

## 2004 ROAD SAFETY RESEARCH, POLICING AND EDUCATION CONFERENCE

### EVALUATION OF THE TRIAL PERIOD FOR DOUBLE DEMERITS LEGISLATION IN WESTERN AUSTRALIA

#### Session Title: Penalties / Unlicensed Driving

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#### ABSTRACT

The WA State Government endorsed the implementation of a trial period in which driver demerit points for offences relating to speeding, drink driving and the non-use of restraints are doubled during prescribed holiday periods. The approach was based on a successful program that has operated in New South Wales since 1997.

The Road Safety Council, over the past few years, has been very successful in raising awareness among the general community about the key factors contributing to road trauma, namely speed, drink driving, the non-use of restraints and fatigue. Public education, combined with active enforcement of speed, drink driving and restraint use can be very effective in reducing road trauma where the penalty levels act as a sufficient deterrent.

In deciding to trial the Double Demerits initiative, it was hoped that the initiative would enhance the deterrent effect of these key factor penalties by focusing on those times of the year when the greater volume of traffic increases the risk of crashes. The single focus "Big Three" double demerits message (ie. with the emphasis on *speeding*, *drink driving* and *non-use of restraints*) was designed to complement WA Police Service operations during these long weekend and holiday times.

The primary objective of the evaluation was to examine the impact and effectiveness of the Double Demerits initiative in changing road user behaviour, and thereby (as a consequence of improved behaviour), reducing the number and / or severity of road crash events.

The aim of this paper is twofold – firstly, to present the **methodology** used to evaluate the trial of double demerits legislation in Western Australia, and secondly, the paper will present the **outcomes** of the evaluation and will draw conclusions in terms of the effectiveness of Double Demerits legislation in reducing road trauma in Western Australia during critical long weekend and holiday periods.

## RESEARCH OBJECTIVES

The primary objective of this evaluation was to examine the effectiveness of the WA Double Demerits trial campaign in changing road user behaviour, and thereby (as a consequence of improved behaviour), in reducing the number of road crash events.

The paper addresses a number of factors which might contribute to determining the effectiveness of the Double Demerits initiative, including:

- The number of WAPS traffic hours and type of **enforcement** activity occurring during Double Demerit periods;
- The number of **infringements** issued by police during Double Demerit periods (for speed, drink driving @ 0.05 and non-use of restraints offences);
- The number, severity and type of **road crash events** that occur during Double Demerit periods (including those where speed, drink driving @ 0.05 and non-use of restraints are deemed to be contributing factors);
- Community awareness of the **media campaign** supporting the initiative;
- Changes in **attitudes and behaviours** of road users, including the effectiveness of the campaign in affecting people's **intentions** to change their driving behaviour during Double Demerit enforcement periods;
- The impact on the community with regard to the number of drivers having their licence **suspended** as a result of receiving Double Demerit points for an offence during a Double Demerit period; and
- The impact on DPI's licensing centre with regard to the number of **calls and emails** requesting demerit point updates.

The data for the **2002/2003 trial period** has been assessed in four ways:

- A comparison to 2001 data during equivalent pre-trial periods;
- A comparison to the previous 5 year average of equivalent pre-trial periods;
- Analysis of 2002/2003 non-Double Demerit period data compared to the equivalent periods in 2001 and the previous 5 year average; and
- Comparisons between Double Demerit and non-Double Demerit periods to assess the relative differences between the 'on' versus 'off' periods.

## IMPORTANT CAVEATS

It is acknowledged that the analysis of the data in this evaluation, whilst incorporating as many relevant variables as possible, is by no means exhaustive. For example, the analyses do not factor in or account for other external variables that may potentially have some impact on crash data including for example:

- Differences in weather conditions between data collection periods; and
- Differences in driver exposure as a function of economic variables.

In addition, the analysis of police Infringement Data is incomplete. While data for Double Demerit equivalent periods between 1997 and 2001 has been provided, the data during non-Double Demerit periods was not available. While this has limited the analysis of the infringement data to some degree, the missing data will be incorporated in to future evaluations and the available data still allows for conclusions to be drawn.

The analysis of crash data focuses exclusively on 'events' (ie. crashes) and does not include an analysis of fatalities or injury data (ie. the number of people killed or injured in those 'events'). On the basis that the Double Demerits initiative is ultimately designed to reduce the number of road crash events on our roads, it could be argued that the analysis of 'event' (ie. crash) data as undertaken in this evaluation is in fact more appropriate.

## THE EVALUATION APPROACH AND METHODOLOGY

### Trial Periods

The defined periods for Double Demerit activity (and corresponding periods for the previous five years for comparison) are summarised in the table below. The periods during 2002/2003 where Double Demerits applied are highlighted in green towards the bottom of the table. This paper presents an analysis of data during the ten periods (62 days) of Double Demerit activity during 2002/2003 up to and including Christmas and New Year, compared to data recorded during the equivalent periods over the previous five years where available.

**Defined Periods for Double Demerits Activity and Comparison Periods**  
From 24 Jan 1997 to 1 Jan 2004

Year	Occasion	Period
<b>Pre-Double Demerit Equivalent Periods</b>		
1997	Australia Day	24 Jan 1997 - 27 Jan 1997
1997	Labour Day	28 Feb 1997 - 03 Mar 1997
1997	Easter	27 Mar 1997 - 31 Mar 1997
1997	Foundation Day	30 May 1997 - 02 Jun 1997
1997	Queens Birthday	26 Sep 1997 - 29 Sep 1997
1997	Christmas / New Year	21 Dec 1997 - 1 Jan 1998
1998	Australia Day	23 Jan 1998 - 26 Jan 1998
1998	Labour Day	27 Feb 1998 - 02 Mar 1998
1998	Easter	09 Apr 1998 - 13 Apr 1998
1998	Foundation Day	29 May 1998 - 01 Jun 1998
1998	Queens Birthday	25 Sep 1998 - 28 Sep 1998
1998	Christmas / New Year	21 Dec 1998 - 1 Jan 1999
1999	Labour Day	26 Feb 1999 - 01 Mar 1999
1999	Easter	01 Apr 1999 - 05 Apr 1999
1999	Foundation Day	04 Jun 1999 - 07 Jun 1999
1999	Queens Birthday	24 Sep 1999 - 27 Sep 1999
1999	Christmas / New Year	21 Dec 1999 - 1 Jan 2000
2000	Labour Day	03 Mar 2000 - 06 Mar 2000
2000	Easter	21 Apr 2000 - 25 Apr 2000
2000	Foundation Day	02 Jun 2000 - 05 Jun 2000
2000	Queens Birthday	29 Sep 2000 - 02 Oct 2000
2000	Christmas / New Year	21 Dec 2000 - 1 Jan 2001
2001	Australia Day	26 Jan 2001 - 29 Jan 2001
2001	Labour Day	02 Mar 2001 - 05 Mar 2001
2001	Easter	12 Apr 2001 - 16 Apr 2001
2001	Foundation Day	01 Jun 2001 - 04 Jun 2001
2001	Queens Birthday	28 Sep 2001 - 01 Oct 2001
2001	Christmas / New Year	21 Dec 2001 - 1 Jan 2002
2002	Australia Day	25 Jan 2002 - 28 Jan 2002
2002	Labour Day	01 Mar 2002 - 04 Mar 2002
<b>Double Demerit Trial Periods</b>		
2002	Easter	28 Mar 2002 - 01 Apr 2002
2002	Foundation Day	31 May 2002 - 03 Jun 2002
2002	Queens Birthday	29 Sep 2002 - 30 Sep 2002
2002	Christmas / New Year	21 Dec 2002 - 1 Jan 2003
2003	Australia Day	24 Jan 2003 - 27 Jan 2003
2003	Labour Day	28 Feb 2003 - 03 Mar 2003
2003	Easter/Anzac Day	17 Apr 2003 - 27 Apr 2003
2003	Foundation Day	30 May 2003 - 02 Jun 2003
2003	Queens Birthday	26 Sep 2003 - 29 Sep 2003
2003	Christmas / New Year	19 Dec 2003 - 4 Jan 2004

## **Enforcement**

The available **enforcement activity data** (ie. total 'active' traffic enforcement hours) covers the periods from April 1999 to December 31 2004 only, allowing a comparison of 2002/2003 data versus the previous 3 year average in most instances. Data on a daily basis prior to April 1999 is unavailable due to changes in Police data collection and reporting methods.

The enforcement data has been provided as a total count and does not provide a breakdown of enforcement hours directed specifically at speeding, drink driving or restraints initiatives. In addition, the figures exclude speed camera enforcement hours.

The **infringement data** provided covers the entire period of interest, except Australia Day and Labour Day 1997, where data is unavailable. The data provides a breakdown of infringements relating to speeding by offence level (ie. 10-14k over; 15-29k over, etc); and drink driving by offence level (ie. 0.05-0.059; 0.06-0.069, etc) – however it should be noted that the drink driving data does not include offences at the level of 0.08 or above, as such offences are not subject to demerit point penalties but immediate licence suspension. Restraints infringement data is also provided which includes both in-vehicle and open-load space offences.

## **Public Education Campaigns**

The introduction of the Double Demerits legislation and announcement of the trial period was communicated to the general public and has been supported in various ways across Western Australia in the lead up to, and during each Double Demerit period, via some or all of the following media:

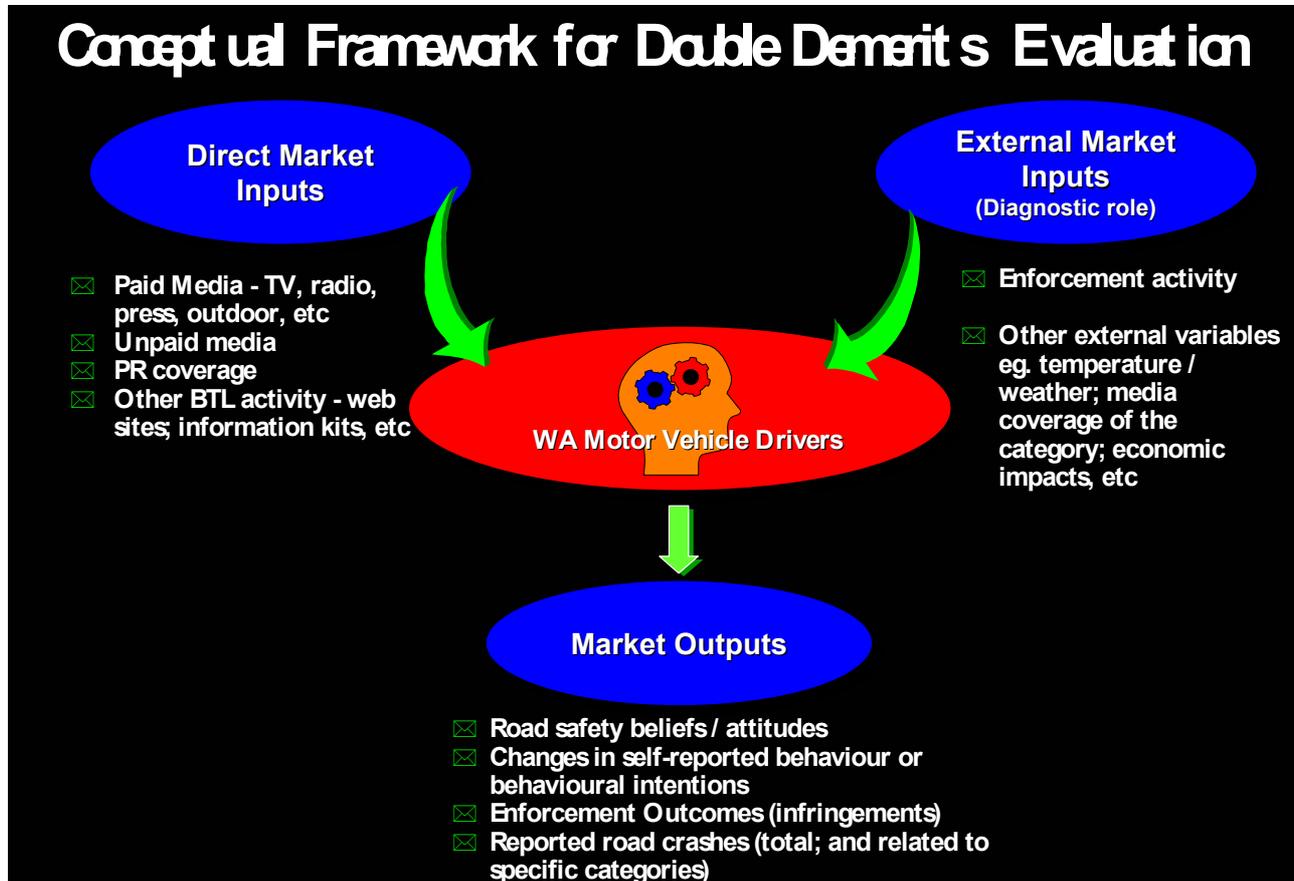
- Television commercials;
- Radio commercials;
- Press ads;
- Mobile Billboards (metro only); and
- Variable Message Boards (metro only).

Additional information has been made available via the Office of Road Safety website, and an information kit, including a campaign summary, a poster, leaflet and order form.

## Trial Evaluation Methods

### Conceptual Framework for the Double Demerits Evaluation

The overall approach is designed to evaluate the impact and outcome effects of the Road Safety Council's Double Demerits initiative in Perth and Regional WA against defined key performance indicators, or outcome effects criteria, as summarised in the diagram below.



Each of the primary direct market inputs, external market inputs and market output measures are discussed in the following sections.

### Media Analysis

The paid media campaign has been monitored continuously since launch via the existing Office of Road Safety Continuous Tracking research program provided by TNS. The television component (TVC) has been monitored both in terms of spontaneous recall (ie. the ability to recall the ad without prompting) and in terms of prompted recognition (ie. aided recall using a visual prompt comprising a series of 'stills' from the ad, or in the case of regional interviews, a verbal description of the ad).

Other supporting media have also been monitored in the Tracking research in terms of non-validated spontaneous recall (ie. monitoring claimed exposure to the various campaign elements amongst motor vehicle drivers).

## **Community Attitudes and Behaviours**

Community attitudes and behaviours in relation to road safety per se have been monitored continuously via the Office of Road Safety's Continuous Tracking research program provided by TNS since July 2000. This research covers all drivers aged 17-59 years in both metropolitan and regional WA and interviews are conducted every week of the year.

An additional series of questions pertaining specifically to the Double Demerits initiative were added to the existing questionnaire in December 2002 for a period of 19 weeks to the end of April 2003. A total of 1,232 drivers were interviewed across Western Australia over this period, providing a statistically reliable base for analysis of this data at the overall level, as well as amongst sub-groups of interest within the driving population.

## **Data Analysis - Enforcement Activity, Police Infringement Data and Crash Data**

To allow for the fact that 2002 was not a full year Double Demerit trial period and that there has been a varying numbers of days that Double Demerits has applied between corresponding Double Demerit trial periods, the data has been analysed on an average "events per day" basis, ie:

Average daily number of Traffic Enforcement hours

Average daily number of Infringements issued

Average daily number of Crashes

...for both Double Demerits trial periods and non-Double Demerit periods.

Three levels of analysis were conducted as follows:

**Analysis 1:** - Comparison of data during the ten periods of Double Demerit activity during 2002/2003, compared to data recorded during the equivalent pre-trial periods both in 2001 and over the previous five years where available. This analysis is referred to as the ***Pre vs Post Intervention assessment***.

**Analysis 2:** - Comparison of data during non-Double Demerit periods in 2002/2003, compared to data recorded during the equivalent periods in 2001 and over the previous five years where available. This analysis is referred to as the ***Pre vs Post Control assessment***.

**Analysis 3:** - Comparison of the Pre vs Post Intervention assessment and the Pre vs Post Control assessment. The relative strength of any differences observed is referred to as the ***Relative degree of effect index***.

### **Hypothesis:**

The impact of the Double Demerits initiative will be demonstrated if the effects observed in Analysis 1 are *greater* than the effects observed in Analysis 2.

The index derived in Analysis 3 will provide a measure of the *relative strength* of any differences observed between the Intervention and Control assessments.

## KEY FINDINGS

The key results across the five primary area of interest were as follows:

- **Media Analysis:** The majority of drivers in Western Australia are now aware of the Double Demerits legislation (91%), a result achieved through the combination of paid and unpaid media, PR and community debate, and enforcement initiatives.
- **Community Attitudes and Behaviours:** Three quarters of drivers are *in favour* of the legislation; two thirds believe the initiative does have at least some impact in terms of *reducing road crashes, injuries and deaths over long weekends*; two thirds claim to have *reduced their speeding behaviour*, one third claim to have *reduced their alcohol consumption* when driving and one quarter claim to have *increased their use of restraints* or their *checking of passengers* during Double Demerit periods. Only 2% of over 1,200 drivers surveyed had received an infringement during a Double Demerit period and three drivers in total had had their licence suspended as a result.
- **Enforcement Activity:** Police report 7.9 times greater enforcement activity during Double Demerit periods – in short, the police have actively supported the initiative ‘on the ground’.
- **Infringement Data:** As a consequence, the number of infringements issued for *speeding, drink driving and restraints-related* offences increased and was 12% higher during Double Demerit periods, however, more importantly, despite the increased enforcement activity and number of infringements issued, the *infringement rate per enforcement hour* was 15% lower than the equivalent pre-trial periods in 2001 and was 46% lower than the infringement rate per enforcement hour during non-Double Demerit periods – this supports the community attitudes and behaviour data above and suggests that vehicle drivers have been encouraged to modify (ie. improve) their driving behaviour during Double Demerit periods.
- **Road Crash Data:** The crash data is the ultimate outcome effect, or indicator, of the effectiveness of the Double Demerits initiative. In short, the analysis of crash data supports, or compliments, both the police infringement data and the community attitude and behaviour data discussed above.

During the trial period for Double Demerits in 2002/2003, the total number of Reported crashes was down 11% during Double Demerit periods and the reduction was 3.4 *times higher* than that observed during non-Double Demerit periods (ie. relative degree of effect index = 3.4). Fatal crashes were *20% lower* during Double Demerit periods, compared to a 9% increase during non-Double Demerit periods; Injury crashes were *down 18%* during Double Demerit periods and the reduction was 1.7 times higher than that observed during non-Double Demerit periods.

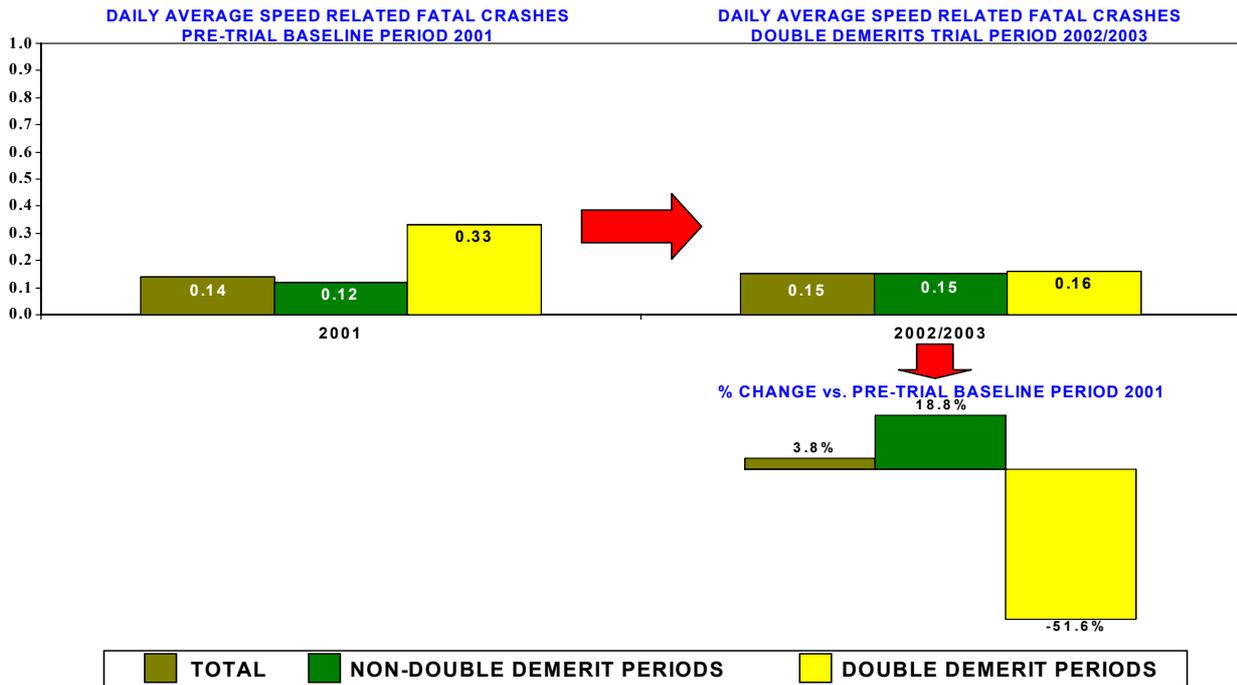
Total crashes where Speed was a factor were *down 40%* during Double Demerit periods and the reduction was 1.6 times higher than that observed during non-Double Demerit periods. Fatal crashes where Speed was a factor were *down 52%* during Double Demerit periods, compared to a 19% increase during non-Double Demerit periods; Injury crashes where Speed was a factor were *down 43%* during Double Demerit periods and the reduction was 1.5 times higher than that observed during non-Double Demerit periods.

Fatal crashes where Alcohol was a factor were *down 54%* during Double Demerit periods and the reduction was 10.3 times higher than that observed during non-Double Demerit periods.

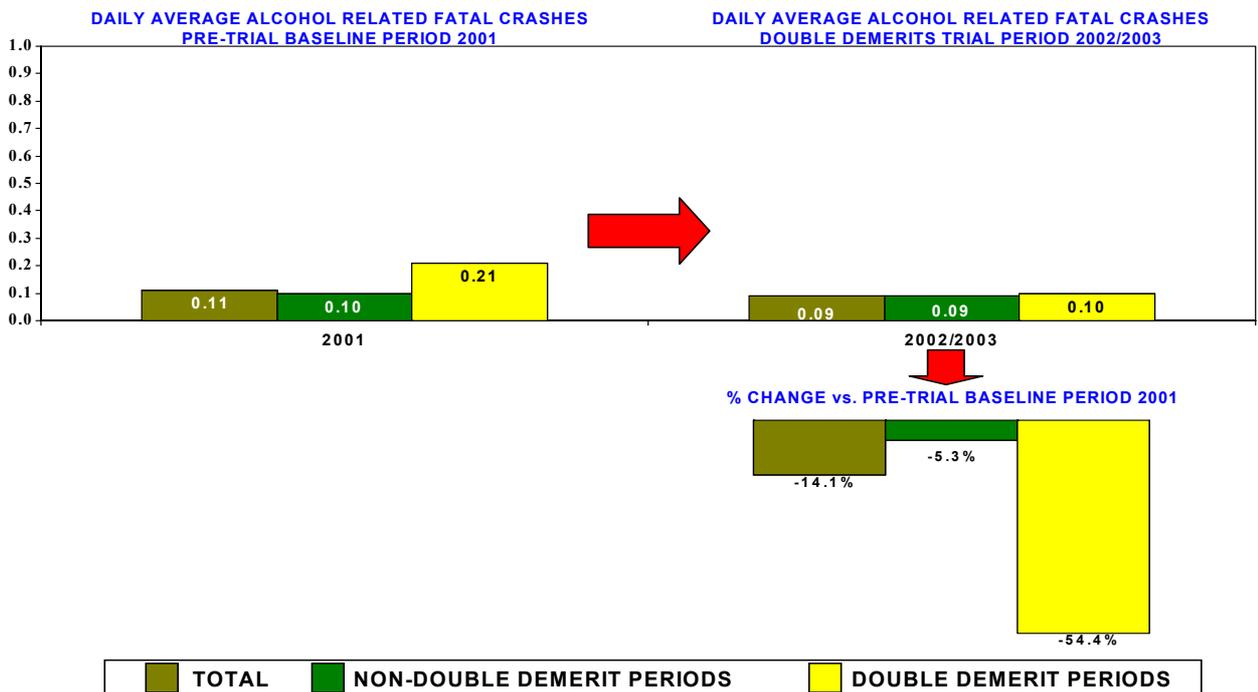
While Fatal crashes where non-use of Restraints was a factor were *down* 7% during Double Demerit periods, they remain slightly higher during Double Demerit periods compared to non-Double Demerit periods. However, Injury crashes where non-use of Restraints was a factor were *down* 39% during Double Demerit periods and the reduction was 1.6 times higher than that observed during non-Double Demerit periods.

The graphs below demonstrate the analysis for two key road crash outcomes observed during the Double Demerits trial period – **the reductions in speed and alcohol-related fatal crashes** compared to non-Double demerit periods in 2001:

**Change in Daily Average Number of Fatal Crashes where Speed was a factor:  
Double Demerits Trial periods vs. 2001**



**Change in Daily Average Number of Fatal Crashes where Alcohol was a factor:  
Double Demerits Trial periods vs. 2001**



## CONCLUSIONS AND RECOMMENDATIONS

In short, there is a high degree of consistency between the data derived from various independent sources – *vehicle drivers report driving safer* during Double Demerit periods, *police report greater enforcement activity* during these periods, the *infringement rate per enforcement hour for related offences is lower* during these periods and the *total number of reported crashes, including the higher severity fatal and injury crashes, are lower* during these periods and have reduced in almost all cases by a greater amount compared to non-Double Demerit periods.

Based on the available information, the trial of the Double Demerits initiative in Western Australia can be considered successful in terms of its primary objective – ie. to reduce the number of road crash ‘events’ and those relating to the three key areas of *speed, alcohol and non-use of restraints* on Western Australian roads during the defined Double Demerit periods. Most importantly perhaps, the Double Demerits initiative has reduced the higher level of fatal crashes involving speed and alcohol that have been observed over these holiday periods in previous years.

While there is some variability in the data between years, there is no firm evidence at this stage to suggest that the impact during year 2 of the trial (2003) is significantly less than the impact in year 1 of the trial (2002)...in some instances the effect in 2003 has been equal to or greater than the effect in 2002. More data and subsequent analysis of year 3 (2004) results will be required to provide a more accurate analysis of trends.

At face value, without the Double Demerits initiative, if the daily rate of road crash events in 2002 and 2003 during Double Demerit periods had remained the same as that recorded in 2001 (Note: the lowest number of fatal crash events ever was recorded in WA in 2001), the overall impact of the Double Demerits initiative over the 62 days of the trial has been to save approximately 8.06 fatal crash events (and approximately 9 lives), and 235.6 injury crash events (and approximately 320 casualties)<sup>1</sup>.

Whilst it is acknowledged that the evaluation the Double Demerits initiative in Western Australia is by no means exhaustive, the evaluation methodology and overall approach has attempted to be as comprehensive as possible and has included as many sources of relevant data as possible – in many respects, this is the most comprehensive evaluation of Double demerits undertaken in Australia and will hopefully serve as a base model for future evaluations in other jurisdictions.

The evaluation has analysed the available data in such a way as to look at the data during Double Demerit periods as well as during non-Double Demerit periods, for comparative purposes. The relative degree of effect analyses take into account the fact that road crashes are generally in decline and provides an estimate of the extent to which Double Demerits has provided an outcome ‘over and above’ naturally occurring phenomenon.

The analysis of crash data has focussed exclusively on ‘events’ (ie. crashes) and has not included an analysis of fatalities or injury data (ie. the number of people killed or injured in those ‘events’). As stated previously, on the basis that the Double Demerits initiative is ultimately designed to reduce the number of crashes on Western Australian roads, it could be argued that the analysis of ‘event’ (ie. crash) data, as undertaken in this evaluation, is in fact more appropriate.

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<sup>1</sup>. Based on 1.09 fatalities per fatal crash event and 1.36 injuries per injury crash event (Source: Reported Road Crashes in Western Australia 2001).

The following **recommendations** are made in terms of the Double Demerits initiative and future evaluations:

1. On the best available evidence, it would appear that the Double Demerits initiative can be considered successful in terms of its primary objective - to reduce the number of crashes on Western Australian roads during the defined Double Demerit periods, with a specific focus on fatal crashes. Moreover, the impact in reducing the number of fatal and injury crashes involving speed, alcohol or the lack of use of restraints is clearly demonstrated. Therefore, it would be prudent to consider making the Double Demerits initiative a permanent feature of the broader Western Australian road safety strategy for an additional period of time – a minimum five year time frame would appear justified, given the results achieved over the first two years.
2. Maintaining high levels of police enforcement and visibility during Double Demerit periods will be crucial to the on-going success of the initiative.
3. The evaluation analyses should be updated annually, to allow the longer-term impact of the initiative to be established, as well as the extent to which the substantial gains observed in 2002 and 2003 can be sustained over time.

## **REFERENCES**

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Legge, M Gavin, AL, Cercarelli, LR. Reported Road Crashes in Western Australia 2001. Injury Research Centre, 2004.