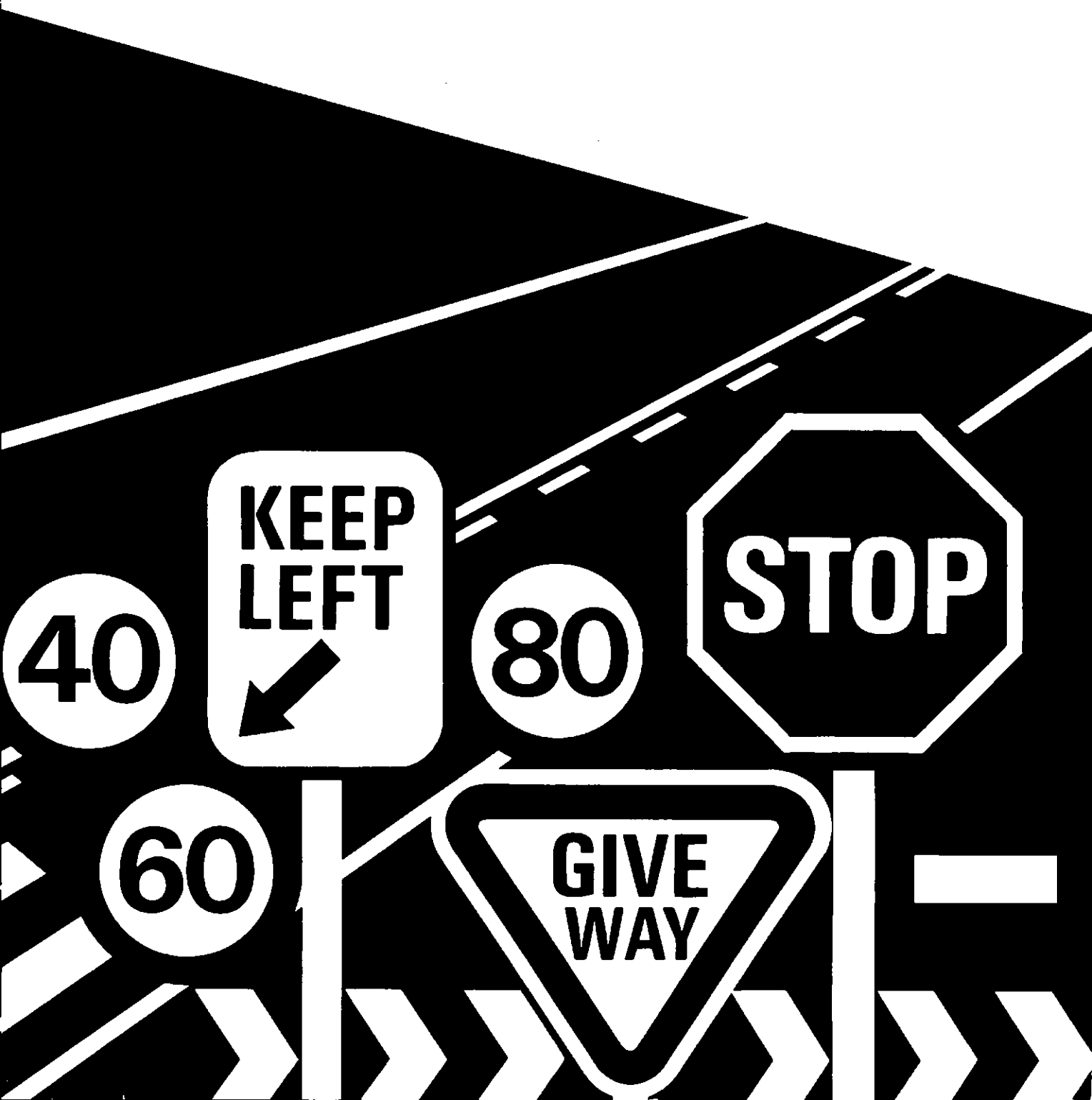


# Death and Injuries on the Road: Critical Issues for Legislative Action and Law Enforcement

ROSS HOMEL & PAUL WILSON

Australian Institute of  
Criminology



**DEATH AND INJURIES ON THE ROAD:  
CRITICAL ISSUES FOR LEGISLATIVE ACTION  
AND LAW ENFORCEMENT**

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Published and Printed by  
The Australian Institute of Criminology  
10-18 Colbee Court, Phillip, ACT, 2606  
Australia

© Australian Institute of Criminology, August 1987

National Library of Australia  
Cataloguing in Publication entry

Hamel, Ross.

Death and Injuries on the Road: Critical Issues for Legislative  
Action and Law Enforcement

Bibliography.

ISBN 0 642 11919 8.

1. Traffic safety - Australia. 2. Traffic regulations  
- Australia. 3. Highway law - Australia.

I. Wilson, Paul R. (Paul Richard), 1941-

II. Australian Institute of Criminology. III. Australia.  
Federal Office of Road Safety.

IV. Title.

363.1'25'0994

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## DEATH AND INJURIES ON THE ROAD: CRITICAL ISSUES

### FOR LEGISLATION AND LAW ENFORCEMENT

#### EXECUTIVE SUMMARY

##### Random Breath Testing

1. While deterrence measures (such as Random Breath Testing) have been effective in reducing alcohol-related deaths and injuries, such deterrent countermeasures, in some jurisdictions, are not cost-effective, and our preoccupation with punishment is often irrational.
2. There is increasing evidence, however, that RBT in NSW has actually achieved what many thought impossible - a permanent deterrent effect, and police enforcement of other non-criminal traffic offences has also produced temporary positive results.
3. The distinguishing marks of RBT in NSW are intensive and sustained enforcement combined with massive and sustained media publicity. A deterrence threshold - testing at least one driver in three each year was reached. Other jurisdictions need to follow this example if they are to achieve cost-effective success with enforcement programs.
4. Evidence from RBT in NSW shows that the effects of this enforcement measure actually intensified in the first year of operation - an achievement which has not been made in any other state or nation for any offence.
5. RBT only results in a permanent reduction in alcohol-related crashes where it is implemented in full - sustained media coverage, breath-testing of at least one driver in three and maintenance of the entire program over time.
6. Results from South Australian studies show that there is a marked decline in impaired driving subsequent to RBT among drivers previously charged (or convicted) with drink-driving offences, that this decline is sustained, and that it holds across age, sex and levels of drinking groups.
7. The trend for police to revert completely to an apprehension-based policy is not recommended, since the essence of RBT is visible, preventive patrols. RBT works not by catching offenders but by deterring the average motorist, although motorists with convictions are much more responsive to the legal threat than those without.
8. Despite the success of RBT in NSW, self-reported drinking and driving is still at unacceptably high levels and a third of fatalities still involve alcohol.

9. One negative side-effect of RBT in NSW was that a minority of heavy drinkers (8.5 per cent), found it harder, not easier, to resist group pressure to drink under the new law.

### Legal Penalties

10. A model of the relationship between legal interventions and traffic offences is given showing the links between individuals' perceptions of the penalties, law enforcement and the outcome behaviours. Official legal activity is relevant to the individual only inasmuch as it enters the world of his/her everyday experiences. The relationship between exposure to law enforcement and fear of sanctions is not automatic as individuals evaluate the range of penalties, possibilities of apprehension and benefits of the 'devious' behaviour.

11. Recent overseas experiences provide no evidence for permanent reductions in alcohol-related fatalities or injuries due to legislative or police enforcement measures. Some measures, which have social impact may only have temporary effects, and traditional deterrent methods do not provide permanent solutions.

12. There needs to be continued searches for ways of influencing the non-legal sanctions through legal means. Such techniques include informal warnings issued by police, written warnings from police or from motor transport department, interviews with errant drivers, and driver improvement programs. These non-legal interventions have proven to be extremely cost-effective.

### Changes to Social Environment

13. Road safety experts have, for too long, concentrated on the physical environment (such as improving road shoulders or the introduction of ignition interlock devices) but have neglected the importance of the social environment.

14. Other manipulations to the physical and social environment are recommended:

- (a) The nature of alcohol outlets requires regulation. Communities must determine whether they want sports stadiums or service stations to sell alcohol and what the characteristics of outlets granted licences should be.
- (b) Increases in the real retail prices of alcohol result in a decline in per capita consumption and hence to fewer alcohol-related problems.
- (c) Reduced availability to young people through higher minimum drinking ages is suggested to reduce drink-driving in the target age group.

- (d) Despite gaps in the literature and lack of empirical data, it appears that advertising stimulates consumption levels, which in turn leads to heavy drinking and to drinking in dangerous situations.

#### Server Intervention Programs

15. The introduction of server intervention programs are strongly recommended. These aim to encourage establishments to control inebriation and under-age drinking, to promote non-alcoholic beverages and food, to improve standards of customer behaviour, and to provide transport for intoxicated customers. These appear to be effective overseas and should be legally implemented through licensing control laws. It has also been demonstrated that such programs do not result in loss of profits to alcohol outlets.

16. However, server intervention programs need to be independently implemented (ie. not identified or linked to the liquor industry as in the Queensland experiment) and they require comprehensive evaluation.

#### Youthful Drivers

17. All research indicates that the highest risk group for traffic crashes are young drivers, especially for males aged 15 to 24 years. Traffic crashes are the largest single cause of death in this age range, both in Australia and overseas, and the overall involvement of young drivers in road crashes is about four times the average for other drivers. The rate of alcohol involvement in fatal crashes is highest among the young, although in Australia it appears to be higher among those aged 20 to 24 years.

18. There is an urgent need to concentrate on measures which reduce the exposure of risk factors to young people, especially teenage boys. As no existing countermeasures have succeeded in reducing youthful crash involvement significantly, steps to remove young people from the roads (as far as possible) and reduce their exposure to risks (eg. alcohol consumption) in other respects is essential to the extent that such steps are supported, or at least accepted, by the community and policy-makers.

19. Most programs involving the young are speculative and have inconclusive results. While some non-punitive interventions have had beneficial effects, the results are limited. Many well-intentioned programs have either been a waste of money or have had deleterious effects eg. high school driver education, which increased the number of licensed 16 and 17-year-olds without reducing the number of crashes per licensed driver.



20. While it is recognised that laws aimed directly at the young are discriminatory and possibly unpopular, a package of regulatory policies could be considered by policy-makers. These include the introduction of curfews which limit driving in the late evening and early morning hours for the first year after obtaining a licence; the implementation of two year learner-driver periods during which time the young driver can develop his/her driving skills; the retention of low Blood Alcohol Content (BAC) levels for provisional drivers; and consideration given to an increase in the drinking age. These measures exacerbate biases against young drivers already present in enforcement practices but there are enough positive indications of these measures reducing the road toll to persuade us that policy-makers may wish to implement some of these measures aimed at young drivers.

### Police Enforcement

21. In conventional enforcement methods, the emphasis should be on high risk times and places as the targets of police activity rather than high risk types of motorists such as young men on motorbikes.

22. If traditional methods of law enforcement are not to create greater tensions between police forces and the community, then some improvements to officer training are required. Attention should be given to: provisions that senior officers have an earlier influence in the training of probationers; that during initial training there be increased emphasis on the value of discretion in traffic work; distinctions between advisory and formal policing roles be made clear; the effective communication of advice and warnings be discussed; and self-awareness in terms of a more personal approach and its positive impression on the road user be included.

23. Research findings highlight the importance of the need for specific policies to be set in train by top police management and the need for such policies to relate to real community concerns, especially safety.

24. Further research is required into selective traffic enforcement programs as no studies to date provide conclusive results. The research must have large numbers of locations, extensive time-series data to achieve acceptable levels of control, statistical power, involve large samples, use random allocation of enforcement treatments, and also include behavioural data.

25. Selective enforcement procedures are recommended, such as general crackdowns, as a rational response to limited police resources. But these methods require monitoring to ensure that resources are not wasted, and they need to be concentrated in high risk places at high risk times.

26. It is argued that highly visible police radar units reduce speed at specific locations and through halo and memory effects, the impact can be extended in distance and to other occasions near those locations.

27. It is proposed that preventive strategies like RBT (focussed on drink-driving) and the enforcement of safety-belt laws be given high priority, alongside a concentration on high risk times and places. The day-to-day operations of the police in traffic law enforcement must be put onto a much firmer scientific base.

### General

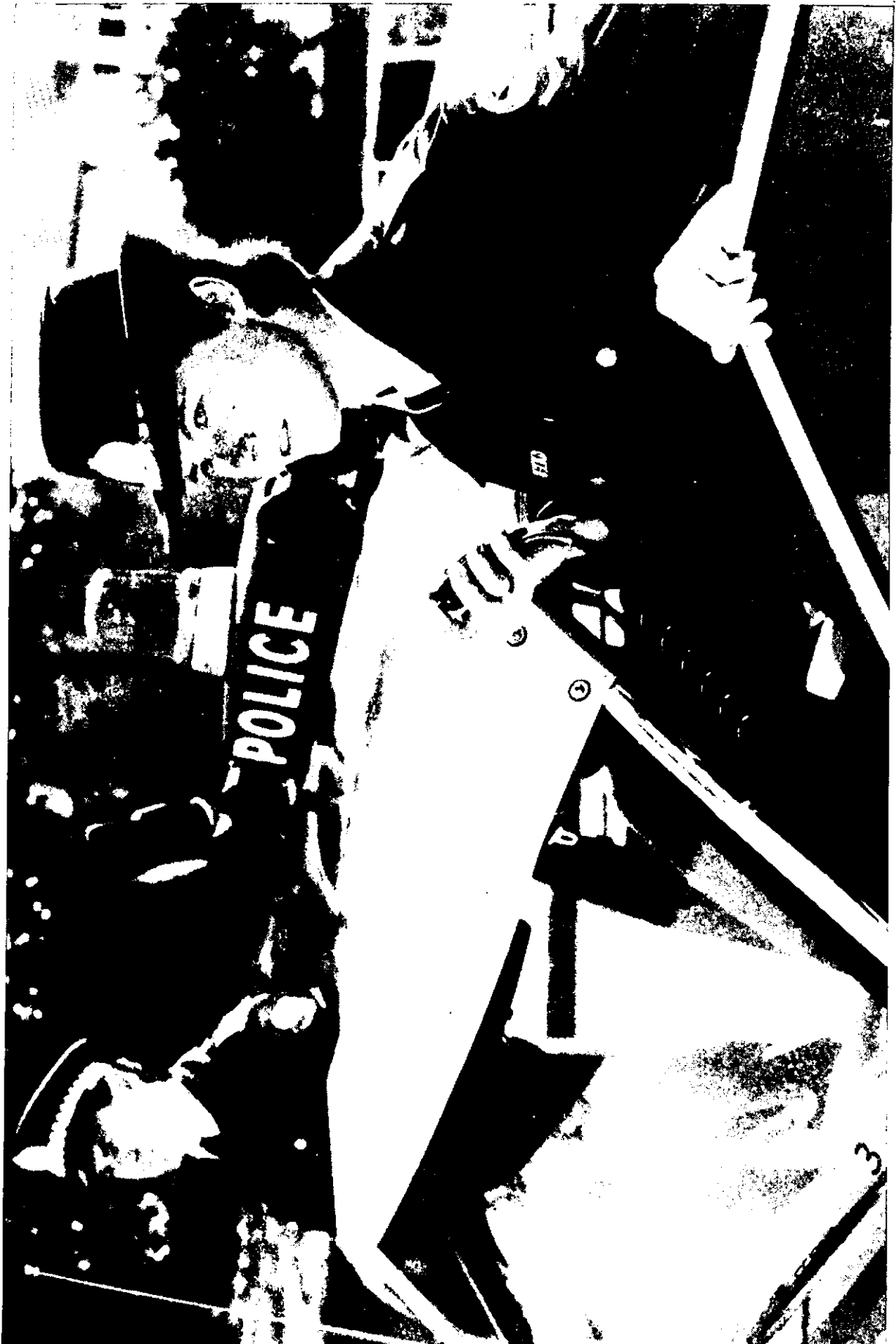
28. The aims of this report included a review of international studies of traffic law enforcement measures, their cost-effectiveness and relevance for Australian conditions; the legislative provisions, particularly in relation to drink-driving which are effective and the most appropriate strategies for road safety benefits. The emphases were on the appropriateness of current laws, the effectiveness of current drink-driving legislation and the cost-effectiveness of such measures.

29. The distinction, in both theoretical and practical terms, between fixed and transient offences needs to be recognised before implementation of countermeasures can be successful. Fixed offences (where the driver cannot change the condition, such as driving while drunk) and transient offences (where the behaviour or condition can be altered, such as speeding) have differing implications for methods used. Highly visible operations like RBT are appropriate as a deterrent for fixed offences, but transient behaviours may require less visible operations.

30. Deterrent measures are only effective in a general, not in a specific sense. Specific deterrent measures (punishment for offenders) have only about a quarter of the potential of general deterrents (advertising the penalties and enforcement methods) for, only a minority of offenders are caught. Even if the punitive measure were totally successful, the crash rate could only ever be reduced by a small amount. However, a significant rise in the conviction rate could boost the potential of specific deterrence.

31. There are significant differences between Australian conditions and those in overseas jurisdictions so that the results of research based on overseas experience are not necessarily applicable in this country.

32. A combination of both radical interventions at the environmental level and traditional enforcement methods are needed if the pressures or opportunities to commit offences or have crashes are to be reduced.



## INTRODUCTION

The general motivation for this report was to provide the background for a submission by the Federal Office of Road Safety (FORS) on the effectiveness of the enforcement of traffic law to the House of Representatives Standing Committee on Transport Safety (HORSCOTS). This report though has been substantially modified from the original submission to FORS and represents the views of the authors and not necessarily the views of the Federal Office of Road Safety.

### The Aims of the Study

The specific aims of the study, in the form in which they were presented to the authors, were to consider the following questions:

- (a) What international studies have been conducted on the effectiveness of traffic law enforcement measures in terms of their cost-effectiveness?
- (b) What is the relevance of the international experience with traffic law enforcement measures for Australian conditions?
- (c) What legislative provisions, in traffic law enforcement generally and drink-driving legislation specifically, are effective given Australian conditions?
- (d) Based on objectives (a)-(c) above what are the most appropriate enforcement strategies to achieve the maximum road safety benefits in Australia?

These questions are very broad, and cover a number of major areas of study. We were directed to the international literature, but also enjoined to apply this literature to Australian conditions. We have therefore reviewed overseas and Australian work in parallel wherever possible.

A second clear theme in the research questions posed is the appropriateness of current laws in relation to road safety. The effectiveness of the enforcement of existing laws is one thing; whether existing laws should be extended, abolished or modified, or new laws passed, is another. Thus we have attempted to glean from the overseas research ideas which might profitably be expressed in legislation in the Australian context.

The reader will note that in (c) we were to consider the appropriateness of drink-driving legislation. We took this to mean, what more can be done through legal means to control drinking and driving, rather than how effective current laws (like RBT) are. Thus our emphasis in the discussion of drink-driving is to consider overseas approaches which do not seem to have been given much thought in Australia (like server intervention programs described in Chapter 2). Nevertheless we

have not neglected the operation of existing laws like RBT, since clearly there is a constant need to monitor and improve the ways in which these laws are enforced, and sometimes overseas experience can assist in this process.

Moreover, it should be noted that at least half the literature on enforcement is concerned with drink-driving, so that any review of the field must give some attention to routine drink-drive law enforcement. We have concentrated on very recent publications and on research which allows an update on the conclusions concerning deterrence set out in Homel (1986a).

A final theme apparent in these questions is cost effectiveness. What works, but particularly, what laws and methods of enforcement will pay their own way? We have attempted therefore wherever possible to review research which includes estimates of costs and benefits.

### Limitations of the Review

By now the reader will be aware of the intended scope of the review. However, limited time was available, and there was a strict deadline, so certain restrictions had to be imposed on what could actually be accomplished.

A big problem was encountered in obtaining overseas reports in the time available. As a result, recent or hard-to-get overseas reports have generally not been included.

A further consequence of the limited time available for the study was the need to restrict somewhat the areas of investigation. The general scope of the review was easy to decide: studies were excluded which were concerned primarily with the epidemiology of traffic accidents, with pharmacological and physiological issues, with driver training, education programs and publicity campaigns, with administrative measures not directly related to law enforcement, and with traffic and vehicle engineering (except to the extent that these latter areas were relevant to law and its enforcement). However, it was somewhat more difficult to decide about some other areas of research.

One major question was how much effort should be devoted to reading the considerable literature on the effectiveness of treatment programs or of punishments imposed on convicted offenders (this field constituted a major part of the earlier review on traffic law enforcement undertaken by Ward, Woods and Brennan [1973]). It was decided on practical grounds to limit investigations in this area to topical issues such as the value of imprisonment and the use of alternatives to traditional legal sanctions. An additional consideration was that Professor Sanson-Fisher and his colleagues from the University of Newcastle completed a review of drink-driver rehabilitation programs in 1986 (Sanson-Fisher, Redman & Osmond 1986), and so it did not seem appropriate to cover this ground again.

Finally, we decided on pragmatic grounds to more or less exclude studies which were primarily theoretical in orientation unless they could offer clear guidelines for policy. Theoretical studies occur most frequently in the sociological literature, and are often concerned with the process of deterrence. Readers interested in this area should consult Homel (1986a) and Homel (in press). A brief outline of basic concepts relevant to law enforcement in the road safety field is set out in Chapter 1, together with arguments for the need to pay closer attention to the physical and social environment.

### Sources of Information and Acknowledgements

The following computer databases were searched:

National Criminal Justice Reference Service (NCJRS). This database covers all aspects of law enforcement and criminal justice, and was therefore of central importance in the review. A number of microfiche documents were ordered from this search but were not received in time to be included.

Psychological Abstracts. As would be expected, documents in this series focussed on issues like the personality characteristics of convicted offenders, assessment procedures for treatment programs, and the effectiveness of various types of treatment programs. Moreover, the vast majority dealt with drinking and driving. Thus for the reasons discussed above, references in this series were not pursued.

Sociological Abstracts. This produced some very interesting papers, nearly all on drink-driving, but most were theoretical in orientation and were therefore not directly utilised in the present review.

Computerised Information from National Criminological Holdings (CINCH). This is a comprehensive database which contains references to criminological material of Australian origin (even newspaper articles). Some useful articles not previously known to the authors were uncovered.

Australian Road Index, Australian Road Research in Progress (ARRD). A useful source of information on Australian publications and work in progress.

Office of Road Safety Retrieval System (LASORS). This is a valuable listing of holdings in the library of the Federal Department of Transport. It has a good coverage of both local and overseas research.

International Road Research Documentation Scheme (IRRD). This covers all aspects of roads, transport and crashes and yielded a large number of relevant documents (especially European), most of which could not be followed up in the time available.

In addition, useful references were obtained from staff of the Federal Office of Road Safety.

The resources of Macquarie University library, the library of the Australian Institute of Criminology, the Australian Department of Transport library, the University of Sydney Law School library, the NSW Traffic Authority library and the traffic and safety library of the NRMA were utilised. Special thanks are owed to Sally Dallas at Macquarie, Graham Hoskins and Margaret Smith at the Traffic Authority, Gaye Miller at NRMA and Kristina Klopp at the Institute of Criminology.

In addition, Peter Homel (one of the author's brothers) and Bruce Flaherty, both of the NSW Drug and Alcohol Authority, were very helpful in supplying reports on current alcohol programs and policy in Australia.

# 1. LAW AND ROAD SAFETY: SOME THEORETICAL ISSUES

In reports on road safety it is customary to refer to the three 'Es' of enforcement, engineering (or environment) and education. In particular, the importance of engineering or environmental approaches is often stressed, in concert with the lament that the emphasis on 'human factors' has diverted resources from these critical areas of endeavour (eg. Klein & Waller, 1970). Despite the emphasis in this report on modifying human behaviour through legal countermeasures, we are inclined to agree with this lament.

Recent developments in criminological theory and crime control policy stress the importance of the physical environment in influencing the decision to offend and in constraining the nature of the offences committed (eg. Bennett & Wright, 1986). One example of the practical policies implemented in the past few years is 'target hardening' to reduce the incidence of vandalism or robbery (Mayhew, Clarke, Sturman & Hough, 1976). Similarly, the critical importance of features of the social environment in encouraging or discouraging the commission of specific offences is increasingly recognised. For example, Felson (1986) has argued that changes in the daily life of the community alter the amount of criminal opportunity in society, hence altering crime rates. He points to such indicators as the 'automobilisation' of youth, adolescent activities with peers and parents and shopping and parking patterns. Neighbourhood Watch programs are one (limited) response to the challenge to alter social patterns in directions which reduce crime.

Road safety experts have long recognised the importance of physical modifications to the road and to the vehicle in reducing the number of potentially hazardous decisions which a motorist must make, and in ameliorating the consequences of incorrect decisions (Searles, 1985). Even problem behaviours which have resisted classical attempts at modification through legal punishments have been attacked in imaginative ways through modification of the environment. An example is the fitting of ignition interlock devices to the cars of convicted drinking drivers in an attempt to reduce the incidence of reoffending.<sup>1</sup> In proposing the use of such imaginative schemes road safety workers have been way ahead of criminologists, who have long been bound by the view that criminal behaviour is caused by impulses beyond the control of the criminal and is therefore a problem which can't be solved by merely physical measures (Bennett & Wright, 1986).

However, road safety researchers have been somewhat slower to see the importance of understanding and manipulating the social environment, or perhaps such measures have been considered too difficult. A perusal of the reports published by the Traffic Authority of New South Wales will reveal much attention to engineering and design issues and to epidemiology and law enforcement, but less to the social contexts within which people live, drink, drive and have crashes. This neglect of social contexts is by no means uniquely a NSW phenomenon (Gusfield, 1984; Mosher, 1985).



Recent developments in thinking among transport and safety researchers to some extent anticipate the kinds of interventions in social contexts consonant with criminological theorising. For example, Haight (1983) has put forward the elementary but profoundly important proposition that the primary factor in road trauma is travel, and that if transport demand can be affected in any way, it should be to restrain it. Whilst recognising that the continued operation of the whole economic, political and social system is dependent on road transport, he argues that for some subpopulations such as young males, selected interventions such as manipulating the driving age are feasible. The problem of changing the driving behaviours of high crash-rate road users is therefore avoided, in favour of changing the law or the social environment in directions which reduce the exposure to risk of these drivers.

Following the sociological approach propounded by Klein and Waller (1970) and by Gusfield (1981a; 1984), among others, we propose a study of the human factor in road safety within a broad physical and social context which takes into account not only the decisions and motivations of the individual, but recognises that these decisions and motivations are influenced by the opportunities and constraints present in the physical and social environment. Some drivers, such as teenage boys, drive a lot at night, and are therefore at risk just for this reason (and of course for other reasons as well). A driver may be scared of getting caught for drinking and driving, but if there is absolutely no other way of getting home he will probably risk driving. A truck driver may recognise the dangers of long distance hauls at night at speeds over the posted limit, but if he needs to work a heavy schedule to earn the money to pay off an enormous debt incurred in purchasing his vehicle, he will probably persist with hazardous driving practices. Legal measures directed at the individual may be much more effective if attention is also paid by the authorities to these environmental and social constraints.

Indeed the case for such environmental countermeasures has been argued for so long by people such as Klein and Waller (1970) that it is perhaps puzzling that they appear to have been largely neglected. In most countries, the theory of deterrence through criminal law enforcement has determined the major system of public responsibility for road safety, with primary focus on the individual motorist (Homel, 1986a). Consequently, much of the present review is concerned with investigating the evidence for the effectiveness of some of these measures. Nevertheless, we will point in later chapters to some legal measures directed at the wider context which, according to overseas research, may have potential to reduce the number of crashes.

#### The Value of Traditional Deterrence-based Countermeasures

It can be argued that society's emphasis on individual level deterrence policies is a realistic reflection of their importance as road safety countermeasures. After all, better highways

certainly save lives (Searles, 1985), but better highways are very expensive. Some objective evidence concerning the value of deterrence-based and other countermeasures is presented in a most interesting paper by Trilling (1978). This paper is notable for its inclusion of a wide range of countermeasures and for its emphasis on the cost-effectiveness of these measures, not just on their overall potential to prevent crashes.

Trilling (1978) examined the pattern of expected fatalities and injuries in the US for the decade 1977-1986 in order to isolate major problem areas and to evaluate countermeasures which may be effective in dealing with them. A large list of countermeasures was reduced to 37 deemed to be the most promising. The paper is centred on a cost-effectiveness analysis of these 37 countermeasures, assuming that those already in force would be developed on an incremental basis. There were obvious shortcomings in the data, but the rankings presented illustrate the methods and allow rough estimates of priorities on a national scale (as opposed to individual states).

It is noteworthy that several of the top countermeasures in terms of fatalities forestalled were essentially focussed on 'human factor' issues. Mandatory seat belt usage was top by a wide margin (with the potential to prevent 89,000 fatalities over the decade), followed by enforcement of 55 mph law (31,000 fatalities), combined alcohol safety action programs (13,000 fatalities), emergency medical services (8,000 fatalities), and selective traffic enforcement (7,560 fatalities). In terms of costs, the most expensive were engineering measures - paved or stabilized shoulders, bridge widening, etc. However, when ranked according to dollars per fatality forestalled, highway construction and maintenance ranked second after mandatory seat belts, although the latter had a much greater potential for reducing crashes (31,000 compared with 459). Alcohol countermeasures ranked around the middle in cost-effectiveness, while the 55 mph law still ranked near the top (fourth).

These data are probably not applicable directly to the Australian situation given the differences between the two countries in the standard of road construction. Moreover, RBT may have made alcohol programs much more cost-effective than was assumed by Trilling's informants, who were probably basing their estimates on the Alcohol Safety Action Program (ASAP) experience (National Highway Traffic Safety Administration, 1979). ASAP was based mainly on traditional enforcement methods combined with treatment for convicted offenders (a very expensive approach with limited road safety payoffs). Thus the cost-effectiveness rankings may need modification for Australia.

Indeed, it is stressed by Trilling (1978) that the effectiveness of each countermeasure is highly dependent on the site where it is deployed and what other measures are currently in use. Methods for determining priorities at the state level are explained, and could be used in Australia. A feature of the methods proposed is the concept of the marginal return to the national dollar, which may be interpreted as a criterion of what constitutes an acceptable investment at any level of expenditure.

In summary, Trilling's paper highlights the paramount importance for accident reduction of three forms of law enforcement. In order of importance these appear to be enforcing the 55 mph speed law, drink-drive law enforcement, and selective enforcement of traffic law. In terms of dollars per fatality forestalled, enforcement of the 55 mph law remained a very attractive proposition, with the other two approaches having a middle ranking in priority compared with a range of educational and engineering countermeasures. Thus it would appear that an objective cost-effectiveness analysis confirms the importance of the traditional emphasis on enforcement and deterrence.

However, Trilling introduces a caveat: estimates of fatality and injury reductions through the application of various countermeasures 'may in fact be very subjective' (p 45). Much of the literature suggests that the relative optimism with respect to the efficacy of law enforcement displayed by the researchers surveyed in the study may be misplaced. Writers in the field have maintained repeatedly that such optimism is simply not justified by the evidence. The Organisation for Economic Co-operation and Development (1974) stated:

There is an air of uncertainty surrounding traffic law enforcement as a means of effecting the safe and efficient movement of traffic. ... Most of the experimental work reviewed in the report appears to strongly suggest a positive road safety value in increased police enforcement. However, it cannot be stated categorically that such is the case (p 3).

The scepticism of Klein and Waller (1970) has already been noted. Rothengatter (1982) notes in a more recent review that although police surveillance can have limited and transient effects, the punitive system is probably not as efficient as one based on direct feedback to motorists or on administrative measures like advisory letters to motorists.

Perhaps the most savage criticisms of deterrence as a basis for road safety policy have come from sociologists. Cressey (1978) expresses an abiding hatred for the whole punitive, repressive philosophy entailed in the use of deterrent measures. His contempt for the claimed effectiveness of such measures, whether applied to traffic or other offences, knows no bounds. Perhaps even more telling are the criticisms of H. Laurence Ross (Ross, 1986; Ross & Hughes, 1986), since he has devoted a great deal of time and effort to evaluating the deterrent effectiveness of legal measures directed at drink-driving (Ross, 1982). Whilst acknowledging that legal countermeasures in Britain, Canada and Australia have succeeded in reducing alcohol-related deaths and injuries, and even conceding that NSW has achieved a world first through RBT in permanently reducing the road toll, he questions the wisdom of deterrent policies. He argues that the intrusiveness of measures like RBT is not justified on civil

liberties grounds, and that the whole emphasis on arrest and punishment is much less cost-effective than environmental approaches, such as air-bags.

We should persist in condemning drunk driving and in prosecuting those who are caught. But an obsessive concern with this single phenomenon carries two dangers. It promises much more than it can deliver in terms of public safety, and it diverts attention from the corporations that ignore the harm caused by their products and the government officials who fail to initiate action to correct defects that threaten lives (Ross & Hughes, 1986, p 664).

He notes further that deterrence thinking comes easily to people like legislators, and that 'if all you have is a hammer, then everything looks like a nail' (Ross, 1986, p 20). There seems to be a universal psychological bias towards attributing blame to human beings rather than to the environment (unless we are the human beings 'at fault': Shaver, 1975), and the view of car crashes as results of individual driver fault is 'the dominant theme in the cultural organisation of accident reality ...' (Gusfield, 1981a, p 41). In other words, much of our preoccupation with punishment and deterrence may well be irrational from a cost-effectiveness point of view.

### The Nature of Traffic Offences

Following this discussion of deterrence policy as at least in part 'irrational', and to lay the foundations for a reappraisal from the literature of deterrence and law enforcement as road safety measures, it is important to consider in more detail the class of behaviours which are the focus of enforcement. Gusfield (1981a) makes a strong distinction between drink-driving as an offence, and other traffic offences. Behind all drink-drive legislation is the image of the 'killer drunk', the morally flawed character who has committed more than an ordinary traffic violation. 'The drinking driver is a villain who threatens the lives of others through indulgence in his own pleasures, and is more open to condemnation than the motorist who occasionally lapses from proper driving conduct' (Homel, 1986a, p 6). In the arena of traffic the law is not an agent of public morality as it is with drink-driving. The essence of non-drink-drive traffic law is administrative, not moralistic: it is a neutral instrument of a rationalised, technologically interdependent society (Gusfield, 1981a).

This distinction is not just of theoretical importance. Laws are not drafted and enforced in a social vacuum, and both the nature and effects of a traffic law will depend to some extent on whether it is an expression of public moral outrage or the output of an expert committee concerned with optimising the safe and efficient flow of traffic. This point is strikingly illustrated

by contrasting the controversy surrounding drinking and driving in this country and overseas with the almost total absence of public debate (at least in Australia) about speed limits.

It is really very interesting to note the extent to which in this country information and discussion about speed limits and the effectiveness of speed law enforcement is the domain of experts. Of course there are the perennial complaints from the public about police 'revenue raising' through radar speed traps (Parliament of New South Wales Joint Standing Committee on Road Safety, 1986), and any motorist if asked will express an opinion on speed limits, but the important decisions seem to have been made largely in an atmosphere of public lack of concern. Australians appear to be happy to delegate these kinds of decisions to the experts, and provided the authorities don't take things like speed law enforcement too seriously are content to live with the decisions.

There are signs that the pre-eminence of alcohol countermeasures in public policy is being questioned (Duncan, 1986) and maybe recent advertising campaigns focussed on speed reduction will alter public perceptions of speeding offences (Traffic Authority of New South Wales, 1986), but we think it unlikely that speed law or any other aspect of traffic law will generate the heat which has surrounded RBT and other drink-drive countermeasures. One has only to read recent literature from Queensland to appreciate the vehemence of the drink-drive debate (Levy, 1986; Moller & North, 1986). Traffic laws, as administrative categories rather than as prohibitors of real crimes, will therefore probably never be adhered to because people do not have a strong moral commitment to the law. Compliance will be a function of informal processes in the peer group (eg. teenagers), as well as opportunity, convenience and (maybe) law enforcement.

Despite the frequently symbolic nature of drink-drive law, there is increasing evidence that RBT in NSW has actually achieved what many thought impossible: a permanent deterrent effect (Homel, 1986b; Ross, 1986). In addition, despite a general pessimism about police enforcement of other 'non-criminal' traffic offences, there is good evidence that temporary effects can be achieved (Armour, 1984; Organisation for Economic Co-operation and Development, 1974; Rothengatter, 1982). This implies that in addition to the moralistic/administrative distinction which is so important in understanding the operation and effects of drink-drive and other traffic law, there may be other ways in which traffic offences can be classified which will aid in a review of the enforcement literature.

A common distinction is between moving and non-moving offences, but since the focus of this review is safety rather than the free movement of traffic, non-moving offences will not be further considered. A more important distinction for our purposes is between fixed and transient offences (Cameron & Sanderson, 1982).

Fixed offences are those which the road user commits and is not able to cease committing in some very short time. Examples are drink-driving and failing to use available seat belts.

Transient offences are those which the road user can cease quickly, or decide to avoid, in response to some visible threat from enforcement operations. Examples are exceeding speed limits and disobeying intersection controls (Cameron & Sanderson, 1982, p 1).

Clearly both the environmental constraints and the decision-making processes will be different for these two classes of offences, and therefore enforcement practices aimed at deterrence may need to take different forms. For example, highly visible operations like RBT may be appropriate to achieve a general deterrent effect for fixed offences, but where behaviours can be altered quickly non-visible operations may help to create the impression of police omnipresence (Booth, 1980), thus extending a deterrent effect.

### The Relationship Between Legal Interventions and Traffic Offences, with Particular Reference to the Deterrence Process

In this section we clarify briefly the nature of the assumed deterrence process, and to consider those aspects of the social and physical environment which may be susceptible to manipulation through legal means. A detailed study of the deterrence of drink-driving may be found in Homel (1986a), and only selected aspects of the theoretical model - applied to all traffic offences - are presented here. Our main aim is to indicate the complex nature of 'simple' deterrence, and to highlight the many ways in which legal interventions may influence behaviour other than through the direct fear of legal punishments.

First, some basic definitions. Gibbs (1975) has defined deterrence in the following terms: 'Deterrence can be thought of as the omission of an act as a response to the perceived risk and fear of punishment for contrary behaviour' (p 2). Deterrence therefore is a psychological process in which perceptions of risk and the fear generated by the legal threat play a key role. A distinction is usually made between general deterrence, which relates to the impact of the threat of legal punishments on the public at large, and specific deterrence, which relates to the impact of legal punishments on those who have suffered them. It is also useful to distinguish absolute specific deterrence and marginal specific deterrence. Marginal specific deterrence is the effect of one type or quantity of penalty compared with another (two weeks in prison versus six months licence disqualification), while absolute specific deterrence is the effect of arrest, conviction and punishment on an offender in

comparison with an equivalent offender who has never been caught. There is virtually no research on absolute specific deterrence for any class of crime, although it is probably of much greater importance than marginal deterrence.

It is frequently maintained that general deterrence has greater crash reduction potential than specific deterrence (by which is meant absolute and marginal effects combined: Summers & Harris, 1978; Cameron & Sanderson, 1982). The basis for this assertion is that only a minority of offenders are caught, and therefore even if punitive measures were totally successful, the crash rate could only be reduced by a small amount. For example, based on work conducted by South (1982) into the involvement of convicted drink-drivers in alcohol-related fatal crashes after their conviction, Cameron and Sanderson point out that if all convicted drink-drivers in Victoria never had another alcohol-related crash, the number of fatal crashes would be reduced by about eight per cent. By comparison, about 35 per cent of drivers involved in fatal crashes in Australia have illegal blood alcohol levels, imposing a ceiling of 35 per cent on the fatal crash reduction potential of general deterrence (assuming all alcohol-related crashes are caused by alcohol).

Thus as a rough rule of thumb, specific deterrent measures have only about a quarter of the potential of general deterrent measures. However the exact ratio undoubtedly varies depending on the class of offence and the seriousness of the crash (fatal, injury or property only). Moreover, it should be noted that these calculations depend to some extent on the proportion of offenders who get caught, and that a significant rise in the conviction rate could boost the potential of specific deterrence. We discuss this issue further in Chapter 2.

In a recent book which brings together theory and data on criminal behaviour as a rational choice between alternatives, Cornish and Clarke (1986) distinguish criminal involvement from criminal events.

Criminal involvement refers to the processes through which individuals choose to become initially involved in particular forms of crime, to continue, and to desist. ... Event decisions, on the other hand, are frequently shorter processes, utilising more circumscribed information largely relating to immediate circumstances and situations (p 2).

They use these concepts to analyse in some detail burglary offences in middle-class suburbs. Applying their models to traffic offences will help to clarify the processes by which traffic law enforcement is supposed to have a deterrent impact.

First, repeating the obvious but important point raised by Haight (1983), it is not possible to be involved in committing traffic offences unless one is a road user - usually a motorist. Whatever factors may predispose a motorist toward committing offences or having crashes, one way of reducing involvement is to reduce exposure to risk through physical or legislative means.

Second, it should be noted that the concept of involvement is centred on explaining premeditation among criminals. However, the role of premeditation is rather unclear in relation to traffic offences. For some fixed offences, such as drinking and driving, premeditation may make some sense, in that some heavy drinkers (for example) may deliberately plan in advance to drive over the legal limit. Similarly, some drivers may choose as part of their lifestyle not to wear seat belts, or to use marihuana whether driving or not.

Thus what needs to be explained is why some motorists are 'deviant' in these respects, how they got to be like that, and how legal threats failed to curb the development of these tendencies. Klein and Waller (1970) discuss in some detail groups who won't or can't conform to the law, as well as the role of social and cultural factors in encouraging traffic offences (especially among minority groups, the working class and the young). Nevertheless, despite the existence of groups with a propensity to offend, the model developed by Clarke and Cornish, and by deterrence theorists generally, incorporates the legal threat and other sanctions. In other words, it is assumed that members of 'deviant' subgroups (like alcoholics) can be influenced by sanctions, although perceptions and evaluations of these sanctions undoubtedly differ from those of other members of the community.

In any case, probably for most motorists committing fixed offences, and even more for those committing transient offences, the event decisions rather than the involvement decisions are the actions which are the primary focus of legal countermeasures. Many traffic offences are committed on the spur of the moment (eg. doing a U-turn at traffic lights), but it is maintained by proponents of deterrence that nevertheless the event decision can be influenced by the threat of legal sanctions.

The model discussed in the remainder of this section attempts to incorporate aspects of the deterrence process operating both at the level of involvement and at the level of the event. It also incorporates non-legal sanctions (such as the financial cost or inconvenience of not committing an offence), which it is assumed can be influenced by various forms of legal interventions. The model is set out diagrammatically in Figure 1.1. The classical 'deterrence process', in which a legal intervention influences criminal behaviour via perceptions and fears of legal sanctions, is represented by the central path in the figure. The physical and social environments are shown at the top and bottom of the figure to emphasise that sanctions and any behavioural responses operate within an overall opportunity structure determined by environmental factors. It is assumed that these environmental factors can themselves be manipulated through legal means.



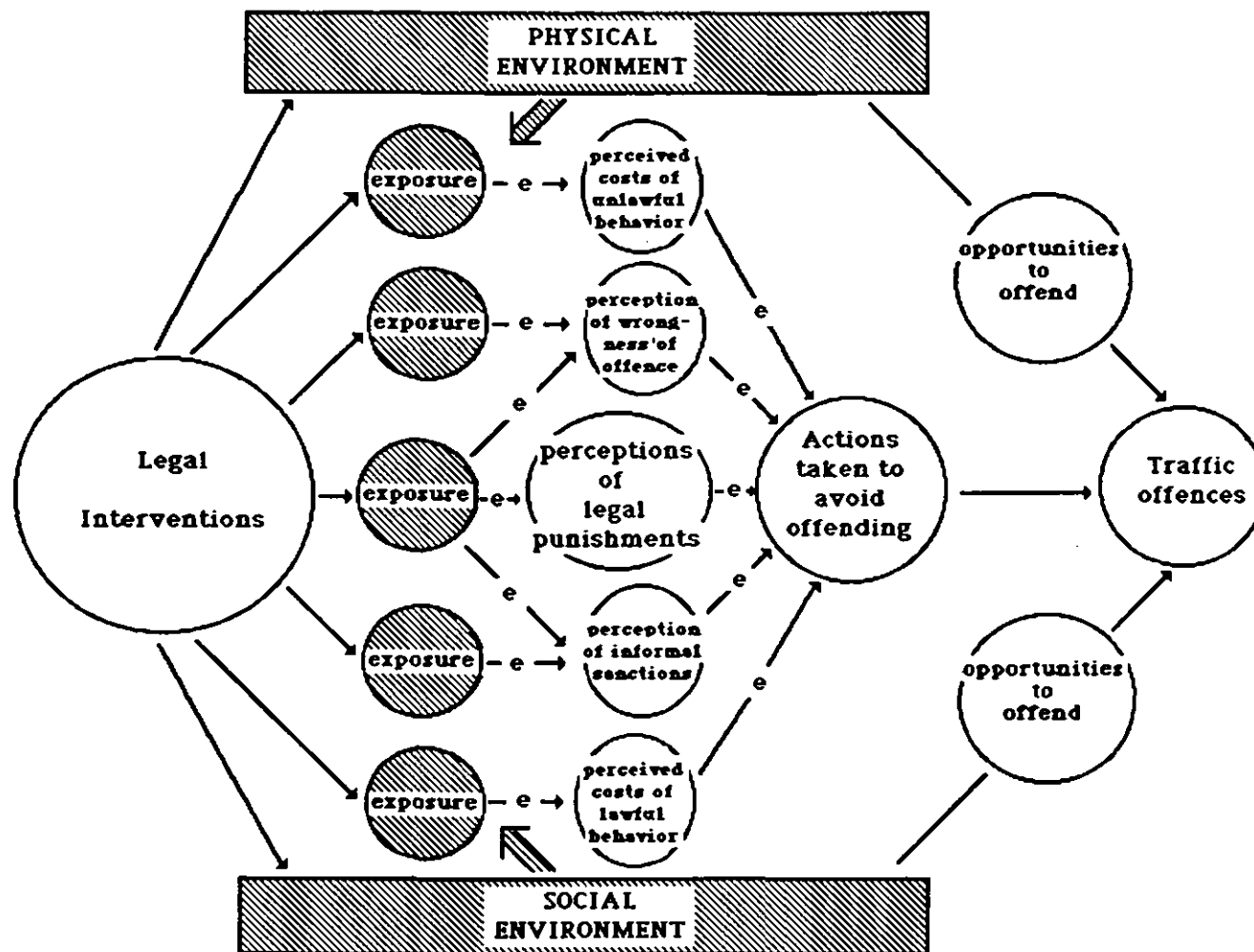


Figure 1.1. Model of the Relationship between Legal Interventions and Traffic Offences

Briefly stating the direct deterrence part of the model, it is proposed that official legal activities and a specific traffic offence are linked through exposure to law enforcement, leading to perceptions of severe and/or certain sanctions and hence to attempts to avoid committing the offence when the motorist is exposed to the possibility of committing the offence. The classes of people to whom deterrence will be applicable are, in the case of general deterrence, all drivers (or all drivers who drink if the offence is drinking and driving), and in the case of penalties, those who have been penalised. As indicated above, it is proposed that the behaviour of all types of persons can be described in terms of the deterrence model, even the behaviour of persons who might have highly developed consciences concerning traffic offences and the behaviour of people labelled as 'deviant' (eg. alcoholics). However, it is recognised that among the non-legal sanctions which can influence behaviour are feelings of guilt if an individual does commit an offence (self-imposed punishment). (Non-legal sanctions are discussed in more detail below.)

At the heart of the model are the perceptions of legal sanctions. However, these perceptions on their own are not sufficient to explain behaviour; a process of evaluation takes place, whereby the individual weighs the personally determined costs of the threatened consequences of his behaviour. Thus two individuals might have exactly the same perception of the penalties which would be applied to them for drinking and driving, but one might be much less worried than the other at the prospect of actually experiencing those penalties. In Figure 1.1 this process of evaluation is designated by the symbol 'e' in the arrows linking perceptions of sanctions and actions.

Perceptions and evaluations of sanctions (both legal and non-legal) influence behaviour. Legal sanctions may encourage individuals to adopt strategies to avoid getting into situations where they are likely to commit an offence, but some sanctions such as informal punishments imposed by peers for non-conformist behaviour, may have the opposite effect. In particular, the belief that threatened punishments would be personally unpleasant and the belief that the chances of arrest are high lead to increased attempts to avoid offending. Such avoidance strategies, in turn, lead to less offending and this (presumably) results in fewer traffic crashes.

In order for this to be a sociological model, perceptions must be linked in some way with the objective legal actions. It is proposed that official legal activity is relevant to the individual only inasmuch as it enters the world of his everyday experience - in other words, to the extent that it impinges on the social or physical environment surrounding the individual. Laws which are passed or punishments which are imposed without the knowledge of the individual cannot affect his decision-making processes, at least until the activities of other people who affect that individual are altered. Thus exposure to legal actions is the variable linking official activity with perceptions and evaluations of sanctions. The more intensive or

frequent the official activity, the more intense or frequent will be the exposure of the threatened or punished population. Exposure might occur through observing or experiencing police enforcement, or through knowing others exposed in this way. In addition, the experience of punishment through a conviction is a form of exposure. The model predicts that those exposed to legal sanctions in any of these ways will be fearful of the consequences of offending and will modify their behaviours accordingly.

But the relationship between exposure and fear of sanctions is not automatic. Once again, it is proposed that an individual process of evaluation takes place (again designated in Figure 1.1 by the symbol 'e' in the arrows between exposure and perceptions of sanctions). The experience of being randomly tested may have more impact on one driver than on another; the experience of a heavy fine and a long period of disqualification may be interpreted by a repeat offender as fair, or at least to be expected, while exactly the same penalty may be interpreted by a first offender as extremely tough. These differing constructions of the meaning of similar experiences will lead to differing evaluations of threatened or actual legal sanctions.

The importance of the physical and social environment is highlighted by the incorporation of non-legal sanctions. The individual is assumed to be subject to several social control mechanisms: guilt feelings resulting from the internalisation of norms, the threat of social stigma resulting from informal sanctions, and the threat of physical and/or material deprivation. One source of material deprivation is formal, legal punishments (loss of licence, etc), but other sources include the costs and inconveniences involved in not committing an offence (eg. losing a contract because the goods were not delivered fast enough or paying for a taxi home after a party), as well as the non-legal material costs entailed in committing an offence. As examples of the costs entailed in committing an offence, some drivers may refrain from speeding because they are conscious of fuel costs, and most drivers are more than conscious of the potential of speed humps to damage their vehicle. Other major material costs are entailed in having a crash. Fear of crashing presumably restrains many a driver from foolhardy and illegal driving behaviours.

The point is that the fear of legal punishments competes with all these other threatened sanctions. In order to increase lawful driving, one could use legal means to enhance the direct legal threat, or one could also use legal means to manipulate these other non-legal sanctions. It may be that increasing the legal threat will of itself influence the non-legal sanctions, as indicated in Figure 1.1. For example, punishment for speeding may actually make someone more aware of the risks and feel more guilty about future acts of speeding (not simply more wary of being caught again). Alternatively, legal actions may be aimed directly at manipulating the internalisation of norms or at informal punishments imposed by peers and others. For example, the use of warning letters to errant drivers may strengthen

internal control mechanisms (Rothengatter, 1982). Again, licensing laws may be devised to require bartenders to intervene if a patron has had too much to drink (Simpson, Beirness, Mayhew & Donelson, 1985). Such interventions may have a marked effect on the informal group processes which frequently encourage drinking to excess.

This last example illustrates the potential of legal measures to alter the social environment within which offences take place. Another example is the use of liquor licensing laws to require drinking establishments to be close to major forms of public transport, thus reducing the cost and inconvenience entailed in the use of public transport. Moreover, the physical environment can be the target of legal measures, as in the use of ignition interlocks or speed governors, which make the offences of drink-driving and speeding more difficult and inconvenient, although not impossible. In addition, legal steps can be taken to influence the driver's involvement in opportunities to offend - the exposure factor. One example is night curfew laws for young drivers (Preusser, Williams, Zador & Blomberg, 1984), and another is the confiscation of an offender's vehicle during a period of licence suspension.

Thus in general legal countermeasures may either be aimed directly at the individual road user or at his social or physical environment. Environmental countermeasures may have as their aim the manipulation of sanctions (eg. increasing the inconvenience entailed in offending) or they may be designed specifically to limit opportunities to offend. Manipulation of opportunities to offend through environmental action are shown explicitly in Figure 1.1. The alterations in the physical or social environment implicit in exposure to legal interventions are indicated by the broad arrows from the environment boxes to the exposure circles, and by the shading of the exposure circles in the same way as the environmental boxes.

In summary, deterrence (fear of legal punishments) is the most direct way in which legal actions can influence behaviour, but legal interventions can also have a great impact through manipulation of the various forms of non-legal sanctions. In addition, legal actions designed to have a direct deterrent effect may influence behaviour by altering these non-legal sanctions. To a greater or lesser extent, manipulation of all forms of sanctions entails alterations in the social or physical environment, since legal interventions must enter the world of the potential offender before they can affect his behaviour. Legal interventions can also have a profound effect by altering the physical or social environment in ways which limit opportunities to commit offences. Whether as a society we are prepared to tolerate the changes in ways of life entailed in such alterations to the environment is another question.

NOTES

1. A pilot project involving the fitting of such devices in the cars of convicted drink-drivers commenced in California in August 1986. The idea is that the car will not start before the driver undergoes a breath test with a breathalyzer installed in the ignition. If he fails the test, the car will not start.

## 2. DRINKING AND DRIVING

The role of moral outrage as a factor in the legal response to drinking and driving was discussed in Chapter 1. Nowhere is this more evident than in the United States, where citizens' action groups such as MADD (Mothers Against Drunk Drivers) and RID (Remove Intoxicated Drivers) have enjoyed extraordinary success in the past few years in persuading legislators to pass laws providing for harsh penalties for the drunken driver. Imprisonment for up to three days is now mandatory even for first offenders in 17 states, and 42 states provide for mandatory jail terms of two to 60 days for second offenders, despite the lack of evidence that more severe penalties, especially imprisonment, have any deterrent value (Ross, 1982; Salzberg & Paulsrude, 1984; Voas, 1986). The success of groups like MADD in the US led to the establishment in April 1982 of the Presidential Commission on Drunk Driving.

The Commission's report was tabled in November 1983, and stressed strategies directed at individual behaviour change - education, deterrence, treatment and publicity campaigns. Mosher (1985) criticised the Commission report as a 'seriously flawed' document (p 239).

If we are to prevent drinking-driving, we must do more than threaten, cajole or persuade individuals to act more responsibly. Prevention requires that we act collectively on three fronts. First, we must examine the social and physical environments of drinking and driving behaviour and seek changes which will diminish the likelihood that individuals will combine these two activities. Second, the role of the 'agents' of drinking-driving - alcohol and the automobile - must be examined. Finally, programs aimed at changing behaviour need to be developed in conjunction with the first two sets of strategies (p 241).

The limited potential of deterrence policies aimed at the individual motorist is stressed by Mosher. A perusal of the recent literature from North America and elsewhere does not much alter the picture presented by Homel (1986a) and others (eg. Ross, 1982; 1985), which is that well-publicised campaigns emphasising the certainty of arrest have a short-term deterrent impact, and that extremely severe penalties generate distortions in the criminal justice system without achieving notable safety benefits.

In this chapter we begin by reviewing this recent literature, paying particular attention to overseas experiences with enforcement practices akin to random breath testing. We also consider briefly the US and Scandinavian experiences with imprisonment, since this is a direction Australian legislators may be tempted to take at some future time. We then briefly

present an update on the Australian experience with RBT, and make some practical recommendations for improving its effectiveness. Following these sections focussed on the individual motorist, we consider the issue of alcohol availability, which leads to a consideration of the US and Australian literature on server intervention programs. The important questions relating to youth and drinking and driving, especially the question of the appropriate minimum drinking age, are considered in Chapter 3 together with the wider issues raised by the serious problem of youthful crashes.

### Recent Literature on the Deterrence of the Drinking Driver

As indicated above, there is now a very large literature on the deterrence of drinking and driving. In this section we will assume that readers interested in the details of this literature will consult Homel (1986a) or Ross (1982), and so we will confine ourselves to providing an 'update' based on studies appearing in the last three years. We are particularly concerned with locating any evidence that enforcement campaigns or legislative changes have had long-term deterrent effects, since such evidence has so far been lacking in overseas research.

#### Britain

We are chiefly indebted to the indefatigable Laurence Ross for information on recent developments, although an article by Riley (1985) also advances our knowledge.

In an analysis of data from the British Crime surveys of 1982 and 1984, Riley (1985) measures the incidence of drink-driving in Britain, and concludes that in the previous week around one in four male drivers and one in thirteen women drivers had driven over .08. The data suggest that beliefs about the legal limit may be more crucial in drink-driving than misinformation about penalties. High-risk groups are (i) the ignorant; (ii) those under social pressure to drink-drive; and (iii) those not fully aware of the penalties. Drinking drivers were less likely to judge drink-driving as 'very serious' than non-drink drivers.

All this is taken to mean that the criminal justice system has limited potential in further reducing the road toll associated with alcohol. Some sensible suggestions for improving the effectiveness of the system are made, including publicity to improve knowledge of the effects of alcohol and the penalties, and RBT.

In Ross' (1986) review of British deterrent measures, he notes that the implementation of the Blennerhassett Committee's recommendations in 1983 may have had a slight effect on rural casualties (the essence of the changes was the simplification of the detection and prosecution of offenders), and that the package of publicised enforcement measures implemented in the 'Christmas Crusade' of December 1983 definitely had a temporary impact on casualties, with a 23 per cent reduction during the month of the 'crusade'. But effects beyond a year or so have not been obtained.

### Scandinavia

Based on the review of Ross, Klette and McCleary (1984), it seems that in the past decade there has been a movement in the Scandinavian countries (with the exception of Norway) from an approach emphasising severity of punishment to one emphasising certainty of apprehension. The use of prison has been reduced, with a corresponding increase in popularity of fines and therapeutically-oriented sentences. In the late 70s and early 80s random breath testing procedures were implemented in Finland, Denmark, Sweden and Norway, but in all countries the 'very restrained use of this technique prevents firm conclusions at this time' (p 471). The authors do note however that Norway's experience with RBT warrants closer attention, since despite a lack of statistical significance the curve of fatalities declined by nine per cent on an apparently permanent basis. Analysis of drunk-driving indices suggested that the overall liberalisation in laws has been accomplished without increasing the number of impaired drivers on the road.

Recent Scandinavian research supports the value of policies emphasising the perceived probability of detection rather than severe punishments. Åberg (1986) compared two counties in Sweden differing in the number of 'routine breath tests' conducted, and found that in the county with the greater number of tests drivers had a higher perceived probability of being tested, and that the perceived probability was linearly related to the number of tests personally experienced. It is of interest, in view of Homel's (1986a) similar results, that publicity concerning enforcement through the mass media did not influence perceptions. Thus despite the more restrained use of RBT in Sweden than in Australia, the psychological research suggests similar responses from motorists in both countries.

Assum (1986) compared levels of drink-driving and alcohol-related crashes in Norway and Sweden. He observed that despite the fact that Norway imprisons drivers caught over .05 while Sweden only fines them (up to BAC levels of .15), more drink-driving actually takes place in Norway. He concluded that Sweden's better record is due to the higher actual and perceived risk of apprehension in that country, and recommends less use of prison in Norway together with a greater emphasis on surveillance.

### Canada

The Canadian drinking-driving countermeasure experience is reviewed by Liban, Vingilis and Blefgen (in press). In common with the US, Canada has lagged behind Australia in the use of roadside breath testing, RBT and so on. Random spot checks have been employed, although it appears that the police must still have reason to suspect alcohol use before demanding a breath test. Evaluations of these campaigns (the Alberta CHECK-STOP program, the Reduce Impaired Driving in Etobicoke program (RIDE), the Reduce Impaired Driving Everywhere (in Toronto) program, the Niagara project and the British Columbia COUNTERATTACK program) all failed to reveal either a large or sustained impact on drink-



driving behaviour or crashes (with the possible exception of the COUNTERATTACK program). All these campaigns appeared to suffer to some extent from a lack of media support (see especially Mercer, 1985) and limited public awareness.

One innovative Canadian measure is the use of a 12-hour license suspension in Ontario for drivers registering .05 or more on a roadside screening device or evidentiary breath tester (Vingilis, Blefgen, Lei, Sykora & Mann, 1986). Unfortunately this law, which was intended to increase the celerity of punishment, coincided with the introduction of random spot checks (targetting certainity), and in any case the enforcement of both aspects of the law was very weak, so little can be concluded about the value of instant licence loss, attractive as the idea is within the deterrence framework.

### New Zealand

Random stopping has been conducted in New Zealand since November 1984. The mode of operation appears to be similar to that employed in Western Australia: roadblocks to check licences and equipment, with the demand for a breath test if the officer has reason to believe that the driver has been drinking. Derby and Hurst (1986) review the impact of this program, and conclude that it may have had an effect in the first three months, when operations were most intense, but that the effects have been negligible ever since. In particular, the effect that did occur was not one of a reduction in numbers from a previous level but of numbers of night crashes holding steady while day-time crashes increased.

### The United States

Trends in the US are very difficult to evaluate because there is such a diversity of approaches in the different states. 'Sobriety checkpoints' are becoming increasingly popular, but are plagued with legal and operational problems. For example, when California police began checkpoints in 1984, the American Civil Liberties Union proceeded immediately to the California Supreme Court, seeking an instantaneous ban on checkpoints on constitutional grounds (Smith, 1985). Within academic circles, the propriety and value of check points is still hotly debated (see Ross, 1986 and Christoffel, 1984 for contrasting views). Moreover, because of the Constitutional and legal restrictions, the police encounter difficulties not faced by their antipodean counterparts. For example, they often have to carry out 'field sobriety tests' to test for impairment (Burns, 1985), and even the passive alcohol sensors promoted as ways of side-stepping or simplifying this process make enforcement time consuming and unwieldy (Jones & Lund, 1986).

Although the American police are enthusiastic about checkpoints, and positive results are reported (Stone, 1985), in contrast to Australians they tend to see checkpoints as having a role subsidiary to traditional enforcement techniques (Smith, 1985).

In any case, hard evidence that they have succeeded in reducing crashes is not currently available. Indeed, we have been able to locate only one scientific article on this subject, and the results are negative. Williams and Lund (1984) review the deterrent effects of checkpoints in Maryland and Delaware, and conclude that although the roadblocks are highly visible and did increase drivers' estimates of the likelihood that drunk drivers would be arrested, there was no change in drinking and driving behaviours.

The results of US legal interventions not incorporating sobriety checkpoints are equally disappointing. Using interrupted time series analysis, Hilton (1984) analysed the impact of new California legislation on fatal crashes during the first post-intervention year. The California law of 1982 introduced per se provisions (at .10) and provided for tougher penalties, including mandatory jail for all repeat offenders and reduced access to plea bargaining. The evaluation showed that although alcohol related fatalities did decline, non-alcohol-related fatalities declined by about the same amount. However, there was some indication that deterrent effects occurred for injury crashes.

Hingson, Heeren, Kovenock, Mangione, Meyers, Morelock, Smith, Lederman, and Scotch (1986) evaluated the impact of a law in Maine very similar to the California law, but described by the Governor of Maine as the 'toughest drunk driving law in the nation' (p 1). They also evaluated tougher penalties in Massachusetts. The authors' conclusion was that in neither state did the measures sustain drunk driving and fatal crash reductions; indeed, in Massachusetts such effects were not even initiated. This is a very disappointing conclusion, because over the first two years it appeared that marked effects in Maine (a 40 per cent reduction in single-vehicle night-time fatal crashes) were going to be sustained.

In a recent review of the US experience, Snortum (1986) has argued that despite the apparent ineffectiveness of simple deterrence, there are two bodies of indirect evidence that stable deterrence may exist. One strand of evidence comes from a comparison of Norway and the US (Snortum, Hauge & Berger, 1986), which demonstrates that Norwegian drivers, with their background of strict laws, strong sanctions and strong moral support for control efforts, are more conscientious than Americans in not driving after drinking. Another comes from the US, where between 1980 and 1985 there has been an unprecedented, steady decline in the proportion of fatally injured drivers over .10, as well as a decline in impaired drivers detected through roadside surveys. This decline coincides with a period of intense legislative activity initiated as a response to pressure from MADD and other groups, but untangling specific cause-effect relationships is clearly far from simple.

### Imprisonment as a penalty

The extensive use by US jurisdictions of short periods of imprisonment, even for first offenders, has been noted. It is perhaps ironic that the Scandinavian countries (especially Finland) have been moving away from heavy prison terms at the same time that community groups in the US have been so successful in getting them introduced. It is worth repeating the conclusion of Ross, Klette and McCleary (1984), that the declining use of prison in Scandinavia has not been accompanied by any increase in impaired driving, a conclusion supported by the work of Assum (1986).

What is the US evidence? Although this review did not reveal any positive specific or general deterrent impact of prison, Voas (1986) concluded that '... it would be a mistake to reject the use of incarceration on the basis of current evidence, if for no other reason than that the expanded use of this sanction in the United States will generate new evidence bearing on the issue'. This seems reasonable, since one problem with evaluating the impact of jail in the past has been the fact that those imprisoned are very different from those receiving less severe penalties (Homel, 1981). In addition, there is some preliminary evidence that for first offenders two-day jail terms do reduce recidivism (Compton, 1986), perhaps by as much as 40 per cent over two years, and there are indications that general deterrent effects can be achieved as well (National Institute of Justice, 1985).

Nevertheless, the Scandinavian experience, together with the great bulk of research evidence to date, strongly suggests that prison does not achieve deterrent effects and may well be counterproductive (Homel, 1981; Assum, 1986). In addition, even if prison is shown to have some deterrent effects, are such effects any greater than those obtained through licence suspension (Peck, Sadler & Perrine, 1985)? New evidence from the US must be evaluated carefully as it comes to hand.

### Conclusion

Recent overseas experiences provide no evidence for permanent reductions in alcohol-related fatalities or injuries due to legislative or police enforcement measures. Lots of things have temporary effects, which are no doubt of great social importance, but traditional deterrent measures do not appear to provide anything like a permanent solution. There are preliminary indications that short periods of imprisonment in the US may have deterrent effects, but additional information is needed before firm conclusions can be drawn.

### Random Breath Testing in Australia

There is by now an extensive literature on RBT in Australia. A list of papers and reports is provided in Appendix A, together with authors' addresses should the reader wish to pursue any issues in greater depth than they will be dealt with here. For handy reference, Homel (1986a & b) and Federal Office of Road Safety (1986b) are recommended. Our purpose in this section is to point out how the Australian experience differs from the overseas experience, and to make some practical recommendations about the administration of RBT.

First, it should be emphasised that the experience in New South Wales with RBT has been unique, both within the Australian context and internationally. There is mounting evidence not only that the law has been effective in reducing alcohol-related fatalities, but that the effects are permanent (Arthurson, 1985; Homel, 1986b; Ross, 1986). That the reduction is due to deterrence and not to some other mechanism is strongly supported by the research of Homel (1986a) and others. Since the distinguishing marks of RBT in NSW were intensive and sustained enforcement combined with massive and sustained media publicity, it can be argued that the 'deterrence threshold' has been reached and that other jurisdictions will have to follow suit - testing at least one driver in three each year - if they are to achieve success with their enforcement programs.

There is one feature of the evaluation of RBT in New South Wales which has not received as much attention as it deserves, but which reinforces the explanation of deterrence as the main factor in the NSW results. Carseldine (1985) summarised the results of three surveys conducted by the Traffic Authority in NSW, and demonstrated that the perceived likelihood of arrest for drinking and driving actually increased between May 1983 (six months after the law) and July-August 1984 (18 months later). There was a corresponding decline in self-reported drink-driving over that period. These findings are consistent with the econometric analyses of Thomson (1983) and Thomson and Mavrolefterou (1984).

This result is absolutely unprecedented, and suggests that not only did RBT not decline in effectiveness in the first year, its effects intensified. No other country has had this type of result for any offence.

Clearly NSW is succeeding and certainly there are no plans to wind the program down (Parliament of New South Wales Joint Standing Committee on Road Safety, 1985). However, before making some observations on how the administration of the program could be improved, it will be instructive to consider briefly the situation of other states in Australia. There are four major forms of RBT or random stopping in Australia.

Tasmania and NSW have firmly adopted RBT. The number of breath tests conducted in those states together with the extent of formal and informal publicity justifies this description, although not as much information about the effects of RBT in

Tasmania is available as for NSW (Madden, 1986; Sutton, Farrer & Campbell, 1986). Victoria uses blitzes periodically and South Australia enforces RBT at minimal levels with limited effects (McLean, Clark, Dorsch, Holubowycz & McCaul, 1984), although steps have been taken in South Australia to improve the effectiveness of RBT (King, 1986). Only Queensland of all Australian jurisdictions does not have some form of random stopping, and RBT there is currently the subject of acrimonious debate (Levy, 1986; Moller & North, 1986).

It is probably a fair summary of the literature to say that only with the full use of RBT as in Tasmania and NSW has there been a permanent reduction in alcohol-related crashes. All other approaches, as with the overseas programs, seem capable of significant but short term effects, although the long term effects of Victoria's program are debatable (Homel, 1986a).

Although South Australia has had a limited use of RBT, much can be learned from the evaluation of the program (McLean et al., 1984). Apart from the very important results concerning avoidance actions by motorists, with a rise in late night casualty crashes on back roads as motorists attempted to evade RBT, perhaps the South Australians' most important findings concern the role of drivers with a previous drink-drive charge. Again, these findings do not appear to be widely known or appreciated.

Based on three roadside surveys, one conducted before the introduction of RBT in October 1981, it was possible to determine objectively the percentage of the driving population over the SA legal limit of .08. Overall, there was very little change in this percentage: 2.7 per cent prior to RBT, 2.3 per cent in the first post intervention survey, and 2.7 per cent again in the third survey. However, among those previously charged with a drink-drive offence, the figures were 16.0 per cent, 8.1 per cent and 8.0 per cent. Thus there was a very marked decline in impaired driving subsequent to RBT among drivers previously charged, and this decline was sustained. These results are consistent with those of Homel (1986a), who was also able to control for other characteristics of the driver (e.g. age, sex and level of drinking). (These controls have not yet been introduced into the analysis of McLean et al., 1984).

These findings for previously charged (or, what is nearly the same thing for previously convicted) drivers, are consistent with deterrence theory but have important practical ramifications. In common with other researchers (eg. Federal Office of Road Safety, 1986b), Homel (1986a) has stressed that the trend for police to revert to an apprehension-based policy should be countered, since the essence of RBT is visible, preventive patrols. The results cited above for convicted drivers introduce an element of irony into the policy equation: certainly RBT works not by catching offenders but by deterring the average motorist, but motorists with a conviction are much more responsive to the legal threat than those without a conviction.

Thus it can plausibly be argued that a significant portion of the effect of RBT (indeed apparently all the effect in South Australia) derives from the reduction in drink-driving among heavy drinking motorists with a previous conviction, and therefore if more offenders were caught the effect of RBT would be enhanced. Such drivers would henceforth be more deterrable. Moreover, catching more offenders who currently take back roads to avoid RBT should enhance the overall effectiveness of drink-drive law enforcement. Consequently, we wish to add a caveat to the recommendations of Homel (1986a):

Parallel with RBT, enforced in the NSW manner, there should be a concentration through selective enforcement on maximising the number of offenders apprehended. Scientific procedures based on crash information, drinking locations and other relevant time and place data should be used to maximise police efficiency in apprehending drink-drive offenders. These procedures should in no way detract from the resources currently devoted to the enforcement of RBT.

We consider further the issue of selective enforcement in Chapter 4 in the more general context of speeding and other traffic offences.

#### Alcohol Availability and Traffic Crashes

Despite the extensive efforts over the years in many countries to deter the individual drinking driver, long term success (except, it seems, in NSW) has been an elusive goal. Even in NSW, it is important to note that, despite RBT, self-reported drinking and driving is still at unacceptably high levels and that a third of fatalities still involve alcohol (Arthurson, 1985; Carseldine, 1985; Homel, 1986a). However, as indicated in Figure 1.1, a model of legal intervention can be much richer than many traditional formulations of deterrence allow. In particular, the legal threat applied to the individual is only one way in which the law can influence drinking and driving behaviour. Other paths involve manipulation of the social or physical environment in order to limit the opportunities to commit the offence, to raise the costs (physical or financial) of committing the offence or to influence the non-legal sanctions which bear on drinking and driving behaviour.

In this section we consider the potential of limits on alcohol availability as a tool for reducing traffic crashes. It will be apparent from the discussion in this and the next section that such limits could have an effect through any of the mechanisms listed above; ie. through influencing opportunities to offend or through influencing non-legal costs and sanctions.

Perhaps the case for intervention at the environmental level through alcohol control policies has been made most eloquently by Mosher (1985) in the paper in which he criticised the report of the US Presidential Commission on Drunk Driving. Mosher observes that the increase in availability of alcohol over the past 30 years, and its promotion as an 'ordinary commodity', has taken place with no attention to the impact on health. He considers several aspects of availability, all of which have relevance to the Australian situation. We will briefly state his arguments, and then consider the evidence for the position he takes.

One critical area of concern is the nature of alcohol outlets. Mosher argues that locations which increase drinking and driving, such as sports stadiums or service stations, should be strictly regulated. Moreover, each community needs to determine appropriate densities of outlets and their availability structure, although there is a need for much further research to assist in this process. Server intervention programs, which we discuss in the next section, need to be encouraged through community action and, eventually, licensing provisions. Mosher cites several studies which support the view that increases in real prices will result in a decline in per capita consumption, and hence to fewer alcohol related problems. Reduced availability to young people through higher minimum drinking ages is argued to be one of the best evaluated measures to reduce drink-driving in the target age group (we discuss this in Chapter 3).

Finally, advertising is seen as of crucial importance, whether or not it results in an increase in consumption. The liquor industry has realised that it is not selling bottles, or glasses, or even liquor, but 'fantasy', with sexual union, psychological freedom, affection, trust and openness and sophistication as key elements. At the heart of the approach to advertising adopted by the liquor industry, according to Mosher, is the concept of the 'beverage market'. Alcohol producers, along with other beverage manufacturers, are emulating the style of advertising pioneered by the soft drink industry, emphasising increased availability, competitive prices, sweeter, lighter beverages, and lifestyle advertising. 'Advertising provides a powerful tool for normalising drinking behaviour without regard for potential health dangers' (p 247). Perhaps the recent controversy in Australia over 'wine coolers', which are alcoholic drinks tasting like fruit juice, being packaged in 'popper-type' packets similar to those purchased by children, should be seen in the light of the broad overview of liquor industry advertising policies.

Our impression is that the recent literature tends to support Mosher's position, although there are many gaps in the empirical research. A fundamental problem is that in the years since Prohibition the dominance of the concept of 'alcoholism', and of the view of alcoholism as a disease, has led to the neglect of the role of law in controlling alcohol use (Wagenaar, 1983). As the U.S. Panel on Alternative Policies Affecting The Prevention of Alcohol Abuse and Alcoholism commented in their seminal 1981 report Alcohol and Public Policy (hereafter referred to as Panel

[1981]), it is widely believed that Prohibition was a failure and that it demonstrated once and for all the futility of attempts to legislate morality. However, without in any way advocating a return to Prohibition, the authors argue that among the real lessons of Prohibition was the finding that the quantity of alcohol consumption and the rates of problems varying with consumption can be markedly reduced by substantial increases in real price and reductions in the ease of availability.

This alleged lesson from the Prohibition experience is of critical importance to the debate concerning alcohol availability and traffic crashes. In a review of the evidence relating to taxation and prices and to other aspects of alcohol supply, the Panel came to the following conclusion:

The common belief that alcohol control measures (government action to regulate the supply of alcohol and drinking premises) are ineffective as prevention instruments is unfounded. This belief has been engendered in part by a misunderstanding of the lessons of the Prohibition experience. There is good evidence from econometric studies that alcohol prices, as affected by excise taxation, can affect consumption levels, and probably the consequent rates of alcohol-related problems. Reductions in the minimum drinking age slightly but consistently increase auto accident involvement by younger drivers. The effects of merchandising practices, outlet density, civil liability for servers, and so forth have not been established with reliability, in part because these control mechanisms are intrinsically very difficult to study. It is possible but as yet hypothetical that the cumulative effect of a number of changes in these areas of regulation has been substantial (Panel, 1981, p. 78).

This conclusion has been quoted in full because it so clearly sets out the limitations of the available evidence while pointing to the potential of control policies for public health. It should also be noted, in passing, that a belief in the potential of alcohol controls to reduce alcohol-related problems is not unique to American commentators: the World Health Organisation (1979) statement contains, if anything, a stronger commitment to control policies.

A basic problem, which is part of the legacy of Prohibition, is that there has been only limited research into the public health consequences of alcohol availability and supply policies. In the remainder of this section we review a few recent studies focussed specifically on traffic crashes, and then we attempt a synthesis of the evidence.



Cook (1981), a member of the US Panel, studied the relationship between liquor taxes, drinking, cirrhosis and auto accidents. He claimed to be able to demonstrate 'with a high degree of certainty' (p 256) that increases in the tax rates on spirits in the US reduce both the auto fatality rate and the cirrhosis mortality rate. His method was to study state tax changes occurring between 1960 and 1975 in 39 states, and using econometric methods to convert net changes in auto fatality rates into price elasticities. He estimated that the effects of an increase of, say, 20 per cent in the alcoholic beverage price level would be likely to be 'measured in terms of thousands of lives saved per year and billions of dollars savings in medical and related expenses' (p 279). Nevertheless he does not advocate that taxes necessarily be raised, since there are costs as well as benefits to raising taxes. 'Rather the message of my results is that the benefits do exist and should be taken into account' (p 284).

Using cross-lagged correlation methods, Wagenaar (1984) found significant relationships between beer and wine distribution in a given month, and the number of alcohol-related motor vehicle crashes one month later. His analysis was based on statistics on the total quantities of beer, wine and distilled spirits sold in the state of Michigan each month from January 1972 through December 1980, together with the number of drinking drivers involved in property damage or injury producing motor vehicle crashes each month in the same state for the same period. He used time-series techniques to remove seasonal variation from the correlations, which resulted in a conservative test of the relationship between random month-to-month changes in sales and similar changes in alcohol-related crashes. He concluded that a random change in the quantity of beer or wine (but not spirits) distributed in a given month is positively related to the number of crash-involved drivers in the same month and the following month.

Based on a nationwide US survey, Atkin, Neuendorf and McDermott (1983) examined the role of alcohol advertising in excessive and hazardous drinking, including drink-driving. Using regression analysis to control for demographic attributes and interpersonal communications influences, they concluded that advertising stimulates consumption levels, which in turn leads to heavy drinking and to drinking in dangerous situations.

Holder and Blose (1986) used a rigorous time series methodology (ARIMA) to evaluate the impact of a change in distilled spirits availability in North Carolina on alcohol-related traffic crashes. Using both police reported alcohol-related crashes and single vehicle night time crashes for drivers over 21, they found statistically significant increases associated with the new law, and concluded that changes in distilled spirits availability need to be evaluated in terms of their traffic crash potential.

In Australia the most active researcher in this field has been Ian Smith of the Western Australian Alcohol and Drug Authority. In a series of studies, both literature reviews and empirical

investigations, he has investigated nearly all of the issues raised by Mosher (1985). In a most interesting early study, he evaluated the effects on traffic fatalities and injury crashes of the law of 7 July 1970, which legalised the sale and supply of liquor on Sundays in the Perth metropolitan area (Smith, 1976; 1979). Fortunately for the experimental design, Sunday sessions operated in the rest of WA for the duration of the study period (three years before and after the law). Crashes occurring on the other six days of the week were also used as a control for factors like traffic volume.

Smith concluded that the results of the study were consistent with, but did not actually prove, the hypothesis that the introduction of Sunday sessions in Perth had a detrimental effect on traffic safety. It is of great interest that a study by the NRMA in NSW after the introduction of Sunday hotel trading in 1979 came to similar conclusions (National Roads & Motorists Association, 1982). They recommended a thorough examination of the issue, which as far as we are aware the NSW Government never carried out.

Recently, Smith himself (Smith, 1987a) has investigated the effects of the introduction of Sunday hotel trading in NSW (clubs could already sell alcohol). He notes that his study of the effects of Sunday hotel trading in Perth was considered by the Select Committee of the NSW Parliament, who recommended that a ten-hour Sunday hotel session (noon to 10.00 pm) be introduced rather than two two-hour sessions as in Perth, ostensibly with a view to overcoming the negative consequences of the Perth experience. However, as we have seen from the work of the NRMA, the data accumulated since the relaxation of the law do not support the optimism of the Select Committee.

Smith (1987a) used a number of controls which increase the plausibility of a causal connection between the new law and the number of crashes: among other devices, Sunday crashes could be compared with crashes on Monday through Saturday, the period midnight to 11.59 am acted as a control for any change in the number of Sunday crashes within the before and after periods, and NSW was compared with Queensland to control for any general increase in Sunday casualty accidents in other parts of Australia. In the light of the data and the controls, Smith concluded that the NSW law was the factor responsible for the often quite sizeable increases in Sunday fatal and injury crashes. More generally, he argued that the analysis supports the availability principle in that if alcohol is available and its availability is increased, additional consumption and alcohol-related problems will occur. He came to similar conclusions with respect to the effects of the introduction of two-hour Sunday sessions in Queensland in 1970 (Smith, 1987b).

Among Smith's conclusions concerning other aspects of alcohol availability (based mainly on North American research) we have the following (see Smith, 1983a,b,c):

- (a) The introduction of on-premise drinking, when off-premise drinking was already permitted, did not result in any significant effects. A similar comment is also applicable to the liberalisation of on-premise drinking.
- (b) The introduction of extension of liquor licences for off-premise sales by grocery stores or supermarkets possibly results in increased consumption of wine and more convictions for drunkenness.
- (c) The number of licences for on-premise drinking appear to be positively related to a variety of indices for the use and abuse of alcohol, although the number of studies reviewed is small.

In recent papers focussed specifically on the relationship between traffic crashes in Australia and the days and hours of sale of alcohol (Smith, 1987c,d,e), Smith concludes that later hotel closing hours in Victoria and NSW did not simply change the time of casualty crashes but also increased the total number occurring. In Tasmania, the introduction of flexible hotel trading hours appeared to result in an increase in the number of casualty crashes between 10.00 pm and 6.00 am even though hotels stayed open for about the same total period of time under the new rules. This occurred probably because hotels stayed open later at night, increasing patronage and hence consumption.

To provide balance to this discussion, we should point out that an extensive review of these issues was undertaken recently by staff of the Traffic Injury Research Foundation in Ottawa (Simpson, Beirness, Mayhew & Donelson, 1985). These researchers came to the general conclusion that it would be difficult to justify the introduction of further measures to control the manufacture, distribution, promotion and sale of alcoholic beverages specifically as countermeasures to reduce the alcohol-crash problem (authors' emphasis). However, in our view some of their conclusions are rather more pessimistic than the evidence warrants, particularly with respect to the legal drinking age. Moreover, they highlight the need for more research (indeed, in many cases the initiation of research) into issues like lifestyle advertising and into the effects of style of drinking, frequency and amount (as opposed to the effects of total consumption).

Certainly in Australia and New Zealand, public policy is swinging strongly toward an interest in alcohol control policies (Casswell, 1985; The Unknown Public Servant, 1986; House of Representatives Standing Committee on Road Safety, 1983). The Draft National Health Policy on Alcohol in Australia (The Unknown Public Servant, 1986) states that the overall objective should be the minimisation of harm associated with alcohol use, and further controls should be placed on availability, price and taxation, advertising and marketing. A review of existing laws and regulations including licensing laws affecting the availability of alcohol is proposed (which covers hours of sale and the legal drinking age), as well as increased taxes to maintain or increase real prices. Measures to reduce the extent to which young people

and women are the targets of marketing and advertising, especially lifestyle advertising, are also discussed. It is argued that the present system of industry self regulation of advertising is not working.

In reviewing the evidence linking alcohol price and availability with traffic crashes, it is apparent that issues of scientific methodology and measurement become entwined with ideological and political considerations. We have attempted in this section to present an historical perspective on the issue while summarising the best of the recent scientific research. Most authorities in the field exercise commendable restraint in expressing their conclusions, and it is probably appropriate in view of the limited amount of research to heed the warnings of the Canadian researchers (Simpson et al., 1985) that sweeping measures targetting broad aspects of availability are not currently justified, at least as traffic safety measures.

Nevertheless, the findings of Smith and the other researchers reviewed in this section are sufficiently compelling to demand a response from governments. Although it might be possible to find fault with studies on an individual basis, there is a consistency in the direction of results which strongly suggests that there is a link between alcohol availability and traffic crashes. Thus, for example, while one could argue that Smith's work could be greatly strengthened by the use of time-series techniques instead of the simple before and after comparisons he always uses (assuming of course that the data were available), the fact that he is nearly always able to demonstrate statistically significant results in the predicted direction suggests either that there is a hidden bias in his methods which guarantees that he will prove his hypothesis - and the nature of any such bias is by no means obvious to us - or alternatively that there really is a relationship between the variables in question.

Certainly several policy initiatives deserve much closer scrutiny. Following Mosher (1985) and others, these include alcohol pricing policies, regulation of hours of sale, alcohol advertising, raising the minimum drinking age, and server intervention programs. The minimum drinking age is examined in Chapter 3, while server intervention programs form the subject of the next section.

### Server Intervention Programs

One of the more intriguing effects of RBT in NSW was that a minority of heavy drinkers, 8.5 per cent of the whole sample, found it harder, not easier, to resist group pressures to drink under the new law (Homel, 1986a). (The hypothesis of the study was that RBT would provide a new 'exculpatory defense' for people who did not wish to drink and drive but who also did not wish to appear as incompetent drinkers in the eyes of their peers [Gusfield, 1981b].) This highlights the importance of drinking contexts, so programs which have as their aim the modification of these contexts deserve closer consideration.

Much of our information about server intervention programs, and the associated legal issues, is derived from the work of staff of the Prevention Research Center at Berkeley in the United States, particularly James Mosher and Robert Saltz. In broad terms, the goal of server intervention is to create an environment for drinking that would: (1) reduce the risk of intoxication; and (2) reduce the risk that intoxicated persons will harm themselves or others (Saltz, 1985a). Mosher (1983) adds more detail relevant to the prevention of traffic crashes:

Server intervention programs focus on the drinking setting which precedes drinking-driving events. They enlist new actors into the prevention efforts (the servers of alcoholic beverages) and create structural changes associated with the drinking setting to lessen the risk of driving following heavy drinking episodes. Existing legal provisions, if effectively amended, experimental server training programs, and recent person-environment research provide the tools for implementation (p 484).

Our primary focus in this review will be on the legal aspects of server intervention programs and their effectiveness in preventing alcohol-related problems.

Leaving the legal issues for a moment, let us first consider the developing literature on the implementation and effectiveness of server intervention programs at the level of the establishment (Saltz, 1985a,b; 1986). The aim is to encourage establishments not only to control inebriation and under-age drinking, but to include the promotion of non-alcoholic beverages and food, improve standards of customer behaviour, provide transport for intoxicated customers, etc. Maintaining or increasing the profits of an establishment is an important goal. Server training covers the effects of alcohol, the legal and moral responsibilities of the management and staff, and law enforcement issues (eg. bar fights). One program works within the context of increasing the professionalism of servers. Management support and involvement is critical to the program, and goals include increasing staff morale as well as increasing profitability.

A particularly well designed research study to evaluate the impact of a server intervention program in a navy club in San Diego, California, is currently being conducted by Saltz (1985b; 1986). The design combines a multi-trait, multi-method scheme with a non-equivalent control group design with pre-test and post-test. Data come from archival sources (nightly patronage, liquor and other beverage sales, drink-driving arrests, etc), observation of customers' behaviour, and interviews with randomly selected customers. Preliminary analyses using both qualitative and quantitative data indicate positive patron reactions to the program, and a marked decline in the proportion of customers drinking over their 'drinksize'; ie. becoming legally intoxicated. These positive effects were achieved with no change

in the club's gross sales - an interesting result in view of the acknowledged need for research into the effects of changes in drinking patterns, not just overall consumption (Simpson et al., 1985).

Despite the need for much more evaluative research, all the writers we have consulted have been most positive about server intervention programs. What is the role of law in these programs? In the US, the legal environment includes the dram shop (civil) liability laws, state and local Alcohol Beverage Control (ABC) codes, and criminal statutes that affect serving practices (Mosher, 1979). From an Australian point of view the ABC codes, which are essentially concerned with licensing controls, are probably the most relevant. Australia has a different history of alcohol use and abuse from the United States, although there are many close parallels, not the least of which has been the strength of the Temperance Movement in both countries (Room, 1984). However, dram shop liability laws have apparently never been enacted in Australia, and given their ambiguous social benefits even in the US context, it does not seem appropriate, at least in this country, to explore their use further. On the other hand, criminal statutes affecting serving practices seem quite similar in the two countries, with prohibitions on the sale of liquor to 'obviously intoxicated persons' and to minors being the most relevant provisions. Again, however, the problems are evident: the underage provisions are difficult to enforce, and the 'obviously intoxicated' criterion is too vague both for effective enforcement and to provide much of a control on drinking and driving practices (Mosher, 1983).

Thus the use of licensing controls promises to be the most effective legal means for ensuring that server training and intervention programs will be implemented, although in some locations in the US programs have been developed on a voluntary basis (Mosher, 1983). As Mosher indicates, various server practices designed to reduce the likelihood of serving intoxicated or under-aged persons could be required as a condition of maintaining a licence. In addition, the location of an alcohol outlet could be regulated to minimise the risks of patrons leaving by way of dangerous highways. A more preventive focus is therefore required of policymakers concerned with licensing laws and their enforcement.

It may be however that in the Australian context a legal framework for the development of server intervention programs is not appropriate at all - not even in the modified form we have proposed. After all, it was noted above that programs have been implemented entirely on a voluntary basis in some communities in the US (Mosher, 1983). Support for this general position comes from Queensland, where a program called 'Patron Care' has been developed by staff of the Alcohol and Drug Dependence Services.

In a paper delivered at the Prevention Research Center at Berkeley, Carvolth (1985a) outlines the Patron Care program as it operates in Queensland. The objectives of this program are,

among other things, to develop training programs for hotel staff which will assist them in identifying patrons of long standing whose drinking is excessive or disruptive, and help them implement policies which will reduce the incidence of alcohol problems. There is an emphasis on channelling problem drinkers from bars into alcohol treatment programs operated by the Alcohol and Drug Dependence Services. Most important, however, the strength of co-operation between the Queensland Department of Health and the liquor industry is emphasised. The traditional stance of seeing the liquor industry as an enemy is rejected.

Our basic approach is that the people that we are dealing with are businessmen marketing legal products and services to a society that has long demonstrated its interest in comparative ready availability of alcohol. Our stance is one of basic respect, trust, interest and sharing of perspectives, planning and development for the future (p 6).

Working at the grass roots with the liquor industry (within their frameworks) is seen as the key to success. The program is focussed on the development of policies promoting 'more acceptable models of drinking and of behaving on licensed premises' (p 10). The program includes much practical advice to trainee servers concerning techniques for improving the atmosphere, reducing patrons' consumption levels (eg. don't anticipate service to a regular patron, don't subtly manoeuvre patrons into joining 'shouts'), and refusing service (eg. offer alternative transportation, give warnings, remain calm, etc.) (Carvolth, 1985b).

In Australia an implicit assumption is that a legal framework, except possibly for the licensing of establishments, is not required (and indeed may be counterproductive) for the success of the program. No evaluation data are quoted, although a number of measures which it is proposed to use for evaluation are listed (Carvolth, 1985a). These include the demographic mix of patrons (male/female, family/other, etc.), the proportion of beer sales accounted for by low alcohol beer, changes in sales of food and non-alcoholic beverages, rate of incidents due to heavy drinking, and numbers referred for counselling or treatment. Unfortunately no thought appears to have been given to traffic crashes as a criterion, one of the main points of interest in the US.

Much of the Queensland approach is consonant with the US programs, but also many differences are evident. The most obvious differences are the wholehearted embrace of the liquor industry philosophy, the general rejection of the need for a legal framework, the apparent lack of interest in traffic crashes, and the emphasis on locating and treating alcohol abusers. In addition, there appears to be no rigorous evaluation data available for the Queensland program. In its own way the Queensland approach is also controversial, for example in

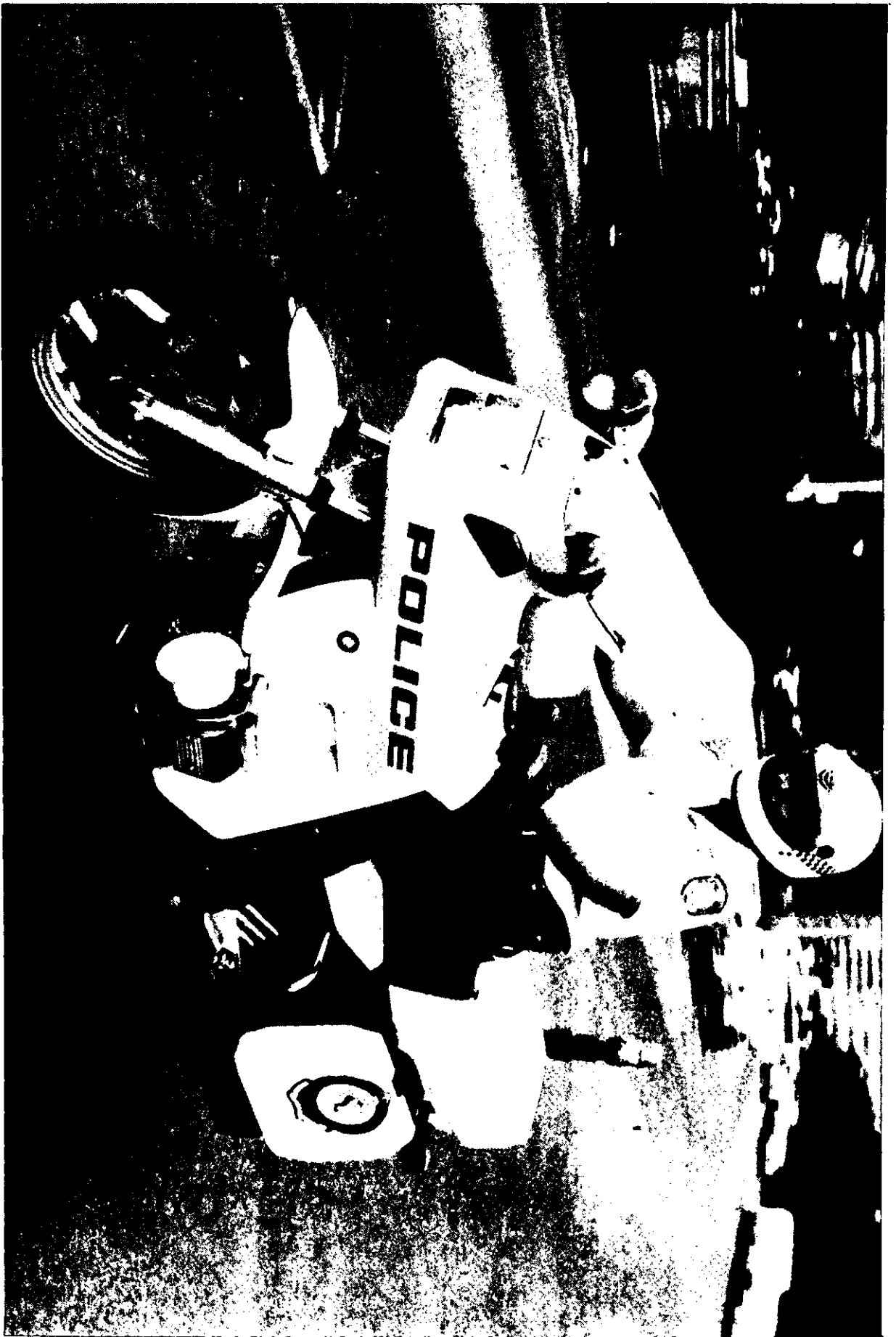
attempting to change the types of patrons at drinking establishments to include families, teetotalers and spouses and girlfriends, so that 'the culture of the male beer swill will be sufficiently diluted for new norms of acceptable drinking levels, behaviour and services to develop' (Carvolth, 1984, p 26). While probably sympathising with the comments on the 'male beer swill', not all members of the community would endorse the 'demographic mix' objective for drinking places (Carvolth, 1985a). Moreover, the theoretical underpinning for this approach in the 'sociocultural model' for the prevention of alcohol problems is itself controversial (Whitehead, 1979a,b).

Our view is that as a home-grown scheme, the Queensland program is of great importance. However, there is an urgent need for rigorous evaluation utilising a design similar to that of Saltz (1985b; 1986) and a need for the traffic safety research community to have some input into the program. We are also rather concerned at the extent to which a government agency identifies with the methods and goals of a particular industry (the liquor industry), and remain rather sceptical that effective statewide intervention programs can be developed in the absence of legislative underpinning of the form discussed above. While endorsing Carvolth's emphasis on co-operation with the retail liquor industry, we would wish to see objective quantitative evidence that alcohol-related problems, particularly traffic crashes, are being reduced before dismissing the need for new licensing provisions oriented toward prevention.

We are convinced that server intervention programs have great potential in this country, particularly in states like NSW where RBT has had such a marked impact and motorists are keenly aware of the need for responsible drinking. We would like to see a rigorously evaluated pilot program carried out in (say) a rural part of NSW, with advice from the Queensland workers but also using some of the techniques which have proven effective in the US. In addition, we recommend an immediate research program to survey the present practices of drinking establishments in discouraging or implicitly encouraging intoxication and drink-driving. Part of this survey should be to determine the usage of self-testing breathalysers in clubs and hotels - how many are there, where are they, who uses them, does management encourage their use?

Finally, at the same time as these research projects are being undertaken, the legal ramifications should be fully explored. In particular, the model dram-shop law which has been drafted by James Mosher and others (Colman, Krell & Mosher, 1985) and implemented in a number of US states should be studied for its applicability to Australian conditions.





### 3. YOUNG DRIVERS

Haight (1983) proposed an epidemiological and public health approach to the road safety problem. Regarded as an epidemic, traffic crashes do not strike in a random fashion - there are certain high risk groups. To some extent the aged driver or pedestrian is at higher than average risk, but all studies are in agreement that by far the highest incidence of the problem occurs among young people, especially males, aged 15-24 (eg. Peck, 1985). Traffic crashes are the largest single cause of death in this age range, both in Australia and overseas (Federal Office of Road Safety, 1986a; Mayhew, Warren, Simpson & Haas, 1981), and exceed suicides by a factor of four. The overall involvement of young drivers in road crashes is about four times the average for other drivers (Organisation for Economic Co-operation and Development, 1975), and teenage drivers in particular are responsible for about five times as many crash deaths per licence holder as drivers aged 35-64 (Williams, 1985). Deaths directly caused by teenagers include passengers as often as drivers, but also occupants of other motor vehicles, pedestrians, bicyclists and motorcyclists.

In 1972 the editors of the newly established journal, Accident Analysis and Prevention, invited two papers on the young driver problem. These papers, by Harrington (1972) and Goldstein (1972), set out the state of the art at that time. Some researchers have commented recently that neither our understanding of the problem nor our ability to do anything about it has improved much since that time (eg. Peck, 1985; Jonah, 1986), although the amount of research has increased and the complexity of the problem is more fully appreciated. It is sobering to note how frequently even in the most recent publications the writer is led to observe how little useful knowledge we have and how difficult it is to alter the basic behaviours involved (eg. Knapper, 1985; Peck, 1985; Clayton, 1985).

Our purpose in this chapter is to indicate some directions for policy, with a focus on legal countermeasures. We summarise the research relevant to the development of such countermeasures, and then indicate a couple of traditional enforcement techniques which in the light of available information may have some value. However the bulk of this chapter is focussed on measures which reduce the exposure to risk of young people, especially teenage boys. We take the view that since no existing countermeasure has succeeded in reducing youthful crash involvement to a significant extent, it is necessary to take direct steps to remove young people from the roads as far as possible, and to reduce their exposure to risk in other respects - particularly through a reduction in alcohol consumption.

The foundations for this approach were laid in Chapter 1, with our emphasis on environmental measures and on limiting opportunities to offend. Given Haight's (1983) comment that the primary factor in road trauma is travel, in the absence of all other solutions the best we can do as a society is remove the

privilege of road travel (and alcohol consumption) from young people, to the extent that such action is supported, or at least accepted, by the community.

### Young Driver Crashes: A Brief Overview

The magnitude of the traffic crash problem among young people has been sketched, but it is also of interest in a review of law and law enforcement to note that according to California data, young drivers are over-represented in the violation statistics (Peck, 1985). The over-involvement of drivers under 21 in speeding violations is particularly notable, even when rates are adjusted for distance driven. Further, the number of one-point convictions is the best single predictor of crash risk across drivers of all ages. Peck comments that despite a certain spurious element in the correlations due to the operation of exposure (drivers who drive further are more at risk for both crashes and traffic violations), 'traffic violations are obviously one of the physical causes of accidents and can be viewed as a form of risk-taking' (p 59). Thus the high violation rate among young drivers is a cause for concern, with Peck's analysis tending to support arguments that effective enforcement of traffic law would have an impact on crashes. (Not all researchers have agreed with this proposition in the past: Booth, 1980.)

Inexperience is clearly another possible reason for the high teenage crash rate, but it is also clear that it is hard to separate the effects of inexperience from those of age (Clayton, 1985; Jonah, 1986). Amount of driving is of great importance: young drivers drive more, especially at night, than older drivers, but taking this into account reduces but does not eliminate the higher youthful crash rate (Mayhew et al., 1981).

Roadside surveys suggest that on any given trip young drivers (at least under the age of 20) are less likely to have been using alcohol than older drivers, and they register lower BAC levels when found positive (Jonah, 1986; Mayhew, Donelson, Beirness & Simpson, 1986). However, for reasons that are not well understood, young people who drive after drinking have a greater risk of crash involvement than older drinking drivers at all BAC levels, and in any case they engage in impaired driving more often since their lifestyle provides them with more opportunities to combine drinking and driving (Jonah, 1986; Mayhew et al., 1986). As a result of these patterns, the rate of alcohol involvement in fatal crashes is highest among the young, although in Australia it appears to be higher among those aged 20-24 than among those younger than 20 (Homel, 1982).

Amount of driving and patterns of driving (more recreational driving at night), inexperience and alcohol use do not exhaust the factors associated with youthful crashes (Mayhew et al., 1981). Other factors identified include non-use of seat belts and especially the propensity of young drivers to take risks while driving (Jonah, 1986). Peck (1985) refers to 'an attitude

or sense of personal invulnerability' (p 60), while Knapper (1985) notes the importance of socio-cultural factors such as peer pressure.

Factors such as risk-taking and a sense of invulnerability are hard to influence, especially through conventional enforcement practices, which has led to some of the pessimistic comments on countermeasures noted above. However, the fact that basic variables such as exposure and alcohol use do not fully explain the high crash and injury rates among youth does not mean that there is no value in attacking the problem from these angles. Indeed, it is quite clear that if teenage night time recreational driving and alcohol use could be reduced or eliminated there would be a marked decline in teenage injury rates, although they would still be higher than the rates for drivers over 25.

Before considering the legal aspects, it is worth quoting one of the recommendations of the Traffic Injury Research Foundation study (Mayhew et al., 1981): Commitment to the development of a comprehensive national research program on young driver accidents. The establishment of 'a cadre of scientists specialising in the study of young drivers and their accidents' (Mayhew et al., 1981, p 136) would do much to build up the information base which is clearly so necessary if effective long-term countermeasures are to be developed.

### Conventional Law Enforcement Tactics

To the extent that traditional enforcement tactics succeed in deterring drivers from committing traffic offences the behaviour of young drivers is probably also influenced, although some authors believe teenagers are particularly resistant to deterrent measures. For example, Klein and Waller (1970) argue that in Western societies automobiles provide adolescents with unique opportunities for experimentation with sex, alcohol, tobacco and other drugs, and that adolescents have learned from literature, films, TV and advertising that daring, risk-taking and excitement are all desirable and attractive.

Yet by virtue of his membership in his age group, he has less opportunity than any adult to express or experience these qualities in socially useful or desirable situations. When he attempts to experience them through needless risk-taking on the highway, he may in fact generate a high number of violations and crashes, but what is important to him is the notion that he is earning prestige - in his peers' eyes and in his own (p 202).

Thus in terms of the deterrence model outlined in Chapter 1, it seems likely that for many adolescents informal sanctions imposed by peers, together with the utilities associated with risk-taking and the increased opportunities to offend entailed in extensive

recreational night time driving, combine to outweigh the legal threat. Strategies that might be employed to influence adolescent behaviour by conventional enforcement methods could include increasing the force of the legal threat, particularly through increasing the perceived likelihood of apprehension for traffic violations, or making teenagers feel more guilty about traffic violations, or more aware of the real risks of erratic driving, perhaps through a system of warnings combined with compulsory education of some sort.

The research we have reviewed does not provide much information about effective enforcement strategies directed specifically at youth, or even much information about the effects on youth of general enforcement programs. The OECD (1975) report discusses driver training, driver licensing, special speed limits for probationary drivers and some drink-drive countermeasures, but close examination of these proposals reveals that they have either been implemented already in Australia or are speculative in nature with no data suggesting their effectiveness (eg. speed governors on the cars of high risk offenders). In a general review of the literature on the effects of increased enforcement of traffic laws on accidents, Raub (1980) does not identify work on young driver crashes. The same comment can be made for Australian studies (eg. RACV Consulting Services, 1983; House of Representatives Standing Committee on Road Safety, 1984; Traffic Authority of New South Wales/New South Wales Police Department, 1986).

Consequently all we have to go on are fragments of information, usually appearing as by-products of investigations with other objectives. The Traffic Law Observance Study (Traffic Authority of New South Wales, 1978), which was based on a survey of motorists, highlighted the importance of concentrating on younger drivers when devising speeding countermeasures (compare Peck, 1985), but did not indicate how this could be done effectively or fairly. The evaluations of RBT in New South Wales indicate that young people changed their drinking and driving behaviours at least as much as older people (Homel, 1986a; Kearns & Goldsmith, 1984), suggesting that any program which increases the perceived likelihood of apprehension to realistic levels will influence young drivers, despite peer pressure and the positive evaluation of risky driving described by Klein and Waller (1970), Jonah (1986), and others. Interestingly, in Homel's (1986a) analysis perceived certainty of apprehension for drinking and driving was not correlated with age and sex either at the zero-order level or after controls for socio-demographic and other factors.

In reflecting on these results and other aspects of the analysis, Homel speculated that enforcement policies aimed specifically at high risk groups may not be necessary, and indeed may not be as effective as more broadly-based policies like RBT. One danger of enforcement practices specifically aimed at high risk groups (rather than at high risk time or places) is that police are open to the charge of bias or abuse of discretionary powers (Homel, 1983). As Kirkham and Landauer (1985) have observed in the context of Western Australian statistics showing an over-representation of young men apprehended by the police:

If the main purpose of traffic law enforcement is to reduce the accident rate, then one might expect that the amount of law enforcement given to a particular group in the community should be roughly in proportion to their accident involvement, or at least to the amount of miles they drive. When a particular group, for instance young men under 25 years of age, are grossly over-represented in the enforcement statistics there must be some cause for disquiet as to whether traffic law enforcement is being applied efficiently (p 214).

If this point of view is accepted, then perhaps there are no grounds for treating young drivers as a high risk group for purposes of police enforcement, unless there is some especially effective enforcement technique applicable to this group. Since there are, to our knowledge, no such techniques at the police level, the best strategies for the police are probably selective enforcement methods (high risk times and places) combined with general deterrent measures like RBT which aim to deter all offenders. The experience with RBT in NSW encourages the belief that enforcement tactics which are effective with older drivers will have at least a measure of success with younger motorists as well.

#### Manipulation of Penalties or Treatments for Errant Drivers

This conclusion with respect to police enforcement leaves open the question of penalties for convicted offenders. It is arguable that specific types of penalties, or more severe penalties, will be more effective with young offenders than with older offenders. Homel (1981) has argued strongly against heavier penalties for young drink-drivers, on the grounds that the probability of reconviction is unrelated both to the type or quantity of penalty and to the age of the offender. This position is supported by the results obtained by Vingilis, Mann, De Genova, Adlaf and Kijewski (1985) in their study of young drinking offenders, and by Peck, Sadler and Perrine (1985) in their review of licence suspension and rehabilitation programs for drinking drivers.

If manipulation of penalties has little deterrent value for young drinking drivers, it may nevertheless be useful for other classes of youthful offenders, especially where the minor nature of the offences allows experimentation with different types of penalties all of about the same degree of severity (circumventing ethical objections to random allocation of penalties). For our present purposes four studies, one nearly 20 years old, will suffice to illustrate what can be done.<sup>1</sup>

Mecham (1968) assigned 280 sixteen-year-old traffic violators in Utah (220 boys and 60 girls) at random to one of four groups: (1) fined; (2) restrained from driving; (3) attend traffic school; and (4) write an essay on traffic safety. After one full year of driving following the child's original court

appearance, the juvenile court traffic file for each child was examined to see whether he or she had committed any additional violations, what they were, and when they occurred. Children who wrote an essay had the lowest recidivism rate, and those fined had the highest (16 per cent versus 52 per cent). Moreover, for boys who wrote essays the lapse between the initial court appearance and the next violation averaged 22 weeks, compared with two weeks for the boys who were fined. Restraint from driving was the next most effective sanction.

The evaluation of the Oregon Driver Improvement Program (Kaestner & Speight, 1974) yielded results which suggest that certain forms of intervention are particularly successful with young drivers who accumulate convictions or accidents. Personalised warning letters worked better than no letter or a standard letter for all drivers, and the beneficial results were most marked for drivers under 25. In a study of alternatives to licence suspension, defensive driving courses appeared especially effective with young drivers with very bad prior records.

Helander (1983) reports the results of a California experiment comparing a variety of intervention strategies for crash involved and/or convicted drivers. Drivers were randomly assigned to (1) a re-examination group (the standard treatment), or (2) a crash-avoidance session, or (3) were mailed a pamphlet/self-administered test, or (4) were assigned to a no-contact control. The best crash results were obtained for the crash-avoidance session group and for the pamphlet/test group, with young women being more responsive to the pamphlet approach than older women, the reverse applying for males. The crash-avoidance strategy worked equally well with all ages and both sexes.

An interesting Australian study has been conducted recently (Clark & Powell, 1984), suggesting that a peer group discussion and decision method can be used to change young drivers' attitudes towards road safety. Based on the very reasonable assumption that peers are critical role senders, either reinforcing or opposing official prescriptions about respect for the law, these researchers carried out an experiment with a small volunteer sample of men under 25 who had been in at least one injury accident or serious property damage crash. The friends of these men were also included in the discussion sessions. They found that attitudes toward the law, other road users, and peer group influence to take risks were changed significantly by the intervention (compared with a control group who were simply tested before and after), but that drinking patterns were not affected.

These experiments indicate that for young drivers (and others) who have committed traffic offences or who have simply had accidents, non-punitive interventions such as interviews or personalised warning letters can have beneficial effects. For young drivers with bad records, defensive driving courses may have particular value. Even something as cheap and simple as writing an essay on road safety may produce spectacular results, although the Meham (1968) study has apparently never been

replicated in Australia (or elsewhere).<sup>2</sup> Although Mecham does not speculate on the reasons for the effectiveness of essay writing, it is possible that it served the function of reinforcing the moral commitment dimension, or maybe it made the young offenders more sensitive to the dangers of risk-taking. However, given the unique social and religious composition of Utah, the extent to which the results can be generalised with confidence is limited.

Both the Utah study and the interventions with errant drivers in other parts of the US are crying out for replication in Australian conditions. The work of Clark and Powell (1984) also deserves closer attention, with a view to making participation in a peer group decision program one of the strategies which could be employed by licensing agencies attempting to influence the driving behaviours of young accident-involved drivers. Any tactics which appear to reduce the violation or crash rates of youth are surely worth investigating, provided they do not contravene basic principles of justice.<sup>3</sup>

### Limitations on Teenage Driving

Williams (1985), a researcher with the Insurance Institute for Highway Safety, argues that there are three law changes known to be very effective in reducing motor vehicle injuries to teenagers and others involved in their crashes: raising the minimum age for purchasing alcoholic beverages, raising the minimum licensing age, and night driving curfews. The last two proposals are the subject of this section.

#### Licensing age

Williams (1985) and Williams, Karpf and Zador (1983) compared teenage fatal crashes in Connecticut, New Jersey and Massachusetts. These three states are located in the same general geographic area and have similar overall motor vehicle fatality rates, but they differ with respect to the licensing age: Connecticut sets the age at 16 years 30 days, Massachusetts at 16 years 6 months, and New Jersey at 17 years. The researchers concluded that based on the Connecticut-New Jersey comparison, between 65 per cent and 85 per cent reductions in 16-year-old driver fatal crash involvement could be expected if the licensing age were increased from 16 to 17.

Williams and his colleagues also deal with some of the obvious objections to raising the licence age. One possibility is that if 16-year-olds do not die as drivers, they may die more often as pedestrians, passengers or bicyclists. However, the data did not support this hypothesis. Another possibility is that if inexperience is a major factor in teenage crashes, in states in which the licence age is higher older teenagers will have higher crash rates. In other words, the problem will not have been solved by raising the licence age, but simply moved up a year or so. This hypothesis was to some extent supported by the data, since for New Jersey 17-year-olds the fatal crash rate per



100,000 licensed drivers was slightly higher than in Connecticut. However, the per capita rates for 17-year-olds were not very different because fewer 17-year-olds were licensed in New Jersey. In other words, raising the licence age appears to delay the extent to which eligible teenagers obtain licences. In addition, the combined data for 16 and 17-year-olds strongly indicated a positive net benefit.

The thrust of Williams' (1985) argument is supported by Robertson (1981), who analysed all fatal crashes in the US for the years 1975-78, and also by the results of an older analysis by Carlson (1973). Robertson concluded that raising the licence age to 18 would greatly reduce deaths among those under 18, and that apart from motorcyclists unlicensed driving would probably not become a major problem. (With motorcyclists unlicensed driving is already a major problem in the US, since nearly half of those killed did not have a valid licence to operate a motorcycle.)

Raising the legal driving age is of course a rather extreme step. Young people have to be granted a licence at some stage, and given the critical importance of motor vehicles not just as a means of transportation but as a symbol of adult status and freedom, it is not surprising that the subject of raising the licence age has not exactly been the centre of heated political debate in this country or overseas. However, there has been a recent enquiry in NSW which investigated, as part of a larger enquiry into car driver licensing, the question of whether the minimum licence age of 17 should be raised (Parliament of New South Wales Joint Standing Committee on Road Safety, 1984).

On the basis of an examination of casualty crash rates for provisional and fully licensed drivers in NSW, the NSW committee observed that 'a minimum age of 20 for "P" plate drivers and 21 for standard licence holders seems appreciably safer than 17, 18 or 19' (p 18). However, the committee went on to say that 'the enormous social and employment repercussions of such a drastic increase in the minimum driving age would not be acceptable to the people of New South Wales' (p 18). They therefore recommended staying with 17 as the minimum age. It is hard to disagree with the committee on the political feasibility of a minimum as high as 20, but Victoria already has a minimum of 18 and the government there does not seem unduly harassed by electoral pressures for a reduction to 17 or 16 (16 is the age in South Australia). So why not on the basis of the data (both local and overseas) raise the minimum age to 18 in all Australian states and territories?

Part of the NSW committee's argument against such a move is that 18-year-old 'P' plate drivers have higher casualty crash rates than 17-year-old 'P' plate drivers, and rates for 19-year-old standard licence holders are even higher than 18-year-old standard licence holders. Importantly, it is argued that 'the central issue in the licence age controversy is not whether the total volume of crashes can be reduced by increasing the minimum driving age but whether 17-year-olds are inherently more dangerous than 18-year-olds or 19-year-olds' (p 11). Well, the

data presented by the committee suggest that 17-year-olds are not more dangerous - but is that really the 'central issue'? We would argue, following Williams (1985), that regardless of whether 17-year-olds are less at risk than 18-year-olds, casualties among 17-year-olds can be vastly reduced by making it illegal for them to drive. Moreover as the US research has indicated these benefits from reduced exposure would not be offset much by increased crash rates due to inexperience among newly licensed 18-year-olds. The central issue is not the relative crash risks of 17 and 18-year-olds, but whether it is politically feasible to set the minimum age at 18. If it is politically feasible in Victoria, why is not politically feasible in NSW and in other Australian jurisdictions?

### Curfew laws

Despite our general policy of favouring anything which reduces driving by young teenagers, we recognise that raising the minimum licence age is a difficult step for any government to take. For this reason the concept of night time curfews for teenage drivers, rather than outright bans on driving, has been the subject of some empirical investigation. Such curfew laws usually limit driving in the late evening and early morning hours (eg. 11.00 pm to 5.00 am), often with some exceptions for travel to work or school.

Williams (1985) and his colleagues (Preusser, Williams, Zador & Blomberg, 1984) report the results of studies comparing crash rates for young teenagers (15, 16 or 17-year-olds, depending on the state) in states with curfew laws with rates in states without such laws. Four states (Louisiana, Maryland, New York and Pennsylvania) were carefully matched by Williams (1985) with non-curfew states to ensure that as far as possible they differed only with respect to the curfew law. To control for possible differences in the time of day crashes occurred in study and comparison states, unrelated to curfew laws, comparisons of crash involvement during curfew and non-curfew hours were also made between older drivers not covered by curfews. In addition, the hours just before and just after the curfews were examined separately, because of the possibility that curfews might affect these non-curfew hours as well. The researchers estimated reductions in the crash involvement of 16-year-old drivers during curfew hours ranging from 25 per cent to 69 per cent, and concluded that curfew laws had very beneficial effects relative to their costs (social and otherwise).

Preusser, Williams, Zador and Blomberg (1984) came to similar conclusions, and also argued from the data that curfew-related reductions for 16-year-olds as non-drivers during curfew hours. There was some evidence that curfew laws discourage teenagers from obtaining licences early, which if true means that the positive benefits of curfew laws are even greater than indicated.

Robertson (1981), in his analysis of US fatal crash data, also concluded that prohibiting driving from 8 pm to 4 am by drivers under 18 would reduce deaths substantially. The particular value of his paper is that it allows a comparison of the relative merits of a range of strategies. He investigated the crash reduction potential of early interventions with young drivers who accumulate a crash or violation record, but pointed out that since fewer than a quarter of drivers under 18 who have a fatal crash have any record, the results of such a program could not be expected to be substantial. In this connection it is also worth noting the comment of Williams (1985) that it is probably a misguided strategy to concentrate on high risk teenage drivers, since about half of all drivers can expect to have at least one crash in their teenage years.

Robertson (1981) also investigated the potential of requiring adult passengers to accompany teenage drivers (as with learner drivers). However, he argued that because of the increased risk to the adults, particularly if teenage driving is not reduced much, such a policy should be carefully researched before it is implemented. He seems to take the view that all that may happen is that more adults will be killed or injured.

Williams (1985) discusses the advantages and disadvantages of laws directed at teenagers. The sources of opposition to such laws are obvious: most teenagers want to drive, some must drive to work, and many parents want to stop acting as chauffeurs. On the other hand, the motor vehicle crash problem is greatest among drivers under 20, and as argued above there are few effective countermeasures currently available. Robertson (1981) points out that many well-meant programs in the past have either been a waste of money or have had positively harmful effects. A prime example is high school driver education, which increased the number of licensed 16 and 17-year-olds without reducing the number of crashes per licensed driver. The net result was more crashes. Similarly, rehabilitation programs for drinking drivers in lieu of licence suspension have had negative effects on subsequent violations and crashes, because at least licence suspension has some effect on exposure to risk while rehabilitation has few discernible effects at all (Peck, Sadler & Perrine, 1985). The critical factor is clearly exposure.

#### The Federal Office of Road Safety Graduated Licence Scheme

Part of the Australian response to the problem of teenage crashes has been to develop a graduated licensing scheme (Federal Office of Road Safety, 1986a). The proposed scheme, which has been agreed to by all states and territories, involves four six month learning stages, and is very similar to the provisional licensing programs developed in the US about 10 years ago (Williams, 1985). During Stage 1, the only driving allowed is during the day under adult supervision with no passengers; Stage 2 allows day time and night time driving under supervision, with passengers allowed during the day; Stage 3 allows solo day time driving but night time driving only under supervision, as well as passengers only under supervision; and Stage 4 allows solo day time and night time driving, but driving with passengers at night must be supervised.

The key elements of this scheme are: (a) an extension of the 'learner driver' period to two years; (b) reliance on adult supervision; (c) prohibition of night time driving for the first six months; (d) recognition of the importance of passengers in crashes and in the injury statistics. A zero BAC would be required at all stages, and for one year after the licence has been received. There are suggestions in the paper (Federal Office of Road Safety, 1986a) that driving may be allowed at an earlier age to compensate for the longer learner-driver period.

In our view the two-year time period during which the young driver can develop his or her driving skills is a useful advance on present licensing schemes throughout the country. The need for a longer period for the acquisition of skills is supported to some extent by the results obtained by Williams (1985), showing that in states with higher licensing ages the 17-year-olds had higher crash rates than in states where they had had a year to get experience. However, in view of all the literature reviewed in this section, we have grave concerns about the possibility that driving will be allowed at earlier ages than at present. Perhaps the greatest virtue of the graduated licence scheme is that it has the potential to reduce exposure and maybe delay the acquisition of licences by teenagers. As indicated by Robertson (1981), adult supervision seems to be an unproven tool for reducing crashes, and the value of the extended learner-driver period would very likely be lost if driving were allowed (say) a year earlier. In other words, exposure (even under adult supervision) is so much more potent than any of the other ingredients of the program that nothing should be done which has the net effect of increasing it.

In view of the literature, we would also argue that there should be a prohibition on night time driving for the first year after obtaining a licence. It seems odd that this prohibition should be in force for the first six months, when risk-taking and night time driving would presumably be less likely in any case, but that it should not apply to the real learning period after the licence is granted when the teenage driver is exposed to all the risks and pressures referred to earlier. Driving skills, the object of the graduated licence scheme, simply aren't as important as the social skills which can only be learned through experience when adult supervision is absent.

#### Raising the Minimum Drinking Age

The third of Williams' (1985) effective tactics for dealing with teenage crashes was to raise the legal drinking age. According to Carlson (1973), drivers aged 16 to 18 have fewer alcohol-related crashes than expected while drivers aged 18 to 21 have more. This highlights the importance of tactics focussed on exposure for the younger teenager and tactics focussed on alcohol for the older teenager.

There is a large literature dealing both with the effects of the lowering of the drinking age in North America during the first half of the 1970s, and with the raising of the drinking age subsequently. We will rely mainly on reviews of this North American literature, as well as on information published about the traffic safety effects of lowering the drinking age throughout Australia. Before summarising the situation, it is perhaps worth noting the claim by Vingilis and De Genova (1984) that interest in and concern with the minimum drinking age is peculiar to North America. This suggests that the North American experience may have little direct application to Australia. Indeed, these authors argue that North America has a tradition of expressing moral concern through the enactment of specific and detailed legislation which is nevertheless symbolic in nature.

However, it is not true that the minimum drinking age has not historically been the object of concern in this country. Legal limits on the availability of alcohol were among the primary goals of the Temperance Movement in Australia in the latter part of the nineteenth century, and minimum drinking ages were very much a part of this strategy. For instance in South Australia the minimum age was raised to 12 in 1863, to 15 in 1880, to 16 in 1908 and to 21 in 1915 (Room, 1984). It was only in 1968 that the age limit was reduced to 20, and in 1971 to 18.

Historically alcohol policy has been an arena for some of the most divisive and bitter conflicts in Australian society, and it is only because of the almost complete eclipse of the 'wowers' since the Second World War that issues like the minimum drinking age now appear non-problematic, perhaps even quaint and old-fashioned. However, the issue is now back on the political agenda in this country (eg. The Unknown Public Servant, 1986), due mainly to the fact that the negative features of alcohol use have become clearer through systematic research into alcohol-related problems.<sup>4</sup> Our purpose in this section is to consider the evidence as objectively as possible with a view to affirming a policy of raising the drinking age only if the analyses of traffic crash data warrant such a position. We will once again consider the wider issues at the end of the literature review.

#### North American evidence

At the outset, it should be pointed out that the phrase 'minimum drinking age law' is something of a misnomer (Simpson et al., 1985), since several North American jurisdictions do not directly prohibit drinking or consumption, but rather deter youth indirectly through a prohibition on the direct purchase or possession of alcohol. Sometimes the law varies depending on the type of alcoholic beverage involved. Many jurisdictions recognise the privacy of the home as well as a certain degree of parental autonomy. Thus 'raising the legal drinking age' has meant different things in different areas, although all the laws have in common greatly increased legal restrictions on access to alcohol by teenagers.

One of the most influential workers in the field has been Alexander Wagenaar (1983). The general question examined in his book is: 'Does state legislation that establishes a minimum legal-drinking age reduce the incidence of alcohol-related problems among those under the legal limit?' Specifically, the study is concerned with young people's involvement in alcohol-related car crashes, and with the effects of increases in the legal drinking-age. Prior to Prohibition in the US, temperance advocates concentrated on restricting the availability of alcohol through such devices as the regulation of the hours of sale, a strategy very similar to that adopted by their Australian counterparts. Strict minimum-age laws were implemented only after Prohibition and were set at 21 years. The movement to lower drinking ages began in 1970 with the extension of the right to vote to 18-year-olds, but no state has reduced the age since 1975, by which time evidence was emerging that the lower ages (usually 18) were leading to higher rates of alcohol-related traffic crashes among young people.

Recent research suggests that the link between traffic crashes and lower drinking ages is truly a causal one. Wagenaar (1983) reviews a number of the evaluation studies, and observes that most of them have found significant increases in crash involvement among previously under-age drivers who acquired the right to drink under the new laws (usually 18 to 20-year-olds). Moreover, several studies also demonstrated substantial increases in crash involvement among under-age drinkers (usually 16 and 17-year-olds). However, many of the evaluations had methodological limitations, including a lack of adequate comparison groups, a lack of extended longitudinal data, and outcome measures of limited coverage with small numbers of cases. Nevertheless, Wagenaar claims that the cumulative impact of the research strongly implicates the lower drinking ages as a causal factor in increased teenage drink-driving and alcohol-related crashes. In addition, the research conducted on the effects of raising the drinking age has generally found significant effects, although such effects were less likely when the increase was only one year, when a grandfather clause was introduced in the law (retaining the right to drink of teenagers who could drink under the old law), or when limited short-term postchange data were available.

Wagenaar (1983) proposes a model of the relationship between the legal drinking age and crash involvement: legal drinking age affects drinking norms (eg. the social acceptability of drinking by teenagers), the marketing activities of industry (eg. locating drinking outlets near college campuses), and alcohol availability (eg. easy physical access to a bar). These three factors are all assumed to affect drinking behaviour, and hence drink-driving and crashes. In addition, alcohol availability is argued to influence drinking situations and hence drinking behaviours (eg. more drinking at private parties).

Wagenaar's own empirical work was based on the non-equivalent multiple time-series design: time-series of property and injury crashes were examined for Maine and Michigan, where the legal age

was raised, and for New York and Pennsylvania, where there was no increase. Police reported alcohol-related crashes were examined, as well as single vehicle night time male driver crashes and day time crashes. In addition to the age group under study, under-age drinkers (16-17) and two comparison age groups were examined (eg. 20-21 and 22-45). Thus the design involved three types of comparisons: between experimental and control states, between focal and older age groups within states, and between alcohol and non-alcohol-related crashes within states and age groups.

The analyses suggested that about 20 per cent of all alcohol-related crashes among young drivers can be prevented through the increase in minimum age from 18 to 21. Results were most pronounced for Michigan, where drink-driving arrests also decreased coincident with the law raising the drinking age. Data on consumption could not easily be interpreted due to the presence of several confounding factors.

Wagenaar's work is characterised by attention to detail and by a concern with methodological issues. However, Vingilis (1984), a Canadian researcher, has criticised the book, claiming that Wagenaar was too critical with studies not supporting his position, but not critical enough of studies consistent with his own analyses and interpretations. In addition, according to Vingilis, he makes little attempt to assess competing hypotheses in his analysis, despite the fact that his results are sometimes more equivocal than he claims. In our view the criticisms of Vingilis are justified, but do not warrant rejection of the overall conclusion of the book.

Indeed, in the reviews of this issue undertaken by herself and her colleagues, Vingilis has come to similar conclusions to Wagenaar (1983), although expressed in somewhat more cautious language:

Overall, the research indicates that although youth drink, their mean level of consumption and collision rates can be shifted upward and downward with legal controls. All research, both Canadian and American has shown either an inverse relationship between the minimum legal drinking age and collision rates, or no relationship. So to put it into layman's language, on the basis of research, if we were to raise the minimum legal drinking age, the expected effect on youthful collision rates would be that it would not hurt and it might help (Vingilis, 1985, p 16).

Vingilis and De Genova (1984) also caution that methodological considerations prevent an exact assessment of the extent of the impact of raising the legal drinking age, although some impact is likely. The measurable effects of the laws have varied markedly from state to state, which means that raising the drinking age is not guaranteed to achieve specific traffic safety objectives in any given jurisdiction.<sup>5</sup> Moreover they stress that the minimum

age laws do not deter the majority of teenagers from drinking, although the research suggests that patterns and amounts of consumption are affected.

The Canadians generally have a more negative view of the benefits of raising the drinking age than the Americans. Simpson, Bierness, Mayhew and Donelson (1985), of the Traffic Injury Research Foundation (TIRF) in Ottawa, take a particularly negative position in their review of alcohol-specific controls in relation to road safety, although they do concede that 'a beneficial impact is likely' (p 50) if drinking ages are raised. In our opinion their conclusions are excessively pessimistic although they are quite correct in pointing to many of the difficulties involved in assessing the evidence. However there is no perfect research study, and especially when one attempts to assess the impact of phenomena as complex as changing laws it is always possible to point to uncontrolled variables and argue that a 'direct causal relationship' (p 50) has not been established. The tobacco industry has been doing this for years with regard to the effects of smoking on health.

Moreover, the TIRF researchers dismiss, or at least seriously question, research based on surrogate measures of alcohol-related crashes (such as single vehicle night time fatal crashes), which effectively wipes out the entire field of drink-drive research! Certainly it would be much more satisfactory to have completely valid and reliable measures, but imperfect measures are a common feature of research in the real world. This of course does not mean that all efforts should not be made to improve the measures, but the lay reader should appreciate that to achieve this it would be necessary to breath analyse (blood test?) everyone involved in a traffic crash. Such a policy has been initiated in some Australian states, but with imperfect success, even for fatal crashes.

Thus while the TIRF researchers' call for caution is accepted and understood, we are inclined to the view that the scientific evidence is fairly persuasive. A recent article by Williams (1986) reinforces this position. In a survey of recent US studies (1985+) Williams points out that as of 1 May 1986, 40 states had a minimum purchase age of 21 for all alcoholic beverages, or had enacted legislation with an effective date prior to October 1986. It is noted that many of the earlier evaluation studies did not deal satisfactorily with design and statistical problems, and that controls both within and between states are required. Six studies (including the work of Wagenaar, 1983) are listed as meeting acceptable standards. All these studies found positive effects of the legislation increasing the legal drinking age, with reductions ranging from 7 to 28 per cent, reflecting in part substantial state-to-state variations.

However, these early studies were based on the experience of a limited number of states, and were limited to a one or two year impact. Because of these limitations, in the mid-1980s three more studies were carried out, on a more comprehensive basis.



These studies suggest a reduction in night time fatal crash involvement of between 13 and 21 per cent among the affected age group. Moreover, these effects appear (at least over a six year period) to be permanent. One study found that the effect of raising the purchase age on night time fatal crashes was proportionally greater for females (26 per cent with 10 per cent for males).

Recently there have been some studies which put a contrary point of view, arguing that 'new drinkers' (just coming of age to drink) are more at risk if legal purchase begins at a later age, since they are less experienced than veteran drinkers of the same age. However, these studies are heavily criticised as flawed in design, and recent research based on cohort and other analyses could find no evidence of negative effects on new drinkers. Williams (1986) concludes that minimum age laws should be seen as only one tool, which reduce but do not eliminate the problem - other policies needed include night time curfews and low BACs for teenagers, plus all-age countermeasures.

#### Australian research

It is interesting to note the link in the US between public policy and research: after 1975 states began raising the legal drinking age again because of the evidence linking the lower age laws with increases in traffic crashes. It is sad to note that there is a much weaker link between research and policy in Australia. It appears that only in 1986 was an evaluation published of the traffic safety effects of lowering the legal drinking age in Australia (Smith & Burville, 1986), 15 or so years after the relevant laws were enacted.

The study by Smith and Burville (1986) focusses on the lower drinking ages allowed in South Australia, Queensland and Western Australia in the late sixties and early seventies. A more recent paper by Smith (1987f) addresses the same issue for Tasmania. The aims were: (i) to ascertain whether there was an adverse effect on traffic safety of the drinking age reductions; (ii) to determine whether changes in the drinking age had an effect on crashes beyond the first two or three years; (iii) to determine if the effects on traffic crashes were the same in urban and rural areas; and (iv) to investigate the role of drink-driving enforcement in relation to the lowering of the drinking age. Unlike many of the North American studies, extensive time series data were not available, so total crashes occurring in before and after periods of two or three years were analysed using 2 x 2 chi-square tests. Unfortunately this means that controls for long-term trends and regression effects were probably not as good as in the time series analyses.

Two forms of controls were used: between state comparisons for the target age-group (16-20 or 17-20) and within state comparisons with the age-group 21-29 or 21-25. In order to restrict comparisons to states of comparable populations, only data for Tas., Qld, SA and WA were employed. Thus Tas. was compared with WA, SA was compared with Qld, WA with Qld, and SA

with WA. Unlike many of the American studies, surrogate measures of alcohol and non-alcohol-related crashes were not available, so it was not possible to establish whether the lower drinking ages affected alcohol-related crashes only.

The overall conclusion of the research was that lowering the drinking age adversely affected traffic safety, although only in SA with the initial reduction from 21 to 20 years was there a statistically significant impact on fatalities, with an increase of about 76 per cent in the 17 to 20 age group compared with the between state control group of the same age. However, in all states there were significant effects on injury crashes and sometimes on all reported crashes involving the 17-20 or 16-20 age-group. In SA effects were sustained in the second three year period, but (inexplicably) not in Qld. Inconsistent results concerning the relative effects in urban and rural areas were obtained for WA and Qld. In Qld motorists aged 17-20 involved in crashes had significantly more positive BACs, despite a big increase in convictions. The authors conclude that the minimum legal drinking age in Australia should be 20 or 21.

Interrupted time series analysis is the most powerful quasi-experimental design, allowing in particular control of regression effects which are so likely in data which is as variable as traffic crashes (Ross & McCleary, 1983). It is therefore unfortunate that Smith and Burville (1986) were not able to obtain time series data disaggregated into at least monthly intervals. There are some anomalies in the analyses which are of concern, such as the failure to establish permanent effects in Queensland from the crash data and the non-significance of the South Australian fatalities data after the lowering of the drinking age from 20 to 18, but there are probably adequate explanations for most of these anomalies. For example, it may be that when the age was lowered from 21 to 20 in South Australia, the effective age became 18 (or less?), so that all the impact of the change in the law occurred in the first stage.

The authors advance a number of explanations for other aspects of the results which are superficially puzzling, and make quite strong claims for the causal impact of the lower drinking ages. Although we take a rather more cautious view in the light of the limitations in the data - particularly the absence of measures of alcohol-related crashes - we do agree that taken together the data for the three states support the contention that the lower drinking ages in Australia had a detrimental effect on traffic crashes. The evidence is not as strong as in the American research, but the very fact that causality is demonstrated more effectively (although not conclusively) in the US studies encourages the interpretation of causality in the Australian data, notwithstanding cultural differences.

#### Policy implications

There are a number of good reasons why it is not possible to rush to the conclusion from this review of the traffic crash literature that Australia should increase the minimum drinking

age. Certainly if one considered only the traffic crash data, then one would be led, on balance, to recommend such a course of action. However, there are clearly many other issues which must be considered at the same time. As Simpson et al. (1985) point out, the debate has been escalated beyond a question of traffic safety or even public health, and bears on matters of economy, morality, justice and individual rights and freedoms - not to mention political feasibility!

It is not possible in this report to discuss all aspects of this complex debate, but a few basic points are worth mentioning. Wagenaar (1983) demonstrates that in the US raising the drinking age is not regarded as unconstitutional, but it is certainly discriminatory since at age 18 young people have many other responsibilities and privileges associated with adult status (including the right to vote and to fight in wars). In effect the political powerlessness of youth is exploited through the minimum age laws, since a prohibition on drinking in any age group would probably have an impact on traffic crashes. This does not necessarily make the laws wrong, since many other areas of legislation are paternalistic, but it is perhaps as well to recognise the element of hypocrisy. Moreover, recent thinking in the alcohol field suggests that uncompromisingly prohibitive attitudes towards teenagers on the part of parents and the community may have counterproductive effects (Davies & Stacey, 1979).

Perhaps the most serious problem associated with raising the minimum drinking age is enforcement. Even with the age set at 18 there are considerable problems of policing, and possibly an unwillingness on the part of the community to demand stronger action. In New South Wales illegal purchases of alcohol are currently made by up to 50 per cent of 16-year-old boys and 38 per cent of 16-year-old girls (P. Homel & Flaherty, 1986), and publicans have often complained about the difficulties they face in even identifying those under age, let alone refusing service. Evidence from North America is that even if teenagers reduce their purchases of alcohol as a result of increases in the legal drinking age, levels of drinking do not necessarily decline - many young people manage to get liquor somehow, often through a legal purchaser (Mangione, 1983). Moreover, it is even possible that a prohibition on the public consumption of alcohol by teenagers could in some cases exacerbate the very problem it is designed to solve, by encouraging drinking by young teenagers in cars and parking lots (Snow & Cunningham, 1985).

Nevertheless the enforcement problem should be kept in perspective. Although not as common as in Australia, under-age drinking is a widespread problem in the US (Homel, 1986b), yet as we have seen from the literature changing the drinking age in the US did affect consumption patterns and road crashes. It is probable, given the legal intervention model outlined in Chapter 1 (Figure 1.1), that compliance with the law is strongly influenced by peer pressure and by moral commitment to the law (Burkett & Carrithers, 1980). Adolescents under greatest group pressure to drink and who have no qualms about disobeying the law

will probably not be much affected by an increase in the legal drinking age, but those of a more conservative and independent disposition might be strongly influenced. This leads to the interesting hypothesis that the expected 20 per cent reduction in alcohol-related crashes will be concentrated among teenagers who would tend to obey the law regardless of perceived levels of enforcement.

One difference between the US and Australia is of course random breath testing. In principle, through RBT it would be possible to enhance the enforcement of a 20 or 21-year minimum age law, provided the zero BAC law in force in most jurisdictions was extended to cover drivers from licence through to age 20. This raises the question of the effectiveness of these zero or low BAC laws, which currently require drivers in the first year of driving to have zero or near zero BAC levels, or (in SA) a level lower than .05 (compared with .08 for older drivers). Indeed it could be argued that given the existence of these laws raising the legal drinking age is unnecessary, since the goal of minimum age laws - the elimination of teenage drinking and driving - is already achieved.

As far as we are aware there are two published evaluations of the low BAC laws for provisional drivers. Maisey (1984) analysed the impact of the Western Australian law of 9 December 1982, which introduced a BAC limit of .02 for 'P' plate drivers, and found a net reduction of 17 per cent in the expected number of drivers under 18 years involved in night time casualty crashes. However these and other results, although consistent with expectations of a reduction in crashes among provisional drivers, failed to reach statistical significance (probably because of the small numbers involved). Smith (1986) also evaluated the WA law, but considered as well the South Australian and Tasmanian laws. He was able to show effects on less severe casualty crashes for males in SA and WA, but not on the numbers of drivers and motorcyclists admitted to hospital. Despite generally positive results, Smith concludes that due to various methodological problems low BAC laws should be regarded as a promising rather than a proven countermeasure for alcohol-related accidents among young people.

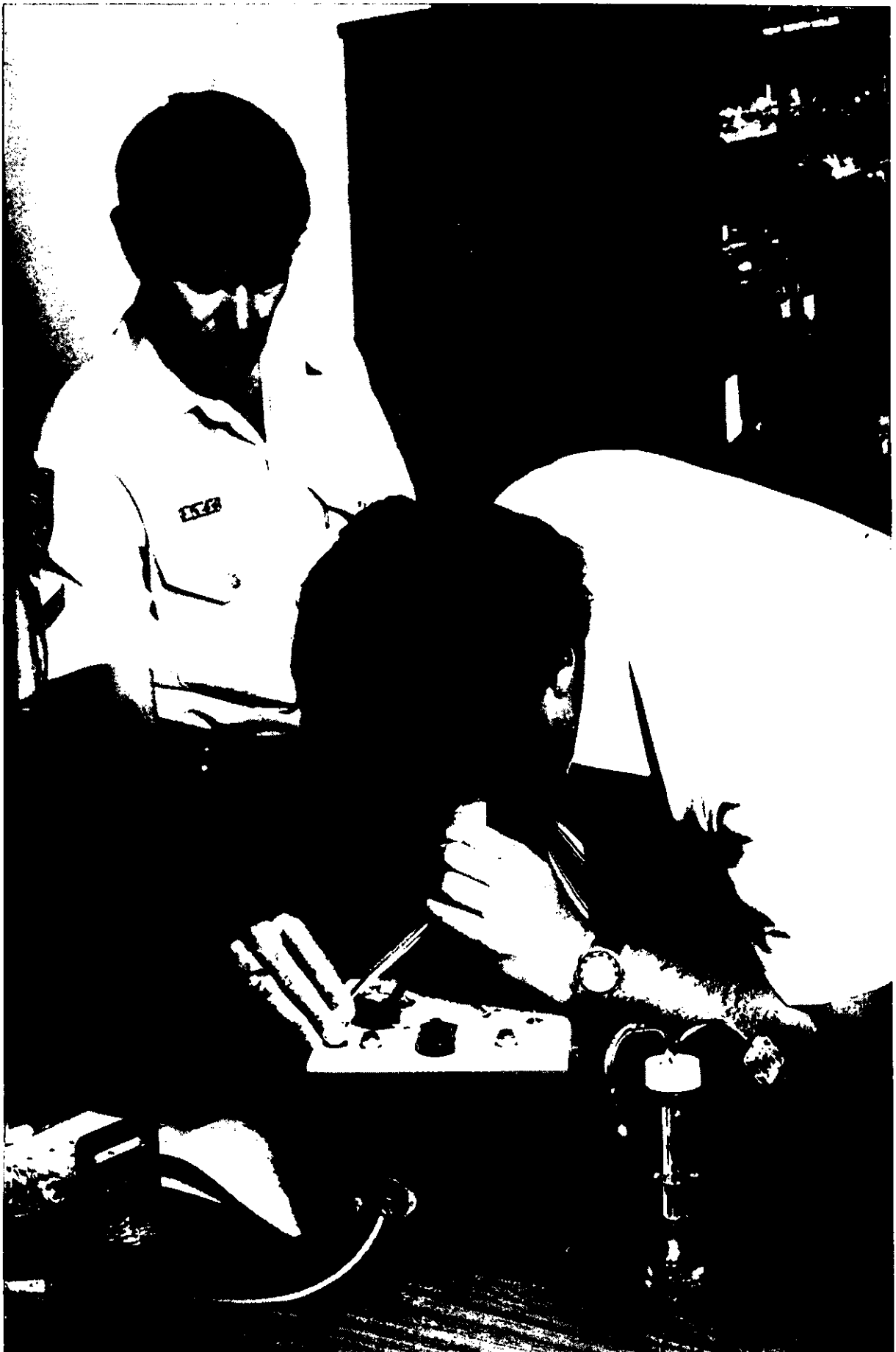
Thus the value of zero or low BAC laws for provisional drivers is not definitely established. Moreover, Homel (1982) has argued against these laws, partly on the grounds that they are discriminatory, perhaps exacerbating biases against teenage drivers already present in enforcement practices (Homel, 1983), and partly on the grounds that vigorous enforcement of the .05 or .08 law for everyone would probably achieve just as much. This last argument is to some extent supported by a comment by Smith (1986) that the greater effects of the low BAC law in SA compared with WA could have been due to the existence of RBT in SA. Nevertheless low BAC laws for provisional drivers are clearly here to stay, and may well be adopted in North American jurisdictions as well (Williams, 1985).

Although the evidence concerning low BAC laws is not overwhelming, and despite our misgivings concerning enforcement, there are enough positive indications to persuade us that they should be retained as part of a package of measures aimed at young drivers. However, the fact that the evidence is much more equivocal for the low BAC laws than for the lowering of the drinking age, even restricting analysis to Australian data, strongly suggests that the low BAC laws do not go far enough as a drink-drive countermeasure for young drivers. Moreover, whatever effects the low BAC laws have, they are restricted to one year of driving.

Despite the Zeitgeist, we must reassert the proposition that alcohol is not just an ordinary beverage (Mosher, 1985). The traffic safety evidence must be viewed alongside the other socially undesirable consequences of alcohol consumption by adolescents and a balanced judgement made with respect to availability policies. If we are not prepared to countenance policies like an increase in the drinking age (at least to age 20, as advocated by Smith, 1987f), then we will be forced eventually to even more radical forms of social engineering (Donelson, 1985). The tragic problem of teenage death and injury on the roads will not go away as a result of conventional education, engineering or enforcement practices, and at the moment the best we can do as a society is to limit exposure to risk as far as is politically feasible.

NOTES

1. Penalties and treatments imposed on convicted offenders or on crash-involved drivers have not been dealt with in detail in this review.
2. Ward, Woods and Brennan (1973) cite a study carried out in Oregon which yielded similar results, but they do not give the reference.
3. However it will be recalled from Chapter 1 that counter-measures based on specific deterrence are probably at best only about a quarter as effective as those based on effective general deterrent strategies, so that interventions with convicted offenders can have only a limited effect on the overall crash rates of young drivers. Such effects are of course much better than nothing.
4. It is noteworthy that during January 1987 the Queensland Cabinet was reported in the press to have included the question of raising the drinking age in its agenda. However, unofficial sources indicate that the question was in fact not discussed.
5. Williams (1985) points out that substantial variations between states in the impact of changes in minimum age laws are to be expected, since states differ in size, population, region and other respects. Moreover, in some states such as Montana, there are very few fatalities in the affected age groups, so that large errors of estimation due to sampling variations occur.



#### 4. ISSUES IN THE ENFORCEMENT OF TRAFFIC LAW

So far in this report we have emphasised modifications to the environment, with a view to devising legal means whereby either the pressures or opportunities to commit offences or have crashes can be reduced. However, the success of RBT in New South Wales highlights the importance of strategies which aim at a direct deterrent effect. It is not a question of radical interventions at the environmental level at the expense of traditional enforcement methods, but a combination of both which is needed. Given the relative potentials of general and specific deterrence for preventing offences, we assume that the emphasis in a discussion of enforcement should be on the police aspects, without neglecting strategies which might improve the records of convicted or multiple-crash drivers.

Our purpose in this chapter is to identify four areas of importance in the enforcement of traffic law (mainly transient offences), and to discuss two of these in some detail. We begin with an examination of police enforcement, leading to a discussion of selective enforcement as a rational technique for making the best use of police resources. We follow this with a brief review of written warnings and the enforcement of licence suspensions.

##### Police Enforcement Practices

In previous chapters we contrasted two forms of police enforcement: RBT, which is a broadly-based strategy aimed at the general deterrence of a specific offence, and traditional enforcement practices of the detection of traffic violations and the sanctioning of offenders. In the discussion of conventional enforcement techniques in Chapter 3, we emphasised that high risk times and places should be the target of police activity rather than high risk types of motorists, such as young men on motorbikes.

In a number of respects conventional enforcement and RBT represent the two ends of a continuum. RBT is essentially a crash prevention strategy, and does not aim at maximising arrests, whereas much traditional enforcement has maintaining or boosting the number of arrests as at least the implicit objective. For example, many police forces use the enforcement index, defined as the ratio of the number of convictions for hazardous violations to the number of fatal and injury crashes, as a work performance criterion (Booth, 1980). Again, RBT is a very specialised mode of enforcement, inasmuch as it is focussed entirely on one offence, whereas traditional enforcement tends to be concentrated on a range of violations, particularly those like speeding which are easy to detect. RBT is characterised by an increasing use of sophisticated management procedures to maximise its effectiveness (Parliament of New South Wales Joint Standing Committee on Road Safety, 1985), while conventional techniques seem to be applied in an ad hoc fashion with few explicit management guidelines (Parliament of New South Wales Joint Standing Committee on Road Safety, 1985).



We do not propose to argue that all traffic law enforcement should be like RBT, or that it should all be based on detailed scientific research. Despite an increasing use of preventive techniques like RBT and selective enforcement, probably the bulk of police traffic work will remain 'conventional' in form. We will therefore examine briefly this form of enforcement before discussing selective enforcement programs.

#### Conventional enforcement practices

Several issues have been addressed in the literature: what criteria the police employ in enforcing traffic law, the effects of this enforcement on the motorist, and the effectiveness of enforcement in reducing traffic crashes. We will leave the question of effectiveness for the moment, and concentrate on what police do, and the effects this has on motorists and the community.

In a classic criminological essay, Cressey (1974) has drawn attention to the importance of a police department's policies with reference to motoring offences for police-public relations. He advances the thesis that the interaction between police and automobile drivers has contributed substantially to a blackening of the police image in motorised nations. Cressey argues that the middle and upper-class status of early motorists, proactive traffic law enforcement, and community insistence that police enforce the law while at the same time overlooking offences, have all 'introduced a misconception of the nature of "the crime problem" and its causes and, by personalising law enforcement, have laid the foundations for accusations of inefficiency, bigotry, and corruption in police departments' (p 233). According to Cressey the extension of judicial discretion to police in traffic cases has backfired since, because motorists know that most offences go undetected, they view citations on the one hand as evidence of police prejudice and warnings on the other hand as evidence of police inefficiency.

More recently, Dix and Layzell (1983) have attempted to investigate empirically some of the issues raised by Cressey (1974). In an excellent exploratory study, based on in-depth interviews with small samples of the general public, with police in one area near London, and with recent offenders among the road-using public, these authors aimed to explore relations between road users and the police. Their specific aim was to investigate whether motorists' attitudes to traffic policing have wider implications for the public's attitude to police in general, as suggested by Cressey.

From the interviews with road users, Dix and Layzell (1983) concluded that there was no evidence for the idea that police-motorist encounters stimulate generalised anti-police sentiment, except in certain exceptional circumstances.

Perhaps the predominant reaction is '... why me?' ... Attitudes several weeks later change and broaden, as the motorist reflects upon and rationalises the incident and perhaps compares his own experience with that of others. ... What seemed clear in the cases we followed through was that:

- \* the 'system' in which police play a part became viewed more critically, but
- \* the police themselves were not.

In some cases attitudes to the system became distinctly more cynical while respect for police based largely on the behaviour of the reporting officers was actually reinforced (pp 94-5).

However, in cases when the police stopped a motorist for 'suspicion of crime' checks there was considerable hostility, particularly when the search for drugs or stolen goods proved fruitless. In addition, for some police officers motorcyclists seemed to act as a 'magnet', contributing to feelings of harassment and consequent disaffection towards the police.

In considering the implications of negative police-motorist encounters, Dix and Layzell (1983) ask whether the instinctive approach to stopping on suspicion can be refined, and whether the potentially damaging effects of unwarranted suspicion can be mitigated. In a previous chapter, they point to the importance of such factors as how the police officer approaches the motorist, how courteous, positive and businesslike the officer is in the actual interaction, and how 'informal sanctions' are used. For example, crouching by the car door reduces the driver's feeling of being looked in and down upon; slowly wandering around the vehicle before speaking to the driver, or unnecessarily repeating questions, can exacerbate tension and create resentment.

It is likely that these kinds of problems arise in one form or another among police forces all around the world. Cressey (1974) maintains that the more motorised a society the more highly educated are its police, particularly its traffic police, which suggests that the solution to the problems created by unfortunate police-motorist interactions are generally seen in terms of police education and training and a greater degree of professionalism. Dix and Layzell (1983) make some explicit recommendations for police training as a response to their own research. The points they make are worth summarising, because even if Australian police forces have addressed some of these issues, they are unlikely to have developed policies which solve all the problems. Among other recommendations, Dix and Layzell propose that senior traffic officers should have an earlier influence in the training of probationers, and that during initial training there be increased emphasis on the value of discretion in traffic work; distinctions between advisory and

formal policing roles should be made clear; the effective communication of advice and warnings should be discussed; and self-awareness in terms of personal approach and its impression on the road user should be included. These emphases are reinforced in American texts for police (see for example Hand, Sherman & Cavanagh, 1976, and Weston, 1968).

### Structural factors influencing police enforcement practices

So far our discussion of conventional enforcement practices has been concentrated on police-motorist interactions at the individual level. However, not all variations in police practices can be explained in terms of the idiosyncracies of individual police officers. A brief discussion of the organisational and sociological dimensions underlying traffic enforcement policies will form a useful introduction to a review of their effectiveness and an examination of selective enforcement programs. The book by Gardiner (1969) is an excellent resource for this discussion.

This book is about the enforcement of traffic law in four cities in Massachusetts. It is based on the assumption that it is in the grey area between conduct which is clearly accepted by the public and conduct that is clearly condemned that one can gain a greater understanding of police work. Traffic law is in this grey area. The rules are clear ('Do not drive faster than 60 kmh in a built-up area') but no police force can possibly enforce all such laws. How can the vast differences between police forces in the emphasis given to traffic enforcement be explained?

Gardiner (1969) explores two hypotheses: (i) the level of traffic law enforcement is the product of the interests, attitudes and activities of the local police chief; (ii) these official preferences are moderately correlated with community characteristics, particularly the degree of geographic stability. The cities studied represented the two highest and the two lowest cities for traffic law enforcement in Massachusetts. In Lynn, traffic work was a 'residual function' - something you did when you were not doing something else. The reason was a basic lack of interest in traffic law - only when there is a specific issue, like a council demand for a crackdown at an intersection, are levels of enforcement increased. By contrast, in Waltham, the high level of ticketing can be explained by the concept of 'specialisation'. The police write tickets when that is their only job - to prove they are doing it.

In considering why forces differ in this way, Gardiner finds support for his initial hypotheses. As suspected, in communities with a higher degree of population stability informal sanctions are employed more frequently, either through political pressures or familiarity with the 'clientele' population. However, to a greater extent policies are formed by the conscious or unconscious judgements of the police chief concerning the totality of his responsibilities. Since public instructions to police in this area are ambiguous, senior police must make their own priorities.

This finding highlights the importance of the policies set in train by top police management and the need for such policies to relate to real community concerns, especially safety. However, from the correlational data available to Gardiner (1969) there was no evidence of any association between higher levels of enforcement and traffic crashes. He concludes that to reduce irresponsibility among police forces in the handling of such poorly defined areas as traffic law enforcement, there must be a clarification of the purposes of police action and an intensification of public surveillance.

The Effectiveness of Police Enforcement, with Particular  
Reference to Selective Enforcement Programs

The effectiveness of traffic law enforcement as a means of reducing crashes has long been questioned (OECD, 1974). In particular, the road safety value of the rule of thumb (frequently employed by police) that the enforcement index should not be allowed to fall below 10, is very doubtful indeed. As Booth (1980) succinctly puts it, 'to shout at traffic enforcement officers to increase their arrests in an effort to reduce accidents is an exercise in futility' (p 317).

Before referring to some of the evidence for this position, it may be useful to explain exactly what is meant by 'selective enforcement', or 'selective traffic enforcement programs (STEP)'. According to the OECD (1974), selective enforcement involves deployment of a given number of police personnel at such times and in such locations as to optimise road safety, and may also aim at the prevention of certain sorts of offences. Booth (1980) gives a more exact definition, which will be developed further below:

TRAFFIC OFFICERS

deployed at

HIGHEST FREQUENCY ACCIDENT LOCATIONS

during

HIGHEST FREQUENCY ACCIDENT TIMES

enforcing

ACCIDENT-CAUSING VIOLATIONS

There have been a number of good reviews in the past decade of the effectiveness of traffic law enforcement. We did not come across any major new studies in our search of the literature, so we will rely mainly on the already published reviews. According to Raub (1980), the studies he reviewed failed to prove that increased traffic law enforcement reduced crashes because they

were defective in design or statistical analysis, there was interference from external factors, periods of enforcement were too short, changes in crash rates could not be properly measured, and there was a sole concentration on enforcing speed limits when the link between speeding and crashes had not been established.

Raub (1980) identifies the statistical problems as the most important, particularly the failure to deal adequately with the problem of regression to the mean. This means that observed reductions in crashes could have been due to the normal tendency for locations with high crash rates to record figures closer to the average in subsequent observation periods. The only really satisfactory way to overcome this problem is to use data over an extended period of time, both before and after the enforcement program. This problem is also emphasised by other researchers, such as Armour (1984).

As an example of the regression to the mean problem, consider a study reviewed by Raub (1980). In 1976 in Creve Coeur, Illinois, the Police Traffic Unit had some apparent success in selective enforcement since there was a reduction in crashes over a one - year period. However, in the second year of operation the number of crashes increased significantly. The increase was such that, for the two-year period, the number of crashes increased even faster than had been expected by trend. This demonstrates the need for time-series analysis to control regression to the mean and to cope with the general randomness of crash data.

In a later study in Evanston, Illinois, Raub evaluated the effects of increased and selective enforcement along four streets. Unlike the Creve Coeur study the findings in the project for the first year were compared to trends and to crashes on streets that did not receive added enforcement.

Subsequent analysis showed that although crashes increased in the second year, they were still fewer in number than predicted from the 10 year trend. Raub suggests on the basis of this study that the ingredients of a successful program are (a) frequent and visible patrol during the hours and days where crashes are most likely to occur; (b) frequent stops of motorists (approximately two per hour); and (c) enforcement of a wide variety of traffic laws, not just speeding.

An oft cited study by Hauer and Cooper (1977) illustrates further the potential of selective enforcement. These researchers were able to take advantage of police procedures in Toronto whereby locations that had accumulated the largest number of crashes in a certain period of time were selected for increased enforcement. Metropolitan Toronto is divided into five police districts, and within each district the 20 street locations (intersections or midblock sections) which had the largest number of crashes in the previous police reporting period of 28 days were the target of special enforcement. Essentially Hauer and Cooper compared the number of crashes in locations with high ranks (many crashes) for a period after enforcement with the expected number of crashes for that period. The expected number was calculated from data

for four years using an equation which took account of crash history, seasonal factors and whether or not the location was an intersection or midblock.

The analysis indicated that subsequent to a street section achieving high rank (and therefore increased enforcement), fewer than the expected number of crashes occurred on it. Effects lasted for a 'fairly long period' (apparently a bit more than a year, perhaps 15 to 20 police reporting periods from the graphs presented) before gradually fading. Type I error rates are presented for various combinations of location crash ranking and time lag (up to five reporting periods) after enforcement, indicating generally significant results at the 10 per cent level. In discussing their results, Hauer and Cooper (1977) argue that in theory all important factors except increased enforcement are randomised. However, due to various methodological idiosyncracies, they caution that the duration and magnitude of the effect of selective enforcement cannot be specified with any certainty.

One strength of the Hauer and Cooper (1977) study is the careful use of crash data over a four-year period to develop estimates of expected crash frequencies in each of the 1800 locations which could have been the target at some stage of increased enforcement. Such time series estimates are essential if the problem of regression to the mean is to be overcome, although Raub (1980) claims (without giving any reasons) that regression to the mean was not satisfactorily dealt with. Raub also criticises Hauer and Cooper for not having any control locations, although it is obvious given the police practice of increasing enforcement at all locations rising to the top 20 in the crash lists that such controls were not possible. The graph presented by Hauer and Cooper showing no reduction in crash at locations not characterised by high crash frequencies does not serve as an adequate control, since clearly low ranking locations would be expected to differ in systematic ways from locations achieving high ranks.

Booth (1980) and McEwen and Brazil (cited in Raub, 1980) emphasise that no two locations are alike and it is therefore almost impossible to select a set of streets or locations as a control in terms of classical design. Presumably what they mean by this is that classical matching techniques cannot be utilised. This problem of the non-equivalence of experimental units can of course be controlled through random allocation, but because the error variance remains high a large number of locations in both groups are needed. Putting the problem in other words, variability between locations can be controlled, although not reduced, through random allocation of enforcement (the experimental 'treatment'), but the value of randomisation and the statistical power of the experiment increases the more locations there are in the experimental and control groups. Certainly more than five or six locations in each group are desirable.

In summary, experiments using selective enforcement as the treatment require large numbers of locations and extensive time series data to achieve acceptable levels of control and statistical power. Such experiments are very expensive, which probably explains why there are so few well-designed studies in the literature. In addition, if real light is to be thrown on the processes by which enforcement achieves a reduction in crashes, behavioural and perceptual data are required as well as crash frequencies. Thus Rothengatter (1982) observes that Hauer and Cooper's (1977) study, because it lacked behavioural indices, could not definitely link the observed crash reductions with increased enforcement. Ideally data on crashes would be supplemented by observations of drivers as well as by interviews with a sample of drivers to measure at least some of the variables depicted in Figure 1.1. In addition there is nothing in Hauer and Cooper's study about police enforcement techniques, so we are none the wiser concerning desirable manning levels, degree of visibility, frequency and lengths of patrols, and so on.

The study by Hauer and Cooper (1977) has been discussed in some detail because it illustrates the problems of experimental design as well as the potential value of selective enforcement. Despite its problems, no other study reviewed by Raub (1980) appeared to produce more definitive results or have a stronger experimental design, although the general trend is for increased enforcement to be associated with reductions in crashes. In many respects Raub echoed the sentiments of the OECD reviewers (OECD, 1974), who referred to the 'uncertainty surrounding traffic law enforcement' as a safety measure, despite the experimental work which 'appears to strongly suggest a positive road safety value in increased police enforcement' (p 69).

The OECD (1974) reviewers recommended an emphasis on selective enforcement in preference to conventional arrest-based procedures, and suggested that techniques similar to those used by industry for statistical quality control should be employed by police. More recently, an Australian reviewer (Armour, 1984) came to similar conclusions:

It seems possible to reduce traffic crashes using law enforcement given the right circumstances and the correct type of site. It would seem that a deployment plan based on high risk times or locations is superior to a simple general increase in enforcement, but there is insufficient information to decide on the optimum type of plan (p. 10).

Despite the uncertainty about optimum procedures, she does suggest that police enforcement should be visible, that warnings should be used in addition to citations to increase police contact with motorists, and that publicity is required alongside enforcement. With respect to the enforcement of speed law, the

evidence suggests that the presence of a police vehicle will cause a reduction in driving speeds which may be maintained for up to five kilometres (a 'halo effect'), and that there may be memory effects as well (perhaps up to ten days or so), although memory effects have not been tested in urban areas. In order to effect a general decrease in speeds a large number of enforcement vehicles are required, perhaps as many as .3 per mile, a level of police activity which is impossible to maintain except for short periods in specific areas.

Thus the authorities in the field generally favour selective enforcement over general traffic enforcement programs. However, our assessment is that the evidence for selective enforcement is not much better than it is for (say) general crackdowns on speeding, although the complexities of the experimental designs employed to study selective enforcement are often greater. Indeed, recent evidence rather favours the general crackdown approach if one considers the evaluations of RBT in New South Wales and the evaluation of the US 55 mph law recently published (Transportation Research Board, 1984).

We suspect that at least part of the reason why selective enforcement is favoured is that it appears to be a rational response to limited police resources. It probably is effective, at least under some conditions, but we don't know much about the conditions or the best methods of operation. Most of the studies reviewed by Raub (1980) which included estimates of costs and benefits were characterised by statistical weaknesses, although one study (Shoup, 1973) which unfortunately did not demonstrate significant results used sophisticated cost-effectiveness measures which we examine in more detail below. The state of the literature is such that guidelines for selective enforcement can be offered, based on research, but cannot be regarded as binding. For example, in the definition of selective enforcement proposed by Booth (1980), police are required to concentrate on traffic violations which cause crashes. Leaving aside the question of how such violations are to be identified, research conducted by O'Brien (cited by Rothengatter, 1982) suggests that the fact that enforcement takes place is more important than the selectiveness of enforcement in terms of violations.

Despite the uncertainties we believe that selective enforcement procedures should be pursued in Australia, but extensive research needs to be undertaken to ensure that resources are not wasted. In the remainder of this discussion of police enforcement we will summarise the present situation in Australia, suggest ways in which selective enforcement programs can be implemented, and indicate the kinds of studies which could be done to improve our knowledge of the cost-effectiveness of such procedures.

### Selective Enforcement in Australia

Recently in New South Wales the Staysafe committee has investigated police enforcement of traffic law (Parliament of New South Wales Joint Standing Committee of Road Safety, 1985; 1986:



Reports 4 and 5). Summarising the thrust of the committee's arguments, it was found that although police in NSW may talk about selective enforcement, in practice most enforcement is not concentrated in high risk places at high risk times. On the contrary, the enforcement of speed law on very safe roads such as the F5 freeway consumes a high proportion of resources, and although there is no formal quota system there is pressure on individual officers to produce regularly a high number of bookings. The committee recommended that the exclusive use of a 'highway patrol-management and statistical return' form (the P.398) as a management tool be abolished, and replaced with a system of data collection which does not entail keeping records on individual officers.

Drawing on the work of Armour (1985), it is argued that highly visible police radar units can not only reduce speed at specific locations, but that through halo and memory effects the impact can be extended in distance and to other occasions near that location. Mobile patrols are rejected as being of little deterrent value. Since part of a scientific selective enforcement strategy is a concentration on traffic law violations which have a relatively high crash or injury risk, it is proposed that preventive strategies like RBT (focussed on drink-driving) and the enforcement of safety-belt laws be given high priority, alongside a concentration on high-risk times and places. It is observed that the day-to-day operations of the police in traffic law enforcement must be put onto a much firmer scientific base.

In some respects the paper by the Traffic Authority of NSW and the NSW Police Department (1986) is a response to the Staysafe reports. These agencies claim that 'crash statistics are used to identify areas where greatest impact can be achieved' (p 9). They also claim that Action Plans for enforcement activities within police districts are developed according to a well-defined process which involves: (i) identifying the nature and extent of the problem; (ii) determining when the problem occurs; (iii) deciding whether or not a police presence will have an impact; (iv) determining the need for support by means of publicity or the Highway Patrol Response Group; and (v) initiating action. They refer to evaluations which are carried out both within districts and by a central policy unit, although apparently none of these evaluations have been published.

These encouraging developments in NSW were anticipated some years ago in South Australia (Furler, 1980), and possibly in some other parts of Australia (eg. Millar & Generowicz, 1979). In a discussion of the scientific procedures employed by South Australian police, Furler describes the work of the Traffic Intelligence Centre which processes current statistics to assist management to deploy effectively available resources, and which collates and evaluates the results of recommended enforcement actions. For example, information on road sections, types and times of collisions and a crash priority report are produced, and used to determine if it is operationally feasible to site a speed analyser. These analysers are usually placed in such a way as to

affect driver speeds as closely as possible before they are exposed to the high hazard area, and they are used in a highly visible manner. The South Australian system is characterised by an effective integration of management goals, computer resources and personnel, with constant feedback and evaluation.

#### Guidelines for selective enforcement

The South Australian system demonstrates that at least some Australian police forces have begun to make effective use of scientific management procedures in traffic law enforcement. From the literature we have reviewed it is possible to suggest some guidelines which may facilitate the expansion of these procedures, although the inconclusive nature of much of the research upon which they are based should be kept in mind.

Cameron and Sanderson (1982) provide an excellent synthesis of research findings, and suggest a priority for police enforcement which probably cannot be improved upon given our present state of knowledge. They argue that general deterrence of fixed offences should be the first priority, using highly visible random stops or publicised and visible patrols. Target offences should be drink-driving and seat belt offences.

The second priority should be general deterrence of transient offences at signalised intersections. In urban areas, a large proportion of road crashes occur at or near intersections, and the bulk of intersection offences relate to failing to obey a traffic control signal or traffic sign (STOP, or Give Way). Consequently these offences should be the main target of enforcement at intersections. Cameron and Sanderson suggest that intersection operations should take the form of sporadic but frequent visible patrols, or (with higher cost-effectiveness) visible mechanical surveillance devices accompanied by warning signs. These recommendations are generally consistent with those of Raub (1980), and would fit well into a selective enforcement program.

Cameron and Sanderson's third priority is general deterrence of transient offences at non-intersection locations.

This should take the form of a mixture of visible and non-visible operations (marked and unmarked patrol cars, or visible and hidden speed detectors) and this form of operations should be publicised. The target offences should include crossing double centre-lines and exceeding rural speed limits by more than 25 kmh (p vii).

Although the use of unmarked cars seems to be generally disliked by police these days because of the high degree of public hostility which they generate (Furler, 1980), a case can be made out for their use, provided the public are aware of the policy and provided it is emphasised that their purpose is not 'revenue

raising' but general deterrence. Booth (1980) argues that, properly used, unmarked cars can heighten the sense of police omnipresence on the roads.

The final priority, according to Cameron and Sanderson (1982), should be selective detection/apprehension operations focussed on high-accident times and locations and on offences which have a demonstrated link with accidents. These offences include the five already mentioned: drink-driving, seat belt offences, disobeying traffic control signals, crossing double centre-lines, and exceeding the speed limit by more than 25 kmh in rural areas. This strategy is, more or less, selective enforcement as defined by Booth (1980), although the higher priority forms of enforcement can also be carried out effectively within a selective enforcement framework (with the possible exception of RBT).

Booth's (1980) book is designed as a text for managers within the police, and is sufficiently comprehensive and well written for us to recommend its use within Australia. Although one can dispute some of his recommendations, such as the focus on crash-causing offences rather than on a range of offences (Raub, 1980; Rothengatter, 1982), any police force would benefit from systematic experimentation with some of his suggested procedures. His discussion of manpower allocation for selective enforcement illustrates how the book could be useful. His recommendation is that all the available resources be devoted to enforcement at high crash times and places, in contrast to the approach advocated by the US National Safety Council, which is proportional allocation of manpower. In this latter approach, police are allocated to duty on each day and for each shift in numbers which are proportional to the number of crashes occurring on that day or during that shift. The problem with this approach, according to Booth, is that it is a waste of police resources to assign officers to any location during low traffic or low crash times, even if the location is determined to be a high frequency crash location.

This debate concerning allocation of police to traffic enforcement illustrates that selective enforcement can be conducted in many different ways, and probably not all ways are equally as effective. Other issues which require direction from management include the frequency of patrols, their duration and the number of officers at each location at any one time. As illustrated by the work being done in SA, it is essential to integrate data collection and data processing into a selective enforcement program, and when this integration is accomplished optimum levels of each of the parameters mentioned above can probably be estimated.

Recent developments in computer technology for selective enforcement, as illustrated by the article by Deitch, Goodson and Johnston (1985), should be carefully studied for their application to Australian conditions. For example, Deitch et al. emphasise the value to Arizona police of direct on-line access to all field personnel for both data entry and inquiry, with the

concomitant demand for flexible and user-friendly software. They claim that the Arizona system when completed at the end of 1986 will provide combined crash cause and enforcement comparisons for any highway and milepost interval for a variety of time frames. Thus it will be possible to determine immediately whether police action is being accomplished in critical areas and in response to those causative factors that can be affected by direct patrol action.

### Research needs

A greater commitment to selective enforcement, whether through investments in computer systems or through changes in enforcement practices, will provide opportunities for research. It is essential that such research be planned and conducted with scientists who are qualified to develop designs, to overcome the major criticisms directed at past research. An emphasis of any research program should be on the cost-effectiveness of specific strategies.

To conclude this discussion of police enforcement, we will consider one study (conducted by an economist) which we believe could be repeated in Australia. It is included for purposes of illustration only, and no doubt much more suitable designs could be devised. In some respects our suggestion may simply be regarded as a more sophisticated version of the proposal put forward by Ward, Woods and Brennan (1973) for a study of the cost-effectiveness of enforcement at intersections.

Shoup's (1973) study of selective enforcement in Los Angeles has already been cited as one which found few significant effects but which is nevertheless worthy of attention because of the general method. The purpose of the paper was to examine the cost effectiveness of a variety of techniques of police enforcement of traffic law in specific areas ('beats') of a city. Results were based on an experiment conducted in Los Angeles in 1968-69, using special motorcycle officers usually assigned to areas with bad crash records ('selective enforcement').

The experimental design involved one beat with one visible police officer who issued no citations, one beat with one officer who issued warnings only, and six beats where standard procedures were used but the number of officers was increased during the experimental period by 4, 3, 2, 1, 0, or -1 (ie. a decrease to a zero level) compared with the base period (number of years not specified). Crash data, citations, traffic volume and speeds were the major outcome measures (speeds were not available for the base period). Cost estimates were obtained for police enforcement and dollar values were put on automobile travel (cents per vehicle-minute). Dollar estimates of the benefits to be gained from reductions in the frequency of various forms of crashes were also obtained.

Warnings appeared to reduce crashes (13 per cent), and the more officers on a beat the greater the crash reduction (rank correlation of .83). However, these results were only

significant at the .15 level, and the analysis of costs showed that all beats which involved varying the number of officers actually showed a negative benefit since the drop in numbers of crashes was outweighed by increased costs. This illustrates how cost calculations can change what appears to be a moderately encouraging picture into a negative one.

A detailed analysis of statistical power was carried out, indicating that type II error rates were quite high, justifying the use of a high alpha level. Few effects on speed were noted, since traffic congestion was high, but it is argued that even small reductions in speed can have surprisingly high economic costs. In this regard, the author notes that '... the traditional concentration on the goal of reducing traffic accidents may represent a serious over-emphasis; the less obvious and much less easily measured effects on travel time may very well be of as much quantitative importance' (p 54). Warnings had a net economic benefit, despite the lack of statistical significance. Saturation patrolling was not recommended. The need for criteria of performance other than total citations is stressed, and it is argued that officers might be required to justify citations in terms of a crash reduction goal.

Despite the equivocal results of the experiment, this study provides a good framework for experimentation by police and for a cost-effectiveness analysis of various styles of selective enforcement. Something like it could profitably be done in any Australian city, with a stress on increasing statistical power.

### Alternatives to Formal Sanctions

The temptation when considering legal interventions is always to think in terms of direct deterrent effects. One purpose of Figure 1.1 was to demonstrate the importance of other mechanisms, such as feelings of guilt about offending arising from a contact with the law. A consistent theme in the literature has been the search for ways of influencing the non-legal sanctions through legal means. Techniques which have received attention have included informal warnings issued by police, written warnings from the police or from the motor transport department, interviews with errant drivers, and driver improvement programs. We touched on some of this literature in Chapter 3 in the context of interventions which may be successful with young drivers. In this section we briefly consider this literature in the broader context of reducing accidents among errant drivers of all ages.

Informal warnings issued by police have the obvious advantage over citations that they are cheaper, and probably more offenders can be contacted by police, perhaps increasing the deterrent effect. However, research by Ennis (cited in Armour, 1984) suggests that speeding drivers who were simply warned were more likely to speed again within the next five miles than those booked. Similarly, Dix and Layzell (1983) present data suggesting that oral warnings have no more effect on driving

behaviour than being taken to court. However, the interview data suggested that informal warnings vary in their effect on attitudes toward reoffending, in part according to whether or not the motorist believes a record has been kept on him.

Dix and Layzell (1983) present further evidence that written warnings can be more effective than both oral warnings and court action. An early study by Campbell (cited in OECD, 1974) suggested that advisory letters sent to drivers who had accumulated more than a certain number of violation points reduced subsequent offending, compared with no action. Armour (1984) also cites several studies indicating that warning letters can be effective in modifying behaviour. On the basis of evidence which he reviewed, Rothengatter (1982) concluded that warning letters sent to offenders could be effective, particularly if they were personalised and referred to the actual time and place of the offence. This conclusion is consistent with the results of Kaestner and Speight (1974), who found that a personalised letter sent to multiple crash or multiple conviction drivers reduced violations and crashes more than either a standard letter or no letter at all. This was especially true for drivers under 25. More recently, Marsh and Kadell (1985) found that, compared with no action, warning letters, notice of intent to suspend and a probation hearing all resulted in a reduction in violations over a one year period, with the probation hearing being most effective but the warning letter being slightly better than the notice of intent to suspend.

Ben-David et al. (cited in Rothengatter, 1982) concluded that advisory letters (1) reduce the relative percentages of violations; (2) have a general influence in that the effects generalise to other similar traffic situations; and (3) have effects that last as long as three or six months. Rothengatter suggests that since there is no actual threat of penalty, advisory letters can be regarded as appealing to internal control mechanisms rather than to the external control system of traffic rules and regulations. However, Dix and Layzell (1983) provide perhaps a more concrete explanation of the mechanism, indicating that the legal threat may still be very much a consideration in the mind of the offender:

He is first advised of an offence, and told that the facts will be reported. For several weeks following there is still no question of 'getting away with it'. The motorist may be pondering the possible fine and hoping any penalty will fairly reflect the circumstances of the offence. Then the police inform him of their decision not to prosecute in this particular case. He is advised with obvious authority against repetition, and evidently the decision is recorded for future reference. The motorist may then be both relieved and appreciative, and generally more careful with his driving in future (p 121).

Dix and Layzell recommended more use of the warning letter in Britain, as well as experimentation with its form and content. In the light of the literature we have cited, as well as the cost-benefit estimates performed by Kaestner and Speight (1974), we would make a similar recommendation for Australia. How often are warning letters already used, what is their form, and how effective are they? This type of research should obviously be undertaken, but the use of written warnings could be justified solely on the basis of existing overseas evidence, particularly if they are personal in nature.

Warning letters are not the only alternatives to formal sanctions which appear to be successful in reducing violations and crashes. In Oregon, both defensive driving courses and flexible interviews with errant drivers were shown by Kaestner and Speight (1974) to be extremely cost effective, although obviously more expensive than the warning letters. They do caution, however, that the interview and driving course may have achieved some of their effects because the threat of licence suspension hung over those involved.

Recent work by Helander (1983) in California confirms the Oregon results as far as interviews are concerned, with crash-involved drivers participating in an 'accident-avoidance session' showing a reduction in crash rates over a one-year period of 23 per cent. Drivers with a 'minimal conviction history' showed a similar crash reduction as a result of being sent a mailed pamphlet and self-administered test, but crash-involved drivers with more extensive conviction histories were apparently not affected by any form of treatment. Helander notes that treatment effects of the magnitude obtained in this study are extremely rare in traffic safety research, but since drivers were allocated at random to treatment conditions it is possible to have a high degree of confidence that the crash reductions are really the result of the interventions. He suggests that the most significant aspect of his study is the amenability to treatment of drivers selected on the basis of crashes, rather than convictions.

In summary, it appears that not only can warning letters be cost effective compared with either no action or the use of formal sanctions, other forms of intervention short of conviction can be extremely cost effective. From Helander's (1983) work we are led to recommend experimentation with crash-avoidance sessions for drivers involved in multiple crashes and pamphlet/self-test treatment for crash-involved drivers with minimal conviction histories. Other possible strategies include defensive driving courses for some drivers, and essay writing for young offenders. These treatments should of course be evaluated in the Australian context, but on the basis of the evidence we are optimistic that results would be very beneficial.

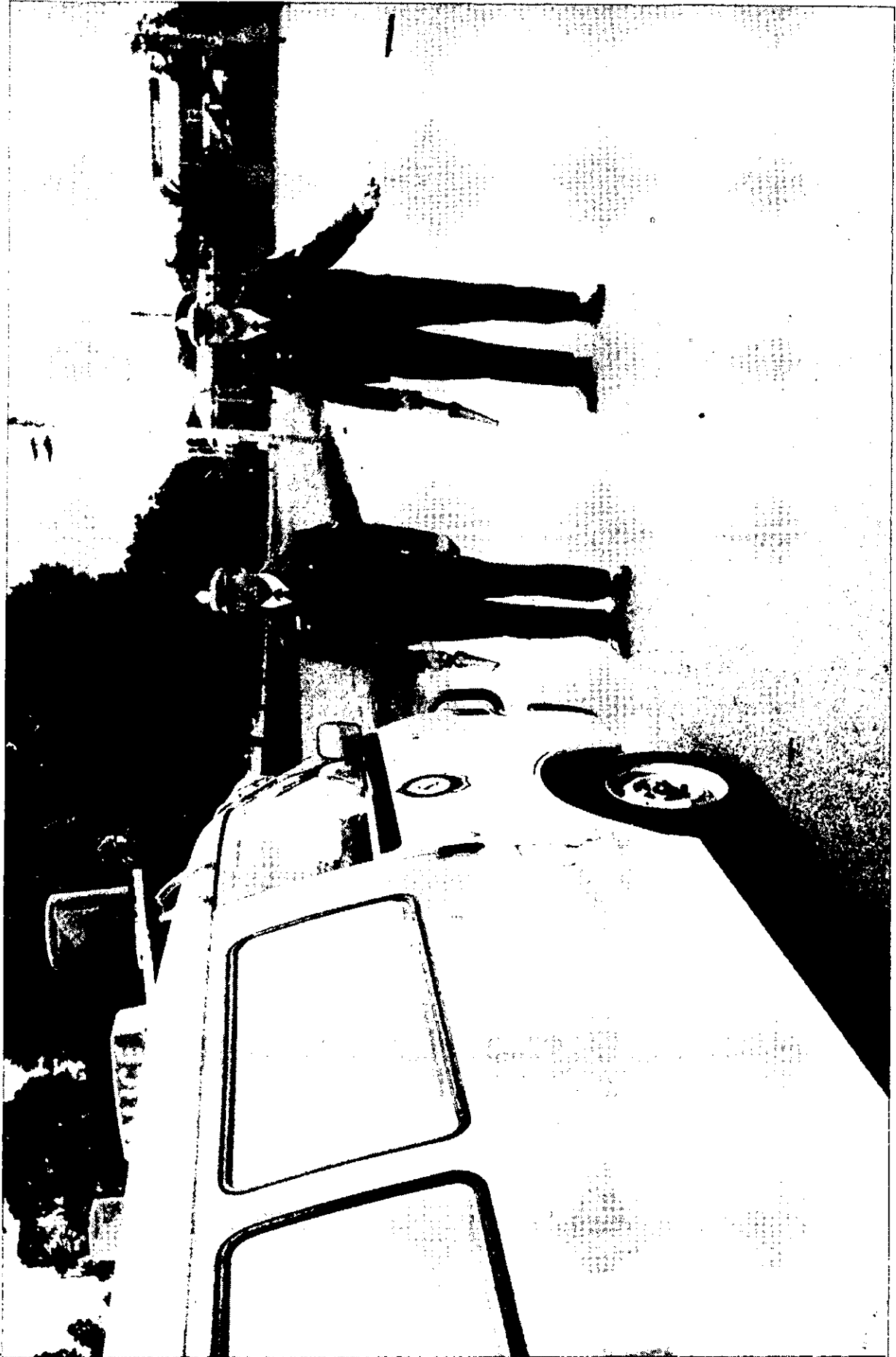
In general, it appears from the literature reviewed here (and in Chapter 3) that a big increase in Australia in the resources devoted to improving the records of errant drivers (especially those involved in a series of accidents with only a small number

of convictions) could prove very cost-effective. However, as Searles (1985) points out, a prerequisite both for evaluation and for the effective implementation of the system is the linking of driver crash, conviction and licensing records, with appropriate safeguards on privacy.

### The Enforcement of Licence Suspensions

The US National Highway Traffic Safety Administration (1979) states that although driver licence suspension is the ultimate administrative sanction, as soon as it becomes necessary to suspend the licence 'we've lost the ball game'. They also claim that the evidence is overwhelming that suspended drivers are over-represented in fatal crashes, and probably all crashes. We believe that current methods used in Australia for enforcing licence suspensions are not working very well, and that strong action may be required to tackle the problem. One fairly extreme solution is to require that all drivers display a tag on the windscreen of their car indicating that they are validly licenced to drive (McGuire, 1973). If this is unacceptable, what practical actions could be taken to increase the level of compliance? There is a relevant literature which should be investigated in further studies of this type.





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APPENDIX AUseful Australian Reports and Papers on Random Breath Testing

Note: This is a selection of papers and reports which deal specifically with RBT in Australia. There are many other Australian reports which deal with the more general issue of drink-drive countermeasures and traffic law enforcement, but these are not listed here unless they are focussed largely on RBT or random stopping.

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Carseldine, D. (1985) Surveys of Knowledge, Attitudes, Beliefs and Reported Behaviours of Drivers - On the Topic of Drink-Driving and Random Breath Testing, Research Note RN 12/85, Traffic Authority of New South Wales, Sydney.

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Address: Box 2626, GPO Sydney, 2000.

Federal Office of Road Safety (1986, August), Drink Driving Controls in Australia. Unpublished manuscript, Federal Office of Road Safety, Canberra.

Address: Federal Office of Road Safety, Department of Transport, PO Box 594, Civic Square, 2608.

Fischer, A. & Lewis, R. (1983), Survey of Attitudes Towards Random Breath Testing, Economics Department, University of Adelaide, Adelaide.

Address: North Terrace, Adelaide, 5000.

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Address: PO Box 110, Rosebery, 2018.

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Address: Assoc. Professor R. W. Gibberd, C/- Hunter Health Statistics Unit, New South Wales Department of Health, PO Box 11A, Newcastle, 2300.

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Address: Box 594, GPO Canberra, 2601.

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Address: North Terrace, Adelaide, 5000.



Madden, B. (1986, March), Random Breath Testing (RBT) in Tasmania. Paper presented at the Victorian Road Safety program Initiatives Conference, Melbourne.

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South, D., Swann, P. & Vulcan, A. (1985), Review of Alcohol Countermeasures in Victoria. Unpublished manuscript, Road Traffic Authority, Melbourne.

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Wood, L. J. (1986), Drink-Driving: Offenders and Penalties in Metropolitan Hobart. Unpublished manuscript, Department of Geography, University of Tasmania.

Address: Dr L. J. Wood, Senior Lecturer in Geography, University of Tasmania, GPO Box 252C, Hobart, Tasmania, 7001.

APPENDIX BA Selected List of References, with Keywords,  
Comments and a Usefulness Rating

Note: The usefulness rating refers only to the usefulness of the article book or report to us in the preparation of this review, and is not intended to be an assessment of the overall quality of the document, although this is one factor we took into account in assigning the rating.

Argeriou, M., McCarty, D. & Blacker, E.	(1985). <b>Keywords</b> -->	Drink-driving / recidivism / criminality / previous convictions				
Criminality among individuals arraigned for drinking and driving in Massachusetts.	<table border="1"> <tr> <td colspan="2" data-bbox="831 427 1344 517"><i>Journal of Studies on Alcohol,</i></td> </tr> <tr> <td data-bbox="831 528 1022 584">46,</td> <td data-bbox="1029 528 1344 584">525-530.</td> </tr> </table>		<i>Journal of Studies on Alcohol,</i>		46,	525-530.
<i>Journal of Studies on Alcohol,</i>						
46,	525-530.					
<p>An article which contains the absolutely breath-taking discovery that many convicted drink-drivers have a criminal record, and that the probability of DUI recidivism is related to the presence or absence of a motoring, drink-drive or criminal record. Generally, the more types of convictions the higher the probability of a further DUI conviction in three years. The most frequent criminal offences involved serious traffic violations, but a substantial minority had a more serious record (theft etc.). The overall DUI recidivism rate over the three years can be estimated from the data presented, and is a high value of 23.3% (N = 1406).</p>						
Usefulness for review: 						

Booth, W.L.

(1980).

**Keywords**


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police science / accident  
investigation / enforcement /  
community perception / unmarked  
vehicles / selective enforcement*Police management of traffic accident  
prevention programs.*Springfield, ILL: Charles C.  
Thomas.

This is a very thorough and surprisingly useful book organized around the theme that police can prevent crashes. More than other books on police science it is oriented toward experiments which aim to test the usefulness of various techniques of police enforcement of traffic law. "The entire book is basically a collection of significant research on traffic accidents, drivers, and enforcement techniques that, when applied, can lead to a successful successful accident prevention programs" (p. xiv). The author notes that police resources are not rationally allocated but reflect what are perceived as public priorities. One of the main emphases of the book is that increased arrests, and increases in traditional patrols of the famous Kansas City variety, do not necessarily mean fewer crashes. Although favouring specialist traffic police, the author argues that proper management is required to ensure that arrests (for speeding particularly) do not become an end in themselves. He reports some U.S. experiments with unmarked cars which suggest that a mix of vehicles - marked, unmarked and motorbikes - is probably most effective. Especially if the community has become used to police use of unmarked cars, the right mix can create the impression of police omnipresence. Even so, bikes and marked cars are better for prevention. He is especially critical of the enforcement index used by many forces (arrests/crashes), since it completely ignores preventive work. The key to an effective selective traffic enforcement program (STEP) is to create the illusion of police ubiquity at selected high risk locations. His model involves the use of data to select such locations, then the creation of this illusion, causing alterations in driver behaviour causing a reduction in violations resulting in fewer accidents. He gives some useful practical examples of the application of this model, highlighting the fact that intersections have different characteristics. Some have many red light violations, others have speeding, others improper turns. STEP works best with (a) at least four visible police at each intersection; (b) stationary police cars; (c) repeated enforcement at the same time of day; (d) enforcement for at least four weeks.

Usefulness for review:



Cameron, M. H. & Sanderson, J.T.	(1982).  <b>Keywords</b> -->	review / general deterrence / drink-driving / speeding / transient offences / apprehension / selective enforcement
<i>Review of police operations for traffic law enforcement.</i>		Melbourne: Royal Automobile Club of Victoria (RACV) Ltd.
<p>This is an excellent report which is an absolute model of clarity and logical reasoning. Two types of police operation are distinguished: (a) detection and apprehension of traffic law violators, and (b) general deterrence of potential violators. It is argued that general deterrence has a greater road safety potential than apprehension policies. General deterrence of fixed offences (drink-driving, seat-belt offences) have great crash reduction potential, and should be publicized and visible (like RBT). For transient offences like speeding, general deterrent policies can also have great value, especially if a mixture of visible and non-visible operations are used (e.g.: marked and unmarked vehicles). A mixture is particularly indicated for speeding enforcement, together with publicity. Evidence suggests that traditional visible speed operations have very localized and short-term effects. It is argued that detection/apprehension operations have limited road safety impact, since only a minority of offenders are apprehended and neither penalties nor other forms of intervention have much influence on subsequent behaviour. In fact for drink-driving, the relative maximum potentials of general deterrence versus apprehension policies is about 35:8. However, apprehension policies can play a role in general deterrence by giving substance to an exaggerated perceived risk (these cases need to be publicized individually). General deterrence of fixed offences (especially drink-driving) is most effective, followed by general deterrence of transient offences at signalized intersections, and then general deterrence of transient offences (especially speeding) at other locations. These latter operations have the best effects if directed at behaviours with known effects on road trauma (e.g.: exceeding the speed limit by 25 km/h in rural areas). At intersections, sporadic but frequent patrols are effective but visible mechanical surveillance devices accompanied by advance warning signs are more cost-effective. Selective enforcement should focus on high-risk times and locations, and on high-risk offences including DUI, seat belts, excessive rural speeds, traffic light compliance and crossing double centre-line.</p>		
<p>Usefulness for review: </p>		

Carvolth, R.

(1984).

**Keywords**

--&gt;

Australia / socio-cultural models  
/ alcohol availability / server  
intervention / drinking  
environment / alcohol relatedQueensland health developments: The hotels  
connection.*Australian Alcohol/Drug Review,*


3,

23-27.


This paper contrasts the distribution model, which predicts that as per capita alcohol consumption declines so will alcohol related problems, with the socio-cultural model, which proposes that: (1) the cultural norms of a community are powerful prescribers of attitudes and behaviour; (2) the community will ideally play an important role in the change process. It is argued that there is little evidence for the truth of the distribution model, and that a better approach to reducing alcohol related problems is to manipulate the drinker's world from within, first by "getting to know the world of the hotelier, the bar attendant, the patron, the brewer", and then by introducing training in a form which can be accepted by these people to alter for the better the drinking environment (see Carvolth, 1985a). Elements of the training program for managers and bar attendants are described (see Carvolth, 1985b). One controversial element of the policy is the goal of changing the types of patrons at drinking establishments to include families, teetotallers and spouses and girlfriends, so that "the culture of the male beer swill will be sufficiently diluted for new norms of acceptable drinking levels, behaviour and services to develop" (p. 26). The legislative approach is rejected; indeed, it is argued that paradoxically old laws to protect the health and comfort of patrons now work in many ways to promote unhealthy styles of drinking.

Usefulness for review:



Carvolth, R.	(1985a: Aug.). <b>Keywords</b> -->	Australia / server intervention /patron care / QLD / liquor industry / training / alcohol related problems
<i>The Queensland patron care approach to working with the liquor industry.</i>	Paper presented to a seminar for researchers and server intervention trainers at the Prevention Research Center, Berkeley, California.	
<p>This paper outlines the Patron Care program as it operates in QLD. The objectives of this program are, among other things, to develop training programs for hotel staff which will assist them in identifying patrons of long standing whose drinking is excessive or disruptive, and help them implement policies which will reduce the incidence of alcohol problems. There is an emphasis in the objectives of channelling problem drinkers from bars into alcohol treatment programs operated by the Alcohol and Drug Dependence Services. Most important, however, the strength of cooperation between the QLD Dept. of Health and the liquor industry is emphasised. The traditional stance of seeing the liquor industry as an enemy is rejected. "Our basic approach is that the people that we are dealing with are business men marketing legal products and services to a society that has long demonstrated its interest in comparative ready availability of alcohol. Our stance is one of basic respect, trust, interest and sharing of perspectives, planning and development for the future." (p. 6). Working at the grass roots with the liquor industry (within their frameworks) is seen as the key to success. Details of the program are not well described (but see other papers by Carvolth), but they would seem to be focussed on the development of policies promoting "more acceptable models of drinking and of behaving on licensed premises" (p. 10). It is observed that Australia has no dram shop liability legislation, and an implicit assumption of the paper is that a legal framework, except possibly for the licensing of establishments, is not required (and indeed may be counterproductive) for the success of the program. No evaluation data are quoted, although a number of measures which it is proposed to use for evaluation are listed. These include the demographic mix of patrons (male/female, family/other etc.), the proportion of beer sales accounted for by low alcohol beer, changes in sales of food and non-alcoholic beverages, rate of incidents due to heavy drinking, and numbers referred for counselling or treatment. Unfortunately no thought appears to have been given to traffic crashes as a criterion, one of the main foci of interest in the U.S.</p>		
Usefulness for review: 		



Carvolth, R.	(1985b: Jan.). <b>Keywords</b> -->	Patron Care / QLD / mutual trust / liquor industry / server training / training program / intoxication /alcohol related problems
(1) <i>Patron care - the implementation phase; and (2) Description and philosophy of Queensland Department of Health (Patron Care Program) input to staff trainees of liquor outlets.</i>	Papers available from Alcohol and Drug Dependence Services, Queensland Department of Health, 270 Roma Street, Brisbane, 4000.	
<p>These two documents describe in some detail the implementation of the programs discussed in Carvolth (1984 &amp; 1985a). The value of grassroots contacts with the liquor industry is again emphasized, and the atmosphere of mutual trust which must characterize the relationship between the health workers and the liquor industry workers. It is suggested that training staff should combine a sound business background with a firm grasp of their health objectives (e.g.: to reduce alcohol related problems). The focus of the intervention by servers is more concerned with regaining control, monitoring and reducing intake, getting on an even keel, than on getting all problem patrons straight to AA. "It is believed that while the program initially developed on taking the nuisance drunk out of the system for treatment, the greatest contribution is now being made in enhancement of atmosphere, bonding of social and family groups, increased profitability in lower or non-alcoholic products and prevention or earlier intervention" (p. 9, "Patron Care ..."). It is observed that no other industry has attracted as much legislation as the liquor industry, but it is implied that cooperation and persuasion are more effective tactics today. The Patron Care people make it clear that they agree with the historic position of the liquor industry that it is problems with excessive indulgence and alcohol abuse which should be tackled, not overall consumption, and that they are also in agreement with the recent industry emphasis on making licensed establishments into "community meeting places" or "family entertainment centres". The program includes much practical advice to trainee servers concerning techniques for improving the atmosphere, reducing patrons' consumption levels (e.g.: don't anticipate service to a regular patron, don't subtly manoeuvre patrons into joining "shouts"), and refusing service (e.g.: offer alternative transportation, give warnings, remain calm etc.).</p>		
<p>Usefulness for review: </p>		

Commonwealth Department of  
Health: Central Statistical Unit.

(1984).

alcohol / social costs / morbidity  
mortality / statistics /  
drink-driving

**Keywords**

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*Alcohol in Australia: A summary of related  
statistics.*

Canberra: Australian  
Government Publishing  
Service.

This is a useful sourcebook of statistics on alcohol use and the social costs of alcohol in Australia. Direct financial costs are not covered. One advantage of the report is that it allows a comparison of the social cost of alcohol-related traffic crashes compared with the social costs of other alcohol-related injuries and diseases (e.g.: alcohol psychosis and drownings). Trends in selected causes of death from 1901 are given. From a traffic safety point of view, perhaps the most useful part of the report is the tables broken down by state showing the involvement of alcohol in traffic crashes, police rated causes of accidents, breath tests conducted and conviction statistics. A final table summarises legal BAC's in a number of countries.

Usefulness for review:



Cowley, J.E.

(1980).

speed limits / Australia / rural  
 free speed / accidents / U.S. 55  
 mph law / enforcement /  
 differential limits

**Keywords**

--&gt;

*A review of rural speed limits in Australia.*

Canberra: Office of Road  
 Safety.

Road traffic laws and regulations, including rural speed limits, differ throughout Australia. A National Road Traffic Code was endorsed in 1962 by ATAC (Australian Transport Advisory Council), which is a Council of Transport Ministers advised by ACRUPTC (Advisory Committee on Road User Performance & Traffic Codes). This study was part of a 1979 review by ACRUPTC of speed limits, and aimed to examine the safety aspects of rural speed limits. It is noted that no such limits in Australia exceed 110 km/h, and that in the eastern states there is a general limit of 100 km/h. There are also differential speed limits for buses, trucks etc. However, there is very little evidence relating to the effectiveness of any of these speed limits (apart from the differential limits). The authorities generally select 85th percentiles of free speeds for speed zones, without much regard for crash rates. During the 70's the major change in policy was the replacement of prima facie limits ("derestricted zones") by absolute limits. Data suggest that speed limits in rural regions of the mainland have little effect on actual free speeds, and the author questions whether either of these variables have much effect on fatalities. The Victorian experience with a 100 km/h limit for 1969-75 yielded a 110-115 km/h 85th percentile, with a reduction in fatalities of 14%, disappearing after one year as speeds increased again. The positive U.S. experience with a 55 mph limit is noted, but the author argues against such a limit for Australia on the grounds that 70% of motorists drive faster than it and compliance diminishes over time. He suggests that either 100 or 110 km/h is a suitable general limit, and opts for 110 as the more realistic. There is a general assumption in the report that it is very difficult to enforce lower speed limits, despite their demonstrated safety value. However, he does acknowledge that speed zones with lower limits of (say) 90 km/h might be appropriate for lower standard and heavily trafficked rural roads. The value of differential limits, including lower nighttime limits, is generally favoured in the context of a 110 km/h general limit. At 100 km/h, he considers there would be little value in differential limits.

Usefulness for review:



Dix, M.C. &amp; Layzell, A.D.

(1983).

**Keywords**

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traffic offences / deterrence /  
 police training/ perceptions /  
 sanctions / attitudes / warnings  
 / discretion / law /interaction

*Road users and the police.*

London: Croom Helm, in  
 association with The Police  
 Foundation.

This is an excellent exploratory study, based on in-depth interviews with small samples of the general public, police in one area near London, and with recent offenders among the road-using public. The general aim was to explore relations between road users and the police, and the specific aim was to investigate whether motorists' attitudes to traffic policing have wider implications for the public's attitude to police in general. There is a useful discussion of the deterrence model, including a full treatment of the non-legal sanctions of recognising the danger to life and property which offending can produce and recognising the anti-social nature of some offences and adopting standards of behaviour against them. With respect to speeding, it is noted that the actual probability of getting caught is about 1 in 7,600 but subjective probabilities may be as high as one in two. Publicity can play an important role in increasing subjective probabilities, as can the use of marked cars, radar, speed warning signs and RBT. Moreover, "the same legal penalty can have a very different effect upon different people" (p. 23) (e.g.: fines). Being stopped by the police can itself be a stigma as well as an inconvenience. It is noted that the danger of many offences is under-rated but may be increased through publicity. Individual standards (e.g.: always staying below the legal BAC limit) can be formed by the law and changes in the law, by socialisation and by habits, and can be modified through education. Although not used much by police, informal or written warnings are recommended as being as effective as prosecution. There is a good discussion of police discretion, advice on how police should approach and speak with motorists, and concern expressed about probable harassment of some groups, such as motorcyclists. Intensive training for police is recommended (e.g.: in reporting a motorist to be "courteous, positive, ... businesslike ... " [p. 79]). The use by police of informal sanctions is noted (e.g.: delaying the interaction), and regarded as allowable only if used properly with a verbal warning. Evidence that general road user attitudes to police are not adversely affected by encounters with traffic police is reported.

Usefulness for review:



Duncan, T.

(1986:  
Dec.).RBT / Australia / civil liberties /  
drink-driving / enforcement

Keywords

--&gt;

Legislators drunk with RBT mania.

*The Bulletin,*


Dec. 9,


32-37.


This magazine article has as its major themes that Australian legislators have an obsession with alcohol as a cause of road deaths, that as a consequence attention is diverted from road engineering and environmental factors which are related to road safety, that RBT is not necessarily the most effective form of traffic law enforcement, and that RBT is an unwarranted intrusion into the civil liberties of motorists. The author engages in a number of tendentious comparisons of road crash statistics in various jurisdictions, arguing that some jurisdictions without RBT (e.g.: most of the U.S.) have lower rates of fatalities than RBT states (e.g.: NSW). Particular note is taken of the acceptance of tough legislative measures by the Australian populace, despite the fact that we have no strong temperance tradition and despite the challenge to civil liberties. The article, which employs colourful and emotive language ("officially contrived climate of fear", "myths about the road toll", etc.), is useful chiefly because it does raise questions about alcohol as the prime cause of crashes and calls into question the appropriateness of strong legal measures to control driver behaviour.

Usefulness for review:





Federal Office of Road Safety.	(1986: August). <b>Keywords</b> -->	RBT / drink-driving / general deterrence / Australia / states / cost benefit / review/ road blocks
<i>Drink driving controls in Australia.</i>	Unpublished manuscript. Canberra: Federal Office of Road Safety.	
<p>This is a very useful review, as at August 1986, of the operation of random stopping and random breath testing programs throughout Australia. RBT legislation currently applies in all states and territories except Western Australia and Queensland. However, the mode of operation varies considerably between jurisdictions. The highest levels of enforcement have been achieved in NSW and Tasmania, with one test per three licence holders each year, or better. Both these states have concentrated on continuous, highly visible enforcement, in contrast to Victoria, where enforcement is at a generally low level (1:10) but reinforced periodically by intensive blitzes in specified locations in Melbourne, and in contrast to South Australia, where enforcement levels have been low (1:6) but not reinforced by blitzes. In NSW levels of paid publicity have also been high, while in Tasmania skillful use has been made of the interest of the media in drink-driving issues, and the names of convicted offenders are regularly published in newspapers. In the Northern Territory alcohol-related fatalities are at a very high level, but RBT has been enforced at relatively low levels (1:7) and does not appear to have had a major impact on casualties. The Western Australian system involves the use of police roadblocks to check licences and vehicle road-worthiness, and appears to operate as a pseudo-random testing program, although at lower levels (1:19) and with more inconvenience to motorists than in states with RBT. Blitzing is a feature of the WA approach. Queensland is out of step with the remainder of Australia in concentrating on "target testing" - i.e., catching drink-drivers - rather than on any form of random testing. In QLD, the ratio of testing to licence holders is around 1:24. Although figures on BAC levels of killed operators need to be treated with caution, since the not-tested percentage varies and in the territories numbers can get below 50 in a year, nevertheless it is of some interest that the lowest percentages of operators with BAC levels are to be found in those states with the most vigorous programs of RBT, supported by paid or informal publicity (NSW, Tasmania and Victoria).</p>		
<p>Usefulness for review: </p>		


Gardiner, J.A.	(1969).  <b>Keywords</b> -->	traffic law enforcement / police discretion / environment / politics / organizational structure / tickets
<i>Traffic and the police.</i>		Cambridge, Mass.: Harvard University Press.
<p>This book is about the enforcement of traffic law in four cities in Massachusetts. It is based on the assumption that it is in the grey area between conduct which is clearly accepted by the public and conduct that is clearly condemned (like traffic law) that one can gain a greater understanding of police work. The rules are clear ("Do not drive faster than 60km/h in a built-up area") but no police force can possibly enforce all such laws. How can the vast differences between police forces in the emphasis given to traffic enforcement be explained? This book explores two hypotheses: (i) the level of traffic law enforcement is the product of the interests, attitudes and activities of the local police chief; (ii) these official preferences are moderately correlated with community characteristics, particularly the degree of geographic stability. The cities studied represented the two highest and the two lowest cities for traffic law enforcement in MA. In Lynn, traffic work was a "residual function" - something you did when you were not doing something else. The reason was a basic lack of interest in traffic law - only when there is a specific issue, like a council demand for a crackdown at an intersection, are levels of enforcement increased. By contrast, in Waltham, the high level of ticketing can be explained by the concept of "specialization". The police write tickets when that is their only job - to prove they are doing it. Why do forces differ in this way? One explanation, supported by correlational data, is that in communities with a higher degree of population stability informal sanctions are employed more frequently, either through political pressures or familiarity with the "clientele" population. However, to a greater extent policies are formed by the conscious or unconscious judgements of the police chief concerning the totality of responsibilities given him by the city or state. Since public instructions to police in this area are ambiguous, senior police must make their own priorities. Certainly there was no evidence of any association between higher levels of enforcement and traffic crashes. To reduce variation between forces, clearer public goals and more surveillance of police are required.</p>		
<p>Usefulness for review: </p>		


Haight, F.	(1983: Feb.). <b>Keywords</b> -->	enforcement / drink-driving / epidemiology / road safety / public health / cost / crashes / exposure / travel demand
<i>Some theoretical aspects of road safety.</i>	Keynote paper, Esso-Monash Workshop, Department of Civil Engineering, Monash University.	
<p>This entertaining paper is based on the assumption that not only is the road safety problem serious, it is intractable. The root of the problem is an apparently insatiable travel demand, although U.S. evidence suggests that the saturation point may be close. The per capita death rate due to traffic crashes has hardly changed in 50 years - safety has improved approximately in proportion to increased driving. Understanding has improved in the following ways in recent years: the problem cannot be eliminated, thinking about causes (and the human factor) is undesirable, our proper goal should be to control effectively the undesirable consequences of using the road transport system, studying exposure is important in research but no use for countermeasures, there are many difficult statistical problems which have been inadequately addressed in previous research, predictions of effects which are reasonably based on sensible hypotheses often go very far astray, evaluation research has been adopted by public agencies, and finally it is no longer inadmissible to discuss safety in economic terms. Haight proposes that for basic research and policy formulation, road safety be considered appropriate to the public health sector. He also argues that the influence of the public has been pernicious to traffic safety ("leave it to the experts"), but that road safety researchers should resolve to tell the absolute truth (not exaggerate or distort for political reasons). Finally, he argues for better research founded on the epidemiological model, with much more information on victims (not just age and sex), allowing precise targets for countermeasures (as with AIDS). He cites as an example police enforcement, arguing that arrests probably do have an influence on crashes, but only for some drivers or traffic situations. Thinking about drink-driving epidemiologically, we need to know such things as whether it is really alcoholics who are involved, or previously arrested drivers. Are the victims the same as the drinkers? Who drinks and drives and doesn't get caught? (This paper is stimulating but in some respects a little naive in view of Gusfield's analysis of the field, and particularly the role of "experts".)</p>		
<p>Usefulness for review: </p>		





Hand, B.A., Sherman, A.W. & Cavanagh, M.E.	(1976).  <b>Keywords</b> -->	enforcement tactics/ traffic laws / police training / traffic engineering / accident investigation / interaction
<i>Traffic investigation and control.</i>		Columbus, Ohio: Charles E. Merrill Publishing Co.
<p>This book is a text for police officers involved in traffic control and law enforcement. It is useful since it gives an overview of these functions from the point of view of the police, and because it provides a good summary of the relationship between engineering and enforcement. The text is based on the assumption that "the human element is a crucial factor in the effective control of traffic. Intelligent, efficient enforcement of well-devised regulations, with certainty and consistency, can and will offer the hope and promise of ultimate solutions to the traffic problem" (p. 4). For the lay person, perhaps the most useful chapters are those dealing with traffic engineering and with the psychology of the traffic stop. The engineering chapter provides a good summary of the aims and techniques of traffic engineering. One of the main aims of engineering is to reduce the number of decisions required of drivers. Useful guidelines are provided - e.g.: that at around 30-35 mph traffic flow is maximised; that the basic intent of speed zoning is to influence as many drivers as possible to operate at or near the same speed (minimizing the variance); and that the 85th percentile of speed (the speed at or below which 85% of the traffic is moving) is usually within two mph of the pace (the 10 mph range of speeds containing the largest number of observations). Furthermore, some useful suggestions on corrective engineering measures given certain sorts of crashes are given, as well as suggestions on how to select crash locations for study. In summary, "the objective of traffic engineering is to achieve efficient, free and rapid flow of traffic, yet, at the same time, to prevent traffic accidents and casualties. The objective of police traffic control is to secure compliance with the law, expedite the flow of traffic and promote the safety of motorists and pedestrians" (p. 35). The chapter on the traffic stop has an entertaining description of different types of police and motorists, and some examples of typical interactions. The chapter on enforcement by contrast is rather dull and staid but has some useful practical advice (e.g.: on the importance of visible enforcement and selective enforcement).</p>		
<p>Usefulness for review: </p>		

Holder, H.D. & Blose, J.O.	(1986: Sept.). <b>Keywords</b> -->	alcohol availability / North Carolina / traffic crashes / ARIMA / interrupted time series
<i>Traffic crashes and changes in distilled spirits availability: A time series analysis in a Southeastern U.S. state.</i>	Paper presented at the 10th International Conference on Alcohol, Drugs and Traffic Safety, Amsterdam.	
<p>The purpose of this study was to examine changes in alcohol-related traffic crashes associated with a change in distilled spirits availability in a Southeastern state of the United States, i.e., North Carolina. The project utilized three traffic measures over the period 1973-1982 in an interrupted time series design with switching replications. Each series was analyzed using the ARIMA (Auto Regressive Integrated Moving Average) techniques associated with Box-Jenkins. Following a legal change which made distilled spirits available by-the-drink for the first time in North Carolina since the end of Prohibition, statistically significant increases were found in (1) officer reported alcohol-involved traffic crashes and (2) single vehicle nighttime crashes with male drivers 21 years and older. No significant changes were observed in single vehicle nighttime crashes for male drivers under 21 years old who were under the legal minimum age of purchase for distilled spirits. The results were further confirmed when employment was considered in the time series analysis. These results provide support for the hypothesis that alcohol-related traffic crashes increased in North Carolina as a result of the specific change in distilled spirits availability. The results also suggest that changes in distilled spirits availability need to be evaluated in terms of their potential for increasing alcohol-related traffic problems. (Authors' abstract.)</p> <p>This is an important paper using the best available statistical methods. It is important because it establishes beyond reasonable doubt that increased availability can lead to increased traffic crashes. The paper was well received at the Amsterdam Conference.</p>		
<p>Usefulness for review: </p>		

Hurst, P.M.	(1986: August). <b>Keywords</b> -->	drink-driving / public opinion / deterrence / moral commitment / peer pressure / New Zealand / arrest certainty / RBT
<i>Public attitudes towards traffic laws.</i>	Traffic Research Circular No. 26, Traffic Research Branch, Road Transport Division, Ministry of Transport, Wellington, New Zealand.	
<p>In this paper, Paul Hurst analyses data from a series of surveys designed to probe public opinion concerning traffic laws in New Zealand over the period 1974 to 1985. He finds that the public attitude towards impaired driving, as measured by an acceptance-condemnation dimension, is toughening, although at a very gradual rate. However, there has been a recent marked increase in the perceived likelihood of arrest for drinking and driving, suggesting that the NZ random stopping program may be having an effect. In NZ "sobriety checkpoints" along American lines are conducted, whereby police can pull over a motorist for a licence or equipment check, but cannot demand a breath test unless there is some evidence of impairment. The data suggest that the majority of New Zealanders are content with this approach, although 29% supported outright random testing. In terms of strategies adopted to avoid drinking and driving, "one stay sober to drive others home" has increased in popularity in recent years. New Zealand has recently increased the open road speed limit to 100km/h, and only 21% of respondents were in favour of reducing this limit. However, fewer respondents than in previous years supported a 20km/h tolerance limit, with more favouring a 10km/h tolerance. Finally, although there would be determined resistance from certain groups, raising the driver licensing age would have strong support from the general public.</p>		
<p>Usefulness for review: </p>		

Kaestner, N. & Speight, L.	(1974). <b>Keywords</b> -->	driver licensing / driving while suspended / warning letters/ interviews / restricted licenses / defensive driving course
<i>Oregon study of driver license suspensions.</i>		Oregon Department of Transportation, Motor Vehicles Division: Salem, Oregon.
<p>This is a nice evaluation study of licence suspensions for "problem" drivers, and of alternatives to it. The Oregon Driver Improvement Program is similar to other programs operating in the U.S. The first stage is a warning letter - drivers who begin to accumulate an excessive number of citations and/or crashes are sent a letter encouraging them to improve their driving. If this has no effect, s/he is brought in for a personal interview. The final stage involves a discretionary licence suspension for about a month. It was found that sending a standard form letter had the same effect as sending no letter at all, but that a personalized letter, whether of the standard form or in a "soft-sell" form, resulted in fewer violation and crash records, especially for drivers under 25. At the second stage a flexible patterned interview was developed, focussing on knowledge and attitudes. Compared with a control group matched for age and seriousness of past driving record, the interview group had a better record over a year (42% and 28% resp. without problems), and took longer to commit offences or have crashes. It was estimated that the letter and interview saved about three-quarters of a million dollars (1974). A study of suspended drivers indicated that many were young and were pathologically asocial. Based on a mail survey with a 44% response rate, nearly half those suspended drove 21 or more times during the one-month suspension, but three out of four claimed to drive more carefully. Using a randomization procedure, suspension was compared with no contact, a "last chance" warning letter, a probationary licence (actually a "restricted licence" which allowed driving to work etc.) and a defensive driving course. In a one year follow-up, both the restricted licence and the course had better results than suspension or no contact, but the authors observe that these programs may have worked partly because the existence of the suspension law acted as an incentive to respond positively to these "less harsh" alternatives. It is noteworthy that the defensive driving course appeared especially effective with young drivers with particularly bad prior records.</p>		
<p>Usefulness for review: </p>		

Klein, D. & Waller, J.A.	(1970).  <b>Keywords</b> -->	deterrence / human factor / crashes / environment / vehicles / young drivers / social factors / education / police enforcement
<i>Causation, culpability and deterrence in highway crashes. (Prepared for the Department of Transportation - Automobile Insurance and Compensation Study.)</i>		Washington: Superintendent of Documents, U.S. Government Printing Office.
<p>It is the thesis of this book that resources should be directed from identification and correction of human "error" to understanding and modifying the road user's environment. Driver responsibility for crashes often cannot be disentangled from aspects of the physical or social environment. In addition, there is no clear causal connection between violations and crashes, and countermeasure systems, such as the points system, which assume such a relationship probably are ineffective countermeasures. A basic problem with any system based on apprehension is that the law is applied unequally and violation records therefore are not valid representations of offending. It is argued that drivers with a "respectable" appearance are less likely to be charged with a serious offence, and teenagers in particular are likely to be the object of more intense levels of police surveillance and are less likely to negotiate the encounter with police in a successful manner. The book pre-dates the extensive research into deterrence which has characterised the 70s and 80s, and therefore reflects the scepticism, popular at the time, concerning the efficacy of deterrent measures. The discussion is nevertheless useful, pointing out that deterrence depends upon social support for legal measures, the driver must be capable of consistently safe behaviour, lapses into unsafe behaviour must be because they offer some advantage, and the threat of punishment must outweigh these advantages. It is pointed out that punitive measures directed at traffic offences do not in fact have public support (although the book predates movements like MADD), and that despite their supposed threat to safety most offences attract penalties much less than minor offences of stealing. The existence of undeterrable drivers is postulated (inexperienced, ignorant, alcoholic etc.). The importance of cultural factors in influencing lifestyle and accidents is stressed, and minority groups, the working class and the young are put forward as groups likely to be deviant in values and therefore possibly their accident and violation rates. For the young driver a car and driving represent a status symbol "par excellence" and a unique opportunity for risk taking.</p>		
Usefulness for review: 		

Levy, C.	(1986). <b>Keywords</b> -->	drink-driving / RBT / Queensland / politics / civil liberties /
<i>Random breath testing - who pays? Why Queensland needs, but does not yet have, random breath testing (RBT).</i>		Brisbane: Drug Awareness and Relief Movement (Drug-Arm).
<p>This is a report of a conference held in Brisbane in November 1985. The aims of the report are to present the proceedings of the conference, provide a succinct overview of arguments in favour of RBT, and to address arguments which have been presented as reasons for not introducing RBT in Queensland. In a discussion of the effects of RBT in Australia, an attempt is made to refute the argument of the QLD Minister for Transport that the decentralised nature of Queensland would make the enforcement of RBT difficult. This is done mainly through a comparison with South Australia, and it is emphasised that the limited impact of RBT in SA is due primarily to the limited resources which have been devoted to it in that state. The report deals on as factual a level as possible with the arguments advanced in QLD against RBT, although at one or two points the arguments are not convincing. For example, it is stated that civil liberties questions have not been raised in those States which have introduced RBT, although in fact there was some early controversy in NSW. Similarly, the discussion of the demonstrated long-term impact of RBT fails to recognise that we do not yet have strong scientific evidence for the permanence of the effects of the NSW legislation (or similar programs). Overall, the report is a useful source of information on RBT in Australia, and throws some useful light on the intransigence of the QLD Government with respect to RBT.</p>		
<p>Usefulness for review: </p>		

Loong, K.Y.

(1986:  
July).**Keywords**


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police enforcement / traffic laws  
/ enforcement costs & practices/  
road users / strategies /  
optimisation of resources*Strategic application of enforcement  
resources. (Working Document 86).*Canberra: Federal Office of Road  
Safety.


"This paper provides a brief perspective of road traffic law enforcement an assessment of the effectiveness of traditional enforcement practices, and outlines a set of broad strategic concepts for optimising police enforcement resources to reduce road crashes" (abstract). It is noted that the road safety benefits of police enforcement are not well understood (with the exception of RBT???), so resources should be concentrated in areas where real benefits can be expected (such as improper overtaking). Some unnecessary aspects of police work include promotion of crash prevention and appearance in court for minor traffic offence cases. Although there is evidence that a level of enforcement of about .25 police vehicles per kilometre used to enforce the speed limit reduces head-on crashes, the evidence is not regarded as conclusive and long-term effects are generally not achieved. It is suggested that a concentration on high-risk times and places (selective enforcement) may be preferable to a general increase in enforcement activities. Promising technological developments include red light cameras at signalised intersections, radar which can be used in heavy traffic, and aircraft for speed detection in rural areas. Police activities can be optimised through the use of management techniques to assess the work performance of officers, highly visible stationary rather than mobile patrols, publicity campaigns combined with enforcement, community policing as in SA (dob a speeder today?), and through selective enforcement. Detailed suggestions include supplying up-to-date information on crashes to police, adequate police training (improved spotting of impaired drivers??), elimination of traffic laws which do not have a road safety (or transport facilitation?) function, a long term and specific strategy to combat speeds which are excessive and incompatible with the surrounding road environment, more use of speed humps near schools and pedestrian crossings, and better co-operation among traffic law enforcement authorities (perhaps through a national or international symposium).

Usefulness for review:



Maisey, G.E.	(1984). <b>Keywords</b> -->	Australia / first year drivers / zero BAC / WA / nighttime crashes / P-plate drivers
<i>The effect of lowering the statutory alcohol limit for first year drivers from .08 to .02 gm/100ml.</i>	Perth: WA Police Department, Research and Statistics Section.	
<p>"The statutory alcohol limit for first year (probationary) drivers was lowered from .08 to .02 gm/100 ml as from December 9, 1982. Driver involvement in casualty traffic accidents was compared for one-year periods before and after the change. Casualty accident involvement at night-time was used as a surrogate alcohol measure and during daytime as a surrogate non-alcohol measure. Since licence status could not be determined from the accident data base, accidents involving drivers under 18 years were used as the experimental group (probationary drivers) and accidents involving older drivers represented the control group. There was a 17% net reduction in the expected number of drivers under 18 years involved in night-time casualty accidents after the introduction of the .02 law. On the heavy drink driving nights, Thursday, Friday and Saturday, there was a similar 17% net reduction in accident involvement for drivers under 18 years of age compared with older drivers. These results were not statistically significant at the .05 level. However, this may have been due to the small sample size. Nevertheless, the results were consistent with a reduction in accidents involving alcohol-affected probationary drivers and this increases confidence in the effectiveness of the .02 law." (ARRD Abstract). Consistent with the work of Smith (1986), although as always one wishes for time series data and larger numbers. Also Maisey does not separate serious casualties and minor casualties.</p>		
<p>Usefulness for review: </p>		



McGuire, J.P.	(1973).  <b>Keywords</b> -->	driver licensing / display tag / driving under suspension / fatal crashes / costs / public acceptance
<i>Field research planning for driver's license law enforcement.</i>	Washington, DC: U.S. Department of Transportation National Highway Traffic Safety Administration.	
<p>This report describes the planning for a controlled field experiment to increase compliance with requirements to not drive while one's licence is suspended or revoked. The basic idea is that every vehicle would have to display (say in the bottom right-hand corner of the front windscreen) a display tag which would contain evidence that the driver is validly licensed to drive. The target population for such enforcement are the unlicensed or the suspended. Data are presented for the state of Delaware indicating that about half of all suspended drivers continue to drive, and that 17% of all fatal crashes involve a driver who has been suspended. Thus the law enforcement problem is considerable but the traffic safety benefit if high compliance with suspension orders could be obtained is also considerable. However, it is observed that the success of the experiment depends on public acceptance of the displayed driver's licence concept, and that any government body conducting a feasibility experiment or introducing the law may run a considerable political risk.</p>		
<p>Usefulness for review: </p>		

Moller, J.E &amp; North, J.B.

(1986:  
Sept.).RBT / Queensland / politics / RID  
/ drink-driving

Keywords

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*Random breath testing in Queensland -  
really an insidious deception.*Paper presented to the Jubilee  
Conference of the Australian  
Orthopaedic Association,  
Intercontinental Hotel, Sydney.

This is a conference paper dealing with the politics of random breath testing in Queensland, the only jurisdiction in Australia not to have introduced some form of random stopping or random testing. The authors are very critical of the failure of the Queensland government to introduce RBT, and argue that the RID (Reduce Impaired Driving) program introduced for six months in August 1986 is "really an insidious deception". RID is in essence an extension of target testing, which concentrates on apprehending intoxicated drivers who have violated traffic law, had a crash, or who have been driving in a suspicious manner. It is claimed that RID will give police operating out of mobile patrols the power to pull up motorists without cause by "relying on common-law provisions connected with the prevention of crime and the protection of life and property". The authors argue that RID cannot be as effective as RBT, since police visibility is not high and does not increase the perceived probability of detection. On the other hand it is claimed that RID leaves police open to accusations of arbitrary conduct and harrassment. It is suggested that the real reasons the Queensland government does not want an effective program like RBT are connected to the power of liquor industry interests, as well as the fear of a backlash from country hotel interests in areas largely supportive of National Party members, strong personal prejudice on the part of individual Ministers, and personal vested interests of Ministers, such as hotel interests.

Usefulness for review:



Moshier, J.F.

(1979).

**Keywords**

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dram shop liability / drinking contexts / drink-driving / server intervention / common law / traffic crashes / prevention

Dram shop liability and the prevention of alcohol-related problems.

*Journal of Studies on Alcohol,*


40,

773-798.

This is an early article which sets out the legal situation with respect to server liability, and points to reforms to make the laws and the courts more oriented to prevention of alcohol related problems, particularly traffic crashes. Dram shop laws were introduced in the mid 1800s by temperance advocates who wanted tavern owners to be financially responsible for the support of families of patrons who had become "habitual drunkards". Prior to Prohibition, these acts were primarily symbolic, but after Repeal many dram shop acts became applicable to drink-drive crashes. By the 1950s in the U.S. dram shop suits had become commonplace, both in states with dram shop laws and in states with common law liability. Suits were most limited in states with "habitual drunkard" provisions, given the evidentiary difficulties involved. In common law jurisdictions, the courts imposed new social obligations on servers based on the courts' views of social policy. The impetus for these legal actions in 27 states has been the rise in alcohol related traffic crashes. The focus has been largely restricted to commercial establishments, but California courts pioneered liability on social hosts, with the result that in 1978 the state put an end to virtually all dram shop liability laws (there was much adverse publicity in one case where a host was sued). These court cases failed to focus on the drinking context and failed to analyze the reasonable controls a social host might impose. The problems with the courts' approaches in the past have been that (1) that the liquor trade has been viewed as an "evil", and (2) that imposing liability has been seen as a way of distributing the social costs of alcohol related problems (from victims to the industry). It has been assumed that commercial servers will seek insurance, but this has been very expensive in recent years. The basic problem with the court actions has been a lack of explicit attention to prevention goals and the drinking context. This is the major legal reform required. Thus a less individualistic approach is required, and more needs to be known about drinking in bars - the way bars differ in informal controls and the ways in which transport problems are managed.

Usefulness for review:



Organisation for Economic Co-operation and Development.	(1974).  <b>Keywords</b> -->	accidents / road use behaviour / police / courts / offences / selective enforcement / warning letters / review
<i>Research on traffic law enforcement: Effects of the enforcement of legislation on road user behaviour and traffic accidents.</i>		Paris: OECD.
<p>This report was initiated partly as a response to ignorance with respect to two related questions: (i) What is the relationship between the level of enforcement and driver behaviour and the relationship between driver behaviour and traffic accidents? (ii) What are the costs of certain types of enforcement? The emphases of the report are police enforcement and costs, not the effects of alcohol or traffic legislation. The report contains a comprehensive review of many experiments designed to evaluate the impact of different forms of police traffic law enforcement on offenses and/or crashes. The general conclusion is that there is an air of uncertainty surrounding traffic law enforcement as a means of effecting the safe and efficient movement of traffic. Nevertheless, most studies do indicate a positive road safety value. Major deficiencies in design include samples too small, inadequate use of time series techniques as opposed to before and after methods, inadequate controls, no replications, no attempt to distinguish publicity effects from enforcement effects, and no examination of the effects of different levels of enforcement. In a chapter on the road user, the need for extensive research on driver perceptions and reactions to law enforcement is emphasized. For example, not much is known about the psychological effects of concealed cars or concealed instruments as opposed to visible patrols. This reviewer's opinion is that although individual experiments can all be criticized, cumulatively they strongly support the deterrent potential of most forms of enforcement. One deficiency of the report is a tendency to be over-critical without summarizing adequately the common threads in the reasonable experiments. One positive emphasis is the potential of automatic enforcement measures, such as cameras, speed-time-distance recorders in cars, and electronic car plates to facilitate detection of offences. Another theme emerging from some studies is the marked impact on vehicle speeds of visible, stationary patrols - even though effects may be of limited duration in space and time. Among recommended guidelines are the value of specialist traffic police, selective enforcement and unambiguous road rules.</p>		
Usefulness for review: 		

National Roads and Motorists' Association (N.R.M.A.).

(1984).

**Keywords**

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traffic law enforcement / speed limits / penalties / rehabilitation / police / radar / selective enforcement


*NRMA submission to the N.S.W. Standing Committee on Road Safety. Part 4: Traffic law enforcement measures and their effectiveness.*

Sydney: NRMA.

In a report representing the presumed views of automobile association members (i.e. with a bias towards the interests of the average motorist), the potential and limitations of traffic law and its enforcement are explored. It is pointed out that effective traffic law enforcement requires the goodwill of the public, and that education, rehabilitation, warnings and guidance should be employed by the police and the courts, in addition to arrest and punishment. It is observed that many studies examining the effectiveness of enforcement have been limited by not using a time series methodology, and that it is difficult to say much in general about the longterm effects of enforcement. An accelerated research program in this area is recommended. It is argued that traffic laws should be simplified, important laws should be supported through mass media campaigns, and that the N.R.M.A. should be consulted before changes are made to traffic laws. In particular, there is a need for laws to be evaluated in terms of their purposes and effectiveness (e.g.: the law allowing trucks to turn from the second lane). The report argues against unrealistically low speed limits, and argues against an urban 40 km/h limit. Where speed is a factor in urban crashes, it can be at quite low speeds which would not be influenced by a lower limit. More research into the 60 km/h limit is recommended. The U.S. 55 mph limit is evaluated negatively, with claims that the reduction in crashes could have been due to other factors. Lack of compliance is noted. It is recommended that on freeways and rural divided roads the limit could be increased to 120 and 110 km/h respectively. Scientific selective enforcement programs, as in SA, are recommended, and the concentration of the police on radar, particularly in light traffic conditions, is questioned. Research into the appropriate mix of publicity and marked and unmarked cars to enhance general deterrence is recommended (unmarked cars may increase the apparent presence of the police when resources are limited). Research into driver improvement programs is reviewed, and the value of warning letters etc. with multiple crash (not multiple conviction) drivers is noted.

Usefulness for review:



National Roads & Motorists' Association (N.R.M.A.).	(1985).  <b>Keywords</b> -->	RBT / drink-driving / STAYSAFE / drugs / police enforcement / econometric analysis / administration of RBT
<i>NRMA submission to the NSW Standing Committee on Road Safety. Part 5 - random breath testing.</i>		Sydney: N.R.M.A.
<p>This publication is useful because it brings together summary statistics, observations of the road safety scene in NSW, and some research. The recommendations to STAYSAFE were mainly non-controversial, and reflected the general belief that RBT in NSW had worked very well in the first two to three years. This belief was supported by econometric analysis carried out by Jim Thomson and his colleagues, which suggests that RBT accounted for 61% of the decline in casualties in 1983/84 and up to 74% in 1984/85 (this research is reviewed separately). Controversial recommendations include highly visible RBT operations in locations which may be near licensed premises, the use of mobile RBT patrols to increase the detection rate and deterrence, and a graduated system of minimum BAC's with .08 as a reward for good driving behaviour. Welcome emphases of the report are the need to experiment with modes of enforcement of RBT to maintain deterrence, and the need to enhance the visual impact of police vehicles from which RBT is being conducted. Outside of the deterrence of drinking and driving, the possibility of combining radar speed checks with RBT is considered, but rejected on the grounds that radar checks may be better located in places other than those optimum for RBT, and on the grounds that the use of radar may increase public resistance to RBT. Nineteen major recommendations are made, covering measures for which benefits are well established, measures which may achieve significant benefits and need further study, and measures which require research to enhance RBT operations or further reduce the consequences of driving after drinking.</p>		
<p>Usefulness for review: </p>		

Parliament of New South Wales  
Joint Standing Committee on Road  
Safety.

(1985).

**Keywords**

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traffic law enforcement / quota  
system / Australia / NSW /  
separate road safety authority /  
citations / traffic offences

*Staysafe 4: Is there a quota system? (Fourth  
report of the Joint Standing Committee of the  
Parliament of New South Wales on Road Safety  
relating to traffic law enforcement and road  
safety.)*

Sydney: NSW Government  
Printer.

This report is one of a series from Staysafe on traffic law enforcement. Two issues are examined: whether a separate road safety authority should be established to free police to concentrate on "real" crime; and whether there is a quota system - in other words, are highway patrol officers required to issue a certain number of traffic infringement notices on each shift? The Committee rejected the proposal to establish a separate road safety authority, on the grounds that in all traffic matters the standard of proof is the criminal standard, and that certain road offences involve serious criminal charges (like culpable driving). Moreover, there is more flexibility created by having the highway patrol form part of the police force, since highway patrolmen can be redeployed at short notice should the need arise. With respect to the quota issue, the Committee concluded that although there is no formal quota system, in the sense that police on a shift are required to issue a fixed number of citations, there is pressure on individual officers to produce regularly a high number of bookings. The criterion of effectiveness for the work performance of individual officers was solely the number of citations. The Committee observes that requiring an officer to produce large numbers of citations does not necessarily mean much is being done to improve road safety, or even that an officer is working hard. It was recommended that exclusive use of a "highway patrol-management and statistical return" form (the P.398) as a management tool be abolished, and replaced with a system of data collection which does not entail keeping records on individual officers.

Usefulness for review:



Parliament of New South Wales  
Joint Standing Committee on Road  
Safety.

(1986).

**Keywords**

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traffic law enforcement /  
selective enforcement / police  
visibility / halo / memory /  
traffic offences / citations

*Staysafe 5: Appropriate strategies for police  
traffic law enforcement. (Fifth report of the  
Joint Standing Committee of the Parliament of  
New South Wales on Road Safety relating to  
traffic law enforcement and road safety.)*


Sydney: NSW Government  
Printer.


The thrust of this report is that selective enforcement, based on up-to-date crash information, and supplemented by several broadly based prevention strategies, should be the basis for police traffic law enforcement. While it is recognised that police have a duty to enforce traffic law, it is argued that resources should be concentrated on preventing crashes in high-risk areas, rather than on catching as many offenders as possible (especially on freeways where crash risk is usually relatively low). In this last respect the Committee continues the theme of its previous report ("Is there a quota system?"). The road safety value of traditional enforcement procedures, based on the points system and on infringement notices, is questioned. It is proposed that crash black spots be identified and that appropriate engineering work be done to reduce the problem, alongside of an intensive police presence in the short term. It is argued that high visibility, perhaps in the form of a blitz and then through periodic reinforcement, is a much better deterrent than unmarked cars. Drawing on the work of Armour (1985), it is argued that highly visible police radar units can not only reduce speed at specific locations, but that through "halo" and "memory" effects the impact can be extended in distance and to other occasions near that location. Mobile patrols are rejected as being of little deterrent value. Part of a scientific selective enforcement strategy is a concentration on traffic law violations which have a relatively high crash or injury risk. Thus it is proposed that preventive strategies like RBT (focussed on drink-driving) and the enforcement of safety-belt laws be given high priority, alongside a concentration on high-risk times and places. It is observed that the day-to-day operations of the police in traffic law enforcement must be put onto a much firmer scientific base.


Usefulness for review:






Parliament of New South Wales Joint Standing Committee on Road Safety.	(1986).  <b>Keywords</b> -->	speed limits / aerial observation of speed / rural speeds / overtaking / enforcement / local access streets /deterrence
<i>Staysafe 8: First report on speed control and road safety.</i>	Sydney: NSW Government Printer.	
<p>This is a comprehensive report on speed control, covering speeds in local streets, rural speeds, pedestrian crossing safety, advisory speed signs and the enforcement of speed law. Although there is little evidence from official police reports of illegal speed being a frequent factor in fatal crashes on 100 km/h roads, in-depth accident investigations have implicated speeds often much lower than 60 km/h in urban areas as a factor in crashes. These investigations imply that the 60 km/h limit on local access roads is too high, and should generally be reduced to 40 km/h. Unfortunately there is no simple relationship between excess speeds and crash likelihood, since many other factors, such as lighting and weather conditions, are relevant. The 100 km/h limit on rural roads in NSW does not appear to have reduced speeds or fatal crashes, and it is argued that advisory speed signs are of little value since they are not accepted by motorists. Indeed, the police are faced with the same problem of enforcement with advisory speed signs as they were with the old "prima facie" limit of 80 km/h in rural areas, which failed to curb excessive speeds. "Speed signs on curves, if they are purely advisory, will not prevent excessive speeding on curves by the most dangerous drivers - those who take delight in demonstrating how fast they can negotiate the curve" (p. 8). Probably the major speed-related problem in rural areas relates to overtaking, which is more likely when there is wide variation in speeds. Possible solutions include bans on slow vehicles, minimum speeds and lower maximums in some zones. It is argued that the most effective way of modifying road use behaviour is through modifications to the physical environment, and that road safety campaigns aimed at changing behaviour should only be used if the change required and the process necessary are made clear. Police enforcement should be highly visible, frequent rather than for long periods at one point, should involve the public display of speed, be stationary with a back-up mobile patrol, use amphotometers and interrupted light beams rather than radar (simpler and lower cost), be concentrated at accident black spots and not make great use of aerial patrols.</p>		
<p>Usefulness for review: </p>		

Riley, D.	(1985). <b>Keywords</b> -->	Drink-driving / deterrence / Britain / crime surveys / high-risk drivers / incidence
Drinking drivers: the limits to deterrence.	<div data-bbox="805 405 1315 499"><i>The Howard Journal,</i></div> <div data-bbox="805 510 1315 566">24, 241-256.</div>	
<p>A paper from Britain with limited application to the Australian situation. In an analysis of data from the British Crime surveys of 1982 and 1984, the author measures the incidence of drink-driving in Britain, and concludes that in the previous week around one in four male drivers and one in thirteen women drivers had driven over .08. The data suggest that beliefs about the legal limit may be more crucial in drink-driving than misinformation about penalties. High-risk groups are (i) the ignorant; (ii) those under social pressure to drink-drive; and (iii) those not fully aware of the penalties. Interestingly, drinking drivers were less likely to judge drink-driving as "very serious" than non-drink-drivers. This is taken to mean that the criminal justice system has limited potential in further reducing the road toll associated with alcohol. Some sensible suggestions for improving the effectiveness of the system are made, including publicity to improve knowledge of the effects of alcohol and the penalties, and RBT.</p>		
<p>Usefulness for review: </p>		

Ross, H.L.	(1986).  <b>Keywords</b> -->	Drink-driving / Australia / Britain / Canada / RBT / deterrence / policy
<i>Deterrence-based policies in Britain, Canada and Australia.</i>	Draft of paper to appear as a chapter in a book entitled "The social control of the drinking driver" (edited by Zimring, Snortum & Laurence). Dept. of Sociology, University of New Mexico.	
<p>Argues that there is a contrast in policy on traffic safety between the United States on the one hand and the Parliamentary democracies of Australia, Canada and Britain on the other. In the U.S. policy has traditionally been focussed on occupant protection and passive restraint, until railroaded by victims' organisations like MADD into a concentration on deterrence of the drinking driver. By contrast, it is argued that the Parliamentary democracies have emphasised human factors approaches, particularly deterrence, for a much longer period. The experiences of the three countries in deterring the drinking driver are reviewed. It is observed that the 1967 British breathalyser law was among the best-known statutes in British history, and appears in some ways to have been the most successful deterrence-based measure ever launched against drink-driving, although the effects were temporary. The British approach was emulated in Canada, but the legislation lacked "color and teeth" and enforcement was frequently not vigorous, so that most Canadian campaigns yielded inconclusive results. The review of Australia's experience focusses on RBT, and contrasts the success of the NSW and Tasmanian approaches with that of other states either lacking RBT or where RBT has not been vigorously enforced (such as SA). The apparently permanent impact of RBT in NSW is noted. However, the author expresses reservations about the appropriateness of the NSW model for other places, particularly the U.S. In essence, it is argued that the civil liberty costs of RBT are a high price to pay for the reduction in road deaths, and that better returns, with no violations of liberties, could be achieved with non-deterrent measures such as air-bags. "If all you have is a hammer, then everything looks like a nail." RBT and similar measures are intrusive and only partially effective, and should be used sparingly as a supplement to non-deterrence based measures.</p>		
<p>Usefulness for review: </p>		

Rothengatter, T.  	(1982).  <b>Keywords</b> -->	deterrence / speeding / traffic offences / selective enforcement / incentives / warning letters / sanctions / points				
The effects of police surveillance and law enforcement on driver behaviour.	<table border="1"> <tr> <td colspan="2" data-bbox="821 389 1316 488"><i>Current Psychological Reviews,</i></td> </tr> <tr> <td data-bbox="821 497 1006 555">2,</td> <td data-bbox="1013 497 1316 555">349-358.</td> </tr> </table>		<i>Current Psychological Reviews,</i>		2,	349-358.
<i>Current Psychological Reviews,</i>						
2,	349-358.					
<p>This is a review article, surveying what is known concerning police surveillance, legal sanctions and the potential of non-legal countermeasures to induce compliance with traffic law. A number of studies have demonstrated that police surveillance can have a direct or "on-view" effect on a variety of traffic offences, particularly speeding. In addition, memory and halo effects have been demonstrated - motorists slow down for at least two weeks at the location where enforcement was concentrated even after the campaign has concluded (the period depends on the level of enforcement), and also slow down in areas other than those in which enforcement took place. The mechanism seems to be a non-cognitive automatic response to the threat posed by the police vehicle, since speed reductions occur irrespective of the initial speed. It is observed that selective enforcement programs sometimes fail because offences not directly related to crashes are the focus of attention (e.g.: speeding citations increase dramatically and citations for failure to yield decline). Since these programs often do reduce crashes it is probably more important to select the place rather than the type of offence to be concentrated on. Feedback to motorists on speeds usually has temporary effects, but one study found that signs which indicate that speeds are actually being recorded and providing feedback about the percentage of drivers not speeding seem to have durable effects (Van Houten &amp; Nau, 1981). In general, police enforcement cannot be maintained at a high enough level to maintain deterrence. The punitive system is evaluated negatively from a psychological point of view (delays in punishment etc.), but few practical suggestions are offered. Several studies, mainly American, have demonstrated the value of warning letters to motorists with crash or violation records. This countermeasure has the value that it can be operated administratively, without the use of police or courts. These letters probably appeal to internal control mechanisms. Demerit points systems may allow positive incentives to be used. For example, drivers may be promised a reduction in points if they take part in a learning program.</p>						
Usefulness for review: 						

Saltz, R.F.

(1985).

**Keywords**

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server intervention / dram shop  
liability / drink-driving / legal  
environment / under age drinking  
/ server trainingServer intervention: conceptual overview  
and current developments.*Alcohol, Drugs and Driving  
Abstracts and Reviews,*


1(4),

1-13.

This article provides an overview of American work in altering the legal and social environment within which alcohol is served. The goal of server intervention is to create an environment for drinking that would: (1) reduce the risk of intoxication; and (2) reduce the risk that intoxicated persons will harm themselves or others. Environmental reform is required at three levels: the legal environment, the community environment and the specific environment of the licensed establishment. In the U.S., the legal environment includes dram shop (civil) liability law, state and local Alcohol Beverage Control (ABC) codes, and criminal statutes that affect serving practices. Dram shop laws are those that hold commercial servers (and sometimes social hosts) liable if they serve obviously intoxicated or underaged persons who cause harm to themselves or others. Current laws are flawed because their goals are not clear, they do not compensate victims, they do not promote responsible serving practices and there are no legal incentives for establishments who implement such practices. The level that has received most attention is the establishment itself (server intervention). The aim is to encourage establishments not only to control inebriation and underage drinking, but also includes the promotion of non-alcoholic beverages and food, standards for customer behaviour, provision of transport for intoxicated customers etc. Server training covers the effects of alcohol, the legal and moral responsibilities of the management and staff, and law enforcement issues (e.g.: bar fights). One program works within the context of increasing the professionalism of servers. Management support and involvement is critical to the program, and goals include increasing staff morale and increasing profitability. Recent developments include regulatory actions to prohibit "happy hours", "two drinks for one", etc. There is a growth in interest in reforming dram-shop liability and mandating server training. A model dram-shop law has been drafted by James Mosher and others (see Colman et al., 1985), which has been introduced in a number of states. The NHTSA has provided seed money to communities interested in developing server intervention programs.

Usefulness for review:



Shapiro, P. & Votey, H.L.	(1984). <b>Keywords</b> -->	drink-driving / deterrence / Sweden / econometric modelling / utility theory /previous conviction
Deterrence and subjective probabilities of arrest: modelling individual decisions to drink and drive in Sweden.	<i>Law &amp; Society Review,</i>	
	18,	583-604.
<p>This paper develops a theoretical model which allows the probability of arrest for drinking and driving to be related to the perceived utility of drinking and driving, the perceived cost (or utility) of an arrest, the actual costs (penalties) and actual probabilities of arrest. The model is based on utility theory, so that (for example) the perceived utility of drinking and driving is the marginal utility of successful drink-driving over lawful behaviour. The model also incorporates a coefficient alpha which relates subjective to objective arrest probabilities. The estimation of parameters for the model is based on aggregate Swedish arrest data for the period 1976-79. In order to apply the model to the aggregate arrest data, it was necessary for the authors to make many assumptions, some of which seem more reasonable than others. Apart from the foundation in utility theory, which may not itself be completely adequate, it is assumed (among other things) that subjective arrest probabilities are an exponential function of actual arrest probabilities, that the only personal characteristic which affects the exponent (alpha) is number of previous arrests, that the legal costs for an individual can be replaced by the expectations of various components (such as period in jail) for a community, that the utility of drinking and driving plus the perceived cost of arrest can be modelled as a weighted sum of age and previous conviction status, and that the expected costs of an arrest are log linearly related to the expected sanctions where the penalty variables are in their log form. Using ordinary least squares regression analysis, the authors conclude that an arrest experience reduces the probability that a person will drive while drunk, either by increasing the perceived probability of arrest ("sensitivity") or by increasing the unpleasantness of an arrest ("responsiveness"). This is an interesting conclusion, given the evidence for the effects of RBT on those with a previous arrest, but there are so many assumptions made, and so many difficulties involved in going from individual level theory to models of aggregate behaviour, that the conclusions simply have to be classified as "interesting".</p>		
<p>Usefulness for review: </p>		

Shoup, D.C.

(1973).

**Keywords**

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selective enforcement /  
experiment / cost-effectiveness  
/ accidents / speeding / type II  
error / visibility / warningsCost effectiveness of urban traffic law  
enforcement.*Journal of Transport Economics  
and Policy,*

7,

32-57.

The purpose of this paper is to examine the cost-effectiveness of a variety of techniques of police enforcement of traffic law in specific areas ("beats") of a city. Results are based on an experiment conducted in Los Angeles in 1968-69, using special motorcycle officers usually assigned to areas with bad crash records ("selective enforcement"). The experimental design involved one beat with one visible police officer who issued no citations, one beat with one officer who issued warnings only, and six beats where standard procedures were used but the number of officers was increased during the experimental period by 4, 3, 2, 1, 0, or -1 (i.e. a decrease to a zero level) compared with the base period (number of years not specified). Crash data, citations, traffic volume and speeds were the two major outcome measures (speeds were not available for the base period). Warnings appeared to reduce crashes (13%), and the more officers on a beat the greater the crash reduction (rank correlation of .83). However, these results were only significant at the .15 level, and the analysis of costs showed that all beats which involved varying the number of officers actually showed a negative benefit since the drop in numbers of crash was outweighed by increased costs. A detailed analysis of statistical power was carried out, indicating that type II error rates are quite high, justifying the use of a high alpha level. Few effects on speed were noted, since traffic congestion was high, but it is argued that even small reductions in speed can have high costs. Warnings had a net economic benefit, despite the lack of statistical significance. Saturation patrolling is not recommended. The need for criteria of performance other than total citations is stressed, and it is argued that officers might be required to justify citations in terms of a crash reduction goal. Despite the equivocal results of the experiment, this study provides a good framework for experimentation by police and for a cost-effectiveness analysis of various styles of selective enforcement. Something like it could profitably be done in any Australian city, with a stress on increasing statistical power.

Usefulness for review:



Simpson, H.M., Beirness, D.J.,  
Mayhew, D.R. & Donelson, A.C.

(1985).

**Keywords**

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alcohol availability / server  
intervention / drink-driving /  
advertising / minimum-age laws  
/consumption / dram shop laws

*Alcohol-specific controls: implications for road  
safety.*


Ottawa: Traffic Injury  
Research Foundation of  
Canada.


This report addresses the impact, on the alcohol-crash problem, of countermeasures intended to control the use, distribution, sale and marketing of alcoholic beverages. Specific issues examined included the minimum drinking age, alcohol advertising, alcohol consumption and availability (location and number of liquor outlets, hours of sale and price), and dram shop liability and server intervention. The authors review the available evidence in these areas, with a particular emphasis on U.S. and especially Canadian research, and arrive at some controversial conclusions. Although acknowledging that raising the legal drinking age from 18 would probably have a beneficial effect on road safety, it is argued that the scientific evidence is not impressive and that neither the magnitude nor the duration of any impact on traffic crashes is known. The costs of raising the drinking age are discussed, and it is emphasised that the issue has escalated beyond a matter of traffic safety or public health. The findings with respect to the effects of advertising are uniformly negative: essentially it is argued that there is no relationship between advertising and consumption or between advertising and alcohol-related crashes. However, it is noted that there is a need for further research, particularly into the cultural-shaping roles of the media. No evidence was uncovered that measures which restrict alcohol availability have a significant impact on traffic crashes, and overall levels of consumption were not related to crash rates. However, factors such as style of drinking may be more critical than consumption, and these may be more capable of being influenced through control measures. Although there is as yet no evidence that dram shop laws and server programs actually reduce crashes, these measures are evaluated very positively. It is assumed that server intervention would be supported by legislation, either through dram shop laws or through licensing laws which require establishments to initiate such programs. This assumption is in contrast to the Queensland approach described by Carvolth (1985a,b; 1984), and implicitly raises the question as to whether the Australian approach is naive in not having a legal underpinning.


Usefulness for review:






Smith, D.I.	(1986). <b>Keywords</b> -->	drink-driving / newly-licensed drivers / low BAC / Australia / injury crashes	
Effect of low proscribed blood alcohol levels (BALs) on traffic accidents among newly-licensed drivers.	<i>Med. Sci. Law,</i>		
	26,	144-148.	
<p>The purpose of this study is to evaluate the impact on traffic crashes of low proscribed (sic) BAC levels for probationary drivers in three Australian states. In February 1971, first-year drivers in Tasmania were not permitted to drive with any alcohol in their blood, in contrast with a .08 limit for all other drivers. QLD drivers and motorcyclists aged 17-20 were used as a control, rather than older Tasmanian drivers, since at the same time other changes to drink-drive laws were introduced in Tas. In comparison to the QLD control group, in the year after the zero BAC law 17-20 year-old Tas. motorists had significantly fewer injury crashes. A .05 limit for P-plate drivers was introduced in SA in June 1981 (the limit remained .08 for older drivers). Due to the introduction of RBT in that state, a within state control was used: 16 year old motorists were compared with those aged 21-25. It appeared that the .05 law reduced the less severe casualty crashes for males by around 40%, but there was no discernible effect on females. In December 1982 a .02 limit for P-plate drivers was introduced in WA, with .08 for all other drivers. 21-25 year-old WA motorists were used as a control, due to the relative isolation of WA and the introduction of de facto RBT. Using a three year 'before' period (1980-82) there was again a reduction in the less serious casualty crashes among males (also there was a significant result for females due to an increase in the control). The author comments that part of the effect of low BACs could be due to the conspicuousness of P-plate drivers. He argues that RBT may have caused young drivers in SA to over-estimate their likelihood of detection, causing stronger effects than in WA. The unexpected finding was the failure of low BACs to reduce casualty crashes resulting in hospitalization. (This is a worrying result, since we would expect a reduction in drink-driving to influence the more severe crashes.) The author concludes that due to the various methodological problems low BAC laws should be regarded as a promising rather than a proven countermeasure for alcohol-related crashes among young people.</p>			
<p>Usefulness for review: </p>			

Smith, D.I. & Burville, P.W.	(1986). <b>Keywords</b> -->	drink-driving / minimum-age laws / young drivers / Australia / lower drinking age / BAC / enforcement		
Effect on traffic safety of lowering the drinking age in three Australian states.	<i>The Journal of Drug Issues,</i> <table border="1"> <tr> <td data-bbox="820 510 1016 560">16,</td> <td data-bbox="1016 510 1347 560">183-198.</td> </tr> </table>		16,	183-198.
16,	183-198.			
<p>This study is a replication in Australia of North American studies investigating the effects on traffic crashes of the lowering of the legal drinking age. This appears to be the only study of its type for Australia. The study focusses on the lower drinking ages allowed in SA, QLD and WA in the late sixties and early seventies. The aims are: (i) to ascertain whether there was an adverse effect on traffic safety of the drinking age reductions; (ii) to determine whether changes in the drinking age had an effect on crashes beyond the first two or three years; (iii) to determine if the effects on traffic crashes were the same in urban and rural areas; and (iv) to investigate the role of drink-driving enforcement in relation to the lowering of the drinking age. Unlike many of the North American studies, extensive time series data were not available, so total crashes occurring before and after periods of two or three years were analysed using 2 x 2 chi-square tests. Unfortunately this means that controls for long-term trends were probably not as good as in the time series analyses. Two forms of controls were used: between state comparisons for the target age-group (16-20 or 17-20) and within state comparisons with the age-group 21-29 or 21-25. In order to restrict comparisons to states of comparable populations, only data for QLD, SA &amp; WA were employed. Thus SA was compared with QLD, WA with QLD, and QLD with WA. The overall conclusion is that lowering of the drinking age adversely affected traffic safety, although only in SA with the initial reduction from 21 to 20 years was there a statistically significant impact on fatalities (an increase of about 76%). However, in all states there were significant effects on injury crashes and sometimes on all reported crashes involving the 17-20 or 16-20 age-group. In SA effects were sustained in the second three year period, but (inexplicably) not in QLD. Inconsistent results concerning the relative effects in urban and rural areas were also obtained for WA and QLD. In QLD motorists aged 17-20 involved in crashes had significantly more positive BAC's, despite a big increase in convictions. It is concluded that the minimum legal drinking age in Australia should be 20 or 21.</p>				
<p>Usefulness for review: </p>				

Smith, J.E.	(1986). <b>Keywords</b> -->	speeding / 55 mph law / enforcement / compliance / arrests / public opinion / speed limits
The challenge of 55: Balancing compliance and enforcement.	<i>Police Chief,</i>	
	53,	50-52.
<p>This is a good discussion of the 55 mph law as it now applies in California (CA). It is pointed out by the author (a senior policeman) that the law is perceived in actuality as a limit of 60-65; a limit that curbs those who would drive even faster if given the opportunity. Thus 55 is a "concept", not a strict numerical limit. In CA and generally in the U.S., more than 75% of the public support the law, but the law cannot now be enforced, and there is a very high level of non-compliance. The non-compliance is despite vigorous attempts at enforcement. For example, in CA there is one traffic policeman for every 27 miles of 55 road (the national ratio is 1:190 miles) and CA has only 4% of the total 55 roads but 13% of the citations. Yet official non-compliance (on rural inter-states) is 49.7%. Traditional traffic law enforcement is based on the expectation that 80-85% of motorists will comply with speed limits of their own volition (limits are set by observing speeds). However, in CA the situation is reversed, since non-compliance is the norm. Thus the issue is not enforcement but public acceptance and voluntary compliance. It is argued that the lifting of the limit on certain carefully chosen rural Interstates would have no harmful safety consequences and would increase acceptance of the law. Nearly two thirds of motorists in CA who drive faster than 55 mph feel they are in compliance with the intent of the law in any case. If there are no changes, the 55 law itself could eventually be inoperative by being totally ignored. Selectively raising the limit and changing the formula used by the U.S. government to monitor the law, giving more weight to serious infractions, would be a better policy.</p>		
<p>Usefulness for review: </p>		

Snortum, J.R.	(1986).  <b>Keywords</b> -->	drink-driving /moral commitment / general deterrence / specific deterrence / U.S. / Australia / Scandinavia /peer pressure
<i>Deterrence of alcohol-impaired driving: an effect in search of a cause.</i>	Draft of paper to appear as a chapter in a book entitled "The social control of the drinking driver" (edited by Zimring, Snortum & Laurence). Claremont McKenna College, Clairmont, California.	
<p>In essence, this paper argues the view that in order to understand the impact of drink-drive law on behaviour and on road crashes, it is necessary to go beyond "simple deterrence", defined as law abiding behaviour in response to the fear of legal punishments. Other mechanisms include moral commitment to the law and the educative effect of law. Andenaes is quoted approvingly on several occasions. Snortum points out that there are now two bodies of "indirect" evidence that stable deterrence may be less elusive than we have been led to believe. One strand of evidence comes from a comparison of Norway and the U.S., which demonstrates that Norwegian drivers, with their background of strict laws, strong sanctions and strong moral support for control efforts, are much more conscientious than Americans in not driving after drinking. Another comes from the U.S., where between 1980 and 1985 there has been an unprecedented, steady decline in the proportion of fatally injured drivers over .10. This decline coincides with a period of intense legislative activity initiated as a response to pressure from MADD and other groups. It appears, however, that social drinkers over 34, and teenagers, have been most affected by these campaigns - the teenagers probably most by the increase in the legal age of drinking to 21 in many states. This suggests that convicted offenders and other high risk groups may be less deterrable than low risk groups - indeed, they may find special ways to "beat the system". This pattern may explain the relatively few successful attempts to achieve specific deterrence with tougher penalties. The apparent longterm successes of simple deterrence through RBT in NSW and in Maine (in the U.S.) are noted, but in addition the importance of "the socializing influence of the law" is emphasized, together with peer pressure and general community influences not to drink and drive. It is concluded that there is a need for the integration of simple deterrence theory - by no means simple! - with these broader effects of law.</p>		
<p>Usefulness for review: </p>		

Summala, H., Näätänen, R. & Roine, M.

(1980).

**Keywords**

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speeding / Finland / standard deviation / 10 km/h violations / experiments / crashes / police strike

Exceptional condition of police enforcement: driving speeds during the police strike.

*Accident Analysis and Prevention,*


12,

179-184.

This is a very nice little paper which analyses the effects on speed on Finnish roads of a two week police strike in February 1976. The main results were: (i) The mean speed was 2-3 km/h higher on a city street but no consistent difference was found on highways outside the built-up area; (ii) The standard deviation of speeds, on highways, was about 20% higher; (iii) The percentage of gross speed violations (speed at least 10km/h higher than the speed limit) was 50-100% higher both on highways and on the city street; and (iv) Car drivers' response to a car parked on a side road changed during the strike so that they ceased to slow down when seeing the car but did it again after the strike. The analysis is based on three experiments which control in different ways for weather conditions. In the first experiment a general index of weather conditions was used as an informal covariate, in the second weather was well controlled because only data on speed differences between two driving directions were used (this experiment isolated the reactions of drivers to the observers' vehicle), and in the third experiment weather was less important because it was based solely on city speeds. All three experiments pointed to radical effects on only a minority of motorists, who greatly increased their speeds, thus producing the increases in standard deviations and the high increase in gross violations. However, the authors argue that the relatively law abiding behaviour of the majority is probably not due to respect for the law, but due to the fact that the weather would have kept most speeds down anyway. Moreover, some motorists may not have been aware of the strike. There appeared to be no effects on drink-driving, perhaps because of the very heavy penalties and the well-developed behavioural norms in this area. Crash data could not be studied because police reporting during the strike was paralysed. However, the authors note that the increase in standard deviations and in the number of gross violations probably means there were effects on crashes.

Usefulness for review:



The Unknown Public Servant.	(1986: Nov.). <b>Keywords</b> -->	Australia / alcohol / availability / minimum drinking age / treatment / national policy / advertising / legal controls
<i>Draft national health policy on alcohol in Australia.</i>		Presented to the Ministerial Council on Drug Strategy (The Drug Offensive).
<p>This draft report highlights the need for a national policy on alcohol in Australia. The author(s) point out that the slight drop in overall alcohol consumption in Australia over the past decade conceals increasing consumption by young people, many of whom are below the legal drinking age, and increasing consumption by women. It is argued that Australia's alcohol consumption, which is the twelfth highest in the world, and the highest in the English-speaking world, needs to be reduced. This is because as per capita consumption in a country declines so too do several indices of harm associated with alcohol use, including traffic crashes. Thus it is recommended that in order to minimise the harm associated with alcohol, but to interfere as little as possible with individual freedom, further controls be introduced in the areas of availability, price and taxation, advertising and marketing. With respect to availability, it is argued that there should be no further liberalisation of the laws and regulations affecting the availability of alcohol, and that there be a review of existing laws and regulations - including the minimum age at which alcohol can be consumed - with a view to reducing or at least not increasing existing levels of availability. (This recommendation is of particular interest given the evidence linking increases in the legal drinking age with reduced traffic crashes among youth.) The objective of price control within the national policy is to maintain or increase the real price of alcohol, thus reducing consumption. In particular, practices such as excessive discounting and happy hours should be actively discouraged. A complete ban on alcohol advertising is not supported, but concern is expressed about the ways in which alcohol is portrayed in the media and the targeting of young people and women by advertisers. It is argued that the present system of industry self-regulation is not working. General legal controls proposed include the initiation of diversion programs for people with alcohol problems in conflict with the law, the introduction of some form of positive age identification, and the introduction of drink-driving laws which will allow the identification of people with alcohol-related problems.</p>		
<p>Usefulness for review: </p>		

Transportation Research Board.

(1984).

**Keywords**

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55 mph speed limit/ U.S. / costs  
and benefits / travel time /  
public opinion / enforcement /  
deterrence*55: A decade of experience.*Washington, D.C.:  
Transportation Research  
Board Special Report 204,  
National Research Council.

In March 1974 the United States introduced a 55 mph speed limit across all states and across all types and standards of roads. Introduced originally as an oil conservation measure, the safety benefits soon became obvious, with a decline of 9,109 in highway fatalities (a reduction of 16.4%). Although some of this decline between 1973 and 1974 could be attributed to the fewer miles travelled as people responded to the price of fuel, as well as to improved medical services and better roads and vehicles, it was estimated that around half the 1974 decline was due to the speed law. Moreover, the safety benefits do not appear to have been a temporary phenomenon: although average speeds on rural Interstates have crept up from 57.6 in 1974 to 59.1 mph in 1983, these speeds are still well below the 1973 average of 65 mph, and it is estimated that in 1983 between 2,000 and 4,000 lives were saved by the 55 mph law. Overall, the 55 mph law may be about 20% less effective than in 1974, but 76% of the public still support the law. In addition, the law brought about a more uniform pace of travel (lower variance in speed), and this variance does not appear to have increased much since 1974. The significance of this finding is that variance seems to be an important factor in serious crashes and fatalities, since the greater the variation in speeds the more lane-changing and overtaking. The chief cost of the law is in increased travel time, with the expenditure of about one year of driving time for one year of life. This cost is more irksome for heavy users of Interstates and urban freeways (such as long distance truck drivers) where the benefits of the law are more marginal, although reduced fuel, maintenance and insurance costs mean that most large trucking firms support the law. The committee dealt with a number of issues which remained unresolved: will growing noncompliance lead to nullification of the law? can the law be relaxed on "safe" roads (freeways etc.)? If some higher speeds were allowed, would there be a spillover to roads still restricted to 55? Can enhanced enforcement reverse the upward trend in speeding? With respect to this latter question, evidence points to the value of high police visibility.

**Usefulness for review:**

Trilling, D.R.

(1978).

Keywords

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countermeasures / deterrence  
/cost-effectiveness / seat belts  
/environment / fatalities / 55  
mph law/ drink-drivingA cost-effectiveness evaluation of highway  
safety countermeasures.*Traffic Quarterly,*

XXXII,


41-66.

The pattern of expected fatalities and injuries in the U.S. for the decade 1977-1986 was examined to isolate major problem areas and to evaluate countermeasures which may be effective in dealing with them. A large list of countermeasures was reduced to 37 deemed to be the most promising. The paper is centered on a cost-effectiveness analysis of these 37 countermeasures, assuming that those already in force would be developed on an incremental basis. There were obvious shortcomings in the data, but the rankings presented illustrate the methods and allow rough estimates of priorities on a national scale (as opposed to individual states). It is noteworthy that several of the top six countermeasures in terms of fatalities forestalled are essentially focussed on "human factor" issues. Mandatory seat belt usage is top by a wide margin, followed by enforcement of the 55 mph law, combined alcohol safety action programs, emergency medical services, and selective traffic enforcement. These all have the potential to forestall tens of thousands of crashes in the U.S. over the decade. In terms of costs, the most expensive are engineering measures - paved or stabilized shoulders, bridge widening etc. However, when ranked according to dollars per fatality forestalled, highway construction and maintenance ranks second after seat belts, although the latter has a much greater potential for reducing crashes. Alcohol countermeasures rank around the middle, while the 55 mph law still ranks near the top (#4). However, it should be noted that in the U.S. highway construction is almost complete, in contrast to the situation in Australia. Moreover, RBT may have made alcohol programs much more cost-effective. It is stressed that the effectiveness of each countermeasure is highly dependent on the site where it is deployed and what other measures are currently in use. Methods for determining priorities at the state level are explained, and could be used in Australia. A feature of the methods proposed is the concept of the marginal return to the national dollar, which may be interpreted as a criterion of what constitutes an acceptable investment at any level of expenditure.

Usefulness for review:





Wagenaar, A.C.	(1983).  <b>Keywords</b> -->	drink-driving / minimum-age laws / young drivers / U.S. / Canada / raised drinking age / alcohol consumption
<i>Alcohol, young drivers, and traffic accidents: effects of minimum-age laws.</i>	Lexington, MA: Lexington Books.	
<p>The general question examined in this book is: "Does state legislation that establishes a minimum legal-drinking age reduce the incidence of alcohol-related problems among those under the legal limit?" Specifically, the study is concerned with young people's involvement in alcohol-related car crashes, and with the effects of increases in the legal drinking-age. Prior to Prohibition in the U.S., temperance advocates focused on restricting the availability of alcohol through regulation of the hours of sale etc.. Strict minimum-age laws were implemented only after Prohibition and were set at 21 years. The movement to lower drinking ages began in 1970 with the extension of the right to vote to 18 year olds, but no state has reduced the age since 1975, by which time evidence was emerging that the lower ages (usually 18) were leading to higher rates of alcohol-related traffic crashes among young people. Recent research suggests that the link is truly a causal one. A model of the relationship between the legal drinking age and crash involvement is proposed: legal drinking age affects drinking norms (e.g.: the social acceptability of drinking by teenagers), the marketing activities of industry (e.g.: locating drinking outlets near college campuses), and alcohol availability (e.g.: easy physical access to a bar). These three factors are all assumed to affect drinking behaviour, and hence drink-driving and crashes. In addition, alcohol availability is argued to influence drinking situations and hence drinking behaviours (e.g.: more drinking at private parties). The study was based on the non-equivalent multiple time-series design: time-series of property and injury crashes were examined for Maine and Michigan, where the legal age was raised, and for New York and Pennsylvania, where there was no increase. In addition to the focal age group, underage drinkers (16-17) and proximate age groups were examined (e.g.: 20-21). The analyses suggested that about 20% of all alcohol-related crashes among young drivers can be prevented through the increase in minimum age from 18 to 21. It is concluded that these laws, perhaps with some modifications, should be one component in a broader prevention effort.</p>		
Usefulness for review: 		

Ward, P.G., Woods, G.D. & Brennan, P.

(1973).

**Keywords**

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legislation / police enforcement / penalties / high risk groups / accident prone / drink-driving / review / Australia


*A review of legislation and enforcement in relation to road safety.*


Canberra: Australian Department of Transport/ Australian Government Publishing Service


This is a literature review undertaken for the Australian Department of Transport in November 1971. Major recommendations focus on assessing the cost-effectiveness of penalties rather than enforcement, although it is not clear from the report why penalties were considered to have the greater potential. (Possibly the literature on penalties at the time was better developed than that on enforcement, the latter tending to consist largely of poorly designed and in-house evaluations of police practices, such as crackdowns on speeding.) A key element of the recommendations on penalties was the use of random allocation, and there is reference to an interesting study in Oregon demonstrating the effectiveness of essay writing for juvenile first offenders. There is a useful discussion of the legal principles underlying traffic law, although the authors conclude that few changes to current practices are required. In particular, they argue that strict liability should continue to be the principle governing the legal response to selected traffic offences, on the basis that judges can be trusted to exercise appropriate discretion when strict liability would lead to injustice. Another recommendation concerns research into the effects of speedier trials, a proposal of some contemporary interest given the increasing use of administrative licence suspension in drink-driving cases. Reflecting the ideas of the time there is a discussion of the concept of "accident proneness", with some quite decent empirical evidence adduced in its support. A sensible suggestion is made concerning the identification of "accident prone" drivers, based on the study of Shaw & Sichel (1971). (This fits with some recent research from California suggesting that early intervention with drivers with a history of multiple crashes may be beneficial.) Review of the literature on the enforcement of speed limits suggests the need for a patrol car approximately every four kilometres, but even so the cost-effectiveness of such measures is not certain. There is an interesting suggestion for an experiment to assess the efficacy of policing intersections with a history of high crash rates, and (early) support for RBT.

Usefulness for review:



Weston, P.B.	(1968).  <b>Keywords</b> -->	police science / traffic law enforcement / selective enforcement / driving unlicensed / police tactics
<i>The police traffic control function (2nd Ed.).</i>		Springfield, ILL.: Charles C. Thomas.
<p>This is a fairly old text for training police in traffic control techniques. Nevertheless it has some useful points, especially in the chapter on enforcement (other chapters include traffic law [Californian], police tactics in dealing with traffic law violators, engineering and control techniques, unit organization and accident investigation). In a section on fraudulent licences it is argued that temporary traffic intelligence squads can be extremely effective in breaking up forging rackets. This may involve police officers in "undercover operations" to locate gangs. Selective enforcement, with a concentration on high accident times and locations and types of violations, is recommended as an effective crash prevention measure. The primary purpose of traffic enforcement is to induce voluntary compliance with reasonable traffic regulations, but a collateral objective is the protection of life and property. Comments on "careless talk about quotas" (p. 58) indicate that the real or imagined existence of quotas is a perennial issue in traffic law enforcement. It is concluded that a city's population respond to even slight changes in the quality or quantity of police traffic law enforcement.</p>		
<p>Usefulness for review: </p>		

Williams, A.F.	(1986). <b>Keywords</b> -->	drink-driving / minimum-age laws / young drivers / U.S. / raised drinking age / alcohol related crashes				
Raising the legal purchase age in the United States: Its effects on fatal motor vehicle crashes.	<table border="1"> <tr> <td colspan="2" data-bbox="840 382 1350 477"><i>Alcohol, Drugs and Driving Abstracts and Reviews,</i></td> </tr> <tr> <td data-bbox="840 493 1029 544">2(2),</td> <td data-bbox="1029 493 1350 544">1-12.</td> </tr> </table>		<i>Alcohol, Drugs and Driving Abstracts and Reviews,</i>		2(2),	1-12.
<i>Alcohol, Drugs and Driving Abstracts and Reviews,</i>						
2(2),	1-12.					
<p>This is a survey of recent U.S. studies (1985+) on the effects on road crashes of raising the legal drinking age. As of May 1, 1986, 40 states had a minimum purchase age of 21 for all alcoholic beverages, or had enacted legislation with an effective date prior to October, 1986. The very limited data available suggest that drinking, and drinking and driving, do decrease when the alcohol purchase age is raised. However, it is possible the legislation could have an effect on vehicle crashes even without changes in the overall consumption of the age groups affected. It is noted that many of the earlier evaluation studies did not deal satisfactorily with design and statistical problems, and that controls both within and between states are required (see Smith &amp; Burville, 1986). Six studies (including the work of Wagenaar, 1983) are listed as meeting acceptable standards. All these studies found positive effects of the legislation increasing the legal drinking age, with reductions ranging from 7 to 28%. There appear to be substantial state-to-state variations. However, these early studies were based on the experience of a limited number of states, and were limited to a one or two year impact. Because of these limitations, in the mid-1980s three more studies were carried out, on a more comprehensive basis. These studies suggest a reduction in nighttime fatal crash involvement among the affected age group of between 13 and 21%. Moreover, these effects appear (at least over a six year period) to be permanent. One study found that the effect of raising the purchase age on nighttime fatal crashes was proportionally greater for females (26% compared with 10% for males). Recently there have been some studies which put a contrary point of view, arguing that "new drinkers" (just coming of age to drink) are more at risk if legal purchase begins at a later age, since they are less experienced than veteran drinkers of the same age. However, these studies are heavily criticised as flawed in design. It is concluded that minimum age laws should be seen as only one tool, which reduce but do not eliminate the problem - other policies needed include nighttime curfews and low BACs for teenagers, plus all-age countermeasures.</p>						
<p>Usefulness for review: </p>						

Wood, L.J.	(1986). <b>Keywords</b> -->	drink-driving / Tasmania / RBT / police enforcement / penalties / Australia / geography
<i>Drink-driving: offenders and penalties in metropolitan Hobart.</i>	Unpublished manuscript, Department of Geography, University of Tasmania.	
<p>This paper examines variations in per capita offence rates and types and severities of penalties between different suburbs of Hobart. The highest conviction rates were recorded in areas of public housing and in inner city areas. Low rates typified the more affluent suburbs. It is suggested that these variations may reflect varying attitudes toward the law in different areas, particularly differences in sub-cultural tendencies to combine drinking and driving. It is also suggested that the variations may reflect constraints imposed by the physical structure of the city and as well as police practices in implementing RBT. For example, locations that are difficult to monitor effectively or produce relatively few apprehensions may receive relatively little attention. The author notes that penalties are heavier in the areas with the highest conviction rates, and argues that differences in rates of recidivism between areas probably account for much of this variation, although he does not discount the role of the individual magistrate. BAC levels did not appear to have much to do with variations in penalties. One recommendation flowing from the research is that the police experiment with the disposition of RBT units, particularly with a view to determining if some areas are currently underpoliced.</p>		
<p>Usefulness for review: </p>		