% | 9.80% |
| Mitsubishi | Starwagon / Delica Starwagon | 87-93 | 16.30% | 12.61% | 20.83% | 8.22% |
| Mitsubishi | Starwagon / Delica Spacegear | 93-00 | 16.52% | 10.11% | 25.81% | 15.70% |
| Toyota | Tarago | 85-90 | 18.73% | 13.91% | 24.75% | 10.84% |
| Toyota | Previa / Estima | 91-99 | 13.79% | 8.66% | 21.23% | 12.57% |
| **Small Cars** | | | | **14.17%** | **15.37%** | **1.20%** |
| Daihatsu | Charade | 82-87 | 17.03% | 10.24% | 26.97% | 16.73% |
| Daihatsu | Charade | 88-93 | 12.75% | 8.91% | 17.92% | 9.01% |
| Daihatsu | Charade | 93-00 | 12.70% | 8.29% | 18.97% | 10.68% |
| Daihatsu | Applause | 89-98 | 15.21% | 9.72% | 23.02% | 13.30% |
| Daewoo | Cielo | 95-97 | 14.96% | 9.25% | 23.27% | 14.02% |
| Daewoo | Lanos | 97-00 | 17.96% | 11.13% | 27.68% | 16.55% |
| Ford | Laser | 90-94 | 16.58% | 14.02% | 19.51% | 5.49% |
| Ford | Laser | 95-97 | 24.38% | 18.16% | 31.90% | 13.74% |
| Ford | Festiva WD/WD/WH/WF | 94-00 | 15.35% | 11.44% | 20.29% | 8.85% |
| Holden | Gemini | 82-84 | 14.60% | 10.83% | 19.38% | 8.55% |
| Holden | Gemini RB | 86-89 | 18.18% | 9.19% | 32.81% | 23.62% |
| Holden | Astra TR | 95-98 | 22.83% | 12.71% | 37.54% | 24.83% |
| Holden | Barina SB | 95-00 | 18.52% | 13.23% | 25.32% | 12.10% |
| Hyundai | Excel | 86-90 | 13.89% | 9.82% | 19.30% | 9.47% |
| Hyundai | Excel | 90-95 | 14.28% | 11.13% | 18.15% | 7.01% |
| Hyundai | Excel | 95-00 | 17.81% | 14.97% | 21.06% | 6.09% |
| Hyundai | Lantra | 91-93 | 19.53% | 12.07% | 30.03% | 17.96% |
| Hyundai | Lantra | 94-00 | 13.58% | 8.42% | 21.17% | 12.75% |
| Mitsubishi | Mirage / Colt | 82-88 / 87-88 | 16.14% | 13.36% | 19.37% | 6.00% |
| Mitsubishi | Lancer / Mirage CA | 89-90 | 16.07% | 12.89% | 19.85% | 6.96% |
| Mitsubishi | Lancer / Mirage CC | 93-95 | 13.53% | 9.99% | 18.06% | 8.07% |
| Mitsubishi | Lancer / Mirage CE | 96-00 | 18.62% | 14.40% | 23.74% | 9.33% |

| Make | Model of Car | Years of Manufacture | Pr(Severe) % | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Mitsubishi | Cordia | 83-87 | 21.47% | 16.65% | 27.24% | 10.59% |
| Ford / Mazda | Laser / 323 / Familia | 82-89 | 14.41% | 13.15% | 15.77% | 2.63% |
| Mazda | 323 / Familia / Lantis | 90-93 | 12.25% | 9.48% | 15.70% | 6.22% |
| Mazda | 323 / Familia / Lantis | 95-98 | 14.08% | 8.98% | 21.40% | 12.43% |
| Ford / Mazda | Festiva WA / 121 | 90-94 / 87-91 | 14.71% | 11.19% | 19.11% | 7.91% |
| Mazda | 121 / Autozam Review | 91-97 | 15.86% | 8.68% | 27.20% | 18.52% |
| Nissan | Pulsar / Langley | 83-86 | 14.59% | 11.95% | 17.70% | 5.76% |
| Nissan | Pulsar / Sentra** | 87-91 | 16.50% | 13.83% | 19.57% | 5.74% |
| Nissan | Pulsar / Sentra | 91-95 | 16.31% | 12.95% | 20.34% | 7.38% |
| Nissan | Pulsar / Sentra | 96-00 | 20.30% | 15.32% | 26.40% | 11.08% |
| Honda | Civic / Ballade / Shuttle | 86-88 | 22.32% | 14.74% | 32.33% | 17.60% |
| Honda | Civic / Shuttle | 89-92 | 18.18% | 12.68% | 25.38% | 12.70% |
| Honda | Civic | 92-95 | 17.82% | 12.24% | 25.20% | 12.96% |
| Honda | Civic | 96-00 | 7.81% | 4.10% | 14.35% | 10.25% |
| Subaru | 700 / Rex | 89-92 | 19.37% | 9.94% | 34.33% | 24.39% |
| Subaru | Impreza | 93-00 | 17.69% | 11.14% | 26.94% | 15.80% |
| Holden / Suzuki | Barina / Swift / Cultus | 86-88 | 11.76% | 8.27% | 16.45% | 8.17% |
| Holden / Suzuki | Barina / Swift / Cultus | 89-93 / 89-00 | 13.23% | 10.41% | 16.66% | 6.25% |
| Toyota | Corolla | 82-84 | 12.55% | 10.49% | 14.95% | 4.46% |
| Toyota | Corolla | 86-88 | 15.99% | 13.71% | 18.56% | 4.85% |
| Toyota / Holden | Corolla / Nova** | 88-92 | 15.43% | 13.57% | 17.50% | 3.93% |
| Toyota / Holden | Corolla / Nova | 93-97 | 15.04% | 12.54% | 17.94% | 5.40% |
| Toyota | Starlet | 96-98 | 15.17% | 9.64% | 23.06% | 13.42% |
| **Sports Cars** | | | | **14.62%** | **18.27%** | **3.66%** |
| Ford | Capri | 90-94 | 14.69% | 8.58% | 24.00% | 15.42% |
| Nissan | Exa | 83-86 | 25.82% | 14.29% | 42.08% | 27.80% |
| Nissan | NX/NX-R | 93-95 | 37.14% | 22.22% | 54.99% | 32.78% |
| Honda | Prelude | 83-91 | 12.12% | 7.41% | 19.20% | 11.79% |
| Honda | Prelude | 92-96 | 23.74% | 14.01% | 37.29% | 23.28% |
| Honda | Integra | 93-00 | 29.48% | 15.29% | 49.21% | 33.92% |
| Honda | CRX | 87-91 | 14.59% | 8.80% | 23.22% | 14.42% |
| Toyota | Celica | 81-85 | 17.59% | 13.13% | 23.16% | 10.03% |
| Toyota | Celica | 86-89 | 19.46% | 13.38% | 27.43% | 14.05% |
| Toyota | Celica | 90-93 | 22.08% | 15.68% | 30.17% | 14.49% |
| Toyota | Supra | 86-92 | 23.32% | 11.84% | 40.80% | 28.96% |

**: The injury severity performance of these vehicles may differ between Australian and New Zealand models

# AGGRESSIVITY RATINGS
# (WITH 95% CONFIDENCE LIMITS)
# Victoria and NSW Data (1997-2000), New Zealand, Queensland and Western Australia Data (1991-2000)

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| **ALL MODEL AVERAGE** | | | **2.46** | | | |
| **4-Wheel Drive Vehicles** | | | **3.42%** | **3.22%** | **3.62%** | **0.41%** |
| Daihatsu | Feroza / Rocky | 89-97 | 3.16% | 1.65% | 6.03% | 4.38% |
| Daihatsu | Rocky / Rugger | 85-98 | 3.45% | 1.67% | 7.12% | 5.45% |
| Holden / Isuzu | Jackaroo / Bighorn | 82-91 | 4.23% | 2.74% | 6.53% | 3.79% |
| Holden / Isuzu | Jackaroo / Bighorn | 92-98 | 3.28% | 1.78% | 6.02% | 4.24% |
| Mitsubishi | Pajero | 84-91 | 3.84% | 2.82% | 5.23% | 2.40% |
| Mitsubishi | Pajero | 92-99 | 3.54% | 2.58% | 4.87% | 2.29% |
| Nissan | Patrol | 82-87 | 4.51% | 3.26% | 6.25% | 3.00% |
| Nissan / Ford | Patrol / Maverick | 88-98 | 3.96% | 3.29% | 4.77% | 1.48% |
| Nissan | Patrol | 99-00 | 5.81% | 3.63% | 9.30% | 5.68% |
| Nissan | Pathfinder / Terrano | 96-00 | 5.34% | 2.85% | 10.01% | 7.16% |
| Lada | Niva | 84-99 | 4.00% | 2.12% | 7.54% | 5.42% |
| Land Rover | Range Rover | 82-94 | 4.58% | 2.88% | 7.28% | 4.40% |
| Suzuki | Vitara / Escudo | 88-98 | 2.51% | 1.52% | 4.17% | 2.65% |
| Suzuki | Samurai / SJ410 / SJ413 | 82-99 | 1.51% | 0.95% | 2.43% | 1.48% |
| Toyota | 4Runner/Hilux | 79-83 | 3.79% | 2.99% | 4.81% | 1.82% |
| Toyota | 4Runner/Hilux | 85-89 | 3.20% | 2.51% | 4.07% | 1.56% |
| Toyota | 4Runner/Hilux | 90-97 | 3.23% | 2.82% | 3.71% | 0.90% |
| Toyota | Hilux | 98-00 | 2.35% | 1.27% | 4.32% | 3.04% |
| Toyota | Landcruiser | 82-89 | 5.16% | 4.39% | 6.05% | 1.66% |
| Toyota | Landcruiser | 90-97 | 4.63% | 3.95% | 5.42% | 1.47% |
| Toyota | Landcruiser | 98-00 | 4.57% | 3.17% | 6.60% | 3.43% |
| **Commercial Vehicles** | | | | **2.75%** | **3.14%** | **0.39%** |
| Ford | Falcon Panel Van | 85-95 | 2.82% | 2.09% | 3.80% | 1.71% |
| Ford / Nissan | Falcon Ute / XFN Ute | 85-93 | 3.25% | 2.68% | 3.94% | 1.26% |
| Ford | Falcon Ute | 94-99 | 3.75% | 2.49% | 5.64% | 3.15% |
| Ford | Ford F-Series | 79-92 | 6.58% | 4.37% | 9.92% | 5.55% |
| Ford | Transit | 95-00 | 2.20% | 1.23% | 3.95% | 2.72% |
| Holden | Commodore Ute VG/VP | 90-94 | 3.27% | 2.00% | 5.35% | 3.36% |
| Isuzu | Pickup | 82-85 | 4.50% | 2.70% | 7.49% | 4.79% |
| Isuzu / Holden | Pickup / Rodeo | 89-95 | 4.07% | 3.31% | 5.00% | 1.69% |
| Holden | Rodeo | 96-98 | 2.30% | 1.44% | 3.69% | 2.26% |
| Holden | Rodeo | 99-00 | 3.65% | 1.85% | 7.18% | 5.33% |
| Holden | WB Series | 80-84 | 3.25% | 2.12% | 4.99% | 2.87% |
| Holden | Commodore Ute VR/VS | 96-00 | 3.41% | 2.63% | 4.42% | 1.79% |
| Nissan | 720 Ute | 82-85 | 2.67% | 1.68% | 4.23% | 2.55% |
| Nissan | Navara | 86-91 | 2.92% | 2.25% | 3.79% | 1.54% |
| Nissan | Navara | 92-98 | 3.12% | 2.11% | 4.61% | 2.50% |
| Subaru | Brumby | 82-92 | 2.43% | 1.38% | 4.27% | 2.89% |
| Toyota | Hiace/Liteace | 82-86 | 3.31% | 2.65% | 4.14% | 1.48% |

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Toyota | Hiace/Liteace | 87-92 | 3.67% | 2.80% | 4.79% | 1.99% |
| Toyota | Hiace/Liteace | 93-00 | 3.17% | 2.57% | 3.90% | 1.33% |
| Volkswagon | Caravelle / Transporter | 97-00 | 4.94% | 3.03% | 8.04% | 5.01% |
| **Large Cars** | | | | **2.40%** | **2.59%** | **0.20%** |
| Ford | Falcon XE/XF | 82-88 | 2.88% | 2.64% | 3.14% | 0.50% |
| Ford | Falcon EA / Falcon EB Series I | 88-92 | 3.04% | 2.76% | 3.34% | 0.58% |
| Ford | Falcon EB Series II / Falcon ED | 92-94 | 3.36% | 2.93% | 3.84% | 0.91% |
| Ford | Falcon EF/EL | 94-98 | 2.77% | 2.47% | 3.10% | 0.63% |
| Ford | Falcon AU | 98-00 | 2.34% | 1.71% | 3.20% | 1.49% |
| Holden / Toyota | Commodore VN/VP / Lexcen | 89-92 | 2.57% | 2.32% | 2.84% | 0.52% |
| Holden / Toyota | Commodore VR/VS / Lexcen | 93-97 | 2.59% | 2.31% | 2.90% | 0.59% |
| Holden | Commodore VT/VX | 97-00 | 2.85% | 2.34% | 3.46% | 1.13% |
| Holden | Commodore VB-VL | 82-89 | 2.80% | 2.54% | 3.09% | 0.55% |
| Hyundai | Sonata | 89-98 | 2.56% | 1.77% | 3.72% | 1.95% |
| Mitsubishi | Magna / Sigma / V3000 | 85-90 | 2.33% | 2.02% | 2.69% | 0.67% |
| Mitsubishi | Magna / Verada / Diamante | 96-00 | 2.65% | 2.28% | 3.08% | 0.80% |
| Mitsubishi | Magna / Verada / V3000 / Diamante | 91-96 | 2.61% | 2.23% | 3.06% | 0.83% |
| Nissan | Skyline | 83-88 | 2.46% | 1.91% | 3.17% | 1.27% |
| Holden / Toyota | Apollo JM / JP / Camry / Sceptor | 94-97 | 2.45% | 2.10% | 2.86% | 0.76% |
| Toyota | Camry | 98-00 | 2.89% | 2.16% | 3.87% | 1.71% |
| **Luxury Cars** | | | | **2.09%** | **2.47%** | **0.38%** |
| BMW | 3 Series | 82-91 | 2.57% | 1.79% | 3.67% | 1.88% |
| BMW | 3 Series | 92-98 | 2.79% | 1.92% | 4.04% | 2.12% |
| BMW | 5 Series | 81-88 | 2.84% | 1.41% | 5.69% | 4.28% |
| BMW | 5 Series | 89-95 | 2.62% | 1.91% | 3.60% | 1.68% |
| Ford | Fairlane Z & LTD F | 79-88 | 2.06% | 1.53% | 2.78% | 1.26% |
| Ford | Fairlane N & LTD D | 88-95 | 2.80% | 1.72% | 4.54% | 2.82% |
| Holden | Stateman/Caprice VQ | 90-93 | 3.23% | 1.73% | 6.02% | 4.29% |
| Holden | Stateman/Caprice VR/VS | 94-99 | 2.63% | 1.73% | 4.01% | 2.28% |
| Jaguar | XJ6 | 79-86 | 3.17% | 1.80% | 5.57% | 3.77% |
| Mazda | 929 / Luce | 82-91 | 2.22% | 1.60% | 3.06% | 1.46% |
| Mercedes Benz | C-Class W202 | 94-00 | 2.91% | 1.44% | 5.87% | 4.43% |
| Mercedes Benz | E-Class W124 | 86-94 | 3.55% | 2.11% | 5.97% | 3.86% |
| Nissan | Maxima | 91-94 | 2.28% | 1.28% | 4.07% | 2.79% |
| Honda | Legend | 91-96 | 3.90% | 2.04% | 7.44% | 5.39% |
| Honda | Accord | 82-86 | 3.18% | 1.98% | 5.12% | 3.14% |
| Honda | Accord | 86-90 | 2.18% | 1.31% | 3.63% | 2.33% |
| Honda | Accord | 90-93 | 2.30% | 1.18% | 4.50% | 3.32% |
| Honda | Accord | 94-97 | 2.60% | 1.58% | 4.29% | 2.71% |
| Saab | 9000 | 86-97 | 2.96% | 1.46% | 5.98% | 4.52% |
| Toyota | Crown / Cressida / Mark II | 81-85 | 3.48% | 2.55% | 4.76% | 2.21% |
| Toyota | Cressida / Mark II | 89-92 | 2.24% | 1.39% | 3.64% | 2.25% |
| Volvo | 850/S70/V70/C70 | 93-00 | 3.96% | 2.33% | 6.76% | 4.43% |
| Volvo | 200 Series | 87-93 | 2.33% | 1.51% | 3.61% | 2.10% |
| Volvo | 700/900 Series | 83-91 | 2.39% | 1.48% | 3.86% | 2.38% |
| **Medium Cars** | | | | **2.04%** | **2.26%** | **0.22%** |

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Daewoo | Nubira | 97-00 | 3.20% | 1.70% | 6.04% | 4.35% |
| Ford | Cortina | 82-82 | 2.39% | 1.83% | 3.13% | 1.29% |
| Ford | Mondeo | 97-00 | 2.70% | 1.63% | 4.48% | 2.85% |
| Holden | Camira | 82-89 | 2.14% | 1.75% | 2.61% | 0.86% |
| Holden | Vectra | 96-00 | 2.27% | 1.26% | 4.07% | 2.80% |
| Mitsubishi | Sigma / Scorpion / Sapparo / Lambda | 82-84 | 2.32% | 1.99% | 2.70% | 0.70% |
| Mitsubishi | Chariot / Spacewagon | 85-91 | 2.02% | 1.03% | 3.94% | 2.91% |
| Mitsubishi | Galant | 94-97 | 2.46% | 1.57% | 3.84% | 2.26% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 83-87 | 2.13% | 1.79% | 2.54% | 0.74% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 88-92 | 2.89% | 2.32% | 3.59% | 1.26% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella / Cronos | 92-97 | 2.04% | 1.58% | 2.65% | 1.07% |
| Nissan | Pintara | 86-88 | 2.69% | 2.01% | 3.59% | 1.58% |
| Nissan | Bluebird | 89-92 | 2.95% | 2.42% | 3.59% | 1.17% |
| Nissan | Bluebird | 83-88 | 2.04% | 1.71% | 2.44% | 0.73% |
| Nissan | Stanza | 82-83 | 3.62% | 1.76% | 7.47% | 5.71% |
| Nissan | Silvia | 84-86 | 2.38% | 1.25% | 4.55% | 3.31% |
| Nissan | Bluebird | 92-97 | 1.52% | 0.92% | 2.51% | 1.59% |
| Subaru | Leone / Omega / 4WD Wagon | 88-93 | 1.55% | 1.15% | 2.10% | 0.95% |
| Subaru | Legacy | 89-93 | 2.45% | 1.89% | 3.17% | 1.28% |
| Subaru | Legacy | 94-98 | 3.28% | 2.09% | 5.15% | 3.06% |
| Toyota | Corona | 82-88 | 2.27% | 1.94% | 2.65% | 0.72% |
| Toyota | Camry | 81-86 | 2.88% | 2.15% | 3.86% | 1.72% |
| Holden / Toyota | Apollo JK/JL / Camry / Vista | 90-93 | 2.50% | 2.20% | 2.85% | 0.64% |
| **Passenger Van** | | | | **2.34%** | **3.08%** | **0.75%** |
| Mitsubishi | Starwagon / L300 | 83-86 | 3.45% | 2.54% | 4.68% | 2.14% |
| Mitsubishi | Starwagon / Delica Starwagon | 87-93 | 3.04% | 2.30% | 4.01% | 1.71% |
| Mitsubishi | Starwagon / Delica Spacegear | 93-00 | 2.80% | 1.68% | 4.67% | 2.99% |
| Toyota | Tarago | 85-90 | 3.11% | 2.29% | 4.24% | 1.96% |
| Toyota | Previa / Estima | 91-99 | 2.04% | 1.26% | 3.31% | 2.05% |
| **Small Cars** | | | | **1.78%** | **1.94%** | **0.17%** |
| Daihatsu | Charade | 82-87 | 2.10% | 1.24% | 3.56% | 2.33% |
| Daihatsu | Charade | 88-93 | 1.53% | 1.06% | 2.22% | 1.15% |
| Daihatsu | Charade | 93-00 | 1.70% | 1.10% | 2.63% | 1.52% |
| Daihatsu | Applause | 89-98 | 2.23% | 1.41% | 3.53% | 2.13% |
| Daewoo | Cielo | 95-97 | 1.97% | 1.19% | 3.24% | 2.05% |
| Daewoo | Lanos | 97-00 | 2.96% | 1.79% | 4.89% | 3.10% |
| Ford | Laser | 90-94 | 2.12% | 1.76% | 2.56% | 0.79% |
| Ford | Laser | 95-97 | 3.33% | 2.39% | 4.65% | 2.27% |
| Ford | Festiva WD/WD/WH/WF | 94-00 | 2.26% | 1.66% | 3.08% | 1.42% |
| Holden | Gemini | 82-84 | 1.68% | 1.23% | 2.29% | 1.06% |
| Holden | Gemini RB | 86-89 | 2.32% | 1.15% | 4.65% | 3.50% |
| Holden | Astra TR | 95-98 | 3.12% | 1.66% | 5.86% | 4.20% |
| Holden | Barina SB | 95-00 | 2.67% | 1.88% | 3.80% | 1.92% |
| Hyundai | Excel | 86-90 | 2.08% | 1.44% | 2.99% | 1.55% |
| Hyundai | Excel | 90-95 | 1.89% | 1.46% | 2.45% | 0.99% |
| Hyundai | Excel | 95-00 | 2.49% | 2.07% | 2.99% | 0.92% |
| Hyundai | Lantra | 91-93 | 2.86% | 1.74% | 4.69% | 2.96% |

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 95% Confidence Limit | Upper 95% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Hyundai | Lantra | 94-00 | 1.86% | 1.13% | 3.06% | 1.93% |
| Mitsubishi | Mirage / Colt | 82-88 / 87-88 | 2.16% | 1.77% | 2.63% | 0.87% |
| Mitsubishi | Lancer / Mirage CA | 89-90 | 1.97% | 1.54% | 2.51% | 0.97% |
| Mitsubishi | Lancer / Mirage CC | 93-95 | 1.72% | 1.24% | 2.37% | 1.13% |
| Mitsubishi | Lancer / Mirage CE | 96-00 | 2.67% | 2.03% | 3.50% | 1.47% |
| Mitsubishi | Cordia | 83-87 | 3.26% | 2.39% | 4.44% | 2.05% |
| Ford / Mazda | Laser / 323 / Familia | 82-89 | 1.94% | 1.75% | 2.15% | 0.39% |
| Mazda | 323 / Familia / Lantis | 90-93 | 1.58% | 1.17% | 2.13% | 0.96% |
| Mazda | 323 / Familia / Lantis | 95-98 | 1.81% | 1.13% | 2.89% | 1.76% |
| Ford / Mazda | Festiva WA / 121 | 90-94 / 87-91 | 2.00% | 1.51% | 2.66% | 1.15% |
| Mazda | 121 / Autozam Review | 91-97 | 1.78% | 0.97% | 3.27% | 2.30% |
| Nissan | Pulsar / Langley | 83-86 | 1.75% | 1.41% | 2.17% | 0.76% |
| Nissan | Pulsar / Sentra | 87-91 | 2.18% | 1.80% | 2.64% | 0.84% |
| Nissan | Pulsar / Sentra | 91-95 | 2.19% | 1.69% | 2.83% | 1.14% |
| Nissan | Pulsar / Sentra | 96-00 | 2.97% | 2.19% | 4.04% | 1.85% |
| Honda | Civic / Ballade / Shuttle | 86-88 | 3.09% | 2.01% | 4.75% | 2.75% |
| Honda | Civic / Shuttle | 89-92 | 2.39% | 1.64% | 3.48% | 1.84% |
| Honda | Civic | 92-95 | 2.34% | 1.58% | 3.47% | 1.88% |
| Honda | Civic | 96-00 | 1.28% | 0.67% | 2.45% | 1.78% |
| Subaru | 700 / Rex | 89-92 | 2.61% | 1.29% | 5.28% | 3.99% |
| Subaru | Impreza | 93-00 | 2.80% | 1.70% | 4.60% | 2.90% |
| Holden / Suzuki | Barina / Swift / Cultus | 86-88 | 1.50% | 1.04% | 2.18% | 1.14% |
| Holden / Suzuki | Barina / Swift / Cultus | 89-93 / 89-00 | 1.60% | 1.25% | 2.05% | 0.81% |
| Toyota | Corolla | 82-84 | 1.55% | 1.27% | 1.88% | 0.61% |
| Toyota | Corolla | 86-88 | 2.10% | 1.78% | 2.49% | 0.71% |
| Toyota / Holden | Corolla / Nova | 88-92 | 2.07% | 1.80% | 2.39% | 0.59% |
| Toyota / Holden | Corolla / Nova | 93-97 | 2.19% | 1.80% | 2.66% | 0.86% |
| Toyota | Starlet | 96-98 | 2.32% | 1.45% | 3.69% | 2.24% |
| **Sports Cars** | | | | **1.98%** | **2.53%** | **0.56%** |
| Ford | Capri | 90-94 | 1.92% | 1.09% | 3.38% | 2.29% |
| Nissan | Exa | 83-86 | 5.24% | 2.80% | 9.83% | 7.03% |
| Nissan | NX/NX-R | 93-95 | 6.79% | 3.91% | 11.78% | 7.86% |
| Honda | Prelude | 83-91 | 1.56% | 0.94% | 2.59% | 1.65% |
| Honda | Prelude | 92-96 | 3.03% | 1.70% | 5.37% | 3.67% |
| Honda | Integra | 93-00 | 3.92% | 1.91% | 8.00% | 6.09% |
| Honda | CRX | 87-91 | 1.98% | 0.98% | 3.98% | 3.00% |
| Toyota | Celica | 81-85 | 3.00% | 2.19% | 4.11% | 1.92% |
| Toyota | Celica | 86-89 | 2.93% | 1.95% | 4.41% | 2.45% |
| Toyota | Celica | 90-93 | 2.87% | 1.93% | 4.26% | 2.33% |
| Toyota | Supra | 86-92 | 6.79% | 3.39% | 13.58% | 10.19% |

# AGGRESSIVITY RATINGS
# (WITH 90% CONFIDENCE LIMITS)
# Victoria and NSW Data (1997-2000), New Zealand, Queensland and Western Australia Data (1991-2000)

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 90% Confidence Limit | Upper 90% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| **ALL MODEL AVERAGE** | | | **2.46** | | | |
| **4-Wheel Drive Vehicles** | | | **3.42%** | **3.22%** | **3.62%** | **3.25%** |
| Daihatsu | Feroza / Rocky | 89-97 | 3.16% | 1.65% | 6.03% | 1.84% |
| Daihatsu | Rocky / Rugger | 85-98 | 3.45% | 1.67% | 7.12% | 1.88% |
| Holden / Isuzu | Jackaroo / Bighorn | 82-91 | 4.23% | 2.74% | 6.53% | 2.94% |
| Holden / Isuzu | Jackaroo / Bighorn | 92-98 | 3.28% | 1.78% | 6.02% | 1.97% |
| Mitsubishi | Pajero | 84-91 | 3.84% | 2.82% | 5.23% | 2.97% |
| Mitsubishi | Pajero | 92-99 | 3.54% | 2.58% | 4.87% | 2.72% |
| Nissan | Patrol | 82-87 | 4.51% | 3.26% | 6.25% | 3.43% |
| Nissan / Ford | Patrol / Maverick | 88-98 | 3.96% | 3.29% | 4.77% | 3.39% |
| Nissan | Patrol | 99-00 | 5.81% | 3.63% | 9.30% | 3.92% |
| Nissan | Pathfinder / Terrano | 96-00 | 5.34% | 2.85% | 10.01% | 3.16% |
| Lada | Niva | 84-99 | 4.00% | 2.12% | 7.54% | 2.35% |
| Land Rover | Range Rover | 82-94 | 4.58% | 2.88% | 7.28% | 3.11% |
| Suzuki | Vitara / Escudo | 88-98 | 2.51% | 1.52% | 4.17% | 1.65% |
| Suzuki | Samurai / SJ410 / SJ413 | 82-99 | 1.51% | 0.95% | 2.43% | 1.02% |
| Toyota | 4Runner/Hilux | 79-83 | 3.79% | 2.99% | 4.81% | 3.11% |
| Toyota | 4Runner/Hilux | 85-89 | 3.20% | 2.51% | 4.07% | 2.61% |
| Toyota | 4Runner/Hilux | 90-97 | 3.23% | 2.82% | 3.71% | 2.88% |
| Toyota | Hilux | 98-00 | 2.35% | 1.27% | 4.32% | 1.41% |
| Toyota | Landcruiser | 82-89 | 5.16% | 4.39% | 6.05% | 4.51% |
| Toyota | Landcruiser | 90-97 | 4.63% | 3.95% | 5.42% | 4.05% |
| Toyota | Landcruiser | 98-00 | 4.57% | 3.17% | 6.60% | 3.37% |
| **Commercial Vehicles** | | | | **2.75%** | **3.14%** | **2.78%** |
| Ford | Falcon Panel Van | 85-95 | 2.82% | 2.09% | 3.80% | 2.19% |
| Ford / Nissan | Falcon Ute / XFN Ute | 85-93 | 3.25% | 2.68% | 3.94% | 2.77% |
| Ford | Falcon Ute | 94-99 | 3.75% | 2.49% | 5.64% | 2.66% |
| Ford | Ford F-Series | 79-92 | 6.58% | 4.37% | 9.92% | 4.67% |
| Ford | Transit | 95-00 | 2.20% | 1.23% | 3.95% | 1.35% |
| Holden | Commodore Ute VG/VP | 90-94 | 3.27% | 2.00% | 5.35% | 2.16% |
| Isuzu | Pickup | 82-85 | 4.50% | 2.70% | 7.49% | 2.93% |
| Isuzu / Holden | Pickup / Rodeo | 89-95 | 4.07% | 3.31% | 5.00% | 3.42% |
| Holden | Rodeo | 96-98 | 2.30% | 1.44% | 3.69% | 1.55% |
| Holden | Rodeo | 99-00 | 3.65% | 1.85% | 7.18% | 2.07% |
| Holden | WB Series | 80-84 | 3.25% | 2.12% | 4.99% | 2.27% |
| Holden | Commodore Ute VR/VS | 96-00 | 3.41% | 2.63% | 4.42% | 2.74% |
| Nissan | 720 Ute | 82-85 | 2.67% | 1.68% | 4.23% | 1.81% |
| Nissan | Navara | 86-91 | 2.92% | 2.25% | 3.79% | 2.35% |
| Nissan | Navara | 92-98 | 3.12% | 2.11% | 4.61% | 2.25% |
| Subaru | Brumby | 82-92 | 2.43% | 1.38% | 4.27% | 1.51% |
| Toyota | Hiace/Liteace | 82-86 | 3.31% | 2.65% | 4.14% | 2.75% |
| Toyota | Hiace/Liteace | 87-92 | 3.67% | 2.80% | 4.79% | 2.93% |
| Toyota | Hiace/Liteace | 93-00 | 3.17% | 2.57% | 3.90% | 2.66% |

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 90% Confidence Limit | Upper 90% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Volkswagon | Caravelle / Transporter | 97-00 | 4.94% | 3.03% | 8.04% | 3.28% |
| **Large Cars** | | | | **2.40%** | **2.59%** | **2.41%** |
| Ford | Falcon XE/XF | 82-88 | 2.88% | 2.64% | 3.14% | 2.67% |
| Ford | Falcon EA / Falcon EB Series I | 88-92 | 3.04% | 2.76% | 3.34% | 2.80% |
| Ford | Falcon EB Series II / Falcon ED | 92-94 | 3.36% | 2.93% | 3.84% | 3.00% |
| Ford | Falcon EF/EL | 94-98 | 2.77% | 2.47% | 3.10% | 2.51% |
| Ford | Falcon AU | 98-00 | 2.34% | 1.71% | 3.20% | 1.80% |
| Holden / Toyota | Commodore VN/VP / Lexcen | 89-92 | 2.57% | 2.32% | 2.84% | 2.36% |
| Holden / Toyota | Commodore VR/VS / Lexcen | 93-97 | 2.59% | 2.31% | 2.90% | 2.35% |
| Holden | Commodore VT/VX | 97-00 | 2.85% | 2.34% | 3.46% | 2.41% |
| Holden | Commodore VB-VL | 82-89 | 2.80% | 2.54% | 3.09% | 2.58% |
| Hyundai | Sonata | 89-98 | 2.56% | 1.77% | 3.72% | 1.88% |
| Mitsubishi | Magna / Sigma / V3000 | 85-90 | 2.33% | 2.02% | 2.69% | 2.06% |
| Mitsubishi | Magna / Verada / Diamante | 96-00 | 2.65% | 2.28% | 3.08% | 2.33% |
| Mitsubishi | Magna / Verada / V3000 / Diamante | 91-96 | 2.61% | 2.23% | 3.06% | 2.29% |
| Nissan | Skyline | 83-88 | 2.46% | 1.91% | 3.17% | 1.99% |
| Holden / Toyota | Apollo JM / JP / Camry / Sceptor | 94-97 | 2.45% | 2.10% | 2.86% | 2.15% |
| Toyota | Camry | 98-00 | 2.89% | 2.16% | 3.87% | 2.27% |
| **Luxury Cars** | | | | **2.09%** | **2.47%** | **2.12%** |
| BMW | 3 Series | 82-91 | 2.57% | 1.79% | 3.67% | 1.90% |
| BMW | 3 Series | 92-98 | 2.79% | 1.92% | 4.04% | 2.04% |
| BMW | 5 Series | 81-88 | 2.84% | 1.41% | 5.69% | 1.58% |
| BMW | 5 Series | 89-95 | 2.62% | 1.91% | 3.60% | 2.02% |
| Ford | Fairlane Z & LTD F | 79-88 | 2.06% | 1.53% | 2.78% | 1.60% |
| Ford | Fairlane N & LTD D | 88-95 | 2.80% | 1.72% | 4.54% | 1.87% |
| Holden | Stateman/Caprice VQ | 90-93 | 3.23% | 1.73% | 6.02% | 1.92% |
| Holden | Stateman/Caprice VR/VS | 94-99 | 2.63% | 1.73% | 4.01% | 1.85% |
| Jaguar | XJ6 | 79-86 | 3.17% | 1.80% | 5.57% | 1.97% |
| Mazda | 929 / Luce | 82-91 | 2.22% | 1.60% | 3.06% | 1.69% |
| Mercedes Benz | C-Class W202 | 94-00 | 2.91% | 1.44% | 5.87% | 1.61% |
| Mercedes Benz | E-Class W124 | 86-94 | 3.55% | 2.11% | 5.97% | 2.30% |
| Nissan | Maxima | 91-94 | 2.28% | 1.28% | 4.07% | 1.40% |
| Honda | Legend | 91-96 | 3.90% | 2.04% | 7.44% | 2.27% |
| Honda | Accord | 82-86 | 3.18% | 1.98% | 5.12% | 2.14% |
| Honda | Accord | 86-90 | 2.18% | 1.31% | 3.63% | 1.42% |
| Honda | Accord | 90-93 | 2.30% | 1.18% | 4.50% | 1.31% |
| Honda | Accord | 94-97 | 2.60% | 1.58% | 4.29% | 1.71% |
| Saab | 9000 | 86-97 | 2.96% | 1.46% | 5.98% | 1.64% |
| Toyota | Crown / Cressida / Mark II | 81-85 | 3.48% | 2.55% | 4.76% | 2.68% |
| Toyota | Cressida / Mark II | 89-92 | 2.24% | 1.39% | 3.64% | 1.50% |
| Volvo | 850/S70/V70/C70 | 93-00 | 3.96% | 2.33% | 6.76% | 2.54% |
| Volvo | 200 Series | 87-93 | 2.33% | 1.51% | 3.61% | 1.62% |
| Volvo | 700/900 Series | 83-91 | 2.39% | 1.48% | 3.86% | 1.60% |
| **Medium Cars** | | | | **2.04%** | **2.26%** | **2.05%** |
| Daewoo | Nubira | 97-00 | 3.20% | 1.70% | 6.04% | 1.88% |
| Ford | Cortina | 82-82 | 2.39% | 1.83% | 3.13% | 1.91% |

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 90% Confidence Limit | Upper 90% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Ford | Mondeo | 97-00 | 2.70% | 1.63% | 4.48% | 1.77% |
| Holden | Camira | 82-89 | 2.14% | 1.75% | 2.61% | 1.81% |
| Holden | Vectra | 96-00 | 2.27% | 1.26% | 4.07% | 1.39% |
| Mitsubishi | Sigma / Scorpion / Sapparo / Lambda | 82-84 | 2.32% | 1.99% | 2.70% | 2.04% |
| Mitsubishi | Chariot / Spacewagon | 85-91 | 2.02% | 1.03% | 3.94% | 1.15% |
| Mitsubishi | Galant | 94-97 | 2.46% | 1.57% | 3.84% | 1.69% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 83-87 | 2.13% | 1.79% | 2.54% | 1.85% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 88-92 | 2.89% | 2.32% | 3.59% | 2.41% |
| Ford / Mazda | Telstar / 626 / MX6 / Capella / Cronos | 92-97 | 2.04% | 1.58% | 2.65% | 1.64% |
| Nissan | Pintara | 86-88 | 2.69% | 2.01% | 3.59% | 2.11% |
| Nissan | Bluebird | 89-92 | 2.95% | 2.42% | 3.59% | 2.50% |
| Nissan | Bluebird | 83-88 | 2.04% | 1.71% | 2.44% | 1.76% |
| Nissan | Stanza | 82-83 | 3.62% | 1.76% | 7.47% | 1.98% |
| Nissan | Silvia | 84-86 | 2.38% | 1.25% | 4.55% | 1.39% |
| Nissan | Bluebird | 92-97 | 1.52% | 0.92% | 2.51% | 1.00% |
| Subaru | Leone / Omega / 4WD Wagon | 88-93 | 1.55% | 1.15% | 2.10% | 1.21% |
| Subaru | Legacy | 89-93 | 2.45% | 1.89% | 3.17% | 1.97% |
| Subaru | Legacy | 94-98 | 3.28% | 2.09% | 5.15% | 2.25% |
| Toyota | Corona | 82-88 | 2.27% | 1.94% | 2.65% | 1.99% |
| Toyota | Camry | 81-86 | 2.88% | 2.15% | 3.86% | 2.25% |
| Holden / Toyota | Apollo JK/JL / Camry / Vista | 90-93 | 2.50% | 2.20% | 2.85% | 2.25% |
| **Passenger Van** | | | | **2.34%** | **3.08%** | **2.39%** |
| Mitsubishi | Starwagon / L300 | 83-86 | 3.45% | 2.54% | 4.68% | 2.67% |
| Mitsubishi | Starwagon / Delica Starwagon | 87-93 | 3.04% | 2.30% | 4.01% | 2.41% |
| Mitsubishi | Starwagon / Delica Spacegear | 93-00 | 2.80% | 1.68% | 4.67% | 1.83% |
| Toyota | Tarago | 85-90 | 3.11% | 2.29% | 4.24% | 2.40% |
| Toyota | Previa / Estima | 91-99 | 2.04% | 1.26% | 3.31% | 1.36% |
| **Small Cars** | | | | **1.78%** | **1.94%** | **1.79%** |
| Daihatsu | Charade | 82-87 | 2.10% | 1.24% | 3.56% | 1.35% |
| Daihatsu | Charade | 88-93 | 1.53% | 1.06% | 2.22% | 1.13% |
| Daihatsu | Charade | 93-00 | 1.70% | 1.10% | 2.63% | 1.19% |
| Daihatsu | Applause | 89-98 | 2.23% | 1.41% | 3.53% | 1.51% |
| Daewoo | Cielo | 95-97 | 1.97% | 1.19% | 3.24% | 1.29% |
| Daewoo | Lanos | 97-00 | 2.96% | 1.79% | 4.89% | 1.94% |
| Ford | Laser | 90-94 | 2.12% | 1.76% | 2.56% | 1.82% |
| Ford | Laser | 95-97 | 3.33% | 2.39% | 4.65% | 2.52% |
| Ford | Festiva WD/WD/WH/WF | 94-00 | 2.26% | 1.66% | 3.08% | 1.75% |
| Holden | Gemini | 82-84 | 1.68% | 1.23% | 2.29% | 1.29% |
| Holden | Gemini RB | 86-89 | 2.32% | 1.15% | 4.65% | 1.29% |
| Holden | Astra TR | 95-98 | 3.12% | 1.66% | 5.86% | 1.84% |
| Holden | Barina SB | 95-00 | 2.67% | 1.88% | 3.80% | 1.99% |
| Hyundai | Excel | 86-90 | 2.08% | 1.44% | 2.99% | 1.53% |
| Hyundai | Excel | 90-95 | 1.89% | 1.46% | 2.45% | 1.52% |
| Hyundai | Excel | 95-00 | 2.49% | 2.07% | 2.99% | 2.13% |
| Hyundai | Lantra | 91-93 | 2.86% | 1.74% | 4.69% | 1.88% |
| Hyundai | Lantra | 94-00 | 1.86% | 1.13% | 3.06% | 1.23% |
| Mitsubishi | Mirage / Colt | 82-88 / 87-88 | 2.16% | 1.77% | 2.63% | 1.82% |

| Make | Model of Car | Years of Manufacture | Serious injury rate per 100 drivers involved | Lower 90% Confidence Limit | Upper 90% Confidence Limit | Width of Confidence Interval |
|---|---|---|---|---|---|---|
| Mitsubishi | Lancer / Mirage CA | 89-90 | 1.97% | 1.54% | 2.51% | 1.61% |
| Mitsubishi | Lancer / Mirage CC | 93-95 | 1.72% | 1.24% | 2.37% | 1.31% |
| Mitsubishi | Lancer / Mirage CE | 96-00 | 2.67% | 2.03% | 3.50% | 2.12% |
| Mitsubishi | Cordia | 83-87 | 3.26% | 2.39% | 4.44% | 2.51% |
| Ford / Mazda | Laser / 323 / Familia | 82-89 | 1.94% | 1.75% | 2.15% | 1.78% |
| Mazda | 323 / Familia / Lantis | 90-93 | 1.58% | 1.17% | 2.13% | 1.23% |
| Mazda | 323 / Familia / Lantis | 95-98 | 1.81% | 1.13% | 2.89% | 1.22% |
| Ford / Mazda | Festiva WA / 121 | 90-94 / 87-91 | 2.00% | 1.51% | 2.66% | 1.58% |
| Mazda | 121 / Autozam Review | 91-97 | 1.78% | 0.97% | 3.27% | 1.07% |
| Nissan | Pulsar / Langley | 83-86 | 1.75% | 1.41% | 2.17% | 1.46% |
| Nissan | Pulsar / Sentra | 87-91 | 2.18% | 1.80% | 2.64% | 1.86% |
| Nissan | Pulsar / Sentra | 91-95 | 2.19% | 1.69% | 2.83% | 1.76% |
| Nissan | Pulsar / Sentra | 96-00 | 2.97% | 2.19% | 4.04% | 2.30% |
| Honda | Civic / Ballade / Shuttle | 86-88 | 3.09% | 2.01% | 4.75% | 2.15% |
| Honda | Civic / Shuttle | 89-92 | 2.39% | 1.64% | 3.48% | 1.75% |
| Honda | Civic | 92-95 | 2.34% | 1.58% | 3.47% | 1.69% |
| Honda | Civic | 96-00 | 1.28% | 0.67% | 2.45% | 0.74% |
| Subaru | 700 / Rex | 89-92 | 2.61% | 1.29% | 5.28% | 1.45% |
| Subaru | Impreza | 93-00 | 2.80% | 1.70% | 4.60% | 1.85% |
| Holden / Suzuki | Barina / Swift / Cultus | 86-88 | 1.50% | 1.04% | 2.18% | 1.10% |
| Holden / Suzuki | Barina / Swift / Cultus | 89-93 / 89-00 | 1.60% | 1.25% | 2.05% | 1.30% |
| Toyota | Corolla | 82-84 | 1.55% | 1.27% | 1.88% | 1.32% |
| Toyota | Corolla | 86-88 | 2.10% | 1.78% | 2.49% | 1.83% |
| Toyota / Holden | Corolla / Nova | 88-92 | 2.07% | 1.80% | 2.39% | 1.84% |
| Toyota / Holden | Corolla / Nova | 93-97 | 2.19% | 1.80% | 2.66% | 1.86% |
| Toyota | Starlet | 96-98 | 2.32% | 1.45% | 3.69% | 1.57% |
| **Sports Cars** | | | | **1.98%** | **2.53%** | **2.02%** |
| Ford | Capri | 90-94 | 1.92% | 1.09% | 3.38% | 1.19% |
| Nissan | Exa | 83-86 | 5.24% | 2.80% | 9.83% | 3.10% |
| Nissan | NX/NX-R | 93-95 | 6.79% | 3.91% | 11.78% | 4.28% |
| Honda | Prelude | 83-91 | 1.56% | 0.94% | 2.59% | 1.02% |
| Honda | Prelude | 92-96 | 3.03% | 1.70% | 5.37% | 1.87% |
| Honda | Integra | 93-00 | 3.92% | 1.91% | 8.00% | 2.15% |
| Honda | CRX | 87-91 | 1.98% | 0.98% | 3.98% | 1.10% |
| Toyota | Celica | 81-85 | 3.00% | 2.19% | 4.11% | 2.30% |
| Toyota | Celica | 86-89 | 2.93% | 1.95% | 4.41% | 2.09% |
| Toyota | Celica | 90-93 | 2.87% | 1.93% | 4.26% | 2.06% |
| Toyota | Supra | 86-92 | 6.79% | 3.39% | 13.58% | 3.80% |

**APPENDIX 6**

# PRESENTATION OF CRASHWORTHINESS AND AGGRESSIVITY RATINGS FOR CONSUMER INFORMATION

# CRASHWORTHINESS AND AGGRESSIVITY RATINGS

## Victoria and NSW Data (1997-2000), New Zealand, Queensland and Western Australia Data (1991-2000)

| | | | CRASHWORTHINESS | | | | | AGGRESSIVITY |
|---|---|---|---|---|---|---|---|---|
| **Make** | **Model of Car** | **Years of Manufacture** | **Significantly less than 20% better than average** | **Significantly better than average but not significantly less than 20% better than average** | **Not significantly different from average** | **Significantly worse than average but not significantly greater than 20% worse than average** | **Significantly greater than 20% worse than average** | **✓✓ = Much better than average<br>✓ = Better than average<br>o = Average<br>x = Worse than average<br>xx = Much worse than average** |
| | | | | | | | | |
| | **4-Wheel Drive Vehicles** | | | | | | | |
| | | | | | | | | |
| Daihatsu | Feroza / Rocky | 89-97 | | | | | | o |
| Daihatsu | Rocky / Rugger | 85-98 | | | | | | o |
| Daihatsu | Terios | 97-00 | | | | | | |
| Holden / Isuzu | Jackaroo / Bighorn | 82-91 | | | | | | xx |
| Holden / Isuzu | Jackaroo / Bighorn | 92-98 | | | | | | o |
| Mitsubishi | Pajero | 84-91 | | | | | | xx |
| Mitsubishi | Pajero | 92-99 | | | | | | x |
| Jeep | Cherokee | 96-00 | | | | | | |
| Land Rover | Discovery / Crossroad | 91-00 | | | | | | |
| Nissan | Patrol | 82-87 | | | | | | xx |
| Nissan / Ford | Patrol / Maverick | 88-98 | | | | | | xx |
| Nissan | Patrol | 99-00 | | | | | | xx |
| Nissan | Pathfinder / Terrano | 88-95 | | | | | | |
| Nissan | Pathfinder / Terrano | 96-00 | | | | | | xx |
| Lada | Niva | 84-99 | | | | | | o |
| Honda | CR-V | 96-00 | | | | | | |
| Land Rover | Range Rover | 82-94 | | | | | | xx |
| Suzuki | Vitara / Escudo | 88-98 | | | | | | o |
| Suzuki | Samurai / SJ410 / SJ413 | 82-99 | | | | | | ✓ |
| Toyota | 4Runner/Hilux | 79-83 | | | | | | xx |
| Toyota | 4Runner/Hilux | 85-89 | | | | | | x |
| Toyota | 4Runner/Hilux | 90-97 | | | | | | x |
| Toyota | Hilux | 98-00 | | | | | | o |
| Toyota | Landcruiser | 82-89 | | | | | | xx |
| Toyota | Landcruiser | 90-97 | | | | | | xx |
| Toyota | Landcruiser | 98-00 | | | | | | xx |
| Toyota | RAV4 | 94-00 | | | | | | |
| | | | | | | | | |
| | **Commercial Vehicles** | | | | | | | |
| | | | | | | | | |
| Daihatsu | Handivan | 82-90 | | | | | | |
| Ford | Falcon Panel Van | 85-95 | | | | | | o |
| Ford / Nissan | Falcon Ute / XFN Ute | 85-93 | | | | | | x |
| Ford | Falcon Ute | 94-99 | | | | | | x |
| Ford | Ford F-Series | 79-92 | | | | | | xx |
| Ford | Transit | 95-00 | | | | | | o |
| Holden | Commodore Ute VG/VP | 90-94 | | | | | | o |
| Isuzu | Pickup | 82-85 | | | | | | x |

| | | | CRASHWORTHINESS | | | | | AGGRESSIVITY |
|---|---|---|---|---|---|---|---|---|
| **Make** | **Model of Car** | **Years of Manufacture** | **Significantly less than 20% better than average** | **Significantly better than average but not significantly less than 20% better than average** | **Not significantly different from average** | **Significantly worse than average but not significantly greater than 20% worse than average** | **Significantly greater than 20% worse than average** | ✓✓ = Much better than average<br>✓ = Better than average<br>o = Average<br>x = Worse than average<br>xx = Much worse than average |
| Isuzu | Pickup | 86-88 | | | | | | |
| Isuzu / Holden | Pickup / Rodeo | 89-95 | | | | | | xx |
| Holden | Rodeo | 96-98 | | | | | | o |
| Holden | Rodeo | 99-00 | | | | | | o |
| Holden | WFR Van | 92-98 | | | | | | |
| Holden | WB Series | 80-84 | | | | | | o |
| Holden | Commodore Ute VR/VS | 96-00 | | | | | | x |
| Nissan | 720 Ute | 82-85 | | | | | | o |
| Nissan | Navara | 86-91 | | | | | | o |
| Nissan | Navara | 92-98 | | | | | | o |
| Honda | Acty | 83-86 | | | | | | |
| Subaru | Brumby | 82-92 | | | | | | o |
| Holden / Suzuki | Scurry / Carry | 82-00 | | | | | | |
| Suzuki | Mighty Boy | 85-88 | | | | | | |
| Toyota | Hiace/Liteace | 82-86 | | | | | | x |
| Toyota | Hiace/Liteace | 87-92 | | | | | | x |
| Toyota | Hiace/Liteace | 93-00 | | | | | | x |
| Volkswagon | Caravelle / Transporter | 97-00 | | | | | | xx |
| | | | | | | | | |
| | **Large Cars** | | | | | | | |
| | | | | | | | | |
| Ford | Falcon XE/XF | 82-88 | | | | | | x |
| Ford | Falcon EA / Falcon EB Series I | 88-92 | | | | | | x |
| Ford | Falcon EB Series II / Falcon ED | 92-94 | | | | | | xx |
| Ford | Falcon EF/EL | 94-98 | | | | | | x |
| Ford | Falcon AU | 98-00 | | | | | | o |
| Holden / Toyota | Commodore VN/VP / Lexcen | 89-92 | | | | | | o |
| Holden / Toyota | Commodore VR/VS / Lexcen | 93-97 | | | | | | o |
| Holden | Commodore VT/VX | 97-00 | | | | | | o |
| Holden | Commodore VB-VL | 82-89 | | | | | | x |
| Hyundai | Sonata | 89-98 | | | | | | o |
| Mitsubishi | Magna / Sigma / V3000 | 85-90 | | | | | | o |
| Mitsubishi | Magna / Verada / Diamante | 96-00 | | | | | | o |
| Mitsubishi | Magna / Verada / V3000 / Diamante | 91-96 | | | | | | o |
| Nissan | Skyline | 83-88 | | | | | | o |
| Holden / Toyota | Apollo JM / JP / Camry / Sceptor | 94-97 | | | | | | o |
| Toyota | Camry | 98-00 | | | | | | o |
| | | | | | | | | |
| | **Luxury Cars** | | | | | | | |
| | | | | | | | | |
| Audi | A4 | 95-00 | | | | | | |
| BMW | 3 Series | 82-91 | | | | | | o |
| BMW | 3 Series | 92-98 | | | | | | o |
| BMW | 5 Series | 81-88 | | | | | | |
| BMW | 5 Series | 89-95 | | | | | | o |

| | | | CRASHWORTHINESS | | | | | AGGRESSIVITY |
|---|---|---|---|---|---|---|---|---|
| **Make** | **Model of Car** | **Years of Manufacture** | **Significantly less than 20% better than average** | **Significantly better than average but not significantly less than 20% better than average** | **Not significantly different from average** | **Significantly worse than average but not significantly greater than 20% worse than average** | **Significantly greater than 20% worse than average** | **✓✓ = Much better than average<br>✓ = Better than average<br>o = Average<br>x = Worse than average<br>xx = Much worse than average** |
| Ford | Fairlane Z & LTD F | 79-88 | | | | | | **o** |
| Ford | Fairlane N & LTD D | 88-95 | | | | | | **o** |
| Ford | Fairlane N & LTD D | 96-98 | | | | | | **o** |
| Holden | Statesman/Caprice WB | 81-84 | | | | | | |
| Holden | Stateman/Caprice VQ | 90-93 | | | | | | **o** |
| Holden | Stateman/Caprice VR/VS | 94-99 | | | | | | **o** |
| Jaguar | XJ6 | 79-86 | | | | | | |
| Mazda | 929 / Luce | 82-91 | | | | | | **o** |
| Mercedes Benz | C-Class W201 | 87-93 | | | | | | |
| Mercedes Benz | C-Class W202 | 94-00 | | | | | | **o** |
| Mercedes Benz | E-Class W123 | 82-85 | | | | | | |
| Mercedes Benz | E-Class W124 | 86-94 | | | | | | **o** |
| Mercedes Benz | S-Class W126 | 82-92 | | | | | | |
| Nissan | Maxima | 91-94 | | | | | | **o** |
| Nissan | Maxima / Cefiro | 95-99 | | | | | | |
| Honda | Legend | 91-96 | | | | | | **o** |
| Honda | Accord | 82-86 | | | | | | **o** |
| Honda | Accord | 86-90 | | | | | | **o** |
| Honda | Accord | 90-93 | | | | | | **o** |
| Honda | Accord | 94-97 | | | | | | **o** |
| Saab | 900 Series | 84-92 | | | | | | |
| Saab | 9000 | 86-97 | | | | | | **o** |
| Toyota | Crown / Cressida / Mark II | 81-85 | | | | | | x |
| Toyota | Crown / Cressida / Mark II | 85-88 | | | | | | |
| Toyota | Cressida / Mark II | 89-92 | | | | | | **o** |
| Volvo | 850/S70/V70/C70 | 93-00 | | | | | | x |
| Volvo | 200 Series | 87-93 | | | | | | **o** |
| Volvo | 700/900 Series | 83-91 | | | | | | **o** |
| | | | | | | | | |
| | **Medium Cars** | | | | | | | |
| | | | | | | | | |
| Daewoo | Espero | 95-97 | | | | | | |
| Daewoo | Nubira | 97-00 | | | | | | **o** |
| Ford | Mondeo | 97-00 | | | | | | **o** |
| Holden | Camira | 82-89 | | | | | | **o** |
| Holden | Vectra | 96-00 | | | | | | **o** |
| Mitsubishi | Sigma / Scorpion / Sapparo / Lambda | 82-84 | | | | | | **o** |
| Mitsubishi | Chariot / Spacewagon | 85-91 | | | | | | **o** |
| Mitsubishi | Chariot | 82-98 | | | | | | |
| Mitsubishi | Galant | 94-97 | | | | | | **o** |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 83-87 | | | | | | **o** |
| Ford / Mazda | Telstar / 626 / MX6 / Capella | 88-92 | | | | | | **o** |
| Ford / Mazda | Telstar / 626 / MX6 / Capella / Cronos | 92-97 | | | | | | **o** |
| Mazda | 626 | 98-00 | | | | | | |
| Nissan | Pintara | 86-88 | | | | | | **o** |
| Nissan | Bluebird | 89-92 | | | | | | x |
| Nissan | Bluebird | 83-88 | | | | | | ✓ |

| | | | CRASHWORTHINESS | | | | | AGGRESSIVITY |
|---|---|---|---|---|---|---|---|---|
| **Make** | **Model of Car** | **Years of Manufacture** | **Significantly less than 20% better than average** | **Significantly better than average but not significantly less than 20% better than average** | **Not significantly different from average** | **Significantly worse than average but not significantly greater than 20% worse than average** | **Significantly greater than 20% worse than average** | **✓✓ = Much better than average<br>✓ = Better than average<br>o = Average<br>x = Worse than average<br>xx = Much worse than average** |
| Nissan | Stanza | 82-83 | | | | | | o |
| Nissan | Silvia | 84-86 | | | | | | o |
| Nissan | Prairie | 82-88 | | | | | | |
| Nissan | Bluebird | 92-97 | | | | | | ✓ |
| Peugeot | 405 | 88-96 | | | | | | |
| Peugeot | 505 | 82-91 | | | | | | |
| Subaru | Leone / Omega / 4WD Wagon | 88-93 | | | | | | ✓ |
| Subaru | Legacy | 89-93 | | | | | | o |
| Subaru | Legacy | 94-98 | | | | | | o |
| Toyota | Corona | 82-88 | | | | | | o |
| Toyota | Camry | 81-86 | | | | | | o |
| Holden / Toyota | Apollo JK/JL / Camry / Vista | 90-93 | | | | | | o |
| | | | | | | | | |
| | **Passenger Vans** | | | | | | | |
| | | | | | | | | |
| Mitsubishi | Starwagon / L300 | 83-86 | | | | | | x |
| Mitsubishi | Starwagon / Delica Starwagon | 87-93 | | | | | | o |
| Mitsubishi | Starwagon / Delica Spacegear | 93-00 | | | | | | o |
| Toyota | Tarago | 85-90 | | | | | | o |
| Toyota | Previa / Estima | 91-99 | | | | | | o |
| | | | | | | | | |
| | **Small Cars** | | | | | | | |
| | | | | | | | | |
| Alfa Romeo | 33 | 83-95 | | | | | | |
| Daihatsu | Charade | 82-87 | | | | | | o |
| Daihatsu | Charade | 88-93 | | | | | | ✓ |
| Daihatsu | Charade | 93-00 | | | | | | ✓ |
| Daihatsu | Applause | 89-98 | | | | | | o |
| Daihatsu | Mira | 90-98 | | | | | | |
| Daihatsu | Sirion | 00-00 | | | | | | |
| Daewoo | 1.5i | 94-95 | | | | | | |
| Daewoo | Cielo | 95-97 | | | | | | o |
| Daewoo | Lanos | 97-00 | | | | | | o |
| Fiat | Regata | 84-88 | | | | | | |
| Ford | Laser | 90-94 | | | | | | o |
| Ford | Laser | 95-97 | | | | | | x |
| Ford | Festiva WD/WD/WH/WF | 94-00 | | | | | | o |
| Holden | Gemini | 82-84 | | | | | | ✓ |
| Holden | Gemini RB | 86-89 | | | | | | o |
| Holden | Astra TR | 95-98 | | | | | | o |
| Holden | Barina SB | 95-00 | | | | | | o |
| Hyundai | Excel | 86-90 | | | | | | o |
| Hyundai | Excel | 90-95 | | | | | | ✓ |
| Hyundai | Excel | 95-00 | | | | | | o |
| Hyundai | S Coupe | 90-96 | | | | | | |
| Hyundai | Lantra | 91-93 | | | | | | o |
| Hyundai | Lantra | 94-00 | | | | | | o |

| | | | CRASHWORTHINESS | | | | | AGGRESSIVITY |
|---|---|---|---|---|---|---|---|---|
| **Make** | **Model of Car** | **Years of Manufacture** | **Significantly less than 20% better than average** | **Significantly better than average but not significantly less than 20% better than average** | **Not significantly different from average** | **Significantly worse than average but not significantly greater than 20% worse than average** | **Significantly greater than 20% worse than average** | **✓✓ = Much better than average<br>✓ = Better than average<br>o = Average<br>x = Worse than average<br>xx = Much worse than average** |
| Mitsubishi | Mirage / Colt | 82-88 / 87-88 | | | | | | **o** |
| Mitsubishi | Lancer / Mirage CA | 89-90 | | | | | | ✓ |
| Mitsubishi | Lancer / Mirage CC | 93-95 | | | | | | ✓ |
| Mitsubishi | Lancer / Mirage CE | 96-00 | | | | | | **o** |
| Mitsubishi | Cordia | 83-87 | | | | | | x |
| Ford / Mazda | Laser / 323 / Familia | 82-89 | | | | | | ✓ |
| Mazda | 323 / Familia / Lantis | 90-93 | | | | | | ✓ |
| Mazda | 323 / Familia / Lantis | 95-98 | | | | | | **o** |
| Ford / Mazda | Laser / 323 | 99-00 | | | | | | |
| Ford / Mazda | Festiva WA / 121 | 90-94 / 87-91 | | | | | | **o** |
| Mazda | 121 / Autozam Review | 91-97 | | | | | | **o** |
| Mazda | Demio | 98-00 | | | | | | |
| Nissan | Pulsar / Langley | 83-86 | | | | | | ✓ |
| Nissan | Pulsar / Sentra | 87-91 | | | | | | **o** |
| Nissan | Pulsar / Sentra | 91-95 | | | | | | **o** |
| Nissan | Pulsar / Sentra | 96-00 | | | | | | **o** |
| Nissan | Micra | 93-95 | | | | | | |
| Honda | Civic | 82-84 | | | | | | |
| Honda | Civic / Ballade / Shuttle | 86-88 | | | | | | **o** |
| Honda | Civic / Shuttle | 89-92 | | | | | | **o** |
| Honda | Civic | 92-95 | | | | | | **o** |
| Honda | Civic | 96-00 | | | | | | ✓ |
| Honda | Concerto | 89-93 | | | | | | |
| Honda | City | 84-89 | | | | | | |
| Peugeot | 306 | 93-00 | | | | | | |
| Rover | Quintet | 82-86 | | | | | | |
| Subaru | 700 / Rex | 89-92 | | | | | | **o** |
| Subaru | Impreza | 93-00 | | | | | | **o** |
| Holden / Suzuki | Barina / Swift / Cultus | 86-88 | | | | | | ✓ |
| Holden / Suzuki | Barina / Swift / Cultus | 89-93 / 89-00 | | | | | | ✓ |
| Suzuki | Alto | 82-84 | | | | | | |
| Suzuki | Baleno / Cultus Cresent | 95-99 | | | | | | |
| Toyota | Corolla | 82-84 | | | | | | ✓✓ |
| Toyota | Corolla | 86-88 | | | | | | ✓ |
| Toyota / Holden | Corolla / Nova | 88-92 | | | | | | ✓ |
| Toyota / Holden | Corolla / Nova | 93-97 | | | | | | **o** |
| Toyota | Corolla | 98-00 | | | | | | |
| Toyota | Tercel | 85-88 | | | | | | |
| Toyota | Starlet | 96-98 | | | | | | **o** |
| Volkswagen | Golf | 95-98 | | | | | | |
| | **Sports Cars** | | | | | | | |
| | | | | | | | | |
| Ford | Capri | 90-94 | | | | | | **o** |
| Hyundai | Coupe | 96-00 | | | | | | |
| Mazda | RX7 | 81-86 | | | | | | |
| Mazda | RX7 | 86-91 | | | | | | |
| Mazda | MX5 / Eunos Roadster | 89-97 | | | | | | |
| Nissan | 300ZX / Fairlady Z | 90-95 | | | | | | |
| Nissan | Exa | 83-86 | | | | | | xx |
| Nissan | Exa | 86-91 | | | | | | |
| Nissan | NX/NX-R | 93-95 | | | | | | xx |

| | | | CRASHWORTHINESS | | | | | AGGRESSIVITY |
|---|---|---|---|---|---|---|---|---|
| **Make** | **Model of Car** | **Years of Manufacture** | **Significantly less than 20% better than average** | **Significantly better than average but not significantly less than 20% better than average** | **Not significantly different from average** | **Significantly worse than average but not significantly greater than 20% worse than average** | **Significantly greater than 20% worse than average** | **✓✓ = Much better than average<br>✓ = Better than average<br>o = Average<br>x = Worse than average<br>xx = Much worse than average** |
| Nissan | 200SX / Silvia | 94-99 | | | | | | |
| Honda | CRX | 87-91 | | | | | | **o** |
| Honda | Prelude | 83-91 | | | | | | ✓ |
| Honda | Prelude | 92-96 | | | | | | **o** |
| Honda | Integra | 86-88 | | | | | | |
| Honda | Integra | 91-93 | | | | | | |
| Honda | Integra | 93-00 | | | | | | **o** |
| Renault | Feugo | 81-86 | | | | | | |
| Toyota | Celica | 81-85 | | | | | | **o** |
| Toyota | Celica | 86-89 | | | | | | **o** |
| Toyota | Celica | 90-93 | | | | | | **o** |
| Toyota | Celica | 94-00 | | | | | | |
| Toyota | Supra | 86-92 | | | | | | xx |
| Toyota | MR2 | 85-89 | | | | | | |
| Toyota | Paseo / Cynos | 91-97 | | | | | | |