

DRIVER LICENSING IN VICTORIA

by

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Abstract:

This report considers driver licensing problems and needs in the State of Victoria. Issues that are addressed include the effectiveness of probationary licences, the nature of the road test, the design of the overall driver and motorcycle rider training systems, and the potential for automated licensing. The study involved the author in observations of licence administration practices, and discussions with both practitioners and researchers.

Key Words:

automated testing, driving licence, elderly, drivers, driving test, on-road test, motorcycle rider training, test procedure, tester training

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EXECUTIVE SUMMARY

The following summary of Victoria's licensing problems and needs results from a month-long study of driver licence practices in Victoria, including observations for licence administration and discussions with both researchers and practitioners.

PROBATIONARY LICENCE

Problem: The current Victorian probationary licence does not fully exploit the available potential for improving the performance of novices in their first three years of driving.

Needs:

- Reduce accident exposure by licence restrictions that limit the most dangerous forms of driving, including operation at night or youthful passengers.
- Motivate safe and lawful driving by making removal of licence restrictions conditional upon a specified period of violation-free driving.
- Improve skill in the perception of hazards by implementing the proposed Hazard Perception Test, providing the means by which probationary licence holders can gain skill in hazard perception and by making issue of a full licence dependent upon completion of training and acceptable performance on the test.

ROAD TEST

Problem: Many qualified applicants fail the road test because of non-uniform, invalid testing as well as ignorance of what is expected of them, resulting in unnecessary expense and inconvenience.

Needs:

- Advise applicants of test performances and scoring criteria.
- Improve test uniformity by use of predetermined test observations.
- Audit examiner performance.
- Conduct periodic examiner reviews.
- Monitor and evaluate South Australia's provision for administration of road test by driving schools.

DRIVER TRAINING

Problem: The potential impact of driver training upon road safety may be compromised by the preoccupation of initial instruction with preparation for road tests, the lack of advanced instruction after licensing and the absence of corrective training for traffic violators.

Needs:

- Establish standards for instructional content, methods, and duration and give consideration to making elements of instruction compulsory.
- Development in the promulgation of instruction in hazard perception.
- Consider corrective training for traffic violators whose records do not warrant licence suspension.

MOTORCYCLE TRAINING

Problem: Inclusion of basic instruction and provision for loan of motorcycles in motorcycle training sponsored by VIC ROADS may encourage riding, thereby increasing exposure to motorcycle accidents.

Needs:

- Consider confining VIC ROADS instruction to the safety-related aspects of motorcycle operation.
- Consider making satisfactory completion of safety training a requirement for the motorcycle endorsement.

AUTOMATED LICENSING

Problem: The current and projected use of automated licence test equipment does not realise the full potential of automation.

Needs:

- Make better use of the dynamic graphic capabilities of automation to improve knowledge testing.
- Increase the range of automated functions to include vision testing and the entry of personal history information.
- Develop an automated test appropriate for people with literacy difficulties in order to reduce the cost of oral testing and adapt the video version of the Victorian Traffic Handbook for use by people with literacy difficulties.

ELDERLY DRIVERS

Problem: Many drivers with age-related deficiencies are neither identified and/or given appropriate driving restrictions.

Needs:

- Develop screening methods capable of detecting sensory, perceptual, cognitive and motor impairments through periodic retesting.
- Improve the referral process to encourage reporting of drivers with age-related deficiencies.
- Design and evaluate programs to remedy deficiencies and apply appropriate licence restrictions.

DRIVER LICENSING IN VICTORIA: PROBLEMS AND NEEDS

INTRODUCTION

This report provides a set of observations as to driver licensing problems and needs in Victoria. It is based upon a month-long review of Victoria's driver licensing process and examination of these processes in light of what we know about licensing from past research and practice.

SCOPE OF STUDY

In keeping with the terms of reference under which it was prepared, the report addresses the following:

1. The purpose of driver licensing.
2. Whether current licensing arrangements for testing skill and knowledge are consistent with the objectives of driver licensing.
3. How services associated with driver licensing are best delivered.
4. Whether alternative methods of training and assessment should be offered to novice drivers.
5. The role of VIC ROADS in the development, maintenance, and review of driver training and standards of driving instruction.

The focus of the investigation is confined to the licensing of novice drivers. It therefore excludes drivers of trucks and other commercial vehicles.

SOURCES OF INFORMATION

In attempting to identify licensing problems and needs, the report combines observations of Victoria's licensing policies and practices with what we have learned about licensing from experience. The lessons of experience come in part from systematic research into licensing problems and in part from the involvement of scientists and practitioners in the licensing process. Where observations made are supported by research, it is so stated, although specific literature citations are not offered (they were not asked for and providing them would substantially increase the level of effort entailed in preparing the report). If the contents of this report are to become the basis of action, it will be on the strength of the discussion presented rather than the authority of the research used.

In tapping the experience of licensing practitioners, the author met with examiners, instructors, and administrators at all levels, not only in Victoria, but in New South Wales and South Australia. Those whose involvement in licensing is primarily scientific included the staff of the Accident Research Centre at Monash University, under whose auspices the study was conducted, as well as researchers from universities and governmental agencies in all three states mentioned. The work took place from 12 February to 12 March, 1992. Considerable assistance was provided by the staff from the VIC ROADS Road Safety Division.

ORGANIZATION OF REPORT

Efforts to address the issues raised in the terms of reference revealed a number of problems and needs in the following areas:

- probationary licence
- road testing
- driver training
- motorcycle rider training
- automated testing
- elderly drivers

These topics represent the convergence of what is important to licensing in Victoria with what the author feels qualified to address. The priority given to the *probationary licence* reflects its potential as a contributor to the safety and mobility of Victoria's motoring public. It offers one of the best means of influencing the behaviour of drivers after they are licensed to drive. As yet, the potential of the probationary licence in this regard has not been fully exploited. *Road testing*, while the most significant and most costly interaction between drivers and the licensing authority, also seems to be the least understood. The *training of drivers and motorcycle riders* is not itself a licensing function. However, training interacts with licensing in that it (1) helps to develop the skills and knowledges assessed in licensing, and (2) provides an opportunity for skill and knowledge assessment that can contribute to licensing. *Automated testing* is examined because of the successful experience with its use in an ongoing pilot test and the need for such equipment in order to implement the Hazard Perception Test. Gaining maximum efficiency from such equipment demands that it be given the fullest possible use. Finally, the study of *elderly drivers* addresses a problem that will increase greatly in magnitude over the coming decades - how to protect the public from drivers with age-related deficiencies while preserving the mobility of those where it is safe to drive.

PROBATIONARY LICENCE

The best opportunity for reducing risk among young novice drivers in Victoria is offered by the Probationary Licence. Because of its enormous potential, the Probationary Licence is given the greatest attention in this report. All that an initial licensing test can do is to ensure that beginning drivers have the minimum knowledge and skill required for operating on public roads without inordinate risk to themselves and others. Its impact upon accident risk beyond the first few months of driving is minimal. The probationary licence, on the other hand, can extend the influence of licensing over a three-year period.

Once drivers possess the minimum skill and knowledge required to operate safely, their risk of accident depends far more upon attitude than ability, rendering the initial licence test largely impotent as a means of influencing day-to-day driving behaviour. What the probationary licence provides is a means by which licensing agencies can extend their influence upon drivers over a longer period - indeed, over the major share of the period in which drivers are learning and their risk is declining.

The probationary licence can reduce risk in three ways:

Exposure reduction - limiting exposure to accidents by regulating the amount and conditions of driving during the period of greatest risk.

Motivation - using relief from probation is an incentive to motivate adherence to the law and to safe driving practices.

Learning - using the terms of probation 3.S incentives to encourage experiences that will lead to increased skill and knowledge as well as more favourable attitudes.

While the terms of the Victorian Probationary Licence, as currently formulated, use each of these routes to reduction of risk, they do not fully exploit the potential available. Possibilities for improving the situation will be addressed in terms of each of the three functions listed.

EXPOSURE REDUCTION

The probationary licence applies one exposure reduction measure to all probationers: restriction to operate with zero BAC. The rationale is entirely defensible - drivers whose ability is only marginal, are likely to be sensitive to even the smallest degree of impairment by alcohol. The zero BAC restriction does not attempt to inhibit drinking, only its coincidence with driving. Its imposition appears to have occasioned no wide spread protest by the affected population. While empirical data as to its benefits are absent, anecdotal evidence concerning its effect upon drinking practices is favourable.

The probationary licence contains no provision for reducing exposure to risk from driving itself. Two risk reduction measures have been considered: *night-time driving restriction* and *passenger restrictions*. Neither has been applied to the probationary licence population as a whole.

Night-time Driving Restriction

A night driving restriction, beyond merely reducing the overall amount of driving, lowers exposure to two forms of risk that are particularly threatening to drivers: (1) the effect of low illumination and low contrast upon drivers whose ability to operate in daylight is marginal and (2) the relatively high incidence of alcohol impaired driving and its disproportionate effect upon drivers who are relatively lacking in the ability to detect and defend against impaired drivers.

Research has shown small but significant reductions in night-time accidents in jurisdictions with night-time driving restrictions. However, the idea of including a night-time restriction among the provisions of the Victorian Probationary Licence was apparently not well received by the public. The age at which a probationary licence is issued (18 years) exceeds the age which any existing curfew has been imposed upon drivers elsewhere. This does not mean, however, that some form of night-time restriction is totally unacceptable. The feasibility of a restriction would depend upon the following:

Duration of Restriction - Certainly a restriction that lasted three years would be intolerable, imposing a burden upon an employed population that could not be justified by the accidents it would prevent. However, a restriction lasting only for the first six months might be acceptable and would be consistent with the learning curve of new drivers, which shows its greatest improvement during the first few months of driving.

Hours of Restriction - If a night-time driving restriction is truly intended to limit exposure to the dangers of operating under lower illumination, it should prohibit driving during any hours of darkness, that is, from sunset to sunrise. However, no existing curfew is so

extensive and none is likely to prove acceptable. Between 11:00 pm and midnight is modal starting time for curfews. While not eliminating night operation, such a late restriction would at least reduce somewhat the hours of night-time driving and would eliminate most of the exposure to alcohol impaired drivers. Moreover, many drivers are disinclined to set out on an evening trip when they are faced with an impending curfew, the result being that the effective hours of curfew often exceed those prescribed by law.

Waivers - Probationary drivers whose employment requires late night travel, along with others who have legitimate reasons for being on the road late at night, can be accommodated by waivers. If applicants are required to specify hours they need to drive and their route of travel, the proportion of the population requesting waivers is typically small and the effort of issuing them quite manageable. Meanwhile it disarms one of the more persuasive arguments against the night-time restriction.

Apparently, there has been pressure from some quarters to standardize the minimum driving age across Australia. Should standardization prevail, and the minimum age is less than 18 years, the night-time driving restriction might accompany the age reduction. Offering day time operation to an age group that has previously been unable to drive at all may prove more palatable than withdrawing night-time operation to an age group that has been permitted to drive anytime.

Passenger Restrictions

A restriction often considered appropriate to novice drivers is one that would prevent their carrying passengers who are not licensed drivers. The rationale for such a restriction is the risk involved when young people are assembled in one vehicle.

Research shows vehicles with more than one young person in them to be over-involved in accidents.

Some exposure reduction also accrues from the fact that any accidents involving one occupant results in injury to fewer people than one involving many occupants. A reduction in this form of exposure is somewhat offset by the numbers of passengers who end up driving rather than riding, not only maintaining their own risk but creating an additional risk to other road users. The net result of these opposing forces is yet to be established.

Limits to Exposure Reduction

Anything that limits driving exposure necessarily limits mobility. It is no trick to achieve an accident reduction by reducing the chief cause of accidents - driving. If exposure reduction can be justified solely by the accidents it prevents, then there is no limit to its exercise; a restriction that can be imposed upon probationary licence holders can be logically extended to anyone whose risk of accident would be reduced.

The validity of exposure reducing measures among probationary licence holders rests upon the *inordinate* exposure of this group to the risk. The risks addressed by night-time driving restrictions and passenger limitations certainly meet the criterion. While they threaten all drivers, they are greatest among the young and the inexperienced.

MOTIVATION

The extent to which exposure reduction is an acceptable means of reducing accidents will depend upon the value placed on the mobility from which exposure results, an issue destined to be controversial so long as those whose exposure is to be restricted (youth) are not among those who get to rule on the value of mobility (adults). Decidedly less controversial are efforts to reduce accidents by increasing the safety of driving rather than reducing the amount of it. Two routes to increased driving safety are improved motivation and ability. Motivation will be addressed first because of the way in which the exposure limitations just discussed can be regulated to influence motivation.

Efforts to motivate safe driving are welcome regardless of the age or experience of the driver. However, if any subset of drivers warrants being motivated to avoid dangerous situations it is those whose ability to escape such situations is minimal. Two proven means of exercising influence over motivation to drive safely are the removal of *restrictions* and the imposition of *sanctions*.

Removal of Restriction

The single largest reported improvement in safe driving under a probationary licence is that achieved by making removal of the night driving restriction contingent upon maintaining a violation free driving record. In the State of Maryland (U.S.A.), newly licensed drivers faced a 1:00am - 6:00am curfew (now 12:00 - 5:00am) for the first six months of driving under a "provisional" licence period. Relief from this restriction came with six months of violation-free driving. While the night-time driving restriction yielded no significant reduction in night-time accidents, the promise of its removal with six months of lawful driving led to a 10% decline in "traffic violations and a 5% reduction in accidents. The other driving restriction that has been discussed - passenger restrictions - might possibly function in a similar capacity. Since passenger restrictions have never been a part of a probationary licence, there is no way of knowing (in Victoria, passenger restrictions only follow restitution of the probationary licence after a suspension).

No one can say what ingredients of the Maryland Provisional Licence were responsible for its beneficial effect upon day-time convictions and accidents. However, the incentive effect of having the night-time restrictions lifted with six months of violation free driving was apparent in discussions with the affected youth. While most of the provisional licence holders admitted driving during the curfew period upon occasion, they agreed that it was not a pleasant experience and that the opportunity to drive at night with impunity, if they were able to avoid being convicted of a traffic violation, influenced the way they drove.

What made the night-time restriction an incentive to lawful driving was the way in which the length of the restriction was tied to the driving record. Had the duration of the restriction been fixed, the incentive would have been absent. Part of the motivating effect may have arisen from the fact that the reward was six months hence. If provisional license holders had to wait three years, the minimum length of a probationary licence in Victoria, it is doubtful that any licence provision would have had incentive value. While it may be possible to embed incentives within a three year probationary licence, extracting maximum deterrent effect from them would probably require that they take the form of a sequence such that each could be realized within a period of months rather than years. The result would be to allow a progressive lifting of restrictions with lawful driving, something of particular importance in a period when the proficiency of drivers is increasing.

Sanctions

An almost universal feature of probationary licence programs is a lowered threshold to imposition of driving sanctions, such as licence suspension after one or two violations. The sanctions themselves are those imposed upon all drivers. Probationary drivers simply get them earlier, that is, with fewer traffic violations. The results of research conducted in California and Michigan (U.S.A.) shows that substantial reductions in accidents and subsequent traffic violations can be achieved by early intervention in the behaviour of drivers who come to the attention of the licensing authority through traffic violations.

Underlying imposition of driving sanctions is the hope that they will deter unsafe driving acts on the part of the entire driving population, not just those who have experienced the sanction. Publicising the existence of the sanctions, as VIC ROADS does in its P-Plate brochure, gives the sanction the visibility needed to become a deterrent. If the threat of a night-time driving restriction discourages unlawful driving, so too should the threat of licence suspension. But does it?

One limitation of sanctions as a deterrent is their remoteness. Even under probationary licence conditions, drivers must commit a series of violations before a sanction as severe as licence suspension is imposed. While VIC ROADS will suspend licences for a first offence, it is only for very serious violations and for only one month.

How concerned are drivers likely to be about a penalty that is several steps removed? The California Probationary Licensing scheme which suspends licences for a third offence, yielded a barely perceptible 3% decline in accidents among probationary licence holders.

LEARNING

Accident studies reveal a consistent decline in accidents over a 5 - 10 year period following original licence issue, indicating that drivers continued to learn with experience. As much as we might like to compress all the lessons of experience into the period prior to initial licensing, the chances of doing so are slim. The skills required take too long to develop and the need for them is difficult for novice drivers to appreciate without some exposure to the hazards of driving. Typically, beginner drivers are fully occupied in simply keeping the vehicle positioned correctly on the road and out of harm's way.

Efforts to improve the knowledge and skill abilities of drivers beyond those required for initial licensing have been thwarted by the reluctance of licensed drivers to accept instruction. Aspiring drivers will take courses and read a traffic handbook in order to qualify for a licence. However, once the license is obtained, the incentive to learn disappears. Studies have consistently shown that the smallest proportion of drivers - less than 2% - will voluntarily enrol in programs designed to improve their proficiency. Those attending "Defensive Driving" courses were mostly violators and employees of companies as part of their job.

One promising feature of a probationary licence is the two-tier licence process it represents and the opportunity it affords to impose additional requirements upon drivers who are already licensed. Participation in the course or some other learning activity can be made a prerequisite to granting of the regular driver licence. Unfortunately, this opportunity has yet to be taken.

HAZARD PERCEPTION TEST

The VIC ROADS "Hazard Perception Test" (HPT), about to be introduced as a stepping stone to a full licence, will be the first known attempt to upgrade skills of drivers following receipt of an initial licence. Where additional tests have been required for the issue of a full licence, this requirement has been generally fulfilled by re-administration of the same test that was taken for the learners permit or probationary licence.

Establishment of the HPT is based upon recognition that perception of hazards involves a skill that takes time to develop and demands familiarity with the road traffic environment that comes only with experience.

Having been assembled under a tightly compressed time schedule, the Hazard Perception Test as it is presently constituted represents a best guess as to the elements of hazard perception and the means of assessing them. It would be unwise to view the current test as any more, than "Mark 1" in a series of test developments. The automation that the test involves will facilitate improvement by the ease with which it permits changes to be made in the test and evaluation data to be collected after each change.

Developing Hazard Perception Skill

A licence test, in and of itself, does not enhance the safety of motor vehicle operators. Rather, it is the experiences that lead to passing the test that assure the ability to drive safely. The role of the test is to create an incentive to learn. Licence applicants study the Victorian Traffic Handbook to acquire the knowledge that is needed to pass the written test and practise driving under supervision in order to acquire the vehicle control skills needed to pass the road test. Without the test, many applicants might well take to the road lacking: the required knowledges and skills.

If the Hazard Perception Test is to enhance hazard recognition skills, the resources needed to acquire those skills must be available to licensed applicants. Right now, the nature of these resources is unclear. Plans for a pamphlet have been described. However, to the extent that the hazard perception requires a skill rather than just knowledge, the value of a pamphlet or any other written document becomes suspect.

A road-traffic hazard, as the term is popularly used, amounts to a condition that represents potential danger to the driver (it is not necessarily an immediate threat). Hazard perception skill involves the ability to perceive in the characteristics, location, or direction of road-traffic stimuli a condition that will result in danger. The signs of danger range in complexity from something as simple as the activation of reversing lights on a parked car to something as complex as pedestrians about to cross a side street where they will enter the path of a left turning car ahead. Evidence that the perception of these hazards involves true skill comes from the every day observation that the driver's foot is off the accelerator and often on the brake, before, the hazard is recognised. Only those conditions that are perceived as hazardous ever intrude upon the driver's consciousness, a situation that knowledge alone cannot produce.

That skill in the perception of hazards can be gained through written materials is doubtful. Indeed, whether such skill can be developed at all without exposure to real hazards is still something of a mystery. Attempts to develop hazard perception skill have involved use of film, video, flash cards and the car itself (commentary driving). Repeated exposure to hazards has been the mainstay of the films used in simulators employed in many driver

education programs across the United States. However, little or no attempt has been made to evaluate the generality of skills developed through these means.

The properties of the hazard perception test are extremely important since they will determine what drivers do during the probationary period in order to acquire hazard perception skill. However, if drivers are not provided a means of acquiring the skills to be tested, the effort is not likely to lead to measurable improvements in road safety. Of all available communication media, only video or film provide a way of generating the dynamic visual stimuli needed to develop perceptual skill. One option as a resource would be a video made available to probationary licence holders through sale or through rental from 'video stores. A precedent exists in the video version of the Victorian Traffic Handbook, "How To Get Your Licence First Time!" However, whereas that video is an adjunct to the printed handbook, a hazard perception video might form the only route of access to the required skills.

CONCLUSIONS

The Victorian probationary licence offers an unprecedented opportunity to advance the safety of novice drivers through the mechanism it provides for controlling the experiences of drivers prior to the issue of a full licence. Presently, only one element of the probationary licence makes use of this opportunity, the .00 BAC limit which, while capable of reducing the accident exposure of all drivers, is particularly justified among drivers whose skill levels are minimal. Other provisions of the probationary licence vehicle power restrictions, licence suspension, and passenger restrictions - are of limited potential benefit.

The Hazard Perception Test about to be introduced represents an additional opportunity to increase the skills of drivers within the probationary licence structure. How well it exploits this opportunity remains to be seen. Unless some resource is provided to enable young drivers to acquire the skills that are to be tested, there is reason for concern as to the outcome. One option would be a video that could be made available to probationary licence holders through loan, rental, or sales.

An innovation that merits consideration is imposition of additional restrictions upon the driving of probationary licence holders, restrictions that limit drivers exposure to danger and can be used as an incentive to motivate novices to operate entirely within the law during their first few months of operation. A night-time restriction has shown benefit in both these regards. While considerable concern has been expressed about of the public's acceptability of such restrictions, one that could be lifted after six to twelve months of violation free driving would be effective and might prove palatable to the public. Certainly, should the minimum driving age ever be reduced, say in conformity with some national standard, a night-time restriction should be part of the deal.

ROAD TESTING

The road test administered to licence applicants in Victoria is almost indistinguishable from that administered by the majority of jurisdictions in Australia and North America. It amounts to a checklist of driving behaviours. A total of 63 behaviours representing 17 aspects of driving make up the Victorian Road Test. An examiner observes an applicant's performance during the road test and records any and all instances of incorrect performance, that is, *errors*. A score is obtained by totalling the errors. However, the

individual errors are differentially weighted along two dimensions: *magnitude* - most of the errors are classified into two levels, "needs improvement" and "poor", the latter being more heavily weighed than the former, and *seriousness* - the numerical weight assigned to each level of the behaviour varies into terms of how serious an error is judged to be.

FUNCTION OF ROAD TESTS

Before attempting to address problems and needs for the Victorian Road Test, it seems a good idea to consider what a road test is really intended to do. Briefly stated, the purpose of a road test is to assess an applicant's possession of the skills required to operate an automobile in a manner that is consistent with both the safety and mobility of the motoring public. It should pass those applicants who have the skill needed to operate without posing a clear and present danger to the safety and mobility of others and fail only those who cannot. The road test is incapable of identifying who will be "good" and "bad" drivers, research clearly shows that there is no relationship between the way people drive on a road test and the way they drive normally.

The road test assesses skill in two ways. First and foremost, it assesses performance on those driving tasks that require skill, including accelerating, shifting, steering, braking, judging distance, and selecting gaps. Poor performance in tasks indicates the lack of requisite skills. The second way it assesses skills is by evaluating performance on those tasks that do not require skill but must be performed simultaneously with the tasks that do. Examples of these tasks are selecting the correct lane, operating at safe speed, signalling, and adherence to traffic signs and signals. Anyone can perform these tasks correctly if they know what they have to do. When drivers pass the written test but fail to act in accordance with this knowledge on the road test, it is often because they are so lacking in the vehicle control that they must concentrate their attention upon those skills and neglect the road craft skills.

Clearly, road test failures are not limited to applicants who lack skill. Many highly experienced drivers - notably applicants from other states or countries - fail because they neglect to do what they know they should do and are capable of doing but do not recognize as part of the road test scoring system. Most of them return for retesting as soon as they can arrange it and succeed in passing. The initial test administration serves no other purpose than to acquaint them with what they were expected to do.

Limitations of Present Road Test Procedure

The present road test procedure provides a highly structured means of observing and recording the performance of licence applicants. However, two limitations inherent in the procedure employed by the road test are (1) inability to control for variation in exposure to various road and traffic conditions and (2) differences in what examiners look for and the way they score it. The result of these two limitations is a non-uniform test, resulting in scores that depend as much upon where and when the test is taken and who administers it, as it does upon the skill of the applicant.

Lack of Exposure Control

An applicant's score on the road test is determined by the number of mistakes the examiner observes and the weight assigned to those mistakes. All else being equal, the number of mistakes will tend to vary with the number of opportunities to make mistakes. An applicant tested on a road that requires frequent manoeuvres and who is confronted by heavy traffic,

will be exposed to a greater number of errors than an applicant fortunate enough to take the test on a route that involves long stretches of straight driving and who encounters little traffic. The substantial differences that have been observed among examiners in the extent to which they record errors in response to traffic signs, or signals or in making right and left turns are as likely to reveal differences in the characteristics of the routes over which they test applicants as it does differences in the abilities of applicants themselves.

The largest single source of exposure differences in the Victorian Road Test involves vehicle transmissions, where applicants tested with manual transmissions commit ten times the "Engine Control" errors as do applicants tested with automatic transmissions. The fact that they do not exhibit a higher overall failure rate is attributed to their performance on tasks unrelated to the transmission. Yet, of applicants with equal performance elsewhere on the test, those who are examined in a vehicle with a manual transmission are more likely to fail than those tested with an automatic transmission.

Examiner Differences

Research shows that no examiner is capable of observing every error an applicant makes. One source of this limitation is purely physical - the inability to look in more than one direction at a time. An examiner who is observing an applicant's placement of the vehicle-in-lane during a turn cannot at the same time observe the position of the applicant's hands upon the steering wheel. Other limitations have to do with attention. An examiner watching an applicant's head and eyes may not notice when speed is reduced, even though the sensory input associated with each applicant's performance can be received at the same time.

Where examiners cannot observe every aspect of applicant performance they must be selective in what they look at. It is clear that what governs their selectivity is highly idiosyncratic. For example, the percent of tests in which errors of lane use are reported by individual examiners ranges from less than 5% to more than 80% of road tests, a difference not easily attributed to variation and characteristics of applicants or the routes over which they are tested. Similar variation is found in signalling errors, which range from less than 10% to almost 90% of tests.

Consequences of Non-Uniformity

The lack of uniformity resulting from variation in exposure and examiners would not detract from a test's usefulness in an educational setting where the objective is to advise drivers on their faults so that remedial action may be undertaken. But, when the test decides who receives a licence, the lack of uniformity represents a defect in the test. The most serious defect is lack of validity where two examiners score the same applicant differently, they cannot both be correct. While not sufficient for validity, inter-examiner agreement is a necessary condition.

Since validity is of paramount concern to the licensing authority, uniformity itself may be more important to licence applicants. A test that is not the same for everyone is unfair. If the wide variation in pass-fail rates from one examiner to another became public knowledge, the road test would be unlikely to retain whatever credibility it now possesses.

ACHIEVING UNIFORMITY

A step toward uniformity of road testing is the practice of identifying a standard set of observations to be made at various points while on a test route. The use of planned rather than extemporaneous observations characterises a number of road tests employed for licensing purposes in studies conducted in Australia, the United States, and Norway.

The practice is operationally employed in testing applicants for motorcycle and heavy vehicle operator licences in Victoria as well as throughout North America.

The Car On Road Test (CORT)

In 1988 a road test employing predetermined observations was instituted on a trial basis by VIC ROADS under the title "Car On Road Test" (CORT). The trial took place at two locations, Ballarat (August - November) and Dandenong (November - December). Results of the evaluation are fully discussed in the VIC ROADS report "The Evaluation of The Car On Road Test (CORT)". The result of principal interest is a 300% reduction in variation among examiners. However, the pass rates across the two licensing offices still varied remarkably, with 80% of applicants passing at Ballarat and only 35% passing at Dandenong. Much of the low pass rate at Dandenong stems not from the CORT scoring procedure but from "immediate failures", which rose from 20% in the regular road test to 53% on the CORT. Moreover, examiner objections to the provisions of the CORT led to the introduction of "improvements", including abandonment of selected test routes and redefinition of observations. The result of these changes was an increase of the pass rate to 49% but also an increase of variation across examiners. The testing procedures employed by the CORT have also been introduced in New South Wales and South Australia and are expected to become the standard, operational road test.

Objections to the CORT Procedure

It has become evident that much of the difficulty reported in use of the CORT arises from the opposition of examiners to the basic procedures employed. Chief objections are as follows:

Pre-determined Routes. As tested in Victoria, the CORT made use of predetermined routes, with observations being made at specified locations along the route. Examiners claimed that applicants were taught by their driving instructors to memorise the performances by location in order to be able to perform them by rote. If this were true, applicants might pass the test on their knowledge of test routes rather than their skill in driving.

Fixed Observations. The fact that observations of performance are made only at specified location means that errors observed at other locations are not recorded. Examiners objected to their inability to penalise applicants with these errors. Of course, the reason for not permitting the recording of such error is the lack of any corresponding provision for recording what applicants do correctly. Again, the score becomes a measure of exposure as it is a measure of skill. The bias was clear when examiners were permitted to score errors observed outside of the fixed observations through "Special" traffic situations, the result was a 94% failure rate indicating an inability or disinclination to see correct performance.

Insufficient Number of Test Routes. One objection to fixed test routes did not involve the concept but rather the small number of routes and the consequent ease with which driving

instructors could memorise them. Others pointed out that most examiners had a small number of pet routes that instructors also memorised.

Some of the examiner's objections are capable of being accommodated. The system upon which the CORT is based does not necessarily require fixed test routes, the observations that are to be made can be tied to manoeuvres wherever they occur rather than to specific locations. The result is equally objective if carried out properly. However, the burden upon the examiner is increased since the observations associated with each manoeuvre must be memorised rather than read off a route-specific check list.

The examiner objection that cannot be accommodated is that which challenges the defining characteristics of the CORT. Evaluation in terms of how well applicants cope with the tasks that confront them rather than simply the number of errors they commit. It goes against the grain of many examiners to be barred from recording errors in applicant performance that are not part of the "Test". Examiners of this type are not mollified by assurances that the CORT procedure yields more accurate observations of behaviour or that the number of observed applicant errors not recorded is considerably smaller than the numbers of true applicant errors that currently go unobserved. The objections reflect a fundamental conflict between the rationale upon which the CORT is based and that which underlies the procedures employed by most examiners.

Road test examiners tend to view their role as one of fault finding rather than one of skill assessment. They are like detectives seeking clues, the more they can find the better they are. This description does not of course, apply to all examiners, those with relatively high pass rates frequently ignore errors of applicants whom they are convinced are competent to drive, believing that there is nothing to be gained by requiring an unnecessary test. However, no attempt to restructure test procedures is likely to gain acceptance among examiners at large until the objectives of testing are more clearly defined.

IMPROVING TEST VALIDITY

As stated earlier, the examiners who cannot agree cannot both be correct. On the other hand, if both examiners are correct they will agree. One route to greater uniformity in testing is, therefore, making the test more valid.

The primary virtue of the CORT procedure is not that it leads to greater uniformity but that it yields a more valid appraisal of total applicant performance by directing the examiner's attention to those aspects of applicant behaviour that are most critical to safety and mobility at times they are most likely to occur. Research has demonstrated that examiners following the CORT procedure succeed in identifying a higher proportion of the applicant errors actually occurring than do examiners allowed to make spontaneous observations.

One means of reducing the chances that critical aspects of driver performance are overlooked by the CORT procedure is to expand a list of observations that examiners make at any location or during a manoeuvre. An attempt to do this took place with the assistance of road test examiners from several VIC ROADS licence offices, including examiners who have participated in the CORT trials. The participation of examiners in the process was intended not only to make use of their experience and the knowledge of road testing, but also to pave the way for greater acceptance should VIC ROADS decide to implement the CORT procedure. After a lengthy discussion of pre-determined checks, and the group's selection of driving manoeuvres to be assessed by the expanded CORT, each participant was assigned one of the manoeuvres and given responsibility for preparing an appropriate

list of observations. The results are appended to this report. They are not presented as a "test" but rather as a consensus of road test examiners as to what performances should be assessed by a test.

The expanded list of observations reduces the chance of overlooking critical performances at the expense of a greater examiner burden. However, the examiners themselves pointed out that, with repeated administrations of the road test over months and years they would become familiar enough with the observations to be able to successfully observe a greater number of applicant performances than might at first appear possible. Generally speaking, the larger the sample of applicant performances observed, the more reliable will be the estimate of applicant ability.

IMPROVING TEST EFFICIENCY

The net result of more valid and uniform road testing is unlikely to be substantially greater safety on the road. There is no reason to believe that the present road test procedures are unsuccessful in detecting drivers 'whose lack of skill poses a menace to the safety or ability of other road users. Rather, the result is more likely to be greater efficiency in achieving the present levels of safety and mobility by reducing the number of tests that drivers must take before they pass. Few would contest the proposition that a large proportion of test failures consists of drivers who possess the requisite skills and would be likely to pass on the next attempt without any appreciable change in their ability or driving habits. Retesting accomplishes nothing more than doubling the inconvenience and expense. Increasing uniformity and validity of the test as a measure of actual performance should help limit unnecessary testing by reducing the chance that qualified applicants will fail because of the nature or number of road traffic conditions they face. Additional steps that could be taken to improve the efficiency of testing include (1) revising immediate fail criteria, (2) apprising applicants of test requirements in advance, and (3) auditing test results.

Revising: Immediate Fail Criteria

Immediate fails are responsible for about half of all test failures and are probably the leading cause of failures among skilled drivers. Logical justification for failing applicants on the spot would be an incident which reveals that (1) the applicant is so lacking in skills that a fail is a foregone conclusion, (2) the applicant presents a clear danger to the safety of other road users and the examiner, or (3) the test is prevented from continuing by an action on the applicant (eg an accident resulting from an applicant error). The acceptability of some immediate failures under these criteria is questionable. A common source of immediate failures is a "rolling stop" at a stop sign, a response that is both unsafe and illegal but rarely contributes to an accident and certainly does not qualify under the criteria just enumerated. Another is stalling at a busy intersection. While applicants deserve to be penalised for these lapses, causing them to fail the test seems unnecessary and unproductive. It simply adds to the cost and inconvenience of road testing.

Informing Applicants as to Road Test Requirements

Licence applicants may be excused for viewing the road test as being rather like a sports competition in which only one side knows the rules. It is likely that many of the applicants who fail the road test on the first try have the ability to pass but simply do not know what is expected of them (witness the large number who retake the test almost immediately and pass it). Having to take the test once simply to learn the rules amounts to an expensive lesson.

The Victorian Traffic Handbook presumably specifies what the State expects of its drivers. Is it not reasonable to expect anything that is as important enough to be in the road test would also be in the Handbook? With some aspects of driving such an expectation is realised. For example, instructions for responding to a stop sign encompass all the road test scoring criteria. However, other elements of guidelines are less clear. For example, the advice to "check in your mirror often" may not imply that applicants will be penalised on the road test if they fail to meet an examiner's criterion of "often". Some performances are not even mentioned, though applicants are penalised three points if they do not hold the steering wheel in a "ten-to-two" manner although the handbook says nothing about holding the steering wheel.

Any driving practice that is important enough to serve as a basis for granting access to the road is important enough to tell the applicant about. If test requirements, and the criteria used to judge them, cannot be made a part of the Handbook, they should at least be supplied as a separate document, the availability of which is well publicised.

Auditing Examiner Performance

While the introduction of pre-determined test observations should lead to greater uniformity in testing, it will not eliminate differences among examiners. Given the non-uniform character of the testing environment, some discrepancy among examiners is almost inevitable. Systematic routine review of examiner performance is needed to identify those examiners whose deviant scoring is evidence: of eccentricity that goes beyond expected acceptable differences of opinion.

Deviant scoring practices can be largely discovered simply by tabulating test scores. As examiners are identified, the source of their deviant scoring may be discovered through a review of pass-fail rates on individual performances. Methods of training individual examiners lie outside the scope of this report. However, discussion with examiners suggests that efforts which brand individual examiners as deficient or derelict are likely to encounter resistance not only from the offending examiners but other examiners as well. Periodic training sessions in which examiners review their scoring practices and seek greater uniformity among themselves seem likely to be more successful than efforts to impose uniformity upon them.

"Trial" Implementation

One reason that the use of pre-determined observations appears to have encountered less resistance in motorcycle and truck testing than in the testing of car drivers may be the fact that most examiners have known no other system. However, it is the opinion of many examiners that resistance to the CORT was encouraged to some extent by its implementation on a "trial basis". They believe that the tentativeness of the implementation suggested uncertainty as to the merits of the approach.

No road test has ever been experimentally evaluated for its value in preventing accidents since to do so would require allowing some applicants to drive: without having to prepare for a road test, a step no jurisdiction has yet been willing to take. However, there is nothing in the road test procedure employed by Victoria that would suggest that it is failing to fulfil its role of determining "whether licence applicants have reached a level of knowledge and skill consistent with safe operation of a "motor vehicle". However, there is reason to question the efficiency with which the road test function is being carried out.

DELEGATION OF THE ROAD TESTING RESPONSIBILITY

While regulating the access of drivers to public roads is undeniably a government responsibility, such is not necessarily true of all the tasks required in meeting this responsibility. Some licensing tasks may be carried out more effectively or more economically by private industry. One such task is administration of the road test, the most expensive of licensing functions.

South Australian Road Test Program

The benefits of allowing the driver training industry to assume responsibility for examining and certifying the skills of licence applicants is about to be assessed by the South Australian Department of Road Transport. Under a program to be instituted during 1992, the driving training industry will be invited to test and certify the qualifications of drivers seeking licences for various categories of vehicles. Defining characteristics of the program are as follows:

Authorised Instructors will be permitted to administer road tests and certify qualifications of drivers who pass them.

Accredited Instructors administering instruction under the National Driver Training curriculum (Cars), the RIDER-SAFE PROGRAM (Motorcycles), the *Training In Lieu of Experience Course* (Heavy Vehicles) can certify students on the basis of satisfactory assessments during training, without administration of a separate test.

Licence Examiners, in a new position amalgamating functions of the Licence Examiner and Road Safety Officer, will be expected to assume responsibility for training driving instructors and auditing their performance.

The Department of Road Transport (SA) will continue to administer the road test to licence applicants requesting it. However, South Australia expects that the great majority of drivers who enrol in instruction (about 80% of all licence applicants) will seek to take the road test from driving instructors.

Rationale For Delegating Responsibility

The impetus for the proposed change is primarily economic. Fees charged to applicants for road tests cover only about two-thirds of the cost, meaning that the road test operates at a substantial loss. Driving instructors would be permitted to charge whatever the market will bear and would presumably administer the road test at a profit. Over time, the Department of Road Transport (SA) expects to all but phase out its road testing function at a considerable saving. While the motivation for change may be economic, a number of additional benefits are anticipated:

- Upgrading the skills of licence examiners, calling upon them to instruct driving school examiners and monitor their performance, will eventually lead to a higher standard of applicant assessment than prevails at the present time.
- Road tests will be available over more locations and more hours of the day, giving the public greater convenience.
- It may prove easier to impose various innovative requirements upon private driving instructors than upon state licence examiners.

Dangers of Delegating Road Testing

The South Australian program offers VIC ROADS an opportunity to examine the results of delegating the road test function to private industry without entailing the risks attendant to such a drastic measure. That a net benefit will be realised is far from certain.

Simply transferring the road test function from licence examiners to driving instructors represents no economy in the cost of road testing - only in who pays for it. In the future, licence applicants will bear the entire cost of what is now partially subsidised. An opportunity for true cost reduction arises through the medium of the "accredited instructor" who can integrate the testing function into training, exploiting the student appraisal that is already a necessary part of effective instruction. The South Australian experience will reveal the extent to which novice drivers are able to qualify for and receive a licence without a significant increase in the duration or cost of their instruction.

Cause to question the benefits of instructor testing arises from the obvious conflict of interest inherent in allowing the producers of driving skill to evaluate their products. While authorized instructors are not permitted to test their own students, it appears that they are not prevented from testing students of other instructors in the same school. Among the accredited instructors, the merger of teaching and evaluation would make it difficult for even the most conscientious instructor to keep the two functions separate. It is tempting to think that the opportunities the school has for continuing instruction of unskilled students provides a built-in incentive to attainment of minimum skill standards. But, what happens when students cannot or will not afford additional instruction and expect to be licensed anyway? Will instructors pass them to maintain satisfied customers?

The real test of the South Australian program will be the extent to which the transfer of road test responsibility is carried off without a reduction in the safety of novice drivers and the public with which they interact. It is unrealistic to expect accident rates to be sensitive to the manner in which novice drivers are licensed. However, any wholesale relaxation of standards in the interests of customer satisfaction could lead to substantial number of inept novices gaining licences, with an increase in the accident rate among newly licensed drivers during the first months of unaccompanied operation.

Requirements for Delegated Road Testing

When the cost of a government service exceeds the revenues gained, the idea of allowing it to be performed by private industry has appeal. The appeal may be strengthened by an ability to regulate contractors more closely than public employees. However, the potential conflict of interest in allowing driving schools to test their own students should raise a flag of caution. Driving instructors have a strong incentive to see that their students pass the road test - that is largely what motivates students to seek their services. The frequently heard complaint that driving schools simply "teach the test" is a simple reflection of market demand.

In the United States, some 12 States waive the road test for successful completion of driver education. However, successful completion of driver education means a passing grade in a course that typically requires at least 30 hours of classroom instruction and 6 hours of instruction behind the wheel, it is not simply a driver instructor's decision that the students qualify. The notion that a record of achievement in a course of the intensity described might provide a more valid measure of ability than a single road test certainly seems

defensible. The practice is in no way comparable to letting instructors administer the road test or certify their students as qualified to drive.

If one accepts the premise that the purpose of road testing is simply to ensure that novices are sufficiently skilled in vehicle operation so as not to pose a serious threat to the safety of themselves or the motoring public, then it should be possible to entrust the assessment of drivers to other parties. Driving instructors have the advantage of being able to incorporate skill assessment in their instruction, thereby improving both the comprehensiveness and economy of skill testing. However, to avoid diluting standards, a number of safeguards must be employed, including the following:

- Specifying minimum standards of training in order to prevent competitive erosion of instructional content and duration.
- Specifying road test observations and scoring procedures as objectively as possible.
- Having VIC ROADS examiners administer road tests to random samples of applicants passed by instructors-
- Auditing adherence to standards by having VIC ROADS examiners participate in courses incognito.

CONCLUSIONS

Approximately one-quarter of the applicants taking the Victorian Road Test fail. While data on the issue is unavailable, it is certain that first-attempt failure rates on the examinations are lower than this figure since almost everyone ultimately passes the test on a subsequent attempt.

The alacrity with which most of those who fail the road test retake and pass it suggest that they possess the ability to pass it the first time. If this is true, it means that considerable inconvenience and expense has been unnecessarily incurred. Two sources of this inefficiency appear to be (1) failure to inform applicants as to what is expected of them on the road test, and (2) lack of uniformity among examiners in scoring road test performance.

With respect to the first point, applicants currently lack any proper source of information for driving performances that will be evaluated on the road test or the criteria that will be employed in evaluating them. The current Handbook is incomplete in this regard.

Steps that may be taken to achieve greater uniformity in testing are (1) clarifying the purpose of the road test as one of assuring minimum knowledge and skill rather than fault finding, (2) making use of pre-determined observations in which applicants are scored on how well they carry out specified performances rather than the number of errors that examiners notice, (3) routinely auditing examiner performance to identify the magnitude and sources of variation among examiners and (4) conducting periodic reviews to enable examiners to collectively examine their performance and refine their criteria.

VIC ROADS has an opportunity to monitor the delegation of road testing to private driving instructors in South Australia. In view of the obvious opportunity this practice offers, for conflict of interest, close attention should be paid to the nature and effectiveness of efforts to maintain testing standards and prevent unqualified drivers from being licensed.

DRIVER TRAINING

Studies of accident rates by years of experience show a steady decline over several years following original licensing, regardless of the age at which licensing occurs. While the decline applies to all categories of accidents, the advantages of experience appear to be relatively greater in preventing collisions with other roads users while age plays the greater role in preventing single-vehicle accidents. Examination of the accidents themselves reveals that the lessons of experience do not necessarily primarily involve the development of skills but rather the accumulation of knowledge - information about where to look, where to place the vehicle, when to slow down, when and how to communicate intentions. The recognition that these subjects can be easily taught at outset has encouraged making driving the subject of formal instruction at the secondary school level in the United States. Such instruction may also become a substantial industry throughout Australia.

Despite the size of the industry it involves, driving instruction seems unlikely to have much impact upon road safety in Victoria. This limitation applies to all three major categories of drivers: novices, experienced drivers and traffic offenders.

Novice Drivers

The training of novice drivers throughout Australia is a customer-driven service. The service that most customers appear to be seeking is assistance in passing the road test.

The extent to which current instruction focuses upon the performances evaluated on the road test (frequently taking place on road test routes) reflects this orientation. While individual instructors may recognise the need for more comprehensive instruction and safety practices, their efforts are limited by what customers were willing to pay for.

Experience would indicate that the only way to broaden the scope of driver training beyond the specific demands of its clientele is through the imposition of standards along with some incentive to drivers to enrol in courses meeting the standards. In the United States, driver education is taught as part of the secondary school curriculum established by the school system. The most common standard involves 30 hours of classroom instruction and 6 hours of actual driving. The incentive to take the course is a very low fee, if any at all. In some States, completion of an approved driver education course is a requirement for anyone seeking a licence under age 18 years. Standards themselves are meaningless in the absence of some incentive for schools to teach it and students to take it. With the world economy as it is, this is not a suitable time to introduce standards for compulsory driver training. In the United States, driver education courses that reached over 80% of eligible youth in the 1970's are now available to less than 50%, and the number continues to decline.

The objective of this discourse is not to encourage establishment of training standards but simply to point out that no substantial change in the nature of driver training is likely to occur without them. It is pointless and unfair to criticise driving schools for providing what their clients demand.

EXPERIENCED DRIVERS

The need for experience in the development of higher level driving skills is discussed in connection with Probationary Licences, as is the 'benefit of this licence as an incentive to the acquisition of such skills. Two types of advanced skills have been taught to experienced drivers:

Perceptual Skills - the skills involved in assessing gaps, judging closure, and identifying hazards.

Motor Skills - skills involving controlling the motion of the vehicle to swerve, stop quickly, and recover from skids.

While courses in vehicle control skill have been frequently taught, their widespread introduction has been hampered by their high costs (the use and abuse of vehicles) and evaluations showing they may amount to a safety disbenefit. While training in perceptual skills has not been evaluated as an accident countermeasure, it is non-controversial and relatively inexpensive to conduct. What has inhibited such instruction to date is primarily the lack of an incentive as noted earlier. Less than two percent of licensed drivers will volunteer for advanced instruction. While the probationary licence provides an incentive, a suitable means of developing skill has yet to be advanced. Programs of instruction offered by schools such as the Driver Education Centre of Australia (DECA) (while offering valuable instruction from qualified instructors with impressive facilities) reach a very small proportion of Victoria's drivers.

The development of hazard perception skills represents a particularly appropriate target for efforts to advance the ability of experienced drivers. However, the Hazard Perception Test itself, in the absence of any systematic program for developing the skills assessed, is unlikely to have the impact of the level being sought. While the mental correlates of hazard perception skill are not well understood, they apparently involve associations among stimuli beyond what are capable of being achieved through pure cognition. Knowing about driving hazards is knowledge, skill in recognition requires experiencing them.

The most ambitious attempt to develop skill in hazard perception is found in the use of simulators widely employed throughout the United States as an instructional aid in driver education. Introduced primarily as a means of reducing expensive in-car instruction, simulators enjoy one important advantage over in-car instruction, the ability to expose students to large numbers of road-traffic hazards in complete safety, registering and recording student responses.

Widespread introduction of simulators to help drivers pass the hazard perception test is clearly unsupportable. However, the simulator's capability lies not in its hardware but in the visual display. The ability of students to develop the associations involved in hazard perception skill might well be developed simply through watching films or videos. An example of skill in hazard perception might be perceiving that an oncoming vehicle overtaking a car about to leave the kerb might attempt to drive around it and enter our lane. One close call might be all we would need to perceive the danger and react to the developing situation.

A set of videos, presenting a variety of hazardous situations might be sufficient to develop several skills similar to those that arise through near accidents in real traffic.

The critical ingredient of skill training is a pattern of stimuli giving clues to a hazardous situation, near collisions that materialise without any warning at all are not useful in developing perceptual skill. The intent here is not to track the course of instruction in hazard perception but to stress the importance of such instruction. The hazard perception test offers the opportunity to make development of higher level skills a condition for securing a full licence, an opportunity that cannot be missed.

TRAFFIC OFFENDERS

Under Victoria's point demerit scheme, drivers who compile 12 points in any 3-year period are eligible for licence suspension. Only by the terms of suspension do they get to retain their licence. This practice contrasts with that employed in many other jurisdictions, where drivers can avoid suspension by agreeing to participate in a corrective training program. Frequently, courts will allow corrective training to mask violations from the licensing agency so that the points are never assessed. This option is also unavailable in Victoria. Would the cause of safety be advanced by allowing traffic offenders to trade participation in corrective training for the imposition of licence sanctions?

Several studies have shown that a corrective training program designed specifically for traffic violators, involving a review of their record and the consequences of additional violations, yield a lower rate of recidivism than taking no action at all. However, a study comparing corrective training with licence suspension showed the latter to have the greater effect upon probationary licence holders, women tend to be deterred by the prospect of suspension and men by the experience of it. According to these findings, any attempt to introduce corrective training as an alternative to licence suspension cannot be justified.

What about corrective training where licence suspension is not an option? Is it necessary to wait until a driver has accumulated two or more traffic offences before taking any action? Since corrective training has shown itself to be superior to no action at all, it appears to be a viable option, particularly when it is offered at the expense of the traffic violator rather than the public.

The problem is one of finding a suitable incentive to induce participation when it cannot be traded for suspension. The most common inducement widely used by magistrates in the United States, is the offer to mask offences by withholding reports to the licensing authority. The unfortunate consequence of this practice is that magistrates, having no way of knowing how many prior offences a defendant may have committed, may extend the same option to someone who has already had the "benefit" of corrective training. If corrective training did not work the first time, why offer it again? Allowing offenders to mask their offences by participation in corrective training appears to be counterproductive as a means of reducing recidivism.

An alternative option would be to allow offenders to elect corrective training before they are eligible for suspension - say, at 6 points. The inducement would be to expunge the points from the driving record. This process is not the same as masking violations since offences have come to the attention of the licensing authority, and can be considered in the event of subsequent violations. The corrective training option would be offered once.

In sum, licence suspension is an effective and cost-beneficial way of deterring recidivism among frequent traffic offenders and deserves to be retained. The corrective training option merits consideration only where licence suspension is not an option and only where it is controlled by the licensing authority so that it cannot be used to circumvent the demerit point system.

CONCLUSIONS

VIC ROADS is not presently involved in the training of drivers prior to or following initial licensing, or upon commission of traffic offences. Nor, is there any compelling reason for it to become involved. While driving school instruction focuses primarily upon skills

needed to pass the road test to the exclusion of broader safety practices, this orientation reflects the desires of its customers. Training could be broadened only through the imposition of standards and the standards enforced only by making training under them a condition for licensing. While safety-oriented driver education courses have shown some effectiveness in reducing accidents, the training required was extensive and costly. The current economic situation would not encourage such a step.

The present road test appears to be sufficient to ensure that new licensed drivers possess the minimum skills required for safe access to the road network, while the knowledge test in conjunction with the Victorian Traffic Handbook, ensures that drivers possess a knowledge of safe driving laws and practices. As fully discussed in connection with the Probationary Licence, acquisition of higher levels of perceptual and motor skills rests upon mastery of more basic skills through practise following licensing. The Hazard Perception Test exploits the probationary licence as a vehicle for enhancing perceptual skills. However, if it is to be successful, probationary licence holders must have a means of developing hazard perception skills. By their very nature, these skills cannot be acquired solely through written material, nor can driving schools be relied upon to meet the need. Because of their highly visual, dynamic nature, skills in hazard perception lend themselves to the use of video, which could be made available to applicants on a loan or a low cost rental basis.

Traffic violators in Victoria are not offered corrective training but rather threatened with licence suspension, recognising that the genesis of their offences lies in lack of motivation rather than lack of ability. The current practice is supported by evidence showing that suspension is the more effective deterrent to recidivism. While corrective training might be introduced at lower point levels, where suspension is not considered viable, it must not be allowed "mask" offences and thereby delay or prevent more drastic action in the event of recurrences.

MOTORCYCLE RIDER TRAINING

Recognising the danger inherent in the motorcycle's relative lack of stability, conspicuity, and protection, Victoria has encouraged development of safe operating knowledge and skills by making available and partially subsidising motorcycle training. In this regard, it is following a practice employed by other States in Australia and the United States that support motorcycle training through funds gained from motorcycle operator licence fees and vehicle registration fees.

Recently, consideration has been given to making motorcycle training compulsory for licence applicants who have not been previously licensed to operate motorcycles. Such a requirement has already been imposed upon applicants in South Australia. This section of the report will address the advisability of making motorcycle training a part of the licensing process, whether voluntary or compulsory. The licensing process itself will not be addressed, the practices employed by Victoria in licensing motorcycle operators represents the best that is available. Indeed, in conducting both off-road and on-road tests at various licence stages, Victoria already takes greater pains to ensure the standards of its applicants than do most other jurisdictions.

MOTORCYCLE TRAINING AND EXPOSURE

The first requirement for any public health measure is that it should not cause harm. Whether motorcycle training can pass this test is uncertain. The potential for harm comes from the possible effect of instruction in encouraging people to ride motorcycles and thereby exposing them to injury from motorcycle accidents.

The role of vehicle training in accident exposure has been hotly debated over the past two decades. The debate largely focuses on the operation of automobiles by youth and the observation that public support of driver education in the United States has been associated with early licensing. Early licensing leads to early driving which, in turn, leads to early accidents. However, this does not mean that driver education causes accidents. Such a relationship is simply the result of *raising* the minimum age for licensing without driver education, taken as a means of inducing participation in driver education programs. The issue is truly one of minimum licensing age, not driver education. It involves the minimum age at which the liabilities of exposure: are offset by the benefits of mobility. This is a difficult issue to resolve.

In moving from four-wheel to two-wheel vehicles, the resolution is easier. Automobiles and motorcycles differ substantially with respects to both (1) the extent to which exposure is offset by mobility and (2) the extent to which it is encouraged by instruction.

Exposure and Motorcycle Riding

Being allowed to operate an automobile is not only a benefit but, in any modern society, virtually a necessity. The only question is at what age this situation should begin. Rarely, however, can the operation of a motorcycle be deemed a necessity. The argument that motorcycles provide a very economical form of transportation to those who cannot afford automobiles applies only to smaller, low powered motorcycles. Whatever small advantage motorcycles might enjoy as an instrument of mobility is lost in their extremely high per-kilometre injury rate, which exceeds that of any four-wheel vehicle by a factor of five.

Obviously, there are benefits to motorcycle riding that riders believe exceed the dangers to which it gives rise. Their freedom to make these trade-offs is not disputed. However, the unequal balance of exposure and mobility certainly would not justify any effort on the part of the state licensing authority to encourage motorcycle operation through the expenditure of public funds on programs that provide both instruction and motorcycles to those who might otherwise not be able to ride. Yet, this is the situation that prevails in Victoria. While the funds for instruction may come from motorcycle licence and registration fees, they are public funds and do not come primarily from the recipients of training.

Exposure and Training

If encouraging motorcycle operation cannot be justified by the mobility it provides, then public support of motorcycle training can only be justified to the extent that it reduces exposure. Does it?

Motorcycle training can be divided into two phases:

- *vehicle control*, where students learn how to make the motorcycle go where they want it to go, including starting, accelerating, balancing, steering, and braking.

- *safety practices*, where students learn to protect themselves from the hazards of the road and other users, rules of the road, search, communication, speed, space, hazard perception and handling emergencies.

Whatever safety or benefits accrue to motorcycle instruction, come primarily from the second phase. The first phase is clearly exposure inducing in the sense that, generally speaking, only those who can make the motorcycle go where they want it to will take it on the public roads and expose themselves to crashes.

If learning how to ride a motorcycle increases exposure, the question to be addressed is whether the public funding of motorcycle instruction encourages such learning. Since there have been no empirical studies of this issue, we can only judge from the characteristics of such instruction whether it is likely to encourage riding by those who would not otherwise do so, or whether the student population comes from the ranks of those who would have ridden motorcycles anyway. Those who believe instruction encourages riding point to the low cost to the student as well as the loan of motorcycles.

Without both of these they believe many students would not have an opportunity to learn. Proponents of instruction point to the numbers of applicants who are deterred from pursuing a license by the need to enrol in training as well as the numbers of enrolled students who are discouraged by what they learn from riding before being committed to it by investing in a motorcycle.

The question of whether or not formal motorcycle instruction increases exposure could be circumvented by confining its scope to the safety practices, that is, accepting as students only those who have mastered control of the vehicle and have already evidenced commitment to riding through the purchase of a vehicle. Whether or not safety-oriented instruction was effective in reducing accidents, motorcycle training could not easily be accused of encouraging exposure. The test currently given for issuing of a learner's permit could form a training pre-requisite. Only those who show they have mastered the basic operating skills will be offered training. However, training would still be required for granting of a motorcycle licence.

Instruction in the basic operation of the motorcycle is, because of its demand for motorcycles and low student-teacher ratio, the most expensive to conduct. The level of funding required for a course confined to safety of operation would be a fraction of that required for present instruction.

Inducements to Participation in Motorcycle Safety Instruction

Since studies have shown that less than two percent of licensed vehicle operators will voluntarily enrol in a program intended solely to enhance their safety, some inducement to enrolment will be needed to attract appreciable numbers to motorcycle instruction. The most effective inducement to training is a law making it a requirement for licensing. As noted at the beginning of this discussion, South Australia has set a precedent in compulsory motorcycle instruction. While a course limited to safety training might not be as palatable as one that gives instruction in basis operation, neither would it be as costly the present subsidy might well cover the entire cost of training.

An alternative inducement, direct payments to students in cash, while not a good candidate for motorcycles at least deserves mention. In the United States, manufacturers of All-Terrain Vehicles ¹ (ATVs) consented not only to provide free instruction to vehicle purchasers and their families but also to provide a \$50.00 per vehicle payment for enrolment. The result was between 30 and 40 trainees per vehicle purchased.

Effectiveness of Motorcycle Training

While evidence that motorcycle instruction does not cause harm would remove a barrier to its implementation, supporting it through public funds or making it compulsory might reasonably demand evidence of its effectiveness in reducing accidents involving motorcycles. Unfortunately, such evidence has not been forthcoming. This does not mean that motorcycle safety instruction is ineffective. A truly conclusive test would require the assignment of students to training on a random basis, something that has not been possible for beginning rider instruction. However, a random experimental study was successful in showing that a three-hour emergency skills training program taught to riders who had already mastered basic controls skills showed that there was approximately a 20% successful reduction in subsequent accidents.

The only evidence as to the effectiveness of motorcycle training in Victoria comes from a comparison of accidents prior to and following implementation of the learner permit program and the skilled rider program. The highly favourable outcomes attributed to training in these comparisons need to be viewed cautiously in light of evidence from more controlled experimental studies, none of which showed training to be effective.

MINIMUM LICENSING AGE FOR MOTORCYCLE RIDERS

In Victoria, as in most jurisdictions, anyone who is old enough to drive a car is also eligible for a motorcycle operator's licence. It is therefore possible that a new licensee's first exposure to traffic may occur on a motorcycle. Is this a good idea?

We know that the first months of driving are the most dangerous, at least on a per kilometre basis. The absolute risk of an accident occurring and the relatively high initial accident rate, are about the same for cars and motorcycles. However, because of the lack of protection afforded to the motorcycle rider, the chances of being injured in an accident are some five times greater on a motorcycle. Would the cause of traffic safety not be advanced by requiring that anyone's initial encounters with hazards of traffic occur within the protective shell that an automobile provides? The answer is obviously "yes". Such a situation could be achieved through a law preventing probationary license holders from applying for a motorcycle learners permit until a fixed period following the issue of their automobile drivers licence. Whether such a requirement would prove acceptable to motorcycle riders is another matter.

Prohibiting large numbers of motorcycle enthusiasts from gaining a licence could produce a wave of opposition to such a measure. While data on driving experience on motorcycle applicants in Victoria is unavailable, studies elsewhere have shown the age distribution of motorcycle riders is such that all but a small fraction come from age groups likely to have drivers licences. Opposition from riders themselves is therefore likely to be minimal

¹ 3-wheel, off-road vehicles

CONCLUSIONS

The motorcycle training currently being supported through public funds (from all motorcycle riders) in Victoria may serve to increase accident exposure by encouraging motorcycle operation by those who would not take it up if such required acquiring a motorcycle and instructing themselves. The possibility of fostering exposure, along with the question as to legitimacy of its involvement in teaching how to ride motorcycles, should lead to re-examination of VIC ROADS role in motorcycle instruction, particularly considering the failure of research to find safety benefits in motorcycle training that would offset the effects of increased exposure.

Whatever benefits are derived from motorcycle training come primarily from instruction specifically aimed at enhancing safety upon instruction that can be provided to licence applicants who have already acquired the basic operating skills. Indeed, the only motorcycle program that has conclusively demonstrated an ability to reduce accidents is a 3-hour emergency skills course that was only offered to those who could ride well enough to seek a licence.

A course aimed exclusively at enhancing the safety of already qualified riders, in addition to being free from the possibility of encouraging exposure, is considerably less costly than one that includes basic operating instruction as well. As a consequence, it is more readily funded and supported through the fees obtained solely from the applicants. However, since it is largely the exposure generating elements of the course that attract students, a safety program will, in all likelihood, have to be made compulsory if it is to have an appreciable impact upon motorcycle safety. As noted in the discussion of probationary licensing, safety-oriented motorcycle training may be most effectively introduced after some experience in operation of motorcycle has been gained.

AUTOMATED TESTING

An automated licence test employed by VIC ROADS at its Camberwell Registration and Licensing office displays questions in text format and permits applicants to register their responses by touching the selected answer on a touch-sensitive screen. Alternatively, they can elect to bypass the item and answer it later. In either case, they may touch the instruction that directs the computer to proceed to the next question. Colour coding of alternative responses minimises the chances of applicant error in selecting a response. Following completion of the test, results are displayed at the test administrator's terminal and printed out for the applicants. The printout presents the number of questions answered correctly and incorrectly. For each question answered incorrectly the applicant is referred to the relevant chapter of the Victorian Traffic Handbook.

Applicants can elect to receive questions aurally in addition to the written form, but this option does not constitute an "oral" test. In the absence of any pictorial representation of answers, applicants who cannot read have no way of matching of what is on the screen with what they have heard. Therefore, they would be at a distinct disadvantage in attempting to recall the alternatives and registering their selection.

GENERAL BENEFITS OF AUTOMATED TESTING

The potential benefits of automating the written licence test include the following:

Labour saving - relieving the examiner of test scoring and debriefing functions;

Accuracy - eliminating the chance of error in scoring items and totalling scores;

Versatility - allowing a wide range of question and answer displays, including realistic motion.

Individualization - allowing the items making up anyone test to be drawn randomly from a large pool.

The ability to inform applicants of the correct answers to questions without allowing them the chance to change the responses they have selected is often presented as a learning benefit. Given the large amount of information for which applicants are held responsible, the limited feedback provided by the test is of meagre benefit. The appropriate source of the information required to pass the test is the Victorian Traffic Handbook. To the extent that feedback may discourage recourse to this source, it is a possible disbenefit.

ENHANCEMENT OF THE VIC ROADS AUTOMATED TEST

The VIC ROADS automated test system has been introduced on an experimental basis and has not as yet had the opportunity to realise the full benefits of automation. Automating the scoring and debriefing functions are of only minimal benefits since these activities do not require much of an examiners time. The accuracy and reliability of automated scoring is deemed a significant advantage.

The benefits realised from automated testing could be enhanced by expanding its capabilities. Candidate capabilities include the following:

Individualisation - plans call for developing a large item pool and selecting randomly from it to create individual tests. This improvement would require no substantial change in the equipment.

Graphics - Since driving on a highway is a visual activity, the ability to present questions in graphic form can enhance the validity of knowledge testing. While written tests can accommodate graphics as well as an automated test, they cannot depict the movement involved in driving. Although the present VIC ROADS configuration does not provide moving graphics, it could easily do so and will, with full implementation of the Hazard Perception Test.

*Aural Testing*² - For reasons noted previously, the VIC ROADS automated test is not suitable for use with illiterates. This limitation could be overcome through the use of pictures to represent what is now presented in textual form, with the sound track to present information aurally. Such modification would create an automated version of the hard copy "pictorial" test used throughout the United States. In the pictorial test, each alternative answer is represented by a picture which attempts to present graphically what the examiner has just described verbally. The translation of words into pictures allows applicants to survey all alternatives simultaneously in reaching a selection, just as literate applicants survey all written alternatives. A fuller description of an automated aural test appears in the next section.

² We shall use "aural" to contrast a test one hears rather than reads, and "oral" for a test an examiner reads aloud.

Vision Testing - The benefits of automation would be further exploited by inclusion of vision testing among the functions to be tested. Symbols such as letters or Landoldt rings could be displayed on the terminal screen and applicants directed to touch the specified symbol." The size of symbols would be progressively reduced to one corresponding to 20/40 acuity. The only modification to existing test equipment needed would be to provide a means of maintaining the applicant's head and eyes at a fixed distance. Instructions on the screen might direct them to swing out a head rest or chin rest containing a pressure bar which must be activated before the test will commence. In addition to saving of labour, an automated test can maintain fixed contrast levels, a condition that does not prevail in present vision testing.

Applicant Information - Applicants currently fill out application forms containing data that must be manually entered in creating a driver record. Much of the labour involved in transcribing information could be avoided by calling upon applicants to enter the necessary information at the automated test terminal. With appropriate prompts, the task could be made simple enough that any literate applicant could key in the necessary information. The feasibility of entrusting this task to applicants is enhanced by a growing computer literacy in general and exposure to data entry task through automated teller machines, telephone banking, and similar automated system. Of course those who cannot cope with automated data entry could use the standard written application form.

TEST APPLICANTS WITH LITERACY DIFFICULTIES

As just noted, the VIC ROADS automated test equipment, while capable of presenting information aurally, is rendered unsuitable for illiterates by the textual nature of the visual presentation. The use of pictures to represent aurally delivered verbal presentations provides a means of allowing applicants to choose among alternative responses. With the advent of the Hazard Perception Test, and the introduction of its dynamic images, the ability of automated test equipment to communicate questions to illiterates should equal or surpass the ability of the written test to communicate questions to literate applicants.

An Automated Aural Test

One State in the United States (Arizona) introduced automated testing of illiterates and found the system capable of replacing examiner administered aural tests in the two languages for which written tests were available for literate applicants (English and Spanish). The test employs a videodisc system to allow questions to be selected on a random basis and presented in audio visual form.. The stem of each question, and the three alternative responses, are presented serially, using motion where it is appropriate to the question. Then, key frames from the question stem and each of the alternative responses are presented simultaneously in split-screen form, each frame being highlighted as the corresponding text is repeated (to allow applicants to connect the frames with the alternative answers). Applicants then select the desired alternative by touching the appropriate frame on the screen.

Pass rates for the automated aural test were extremely low until an audio version of the Driver Handbook was prepared and made available to applicants prior to testing. All applicants were required to watch the video in the licence station before taking the aural test. Those who failed were encouraged to view it again at their leisure by borrowing

copies from the Licence office, local library, or neighbourhood video store. The pass rate immediately doubled.

Advantages of Automated Aural Testing

The advantage of an automated aural examination is its ability to test more economically and validly than an examiner administered oral test. The potential cost savings is equal to the amount of examiner time currently involved in oral testing, which amounts to approximately one-third of a person year each year in Victoria. The cost of equipment, approximately \$10,000, would be recouped in about a year. With implementation of the Hazard Perception Test, the cost would be almost be non-existent.

The greater validity of an automated test comes from its ability to present the dynamics of motion, an important element of most questions related to driving. People who have difficulty handling the verbal symbols of written language often have difficulty with other symbols, including the use of the spoken word or static pictures to represent the dynamics of driving. Research shows that dynamic visuals lead to better comprehension of questions involving motion than either text or static pictorials.

Use of an automated test for applicants with literacy difficulties is of little value without some means of communicating the information needed to pass the test. The video "How To Get Your Licence for the First Time!" may well suffice for this purpose, particularly if the questions making up the test are confined to information presented in the video. It might be necessary to provide a means by which these applicants can rent the video or view it a licence office, in order that they may come qualified to pass the test without having to purchase the video.

CONCLUSION

Automation can lead to substantial increases in the economy of licence testing if its role is expanded from mere automation of the written test to testing vision, hazard perception, and knowledge of illiterate applicants. With respect to applicants with literacy difficulties, it can also lead to more valid knowledge testing and, accompanied by a video version of the Victorian Traffic Handbook, can become an accident countermeasure.

ELDERLY DRIVERS

The proportion of the driving population falling in the "elderly" category is increasing and will rise sharply over the next 20 years as the Post World War II high birthrate group reaches advanced years. In terms of raw accident involvement, the elderly do not constitute a problem. As an age category, their relatively small numbers in the driving population result in small numbers of accidents. Even on a per-driver basis, their accident rate is as low as any age group. However, any time they drive, they pose a threat, the per-kilometre accident rate begins to climb sharply around age 70 and continues upward. Fortunately, their mileage also declines. Their low per-driver rate is a result of reduced travel which to some extent, may be evidence of self-imposed exposure reduction. While the absolute numbers of accidents resulting from elderly driver deficiencies are small, victims of such accidents are not mollified by this fact and particularly when the nature and magnitude of the deficiency is so obvious.

The consistent overall increase in accidents per-kilometre with age does not correspond to a universal decline in ability to drive safely; many elderly drivers are as safe as they ever were. Rather, it results from the increasing *numbers* of drivers who are affected by physical and mental disabilities that stand in the way of safe driving. Those disabilities that are of traumatic origin, such as stroke or heart disease, are generally well recognised by the drivers as well as the physicians, occupational therapists and other medical professionals treating them. The challenge to licensing comes from the elderly whose deficiencies are insidious, resulting in gradual and imperceptible declines in the ability to drive safely. These deficiencies include declining ability to see well, process information, judge speeds and distances, attend to the highway traffic environment, remember directions and warnings and so on.

When driver deficiencies result in manifestly unsafe or disruptive behaviour, drivers may be reported to the licensing authority by police, physicians, or relatives. However, for each elderly driver so reported, there are undoubtedly larger numbers whose observed deficiencies go unreported, and much larger numbers whose deficiencies are never even observed - until an accident occurs.

REPORTING OF DEFICIENT DRIVERS

One means of identifying drivers whose ability to operate safely may be questioned, is to facilitate reporting by those who have had an opportunity to assess these deficiencies or witness their effects. Such informants include police, medical professionals, relatives, and friends. Ways of facilitating reporting would include the following:

Better identification of deficiencies. The objective here is two-fold. Firstly to enable potential informants to increase both the number of deficient drivers who are identified and secondly to assure that those so identified are truly deficient. On the first point, people who are reluctant to expose an elderly driver to licence action often attempt to explain away unsafe behaviour as being due to traffic conditions, other drivers, or temporary infirmities. Conversely, some people who see but one occurrence of unsafe behaviour on the part of an elderly person may attribute it to age when it is only an occasional lapse of the type that can afflict any driver. Helping people to better identify the signs of age-related driving deficiencies protects both the public and the elderly driver.

Protection of Informants. People who have witnessed the deficiencies of elderly drivers are often reluctant to report them out of fear of possible consequences. Friends and relatives fear the animosity of the elderly person when they learn the identity of the informant. Physicians may fear loss of a client or the possibility of a law-suit. Police may fear that administrative follow-up will take time away from their primary enforcement duties. The resolution of this problem involves policy issues that cannot be addressed in this report. However, if elements of the public are to be called upon for assistance, they must be encouraged to do by minimizing the adverse consequences.

Equitable Treatment. Potential informants are more likely to report deficient drivers if they believe appropriate action will be taken and that the reports will neither be ignored nor result in the driver being treated harshly. A way in which deficient drivers are handled will be addressed later. The objective here is to see that informants are given assurances that will encourage their intervention.

DETECTING AGE-RELATED DRIVING DEFICIENCIES

The greatest challenge to driver licensing presented by unsafe elderly drivers comes from those whose deficiencies have gone unnoticed by others, and often by themselves. One way of identifying these drivers is through frequent comprehensive renewal examination. Historically, most jurisdictions in the United States have required such re-examination every three to four years, many of them increasing the frequency of re-examination beyond age 70. Because of the expense involved in periodic determination, an increasing number of states have reduced the frequency of re-examination for all drivers while others, in fear of being labelled discriminatory, have abandoned separate re-examination schedules for the elderly.

Presently, Victoria renews all driver licences at 10 year intervals. From a safety viewpoint, 10 years may be too long, even for young drivers. Deterioration in vision, and a variety of other infirmities can occur at any age, going unreported without re-examination. However, the frequency and extent of decline among the elderly people makes the need for careful monitoring of this group particularly critical. Without it, the rising numbers of elderly people will bring an increase in the number of accidents attributable to drivers who were not equipped to operate safely, at least under the conditions in which they were driving.

Currently, the road test is the primary basis for deciding who retains a licence, just as it is for deciding who gets a licence in the first place. Among the elderly, a road test is well-suited to identification of drivers with motor and psychomotor deficiencies reflected in inability to handle a vehicle. However, a road test is not particularly useful in detecting sensory, perceptual, or cognitive limitations. Even in assessing the psychomotor skills involved in vehicle handling, the standard road test is inadequate. Road tests are best given to drivers already known to have deficiencies that impair vehicle control and administered by medical professionals with specific knowledge and experience in recognizing driving related problems and their implications for driving restrictions.

Research is underway to develop automated psychophysical test measures that will permit rapid screening of drivers to reveal types of related deficiencies in functions known to be related to automobile accidents. The objective in designing such measures is to allow rapid screening of all elderly drivers. Those whose performance reveals no deficiencies would be quickly cleared. Those who display significant shortcomings in one or more functions would automatically undergo a more thorough, diagnostic series of tests aimed at assessing the nature and magnitude of their limitations. The measures that are under study can be administered by the same equipment used in the Victoria automated knowledge test and the proposed Hazard Perception Test.

DRIVING RESTRICTIONS FOR THE ELDERLY

To many, restrictions in elderly drivers means getting them "off the road." While this may be the only option in some instances, it should be viewed as a last resort. The objective in restrictive (conditional) licensing should be to give the elderly the maximum mobility possible without threatening the safety or progress of other road users. Alternative options include:

Night restrictions for drivers whose deficiencies are largely visual, such as low day acuity, night acuity, or low-contrast acuity.

Low density traffic (non-rush-hour) for drivers with deficiencies in attention, information processing, form/motion detection or choice reaction time.

Familiar route (e.g., back and forth to supermarket) for drivers with poor short-term memory, attention span.

Even with such restrictions, many elderly drivers will present a higher risk when they are on the road than do other drivers. However, in addition to altering the conditions of driving, these restrictions also limit the total amount of driving with the result that, on a per-driver basis, the risk they present to the public is no greater than that of the driving population at large.

Eventually, deficiencies are likely to reach a point where any driving at all is dangerous. Therefore, drivers under restriction may require re-examination at more frequent intervals than drivers whose previous assessment disclosed no significant deficiencies.

CONCLUSIONS

The number of drivers with age-related deficiencies that adversely affect their safety of vehicle operation will climb substantially over the next two decades. Those of gradual rather than of traumatic origin are often difficult to detect and therefore go unnoticed.

One way of increasing the likelihood of detection is by encouraging and enabling police, medical practitioners and related professionals, relatives and friends to bring deficient drivers to the attention of the licensing authority. Of value are guidelines that will permit each category of potential informant to better recognize signs of deficiency as well as providing ways of protecting them from recrimination by drivers they have identified. At the same time there is a need for mechanisms to guard against false reporting.

Improved detection of deficient drivers must be accompanied by techniques for diagnosing the magnitude and nature of deficiencies in a way that will permit appropriate remediation where possible, and driving restriction where not. In developing such techniques, it may be necessary for VIC ROADS to undertake a program of research seeking out relationships between measures of mental and physical deficiency on the one hand and observed driving strengths and weaknesses on the other.

APPENDIX

ROAD TEST MANOEUVRE OBSERVATIONS AND SCORING CRITERIA

What follows is a list of observations to be made by road test examiners during manoeuvres performed by applicants along test routes. Each observation is accompanied by criteria that define competent performance. Applicants who meet the criteria are scored "Yes", while who do not "No". If applicants do not have the opportunity to perform the observed activity, they are scored "Not applicable".

LEAVING THE KERB

MIRRORS	Checks inside and right mirrors before moving vehicle.
SIGNAL	Activates right turn signal for at least three flashes, and maintains signal until vehicle has entered the line of traffic.
GEAR SELECTION	Places transmission in to first gear with clutch completely depressed.
ACCELERATION	Applies sufficient power to accelerate vehicle without over-revving and without stalling.
HEAD CHECK	Looks over right shoulder before leaving kerb.
GAP SELECTION	Rejects first unsafe gap; accepts first safe gap.
STEERING	Steers away from kerb to a position entirely within the carriageway.
GEAR CHANGING	Shifts through gears without causing the engine to labour or overrev.
SPEED	Assumes posted speed; does not exceed for more than 5 secs; does not fall more than 10km/h below speed limit.
MIRRORS	Checks inside mirror at least once after speed has been obtained.

RIGHT TURN

MIRRORS	Checks inside and outside mirror while approaching intersection.
SIGNAL	Activates signal no less than 30 metres or three flashes from the intersection.
LANE SELECTION	Approaches intersection in the appropriate lane for right turn.
SEARCH	Scans intersection ahead for pedestrians, other vehicles.
SPEED	Reduces speed before entering intersection.

SLOWING	Brakes\down shift smoothly when reducing speed.
STOP POSITION	Brings the vehicle to a stop close enough to stop line or cross walk to see cross traffic but does not hang over the line.
SEARCH	Looks in the direction of approaching traffic from right, left and oncoming before entering travel paths.
GAPS SELECTION	Accepts first safe gap from right, left and oncoming traffic; rejects unsafe gaps.
PATH	Remains within the boundaries of carriageways prior to and following completion of turns; remains to the right of intersection centre point.
LANE SELECTION	Enters correct (right-most) lane of new carriageway.
SPEED	Accelerates through turn and shifts up smoothly .

LEFT TURN

MIRRORS	Checks inside and outside mirror while approaching intersection.
SIGNAL	Activates signal no less than 30 metres or three flashes from the intersection.
LANE SELECTION	Approaches intersection in the appropriate lane for right turn.
SEARCH	Scans intersection ahead for pedestrians, other vehicles.
SPEED	Reduces speed before entering intersection.
SLOWING	Brakes\downshifts smoothly when reducing speed.
STOP POSITION	Brings the vehicle to a stop close enough to stop line or cross walk to see cross traffic but does not hang over the line.
SEARCH	Looks in the direction of approaching traffic from ahead and the right before entering travel paths.
GAPS SELECTION	Accepts first safe gap from right and oncoming traffic; rejects unsafe gaps.
PATH	Remains within the boundaries of carriageways prior to and following completion of turns.
LANE SELECTION	Enters correct (left-most) lane of new carriageway.
SPEED	Accelerates through turn and shifts up smoothly.

CROSSING UNCONTROLLED INTERSECTION (FACING A STOP OR GIVE WAY SIGN)

MIRRORS	Checks rear view mirror before decelerating.
SPEED	Slows smoothly.
STOPPING	Brakes smoothly to a stop.
STOP POSITION	Comes to a complete stop within two metres of stop line but not with any part of the vehicle going past the stop line.
GAP SELECTION	Accepts first safe gap; rejects first unsafe gap.
ACCELERATION	Accelerates \ shifts up smoothly.

CROSSING BLIND INTERSECTION (WHERE INTERSECTING TRAFFIC FACES A STOP OR GIVE WAY SIGN AND A SIGHT RESTRICTION)

SEARCH	Moves head and eyes to search for possible intersecting traffic.
SPEED	Eases pressure from accelerator and covers brake.
EVASIVE ACTION	Applies brake or takes other precautionary action if another vehicle is present.

MERGING

MIRRORS	Checks inside and appropriate outside mirror before initiating merge.
OBSERVATION	Shifts attention between vehicle ahead and traffic in the lane to be entered.
SIGNAL	Activates signal in the direction of merge at least 3 flashes or 50 metres before reaching merge point.
SPEED \ ACCELERATION	Assumes the speed that matches the speed of traffic in lane to be entered; selects gear appropriate to speed.
GAP SELECTION	Selects the first safe gap; rejects unsafe gaps.
LOOK BACK	Turns head and looks back over the shoulder in the direction of traffic stream to be entered.
MERGING POINT	Enters nearest lane at the earliest opportunity.
LEFT MIRRORS	Checks internal and side mirror after entering lane.
SIGNAL OFF	Signal cancelled within two seconds or three flashes after entering new lane.

DIVERGING

MIRRORS	Checks internal and appropriate external mirror before beginning the manoeuvre.
SIGNALS	Activates signal in appropriate direction at least 30 metres or 3 flashes prior to beginning manoeuvre.
LOOK BACK	Looks over shoulder in the direction of intended movement before the movement starts.
GAP SELECTION	Selects first safe gaps and rejects any unsafe gaps.
SPEED	Assumes a speed appropriate to the diverging manoeuvre.
CLEARANCE	Remains at least 1.2m from any vehicle or obstruction.
SIGNAL OFF	Turns signal off within 2 seconds or 3 flashes after vehicle has completed manoeuvre.

LANE CHANGE

MIRRORS	Checks inside mirror and outside mirror in the direction of intended lane change before commencing manoeuvre.
SIGNAL	Activates signal at least 30 metres or 3 flashes prior to initiating lane change.
GAP SELECTION	Selects first safe gap following activation of turn signal; does not accept unsafe gap.
LOOK BACK	Looks over shoulder in the direction of intended lane change prior to beginning manoeuvre.
SPEED	Maintains speed of traffic during manoeuvre.
LANE POSITION	Remains entirely within boundaries of the lane entered.
STEERING	Steers smoothly and gradually into the new lane.
MIRRORS	Checks inside rear mirror after vehicle is positioned completely within lane.
SIGNAL CANCEL	Cancels signal within 2 seconds or 3 flashes after vehicle is completely in lane.

STREET DRIVING

SPEED	Does not exceed the speed limit for more than 5 seconds; does not drop more than 10km/h below speed limit.
POSITION	Remains entirely within boundaries of lane; avoids excessive side-to-side motion.
FOLLOWING DISTANCE	Avoids following at less than a 2 second interval at any point during the zone in which straight driving is checked.

REVERSE PARKING

START POSITION	Rear of vehicle is forward of the front pole prior to instruction to start manoeuvre.
SIGNAL	Left signal is activated before reversing.
GEAR SELECTION	Transmission is placed in reverse gear.
LOOK BACK	Looks back through window before starting reverse manoeuvre.
SHIFT ACCELERATING	Rearward motion is initiated smoothly and gradually.
REVERSE MOVEMENT	Vehicle is manoeuvred "out of traffic" and into the bay in one reverse movement.
POLES	Avoids hitting poles.
KERB	Avoids touching kerb with wheels.
POSITION	Manoeuvre is completed with no more than three changes of direction.
STOP POSITION	Wheels are no more than 300mm from kerb and one metre from rear pole.