Australian Government

Department of Infrastructure, Transport, Regional Development and Local Government

Regulation Impact Statement for Vehicle Standards for Instrument Panels

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1. STATEMENT OF THE PROBLEM

1.1 Introduction

When a vehicle is involved in a crash, injury may occur to occupants if they make contact with sharp or hard objects in the interior compartment. Requirements to limit injury to occupants from rigid instrument panels have been in place in Australia for many years. With airbags, seatbelt and seat improvements, head and upper body injury outcomes are reduced but further benefits would be gained by use of less injurious and less hard materials for the construction of instrument panels.

1.2 Interaction of Occupant Protection Measures

A concept which is useful in estimating the effect of safety measures is the fact that any road crash and its injury outcome, is the result of a chain of events and if any one link in the chain can be broken, then the outcome can be changed. Occupant protection measures reduce the extent of injury by reducing the progression from one event to the next.

Occupant protection measures are inherently multiplicative in nature e.g. if the occupant is restrained, seatbelts will provide some protection in the first instance, before a possible second event involving impact with the steering wheel/column or contact with an airbag, followed by a third possibility of contact with the instrument panel or other parts of the vehicle interior. For the front seat passenger, there is nothing between the occupant and the instrument panel, unless the vehicle is equipped with a passenger airbag. For an unrestrained driver, the steering wheel/column or airbag (if available), would be the first line of defence and would have to compensate for the lack of occupant restraint to provide a comparable level of protection.

This demonstrates the effect of occupant protection measures in reducing the risk of exposure to injuries or fatalities. In the event where an occupant is likely to impact the instrument panel, the risk of injury is considerably reduced by a collection of safety measures; seatbelts providing the initial restraint followed by inflation of the airbag, if available. In the case of the driver, an appropriately designed steering wheel and column provide a third level of restraint. The net effect of these safety measures is a reduction in the overall risk of injury or fatality.

1.3 The Extent of the Problem

Frontal collisions account for over 50% of Australian road trauma. As a result of such collisions, front occupants are exposed to risks arising from impacts with components located in the front compartment. Such devices include the steering column, sun visors and instrument panel. This RIS discusses the problem arising from front occupants impacting with the instrument panel (steering columns and sun visors have been addressed in other RIS). The risk of injury resulting from impact with an instrument panel is substantially higher in case of unrestrained occupants than with restrained occupants. In 1996, the national seatbelt wearing rate averaged around 95% (FORS, 1996). This figure has remained reasonably constant over the last ten years.

Injuries resulting from impacts with instrument panels as a result of frontal collisions include head, neck and facial areas. For vehicle occupants injured seriously enough in a crash to be hospitalised or killed, head, neck or facial injuries make up about 79% of all injuries (McLean

et al, 1997). In fatalities, head injuries occur in 66% of all cases and in about two thirds of these, the head injury was the sole cause of death. The instrument panel is a point of contact in 27% of injuries for front-left passengers and in 7% for drivers (McLean *et al*, op cit). It is not known whether these instrument panel contacts relate to restrained or unrestrained occupants as both were included in the sample used by McLean *et al*. However, an unrestrained occupant is far more likely to contact the instrument panel than a restrained occupant, particularly for a front passenger.

1.4 Why Government Action Is Needed

The Government provides consumer protection for new vehicle consumers on two fronts, through the *Trade Practices Act 1974* and the *Motor Vehicle Standards Act 1989*. The Australian New Car Assessment Program (ANCAP), operated by a consortium of state and territory governments and insurance companies, serves to enhance consumer protection by complementing the primary effects of legislated arrangements through their public information program. The program is aimed at publicising the relative performance of vehicles in the important area of frontal impact occupant protection, in the hope that consumers will make informed choices, based on safety performance.

The *Trade Practices Act 1974* (TPA) provides consumer protection and quality of supply of product. Section 65C of the Act requires goods to meet prescribed consumer product safety standard. Consumer protection laws are important as a device for increasing equity in market place dealings between consumers and producers of vehicles. Part IV B of the TPA can prescribe self regulated or quasi regulated industry codes into black letter law which applies the remedies contained in the TPA to those who contravene codes, mandatory or voluntary. It is important to note that the TPA applies across all sectors of the economy and is not industry specific.

The *Motor Vehicle Standards Act 1989* (MVSA) provides mandatory vehicle safety standards with which suppliers of new vehicles are required to comply. It is important to note that consumers benefit from the functions of the two Acts, the MVSA providing a preventative effect, the TPA providing both compensatory and preventative effects. The compensatory effect comes through the Act's comprehensive coverage in most areas of consumer protection and the preventative effect through the prescriptions of codes by legislative means.

Besides the two Acts, market mechanisms as demonstrated by the consumers' willingness to pay for safer vehicles (with airbags, immobilisers and ABS) and vehicle manufacturers responsiveness to the consumers' desires have been gradually moving market forces towards a social optimum. This is assisted by information programs provided by government sponsored and non-government organisations and the provisions of the TPA. All these methods are desirable as they help improve the allocation efficiency of markets for automotive safety.

Australian Design Rule (ADR) No. 21 specifies requirements for the instrument panel fitted in passenger cars. ADR 21 is intended to reduce the injury potential when an occupant strikes the dashboard during a crash.

The conditions under which the market will produce an optimal level of product safety exist when individuals have perfect information about the risk of personal injuries (i.e. with and without safety equipment) and there are no externalities. This solution comes about from each individual balancing the benefits in terms of injury avoidance or minimisation from

safety devices against the cost of purchasing and utilising safety devices. This behaviour will lead to an outcome in which injury and injury avoidance costs are minimised for society as whole.

Determining the benefits and costs of using safety devices is generally a complex task, where the relevant risk for any individual is likely to be driven by assumptions about the road environment and personal driving habits. Individuals will likely encounter serious difficulties in making a well-informed decision about the value of safety devices. In principle, this uncertainty about the benefits of protection could lead to a less than optimal utilisation of safety devices.

Another basic source of market failure is the presence of market externalities. Auto accidents that result in injuries or deaths because of the failure of individuals to use safety equipment impose costs on other parties in society. In an unregulated market system, all these factors mainly 'information problems' and externality effects result in the sub optimal usage of safety devices. These are discussed in greater detail in the externalities section.

Government intervention in the market for delivery of safer vehicles to consumers arises as a result of potential market failure from:

- Imperfect Information and manufacturer myopia, and
- Externalities

Imperfect Information and Manufacturer Myopia:
Individual consumers would be able to effectively exercise their safety preferences if they were in a position to accurately assess the safety level offered by different vehicles. The typical consumer does not possess the engineering knowledge or information to make a comparative evaluation of safety devices in vehicles.

The issue of manufacturer myopia is important as in the absence of standards or regulations manufacturers could respond to market pressures, to the general detriment of society. In a market based regulatory environment manufacturers may project an image that vehicles are safe without in fact even incorporating basic protective safety features and the consumers would be unable to differentiate between vehicles with and without basic safety features.

Externalities:
When manufacturers introduce vehicles into the Australian fleet, several negative externalities arise. These include:

- Road trauma costs which are borne by the community. In the current regulated environment, road trauma costs the Australian community $6.0 billion annually in terms of health care,
- Costs in terms of losses in utility to family and friends, losses in productivity to other workers in team oriented job tasks and also from the necessity of hiring and training temporary or permanent replacements,
- Other costs include property damage, and inconvenience to the community,
- The medical treatment of injuries and disability also diverts medical resources from other uses,
- Medical insurance programs can also introduce distortions and cause a potential problem on efficiency grounds to the extent that they lead to disincentives to the purchase and

utilisation of safety devices because individuals do not have to bear the full costs of restoring their health and well-being after injury due to a crash.

Negative externalities are also likely to emerge when consumers make poor decisions in relation to an optimal level of vehicle safety. In the absence of government based regulation, vehicles with less than the optimal level of safety may become available to consumers. Such a situation would create a demand by risk takers for very low cost vehicles with very few safety features. Although consumers may wish to maximise their private benefits through such a trade off, the social costs of such a transaction are likely to result in a net cost to the community.

The negative externalities arsing from manufacturers introducing less than optimally safe vehicles and poor selection of vehicles by consumers are therefore reflected by increasing expenditures on hospitalisation, a loss of quality of life, property damage, rehabilitation and other costs, most of which are borne by the community, not the individual consumer.

1.5 Government Undertaking and Treaty Obligations

The Australian Government has undertaken to review the ADRs to ensure that they are relevant, cost effective and do not provide a barrier to importation of safe vehicles and components. These objectives are shared by the New Zealand Government, which has been reviewing its vehicle safety standards. The review is being carried out by the Vehicle Safety Standards Branch of the Department of Infrastructure Transport and Regional Development and Local Government (the Department) together with the National Transport Commission (NTC) and New Zealand Land Transport.

The aim of the ADR review is four-fold:

1 to identify whether existing standards are relevant in the light of on-going developments in automotive safety technology, given the fact that some of the standards are in a mature stage,
2 if existing standards are relevant, to identify any refinements required to ensure their progression and positive contribution in the standards life cycle,
3 to ensure standards do not impose excessive requirements on business, that they are cost effective and take account of community, social, economic, environmental, health and safety concerns, and
4 to pursue where appropriate harmonisation with international standards, rather than with regional or national standards.

The review takes account of the provisions of the Trans-Tasman Mutual Recognition Arrangement (TTMRA) Annex 4 – Road Vehicles. While the main object of the TTMRA is that goods sold in Australia could be sold in New Zealand and vice versa, it was acknowledged that there would be difficulties with Trans-Tasman trade in road vehicles, given the different regulatory regimes of the two countries. Road vehicles were therefore granted a special exemption from the immediate application of the TTMRA until the regulatory systems could be aligned. In Annex 4 of TTMRA, the Parties undertook to embark on a cooperation programme aimed, where appropriate, at harmonising Australian and New Zealand standards with United Nations - Economic Commission for Europe (UNECE) Regulations or those national or regional standards that are agreed by the Parties. The Parties also agreed to seek to develop consistent conformance assessment and certification requirements in both countries. The UNECE is regarded as the international standards setting

body, meeting the provisions of the World Trade Organisation (WTO) Agreement on Technical Barriers to Trade, as standards development in the UNECE is open to participation by the international community.

New Zealand and Australia's accession to the 1958 Agreement is consistent with commitments by Asia Pacific Economic Cooperation (APEC) region economies to facilitate trade in automotive product by harmonisation of road vehicle regulations through the multilateral UNECE arrangements. Accordingly, the regional perspective of the TTMRA has been overtaken by APEC-wide developments. There is little to be gained at this juncture in pursuing a programme of bilateral coordination, and bilateral convergence will be a function of the pace at which Australia moves to harmonise its ADRs with UNECE regulations.

2. OBJECTIVES

2.1 General and Specific Objectives

The general and specific objectives of Australian Government action are to establish the most appropriate measures for delivering safer vehicles to the Australian community. These include:

General Objectives:

- reduce road trauma arising from any potential failure of the market to provide vehicles with adequate levels of occupant protection;
- ensure that community, social, economic, environmental, health and safety standards are not compromised;
- determine what form of action is required, either government intervention or the use of market based measures;

Specific Objectives:

- eliminate any duplication and overlap arising from ongoing development of frontal protection countermeasures;
- ensure that the new measures proposed for frontal protection in the form of impact requirements for instrument panels arising do not create a barrier to the import of safer vehicles.

This RIS examines present Australian Government regulation for protection of occupants exposed to the risk of injury arising from impacts with instrument panels. It assesses the relative costs and benefits of both the present and proposed regulations and non-regulatory alternatives.

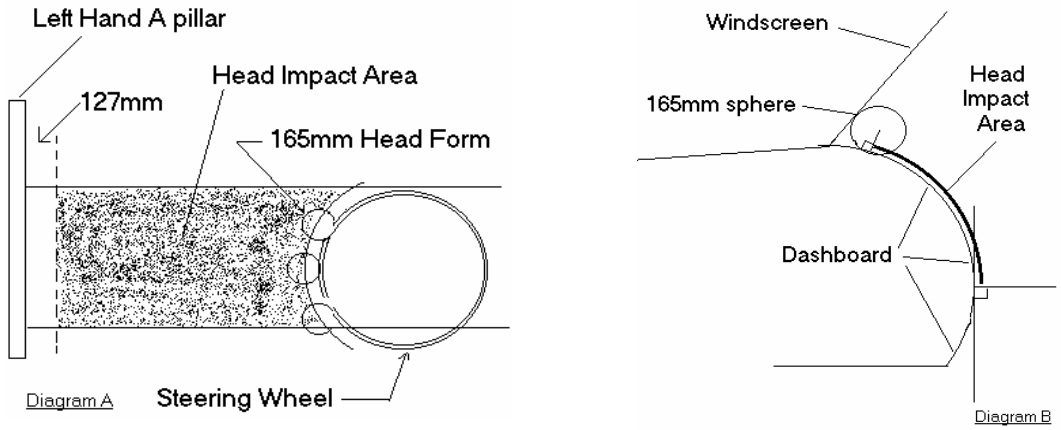
2.2 Present Government Regulation

ADR 21 applies only to MA category vehicles (primarily passenger cars) and to some LE category vehicles (trikes). The ADR defines a *Head Impact Area* of the dashboard as that area contactable by a 165mm diameter sphere but excluding:

- any area within 127mm of the left hand A pillar (forward-most pillar that generally supports the windscreen),
- areas to the right of the left hand edge of that part of the dashboard protected from contact by the sphere by the left hand side of the steering wheel; and

- areas below the rearmost face of the dashboard.

Diagrams A and B illustrate the *Head Impact Area*.



Requirements in ADR 21 are primarily:

- when the *Head Impact Area* is impacted by a 165mm diameter head form of mass 6.8kg the head form must not exceed a deceleration of more than 80g continuously for more than 3 milliseconds. The test must be carried out in accordance with SAE test procedure J921 – *Instrument Panel Laboratory Impact Test Procedure, June 1965*. For this test the impact velocity is 24.1 km/h for all vehicles other than those which use an inflatable supplementary restraint system for the front outboard passenger seating position to comply with ADR 69. In the latter case the impact velocity is 19.2 km/h;
- any instrument panel compartment door must remain shut when the dashboard is tested as above;
- any instrument panel compartment door must remain shut when subjected to a 10g loading vertically and horizontally when tested in accordance with SAE test procedure J839b – *Passenger Car Side Door Latch Systems, May 1965 or Jan 1972* (or an approved equivalent); and
- any instrument panel compartment door must remain shut when subjected to either:
  - ⇒ a front end longitudinal barrier collision test at not less than 48km/h conducted in accordance with SAE test procedure J850 – *Barrier Collision Tests, February 1963* (or an approved equivalent); or
  - ⇒ a 30g horizontal longitudinal loading in accordance with SAE test procedure J839b – *Passenger Car Side Door Latch Systems, May 1965 or Jan 1972* (or an approved equivalent).

There are currently no accepted alternatives to the ADR 21 requirements. This means that irrespective of what other international standards a vehicle meets it must demonstrate compliance with ADR 21.

While the ADRs apply to new vehicles, which must comply before they can be supplied to the market, once in service the vehicles must comply with the regulations administered by the states and territories. The general principle applied is that vehicles produced in compliance with ADRs applicable at the time of manufacture must continue to comply with those ADRs. In 1999, the National Transport Commission (NTS) published the Australian Vehicle

Standards (AVSRs) with the aim of providing a set of national uniform in-service vehicle rules and all jurisdictions agreed to implement the AVSRs.

The AVSRs have preserved the general principle of continuing compliance with the ADRs but also make particular provisions in areas not covered by the ADRs. There are also provisions in recognition that as vehicles age, continued compliance with the ADRs is not practicable. Another area where departure from the general principle is allowed is to accommodate established practices such as window tinting and alternative tyre selection. In case of passenger vehicles and NA (light commercial vehicles) and LEP categories of vehicles, the AVSRs demand continued compliance with ADR 21. If ADR 21 was to be removed, the states and territories would have the option of applying an in-service standard.

3. OPTIONS FOR FUTURE GOVERNMENT LEGISLATION AND ALTERNATIVES

The means available to promote safer vehicles to consumers can be classified as those which recommend government intervention or regulatory options and those that use non-regulatory options such as the use of market based instruments.

3.1 Regulatory Options

The four options for future legislation are:

Option 1: Retain ADR 21 as is;

Option 2: Retain ADR 21 and accept the relevant part of UNECE R21 as an alternative standard;

Option 3: Delete ADR 21;

Option 4: Use of American and Japanese standards as alternative standards in each of the first two options.

The international standard, UNECE R21 Interior Fittings, has almost identical provisions to ADR 21 regarding energy absorbing dashboards but ECE R21 covers a much wider range of possible contact areas within a vehicle including handbrake levers, window winders, head lining and sun roofs. It makes no reference to the glove box lid (instrument panel compartment door) staying closed during a crash. If a glove box in the *Head Impact Area* opens during a crash the occupant's head would be exposed to the inside edges of the glove box, its catch and possibly the hinges as well as any contents of the glove box. However, this requirement is probably no longer an issue as modern car design now puts the glove box under the dash rather than on the front or top face. Further, modern glove box lids and catches are relatively soft plastic and much less likely to cause any serious injuries.

The United States Federal Motor Vehicle Safety Standard (FMVSS) 201, Head Impact Protection, formed the basis of ADR 21 when it was prepared in the late 1960s. In addition to dashboards, FMVSS 201 also covers sun visors (covered by ADR 11), seatbacks (for rear seat passengers - covered by ADR 3) and armrests (covered indirectly in ADR 42 – no dangerous projections, etc). FMVSS 201 is being phased in for vehicles other than passenger cars and now includes upper interior components, including, but not limited to, pillars, side rails, roof headers and the roof. FMVSS 201 also now includes optional requirements for dynamically deploying upper interior head protection systems providing head injury protection in lateral crashes.

A possible alternative would be to replace ADR 21 with either or both UNECE R21 and FMVSS 201. In practice, the additional stringency of these rules (because they cover a wide range of other issues not currently covered by ADR 21) would lead to increased certification costs, with no guaranteed safety gain. In addition, modern standards are moving away from specification of individual vehicle parts to overall standards for occupant protection. It is more feasible to adopt the relevant parts of UNECE R21 as an acceptable alternative to ADR 21 as the requirements are similar.

The fourth option involves the use of standards applying in the United States of America and Japan. The allowance of alternative standards is only of real benefit where compliance with those standards can be easily verified by the issue of authoritative certificates of compliance or the standards are materially different and vehicles would need to be modified to comply with the Australian standard. In the case of instrument panels, neither of these conditions applies.

The United States standard, FMVSS 201, is a head impact protection standard which, similar to UNECE R21, covers a range of interior fittings such as sun visors, seat backs, glove box and armrests in addition to instrument panels. As the US government does not get involved in pre-market approval of vehicles, there is no approval certification available for vehicles claiming compliance with the US Head Impact Protection standard.

Japan is a contracting party to the 1958 Agreement (as is Australia) and if it decides to adopt UNECE R21, any UNECE R21 approvals issued by Japan will be accepted in Australia without the need for additional approval activities (such as providing test evidence). Presently the Japanese domestic standard applies to vehicles destined for domestic and export markets. The Japanese government does not issue certificates of approval for vehicles built for export markets and it would be up to the Australian vehicle safety regulator to confirm compliance with a standard if the current Japanese standard was to be accepted as an alterative to ADR 21.

Maintenance of alternative standards is another issue that seriously erodes the regulator's efficiency to mange the administrative functions as a result of the need to continuously examine ADR amendment proposals to maintain the currency of the ADRs in relation to the alternative standards. The process for amending an ADR to allow compliance with an amended alternative standard typically involves assessment of the technical differences and preparation of a proposal for consideration by the advisory group responsible for ADR development. Following this stage, depending on the nature of the change, the proposal may need to be submitted to the state and territory governments for consideration. If they agree with the proposal, the amendment needs to be approved by the Australian Transport Council and finally determined by the Minister for Infrastructure, Transport and Regional Development and Local Government.

Depending on the nature of the amendments this process could take anywhere between 3 months and several years. In the mean time, manufacturers would not be able to progress compliance of components and vehicles certified to the amended alternative standard. The total cost of this activity is difficult to determine as it involves people from many other organisations.

For reasons outlined, the viable alternatives are:

Option 1: Retain ADR 21 as is;

Option 2: Retain ADR 21 and accept the relevant part of UNECE R21 as an alternative standard; and

Option 3: Delete ADR 21 and consider non-regulatory options.

3.2 Non-Regulatory Options

Non-regulatory options form an important part of the compensatory arrangements for consumer protection in addition to the prevention part provided by a design rule. Non regulatory options can be classified into three categories: using market forces fully supervised with the use of the *Trade Practices Act 1974*, public information campaigns and the use of an industry code of practice.

3.2.1 Leave to Market Place and rely on powers under the *Trade Practices Act 1974*

Manufacturers delivering unsafe vehicles into markets in the absence of mandatory standards would suffer a loss of sales and reputation if the market has well developed market information systems, to advise consumers if a particular make or model of vehicle was unsafe. Such information systems may be operated by competing manufacturers, motoring associations and insurance companies who would have an incentive to provide this information to consumers.

ADR 21 represents a part of the occupant protection system for a motor vehicle that is acceptable to the market and meets consumer expectations. The absence of ADR 21 could result in loss of assurance for consumers that instrument panels fitted in vehicles and supplied to the market provide an appropriate and adequate level of safety. The absence of a standard will be more pronounced for consumers of vehicles who rely primarily on ADR 21 for front occupant protection and to a lesser extent on consumers who have access to airbags and other restraint systems. A small but significant number of vehicle owners rebuild/refurbish instrument panels in vehicles and the absence of a mandatory standard could lead to vehicles being refurbished or rebuilt to inappropriate requirements, thus exposing the community to an unsafe road environment. The spill over costs of non-intervention by the government in the market could potentially lead to an increase in road trauma, property damage and community anxiety from a less safe road environment.

There are two compensatory mechanisms available for the consumer under the TPA.

1. Section 65F – Compulsory product recall and Part V A – Liability of manufacturers and importers for defective goods of the Trade Practices Act has a compensatory effect for consumer protection as opposed to the ADR or mandatory or voluntary code prescribed under the TPA which has a preventative effect as it prevents a supplier from placing unsafe vehicles on the market. Given the high-risk nature of car travel and the community costs when fatalities or injuries occur, it may not be appropriate to rely solely on a compensatory measure but rather to have a preventative measure such as an ADR or code prescribed under the TPA.

2. Part V A provides a well-defined right for consumers to sue for damages, which places pressure on vehicle manufacturers to avoid large compensation payouts by making their vehicles safer,

Full reliance on provisions of the TPA without the use of an ADR or mandatory/voluntary code prescribed under the TPA and non government information programs are likely to result in the following effects:

- Interior impact performance is not conducive to casual inspection. Consumers are therefore not in a position to assess the level of protection afforded by instrument panels and are may make decisions that result in inadequate level of safety imposing costs on the community. The only way to assess performance is through a test protocol that calls for detailed examination of the interior in front of the front seat occupants and it is not reasonable to expect the public to be able to discriminate between models.

- Lack of a definitive regulation could still result in costs to manufacturers as responsible sections of the industry would still incur the overall cost of design, development, styling and testing whether or not there was a regulation. The absence of regulation in such a technically complex area may offer some manufacturers the choice to skimp on vehicle safety,

- In the absence of regulation, states may introduce their own standards, potentially leading to lack of uniformity, undue jurisdictional requirements for consumer standards. This could result in additional testing and assurance procedures and hence additional costs to industry and eventually the consumer.

While allocation of safer vehicles could be achieved by market forces acting together with information programs and the compensatory provisions of the TPA, of paramount importance is the need to prevent unsafe vehicles from entering the market and this can be achieved by the use of regulatory options such as an ADR or a prescribed code under the TPA.

3.2.2 Public Education Campaigns

Public education campaigns can be effective where the information being provided is simple to comprehend and unambiguous. If public information campaigns based purely on the ADR requirements were freely available, most consumers would be unable to comprehend the technical content and make decisions about the safety aspects of a specific vehicle's steering column. A campaign targeted to the typical consumer would be just as ineffective as without the technical content the campaign would be nothing but flashy advertising and an inefficient use of public money.

In these situations, where the majority of consumers are unable to make informed decisions regarding particular technical aspects of a product, such decisions are left to the manufacturer (if consumers trust the manufacturer) or to a government nominated regulatory authority (if the product is regulated). In the case of the automotive industry, the majority of safety related decisions reside with a regulatory authority. It is for the above reasons that public education campaigns on car safety have not enjoyed much success among vehicle buyers.

One simplification that would assist the consumer is the use of rating system. This allows complex technical information to be assessed by experts and then be presented in a way that the typical consumer will understand. The difficulty with a rating system is that the more important features such as crash protection would dominate and it is doubtful that consumers would be able to focus on individual components (for example, when compared with frontal crash protection, the quality of rear vision mirrors will seem less critical). Alternatively, each safety system would have to be rated separately and consumers would have to establish their

own priorities as to which safety systems are more or less important in the final decision. It has already been stated above that most consumers are not in a position to make such decisions. It is unreasonable to expect consumers to assess the merits of each component and make an informed decision. A rating system, the Australian New Car Assessment Program (ANCAP), is currently being successfully used in conjunction with the existing ADR system.

Although ANCAP carries out tests similar to those presented in some of the ADRs, there are several major differences. Up until 1999 a full frontal collision (driving the front of the vehicle into a stationary object) was also carried out at an impact speed of 56 km/h, 8 km/h higher than that required by ADR 69. The expectation was that the higher speed would magnify the differences between cars and provide consumers with a better picture of the relative performance of these vehicles (Explanation of ANCAP Test Procedures 2005).

ANCAP and the ADRs currently work in a complimentary fashion. While the ADR provided baseline performance requirements such that consumers are assured that all vehicles perform to a legislated level, ANCAP provides supplementary information to help consumers make informed choices in purchasing vehicles, if they care to consider the relative safety performance in making that choice.

The ADR provides consumers with the assurance that all vehicles will perform to a minimum acceptable level. In the absence of the ADR and in reliance on ANCAP alone, no such assurance would be available, as there would be no legal compulsion to perform well in the ANCAP tests. Manufacturers may well pursue a good ANCAP result but this cannot be guaranteed.

Furthermore, there is no guarantee that such programs will continue in their current form. Full frontal impact tests were originally carried out at a higher speed than the ADR required and ceased in 1999 in favour of offset frontal impact tests. This is a prime example that although the ANCAP can provide valuable information, it is prone to change from time to time and does not offer the stability and continuity of government regulation. Testing is further limited by the cost of carrying out tests. Each test involves the purchase of vehicles which could be anywhere from $15,000 for a small car, up to above $60,000 for a four wheel drive. This financial constraint means that it is unlikely that all available vehicles would be tested, making ANCAP of limited use to consumers.

Organisations such as ANCAP are more suited to inform on overall vehicle safety rather than the safety provided by particular systems. It would be difficult to package the information in a manner that the average consumer would understand as in order to present safety data on individual features the current safety index would not be usable. On the other hand, consumers would not appreciate being inundated with detailed test results that are time consuming and difficult to comprehend.

3.2.3 Voluntary Code of Practice

Another alternative to direct government intervention for delivering safety outcomes is via a code of practice. These can be either mandatory or voluntary as provided for under the *Trade Practices Act 1974*.

Part IV B – Industry Codes, of the TPA allows the development of mandatory and voluntary industry codes. Under section 51AE of the TPA, regulations may prescribe an industry code

or specified provisions of the code and the industry code may be declared mandatory or voluntary. Prescriptions will apply the remedies to those who contravene such codes. These remedies include: injunctions, damages, orders for corrective advertising and refusing enforcement of contractual terms.

Of course a mandatory code of practice is hardly a non-regulatory option because participation and compliance are mandatory and the TPA provides for prescriptions and remedies including injunctions, damages and orders for corrective advertising for those who contravene such codes. Mandatory codes can be enforced under the TPA against all businesses in the automotive sector regardless of whether they are signatories to the code.

A feature of such prescribed codes is that they retain a high degree of industry involvement while providing the enforceability and coverage that can be ensured only through legislative means. However, breaches can only be revealed by failures in the field or by third party reporting and any savings through avoiding government intervention need to be balanced against the consequences of failures.

The use of codes prescribed under the TPA is an effective means of regulation in areas where government agencies do not have the expertise or resources to monitor compliance. In case of regulating the design and construction of motor vehicles, the responsible government agency (Department Infrastructure, Transport, Regional Development and Local Government) has the expertise and resources to administer a cost effective compliance regime and a mandatory code of practice is unnecessary.

The arrangements for administering the compliance regime have recently been reviewed and endorsed as part of the review[1] of the *Motor Vehicle Standards Act 1989*. Among the options examined was that in place in the US which involves the regulator purchasing vehicles in the open market and conducting its own testing program. The task force noted that:

- This activity involves high costs. In the US for example a budget of approximately USD 25 million is provided, and

- In the event that vehicles are found not to comply with mandatory standards, action is taken by the regulatory authorities either in courts or through mandatory recall. Resolution in the courts can be a lengthy process during which potentially unsafe vehicles can remain in the market.

With voluntary codes of practice, given that there is no compulsion to participate or comply with the nominated standards, there needs to be some incentive to encourage operators to take part. A voluntary code would only apply to those agents who are willing to be bound by it. Industry associations could assume a supervisory role and persuade its members that participation and compliance is preferable to the more onerous alternative of direct government intervention, both in relation to setting mandatory standards and enforcing them.

Also, the associations would be in a position to negotiate special status for their members in recognition of their voluntary compliance with the code. This could include access to schemes to maximise productivity gains such as in the case of driving hours regulation, where

[1] Review of *Motor Vehicle Standards Act 1989*, Department of Transport and Regional Services, August 1999. The review analysed the use of self regulation and self-certification as alternatives to the current system and concluded that the costs of the new proposals outweighed the benefits.

bus operators complying with the code for sleeper berths can operate on longer routes and share the driving between two drivers. The same arguments that rule against adopting mandatory codes for regulating vehicle safety apply in the case of voluntary codes of practice. Despite the inappropriateness of codes of practice as a form for enforcement of standards, the possibilities of using a code of practice are explored further in the discussions below.

The motor vehicle industry delivers new vehicles and used vehicles to automotive consumers. New vehicles are delivered from domestic production as well as from foreign production carried out in overseas plants. Imported used vehicles are mainly sourced from Japan. There are two industry associations, which represent a large collection of manufacturers in the new vehicle industry; these include the Federation of Automotive Product Manufacturers (FAPM) and the Federal Chamber of Automotive Industries (FCAI). Membership coverage by FAPM would approximate 40% while that of the FCAI would be around 99%[2], which also includes importers.

For a voluntary code of practice to succeed, the relationship between business, government and consumer representatives should be collaborative so that all parties have ownership of, and commitment to, the arrangements (Grey Letter Law, 1997)[3]. In considering a code of practice, it is useful to note the following conditions, which exist in the automotive industry. These include:

- Universal application of standards is relatively difficult as numerous sectors exist and which in turn are represented by their own industry associations,

- It is not clear whether the industry associations can apply effective sanctions,

- Effective operation of a voluntary code of practice would require an enforcement system identical or similar to the one currently operated by the government regulator. This requires the members of the associations to provide evidence to their associations as currently required for obtaining an approval. It is quite difficult to envisage an environment where profit maximising companies would share information with their industry associations to enable the system to deliver certainty to consumers and governments.

An example of a code of practice applying in the automotive industry is the FCAI's code of practice for Electromagnetic Compatibility (EMC). This code of practice applies exclusively to FCAI members and while compliance with the nominated standards is mandatory, as prescribed by the Australian Communications Authority (ACA) for electromagnetic emissions from electronic devices under the Radio Communications Act, the Authority relies on the FCAI to ensure that its members comply. In this case it is understandable that the ACA has opted for a code, given the vast scope of its sphere of responsibility, as it covers all electronic equipment producers and the costs of direct Government supervision over all sectors would have been prohibitive.

Although it is called a Voluntary Code of Practice, there is no option but to comply with the nominated mandatory standards and while the ACA is willing to rely on the FCAI to enforce compliance by its members, the full weight of the law would come down on those who fail to

[2] Membership base of the FCAI includes vehicle manufacturers and the FAPM. It does not include sectors such as tyre manufacturing, vehicle distribution, transport logistics and after market supplies.
[3] Grey Letter Law, Report to the Commonwealth Interdepartmental Committee on Quasi Regulation, 1997

comply. Therefore it would appear that this code fits in with the concept of a mandatory code of practice.

Since the issue of providing safer vehicles is high risk-high impact in nature, there does not appear to be any scope for adopting a voluntary code of practice. As discussed previously in relation to a mandatory code of practice, the standards setting component is no different to what is being examined in this RIS, while the enforcement component is beyond the scope of this RIS, having been previously determined under the review of the *Motor Vehicle Standards Act 1989*. The presence of mandatory standards is one of the main reasons why codes of practice do not operate and there would be great incentive for their development in the absence of standards.

4. IMPACT ANALYSIS

4.1. Introduction

Some 580,000 new passenger cars to which ADR 21 applies are sold in Australia each year. These vehicles are produced by 34 different manufacturers and cover about 180 different models. There are four major domestic manufacturers which are subsidiaries of their American and Japanese parent organisations, these manufacturers – importers carry around 10 to 12 product lines which on an average accommodate 4 models and account for over 50% of the new vehicle market (120 models). Four large importers account for over 25% of the market (32 models) while the remaining 26 manufacturers account for 28 models.

Only impacts in Australia are considered in this RIS.

4.2. Identification of Affected Parties

The parties affected by ADR 21 are:

- Domestic vehicle manufacturers who are also importers,
- Vehicle importers (includes foreign manufacturers and their representatives),
- vehicle owners,
- vehicle users, and
- governments.

The affected parties are represented by several interest groups and these include:

- the Federal Chamber of Automotive Industries, which is an all encompassing group representing the interests of the manufacturing sector. This includes vehicle manufacturers, vehicle importers and component manufacturers/importers;
- the Australian Automobile Association (AAA) which is considered representative of vehicle owners and vehicle users (passenger cars and derivatives) through the various automobile clubs around Australia (RAC, RACV, NRMA etc),
- commercial vehicle owners/operators who are represented by the Australian Trucking Association (ATA);

- Australian Automobile Aftermarket Association (AAAA), Australian Road Transport Suppliers Association (ARTSA) and other interest groups, which represent economic agents operating largely in the after market industry,

- special interest groups that exist to represent specialist component and whole vehicle manufactures, and uses of various vehicle types.

4.3. Effect on Existing Regulations

ADR 21 forms part of an occupant protection package, which contains eight ADRs. These vehicle standards need to be viewed in terms of a diversification of risk they bring about. Although it is difficult to demonstrate, the net result would be to produce a lower risk than would be possible if the regulations had an individual additive effect. The occupant protection safety ADRs operate in conjunction with other vehicle standards such as traction, structures and vision to reduce the overall risk of injury and fatality to vehicle occupants.

In considering the interaction between the occupant protection regulations, including trauma resulting from inappropriate sun visors, steering column intrusions, ADR 69 (full frontal impact protection) with and without airbags and ADR 73 (offset frontal impact protection), the following observations arise.

- ADRs 10 and 11 assume the occupant is not restrained;

- Even restrained occupants would benefit from ADRs 10 and 11 because seatbelts must incorporate some "give" under load, which could bring the occupant within the impact zone of a sun visor in a frontal impact.

- ADR 69 assumes the occupant is restrained. ADRs 10 and 11 would cover those occupants that are not restrained. Airbag equipped ADR 69 complying vehicles are exempt from ADR 10,

- ADR 73 assumes the occupant is restrained. ADRs 10 and 11 would cover those occupants that are not restrained. Airbag equipped ADR 73 complying vehicles are exempt from ADR 10.

From the above it can be seen that the benefits of ADR 21 accrue mainly to unrestrained occupants. While there are also some benefits for restrained occupants, the impact analysis only assumes benefits for unrestrained occupants.

The following three options merit further consideration.

- Option 1 would retain existing Australian Government legislation in the form of ADR 21.

- Option 2 would adopt the internationally recognised UNECE requirement as an alternative standard to the existing requirements, while

- Option 3 would remove present the requirements. State and territory regulation or non-regulatory measures would likely replace the requirements of the ADR.

4.4. Categories of Expected Impacts

4.4.1. General impacts

Option 1 would retain the present requirements, which involves:

- no change in compliance costs for vehicle manufacturers;
- no change in road trauma benefits for vehicle occupants.

Option 2 would retain present benefits for road trauma but reduce compliance costs for some manufacturers. Those currently using or whishing to use instrument panels certified to UNECE R 21 would not bear additional costs due to further testing to ADR 21. This would also provide small benefit to local manufacturers wishing to export instrument panels.

Option 3 would remove compliance costs and may increase road trauma. The extent of the trauma increase would depend upon the extent of change to present practices for instrument panel design. This would vary according to any state and territory legislation or non-regulatory measures that were introduced. In a worst case scenario, of there being no requirements for instrument panels, it is likely there would be an increase in the cost of road trauma.

4.4.2. Quantification of impacts

US research (Kahane 1988) examined the changes in trauma risk from changes introduced to dashboards around the time that FMVSS 201 was introduced. He found that the fatality and injury risk of unrestrained occupants in the front outboard seat in frontal impacts reduced by nearly 25%. It is difficult to assess how much of this benefit was a direct result of FMVSS 201 due to the complex interaction of vehicle safety measures and the continuing evolution of safety technology. ADR 21 was based on FMVSS 201, which was implemented primarily to protect non-seatbelt wearers in the US in the early 1960s. No benefits have been shown for drivers as a result of FMVSS 201 and hence it would appear that ADR 21 has little if any benefit for drivers. This is not surprising given the position of the steering wheel and column, it is unlikely that a driver would make contact with the instrument panel.

In relation to seatbelt wearing, there appears to be no significant difference in non-wearing rates between drivers and front seat passengers. About 5% of all vehicle front seat occupants in Australia do not wear seatbelts.

Passengers in vehicles incur nearly 25% of all fatalities (FORS 1996). Front outboard passengers comprise over 80% of all passengers, and are a higher risk group than rear passengers. It can be deduced therefore that instrument panel injuries account for a proportion of total road trauma as follows:

Proportion = 25% of total trauma * 80% for front seat passenger * 5% unrestrained * 50% frontal crashes = 0.5%

Therefore, instrument panel injuries from frontal crashes account half a percent of all road trauma.

The benefit from ADR 21 might be as high as 25% for front seat unrestrained passengers as suggested by Kahane. However, because of other changes in dashboard design, around 10% is likely.

As road trauma costs around $6 billion per annum, the total cost of instrument panel injuries is around $30 million (0.5% of $6 billion) per year. A 10% benefit of ADR 21 in reducing road trauma would result in benefits of about $3 million annually. The same benefits could apply to both Options 1 and 2.

Tests for ANCAP show that the heads of properly restrained front seat passengers can still strike the dashboard. As the velocity of some of these impacts may be much less than the crash speed (and nearer the 24.1 km/h or 19.2 km/h of ADR 21) it can be assumed that the energy absorption requirements of ADR 21 will have some benefits for seatbelt wearers also. However, this benefit has not been quantified and while, in this context it will be relatively small in the overall occupant protection scenario, it nevertheless is a positive benefit.

Benefits of Option 3 in relation to trauma will depend on the extent to which vehicle manufacturers modify instrument panel design. Although not a high cost item, some manufacturers in highly competitive markets may consider reducing costs for instrument panels and producing less occupant friendly panels. It is estimated that about 40% of road trauma benefits would be retained, about $1.2 million per year.

A head form impact test is estimated to cost $4,000 per certification test and the 10g instrument panel compartment door loading test is estimated at another $1,500. Other dynamic tests can be done in conjunction with tests for other ADRs (e.g. ADR 69). Collation and submission of evidence is estimated at $500. Therefore total industry compliance cost per vehicle model is estimated at $6,000.

Some 580,000 new passenger cars are sold in Australia each year produced by 34 different manufacturers and covering around 180 different models. Some models may run for a number of years without change while others may have changes that require re-certification more regularly. For the purposes of this RIS it is estimated that about 100 models each year require certification to ADR 21.

Total industry compliance for Option 1 is therefore about $600,000 per year.

It is estimated that about 30% of new models have UNECE R21 certification, saving most of the $6,000 compliance costs. Savings from UNECE R21 certification are therefore estimated at about $170,000 annually, leaving industry compliance costs of about $430,000 per year.

For both Options 1 and 2, some government compliance costs apply but these costs are relatively small by comparison.

No compliance costs are incurred with Option 3.

4.4.3. Summary of impacts

The summary of relative quantified benefits and costs shown in Table 1 and the consequences for affected parties are shown in Table 2.

Table 1: Summary of Relative Benefits and Costs
(per annum)

	Option 1 retain ADR 21	Option 2 include UNECE R21	Option 3 delete ADR 21
Benefits			
• road trauma	about $3 million	about $3 million	about $1.2 million
Costs			
• total compliance costs	about 0.6 million	$0.43 million	nil
Net benefits	about $2.40 million	about $2.57 million	about $1.2 million

Table 2: Impacts on Affected Groups

Affected group	Option 1 retain ADR 21	Option 2 allow alternatives	Option 3 delete ADR 21
vehicle manufacturers and importers	• present certification costs are retained	• reduced compliance costs for some manufacturers	• no compliance costs
vehicle owners	• present certification costs are recovered from owners	• reduced certification costs are recovered from owners	• no compliance costs recovered from owners
vehicle occupants	• no change to present trauma	• no change to present trauma	• more road trauma
Governments	• present compliance supervision costs are incurred	• present compliance supervision costs are incurred	• compliance supervision costs are not incurred

It is useful to consider the likely response of the market to occupant protection in the absence of an instrument panel regulation. Several observations arise, some of which are summarised below:

- The demand for independent assessments of the injury reduction potential of instrument panels in particular and vehicle safety performance in general is not high. This is likely as a result of the strong presence of vehicle safety regulations, which have enjoyed a high level of acceptance by consumers, manufacturers and community organisations.

- Consumers are particularly confident of current arrangements in delivering vehicles with safe instrument panels to the market. In the absence of current arrangements, two possibilities emerge. If consumers value safe instrument panels, there will be an incentive for manufacturers to make available safe instrument panels. Consumers in the small car segment tend to be unwilling to pay for safety features and to remain competitive, manufacturers offer features which consumers have a willingness to pay. Recent advertisements featuring safety features in small cars launched by European car manufacturers in Australia indicate that small car consumers are gradually accepting the importance of safety features. However it will take some time before medium and large car consumer acceptance levels for safety are reached in the small car segment.

- New institutions may emerge to supply consumer with safety information while existing institutions may increase their activities in relation to information delivery. Institutions disseminating information may demand compensation for their services. If their services are available freely the issue of information asymmetry arises as some of these institutions could be sponsored or owned by vehicle manufacturers or other special interest groups.

- As discussed earlier, it is likely that market forces need to be supplemented by public education programs and government regulation to reduce the negative externalities imposed on the community.

4.5. Discussion of impacts

The quantitative and qualitative assessment of benefits and costs above indicates that options 1 and 2 are similar while option 3 has a lower overall benefit. The difference between the direct benefits and costs of options 1 and 2 are minimal so secondary benefits need to be considered.

Option 1 has the advantage of retaining the current requirements – not requiring any change on the part of business or government. Option 2 requires some minor change to existing legislation but furthers the process of harmonization with international vehicle standards. It will give manufacturers more flexibility and potentially reduce costs for both importers and exporters.

5. CONSULTATION

Development of the ADRs is the joint responsibility of the Vehicle Safety Standards Branch of the Department and the National Transport Commission and is carried out in consultation with representatives of Australian Government, State and Territory Governments, manufacturing and operating industries, road user groups and experts in the field of road safety.

In carrying out the ADR review, a number of single issue working groups (SIWG) were established to consider proposals and provided technical advice. The group that considered ADR 21 agreed that Australia should allow the use of UNECE R21 in keeping with the overall goal of standards harmonization. The occupant protection SWIG was tasked with reviewing the requirements of instrument panels and other occupant protection countermeasures. A list of organisations that participated in the working group is presented in Appendix 1.

5.1. Public Comment

The proposal was circulated for 90 days public comment from November 2000 to February 2001. Notification was also sent to the World Trade Organisation under Australia's Technical Barriers to Trade obligations.

Three responses were received. The response from the Federal Chamber of Automotive Industry (FCAI) represents the bulk of vehicle manufacturers, the Australian Automotive Association (AAA) represents the interests of road users through automotive clubs and the Motor Trades Association of Australia (MTAA) represents retail, service and repair sectors of the automotive industry. All three supported the use of UNECE R21. The FCAI did not want to see the introduction of a single interior impact protection ADR (mandating the entirety of

UNECE R21), while the MTAA indicated a preference for replacing ADR 21 with the UNECE standard. A summary of public comment responses can be found in Appendix 2.

5.2. Transport Agencies Chief Executive (TACE)

After the completion of public comment, the package was sent to transport agencies in all state and territory governments as well as New Zealand (under TTMRA arrangements). Responses were received from all jurisdictions, agreeing to harmonize with the UNECE regulation for the purposes of instrument panels. There was also a desire to keep the existing ADR requirements and not move to an all encompassing interior impact protection standard.

5.3. Australian Transport Council

At the June 2005 Australian Transport Council (ATC) meeting, transport Ministers endorsed a recommendation that broadly supported, non-contentious, UNECE harmonised proposals could proceed directly to determination following public consultation. The public comment process is used to determine whether this proposal qualifies as a non-contentious item and whether further consultation would be necessary. As there was full support at both the public comment and TACE stage, ADR 21 will not be presented to ATC.

6. CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Identifying the most preferred option for setting standards to deliver safer vehicles to the community is beset with difficulties particularly when one is dealing with a situation, which is high impact and high risk in nature. The option selected must not only serve to maximise the total surplus to the community but must fully recognise the difficulties encountered by producers in supplying safer vehicles to the market and at the same time meet the objectives of this exercise.

This Regulation Impact Statement has considered both the regulatory and non-regulatory options available to reduce instrument panel impacts arising from frontal crashes. The non-regulatory options appear to meet some of the secondary objectives but fall short of the primary objectives particularly in averting market failure and progressing the market towards a social optimum. The discussion identifies the clear benefits that arise from retaining standards for instrument panels. In identifying the best option, the social value of the option also needs to be considered. As the net benefits of Option 2 are greater than the other options, the adoption of Option 2 is recommended. The regulatory option - option 2 is the most effective option as it helps reduce road trauma by correcting for market failure, increasing the number of vehicle offerings in the market through harmonisation of standards. Harmonisation of standards allows overseas manufacturers to access the market with lower compliance costs and promotes competition by increasing the number of players in the market. The option also helps coordinate market forces through the TPA and non-government information programs.

6.2 Recommendation

As the net benefits of regulatory Option 2 are greater than the other options, the adoption of Option 2 – keep the existing ADR 21 requirements and allow the use of UNECE R21 as an alternative.

7. IMPLEMENTATION AND REVIEW

Amendments to ADR 21 will be given force in law in Australia by making determining it as a vehicle standard under the *Motor Vehicle Standards Act 1989*. It will be implemented under the type approval arrangements for new vehicles administered by the Vehicle Safety Standards branch of the Department.

Additionally there are arrangements for on-going development of the ADRs. This is the joint responsibility of the Vehicle Safety Standards branch of the Department and the NTC and is carried out in consultation with representatives of Australian Government, State and Territory Governments, manufacturing and operating industries, road user groups and experts in the field of road safety.

A manufacturer will be required to ensure that vehicles supplied to the market comply with the requirements of any package of regulations. Penalties for non-compliance with the *Motor Vehicle Standards Act 1989* are 120 penalty points for each offence.

For revised ADRs, which do not represent an increase in stringency, there is no need for lead-time. For those ADRs that are updates of existing ADRs, they will have the same applicability as the originating ADR currently has. There will be a seamless transition from the existing ADRs to the revised package.

APPENDIX 1 – OCCUPANT PROTECTION SINGLE ISSUE WORKING GROUP

The Producer Group
Australian Road Transport Suppliers Association
Commercial Vehicle Industry Association
Federal Chamber of Automotive Industries
Federation of Automotive Product Manufacturers

The Consumer Group
Australian Automobile Association
Australian Trucking Association

The Government Group
Commonwealth Department of Transport and Regional Services
Department of Transport , South Australia
Queensland Transport
Roads and Traffic Authority, New South Wales

Inter Governmental Agency
National Road Transport Commission

Independent
Dr Michael, Henderson, Road Safety Expert

APPENDIX 2 - PUBLIC COMMENT RESPONSES

Name	Agree with RIS	Comments	Response to comments
Australian Automobile Association	Y		
Federal Chamber of Automotive Industry	Y	Does not agree with phasing out of existing ADR for proposed Interior Impact Protection (IIP).	
Department of Infrastructure, Energy and Resources (TAS)	Y	Harmonise with ECE	
Department for Planning and Infrastructure (WA)	Y	Indicated an error in the draft ADR – clause 2.2 refers to a non-existent IIP standard.	Error corrected.
Department of Transport and Works (NT)	Y		
Department of Urban Services (ACT)	Y		
Land Transport Safety Authority (NZ)	Y		
Motor Trades Association of Australia	Y	Phase out over 2 years and replace with IIP.	
Queensland Transport	Y	Retain ADR and accept relevant parts of ECE R21	
Road and Traffic Authority (NSW)		Allow compliance with ADR 11 and ADR 21 together or ECE R21 as an alternative standard.	
Transport SA	Y	Supports the eventual introduction of an IIP standard.. The loss of instrument panel door requirements would be a retrograde step. Any IIP standard should include requirements for instrument panel door (glove box) to remain shut in a collision test at 48km/h or 30g horizontal longitudinal loading	
VicRoad	Y	Supports option 2.	

APPENDIX 3 – DATA SOURCES AND ASSUMPTIONS

Primary sources of data and information were:

The Black and White Guide, 1999 Edition, published by Glass's Guide.

IIHS (Insurance Institute for Highway Safety) (1993), Status Report No. 28 (October 9)

Kahane, D J (1988). *An Evaluation of Occupant Protection in Frontal Interior Impact for Unrestrained Front Seat Occupants of Cars and Light Trucks*. NHTSA Technical Report, DOT HS-807 203. National Highway Traffic Safety Administration, Washington D.C.

FORS: Road Fatalities, Australia, *1996 Statistical Summary. ISSN 1323-3688*
Federal Office of Road Safety, Canberra.

McLean, A J; Fildes, B N; Kloeden, C N; Digges, K H; Anderson, R W G; Moore, V M & Simpson, D A (1997). *Prevention of Head Injuries to Car Occupants – An Investigation of Interior Padding Options*. FORS Technical Report. - CR 160, Federal Office of Road Safety, Canberra

Information supplied by industry sources.