

**Deliberations of the NSW School Bus Safety  
Working Group:**

**SEAT BELTS ON SCHOOL BUSES**

**For:**

**NSW SCHOOL BUS SAFETY WORKING GROUP**

**By:**

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## Executive Summary

### Background

After the Minister for Transport Services had met with representatives of various parent organisations, he established the School Bus Safety Working Group to consider school bus safety matters, particularly seat belts.

The Working Group was chaired by the Independent Transport Safety and Reliability Regulator and comprised representatives from Government agencies, the bus industry, and parent and community organisations.

The Working Group's purpose and role are set out in its Terms of Reference, which are to:

- Identify concerns regarding school bus travel.
- Examine potential and practical solutions.
- Provide a report to the Minister for Transport Services for consideration.

The Terms of Reference also provide the basis and structure for the Working Group's deliberations.

### The work

The work entailed:

- ascertaining members' concerns,
- collecting relevant information about these concerns,
- examining, discussing and reviewing members' suggestions and proposals,
- considering the relevant issues in light of the information, and
- making conclusions and recommendations.

The information and data examined included:

- a review of relevant research literature
  - It was necessary to consider the issues in light of current knowledge about the safety benefits to be obtained from seat belts in school buses.
- analysis of injury and fatality statistics
  - This would assist in identification of the issues regarding children's transport safety, particularly when travelling to and from school, by different modes.
- defining options for fitting seat belts to school buses, and estimating costs associated with each.

The ITSRR contracted an independent consultant to assist the Working Group in addressing the Terms of Reference and in its deliberations by:

- providing expert advice and facilitating the exchange of information and views on the issues raised;
- providing presentations based on reviews of existing research studies and analysis of statistics on buses and road crashes
- determining the costs associated with the installation of seat belts in NSW and rural school buses, and

- preparing the final report on the Working Group's deliberations for Ministerial consideration.

The Working Group met six times - December 2003, and March, April, May, July and October 2004 to carry out the above work.

### **Concerns**

Before the first meeting, Working Group members were invited to make submissions outlining their concerns regarding school bus travel. The most common concerns of parent and community organisations were:

- seat belts should be fitted to school buses
- standing should be prohibited on school buses
  - for the above two concerns, emphasis was given to roads with higher speed limits or roads in country areas
- elimination of the policy under which three small children can sit in a seat designed for two adults.

In considering the issues, two approaches were identifiable.

One approach was a cost-effectiveness approach. In this approach, the aim is to identify actions which will have the most effect in preventing death and injury to children for the available resources. Under this approach, it is relevant to look at the benefits achievable from fitting seat belts and the costs of fitting them. If other actions could prevent more children's death and injury for the same or a lesser cost, would have higher priority.

An alternative was an ethical or legal approach. Under this approach, statistics about child death and injury are seen as irrelevant. A central argument is if there is a major school bus crash, action will be demanded. Public outrage and perhaps legal liability would follow such a crash, if buses operate that are in any way less safe than they might be.

### **Australian Design Rules**

Requirements to fit seat belts to coaches arise under Australian Design Rules (ADRs). Other than the ADRs, there are no requirements to fit seat belts to buses. The ADRs are administered by the Australian Department of Transport and Regional Services, and are the required standards for new vehicles under the Federal Motor Vehicle Standards Act 1989. States and Territories ensure compliance with ADRs when vehicles are in use.

Buses with a Gross Vehicle Mass of 3.5 tonnes or less (many small buses but not most) are required to have seat belts. Buses of this size with more than 12 seating positions are also required to have seat belts, but only if they were first manufactured on or since 1 January 2000.

The ADRs require seat belts on heavy omnibuses, but this applies only to long distance and tourist coaches. Seat belts are not required on school buses or other route buses.

### **Recent studies relevant to seat belts and standing**

Most recent Australian studies arose out of the work of the Australian Transport Council. The Australian Transport Council's work in relation to seat belts on school buses is outlined:

- 4 December 1998



- The Australian Transport Council directed Austroads to examine school bus safety in Australia.
- 2001
  - Austroads published its report on its examination of school bus safety, which included a National School Bus Safety Action Plan.
- 25 May 2001
  - The Australian Transport Council acknowledged the Austroads report and agreed to the formation of National School Bus Safety Advisory Group within Austroads.
- 2002
  - The National School Bus Safety Advisory Group, within Austroads, reviewed the School Bus Safety Action Plan, addressing priorities, and reported.
- 8 August 2002
  - The Australian Transport Council accepted the School Bus Safety Advisory Group’s report, and its recommendation to give priority to measures that address accidents involving children struck by cars after leaving the bus or before boarding. The Council also reported that the Advisory Group was looking in more detail at internal bus safety measures, such as seat belts.
- 2002
  - The Advisory Group reported on internal school bus safety measures.
- 30 April 2004
  - The Australian Transport Council noted the continuing strong concern of many parents, and indicated that measures would continue that are likely to be most effective in reducing risks to children.

The studies indicated that State and Territory jurisdictions had correctly identified the safety of child pedestrians around buses as the highest priority relating to school bus safety, and the jurisdictions had relevant actions in place and were developing further actions to address the problem.

Among the above major studies, the most relevant to seat belts in school buses was the Austroads report entitled *Investigation of Internal Bus Safety Measures*, published in 2002. This study investigated the following measures:

- Installing lap-sash seat belts in school buses in Australia.
- Fitting school buses with higher seatbacks (improving compartmentalisation).
- Requiring school buses to be limited to carry one child to each single seat, compared to current three-for two seating policy.
- Prohibiting standing passengers while the bus is moving.
- Improving the rollover strength of buses.

The conclusions were:

- Compared with a passenger’s, the risk is “considerably greater” as a pedestrian before getting on and after getting off the bus.
- There is “varying evidence” about the safety effectiveness of fitting seat belts, allowing students to stand, allowing three for two seating, or installing higher seat backs.

- There is “conflicting evidence” regarding the effectiveness and costs of fitting seat belts. Lap-sash seat belts may improve protection in side impact and rollover crashes, compared with compartmentalisation alone.
- There is a “lack of evidence” to indicate that seated travel is significantly safer than standing.
- “The research is mixed and the evidence is largely inconclusive due to the low number of crashes associated with school buses.”

In estimating costs, they considered three options for implementing the measures considered. The options varied in estimated cost between \$2.5 billion and \$6.4 billion.

Other relevant Australian studies and investigations have been undertaken in NSW, Queensland and Victoria.

Two studies undertaken for the NSW Department of Transport in 1994 and 1996 concluded that fitting seat belts on large buses or prohibiting standing would have costs quite disproportionate to the likely safety benefits. The resources would be better used to prevent pedestrian and bus accidents. Several recommendations were made to improve the safety of occupants of school buses, all of which have been implemented.

The Queensland School Transport Safety Task Force released its report in 2001. It covered a wide range of issues, including the safety of pedestrians and bicyclists. The Task Force recommended the fitting of seat belts to buses that operate in certain more hazardous environments, starting with areas that have long steep or very steep grades. They noted that adult seat belts may not be suitable for smaller children.

Following the Task Force’s report, the Queensland Government approved a trial of seat belts on school buses in some mountainous areas. There were several relevant findings. The evaluation found inadequate wearing rates, especially among the older children. But the wearing rate data relate to only a small number of buses. There were also indications of incorrect wearing.

In Victorian, the 2001 review of school bus services released its report. It concluded that the cost of fitting seat belts in new buses was significant, and actions to improve the safety of child pedestrians around school buses were more likely to improve safety.

In the USA, the National Highway Traffic Safety Administration reported to Congress on crashworthiness of school buses. The USA has dedicated school buses, and so it is not usually possible to generalise to Australia where nearly all route buses are used to convey school children. Nevertheless, the USA researchers confirmed the view of Australian researchers that lap only belts can increase the risk of serious injury to children. They pointed out that lap-sash belts are misused, and if worn improperly (for example, with the sash part behind the back or under the arm) they can increase the risk of injury in the same way as lap-only belts.

The following common features of the studies would tend to imply that seat belts would be fitted to buses only if resources were available after accounting for other expenditure on child health and safety:

- Buses provide the safest form of road transport by far.

- Fatalities are extremely rare.
- Serious injuries are rare.
- Lap only seat belts are unsuitable.
- The safety benefits of lap-sash seat belts are unknown, but are likely to be much smaller in buses than the benefits that they provide for small vehicles.
- The costs of fitting seat belts to buses, with the implications of reduced capacity on buses, would be very high (billions of dollars for Australia).
- There are other safety actions that could be undertaken with road safety resources that would have greater effect in protecting children from death and serious injury.
- Increased costs and demands on school bus operations could result in fewer children using buses and moving to other road travel modes where they would be much less safe.

On the other hand, the following features from the studies are positive aspects of fitting seat belts on buses:

- Many parents are concerned about children travelling without seat belts on buses.
- A major bus crash, in which several children were killed, would change the statistics.
- Lap-sash belts with higher seat backs would provide additional protection.
- The benefits would be greater on small buses than on large buses.

Other issues were identified that need resolving:

- How many children would actually wear a seat belt if provided? How could the wearing rate be maximised?
- Who would be responsible for children's seat belt wearing?
- There appears to be a need for a specially designed belt that:
  - would be safe for small children
  - would be comfortable and likely to be worn correctly by children for whom the adult seat belt rides high on the neck or the face.

### **Injury and fatality statistics**

It is essential to consider the number of deaths and injuries of children travelling to or from school by bus or by other modes, to estimate the relative size of the problem. This provides centrally important information for deciding how to allocate available resources so that child death and injury can be minimised.

The injury and fatality statistics considered cover the 10 years 1993 to 2002 inclusive. State or Territory statistics do not indicate the purpose of the trip in which the person was killed or injured. The NSW RTA's crash data provide an indication of the number of accidents that might be associated with school travel by noting whether the accident happened during school travel time. School travel time is defined as:

- 7:30 am to 9:30 am inclusive, and 2:30 pm to 5:00 pm inclusive
- weekdays
- not public holidays or other school holidays.

Since 1993, in NSW, six bus passengers aged 5 to 18 years have been killed during school travel times.

Of the six bus child passengers killed, the following five fatalities occurred as a result of other factors such that it is unlikely that a seat belt may have prevented the outcome:

- two fatalities occurred as a result of being trapped in the rear door while alighting and being dragged;
- one fatality occurred while standing near the door (after leaving seat) while waiting to get out;
- one fatality occurred while leaning out the window and being struck by a telegraph pole,
- one fatality occurred while seated and being stuck by an intruding load from another vehicle.

The remaining fatality of the total of six fatalities may have been prevented by a seat belt.

In the 10 years 1993 to 2002 in NSW, as well as the six (8%) bus passenger fatalities described above, other children aged 5 to 18 years were killed in school travel times:

- 9 pedal cyclists (13%)
- 23 car passengers (32%)
- 34 pedestrians (47%)

Similarly, for children non-fatally injured in school travel time, there were many times more car passengers and pedestrians than bus passengers. Even for pedal cyclists, three times as many were reported injured as bus passengers.

If the aim is to prevent injury to children, it is relevant to look beyond school travel times, and beyond the four modes by which children are likely to travel to school. In the years 1993 to 2002, inclusive, in NSW bus passengers constituted:

- 2% of children aged 5 to 11 years fatally injured (three out of 151)
- 1.8% of those 12 to 16 years fatally injured (four out of 217)
- 0.3% of those aged 17 or 18 years fatally injured (one out of 367).

Some Working Group members suggested that seat belt introduction should have priority in country areas because country areas are more hazardous. It is the case the crashes on higher speed roads are more serious on average.

There were about as many child bus passengers injured in school travel time in country (9%) as in metropolitan (5%) areas.

Over the 10 years 1993 to 2002, there was no increase in the number of children killed in NSW. There was a decline in the number killed in school travel times (all modes, not just bus).

Statistics from other States and Territories were also considered. These also indicated that over the same 10 year period, bus passengers aged 5 to 18 years represent a small proportion of children killed or injured during school travel time in comparison with other road users in these age groups.

Based on the safety experience with school buses, the installation of seat belts in school buses could not have a high priority, relative to other road safety work.

### **Estimate of costs**

In order to estimate costs, it was necessary to estimate the number of buses that would be likely to transport children to and from school. This was to be done separately for country and metropolitan buses, because some of the options would include only country buses.

Currently, however, available statistics are insufficient to enable an estimate of the numbers of buses used for school purposes. Therefore, it was necessary to use the Roads and Traffic Authority's vehicle registration data.

It was estimated that 8,209 buses are used to transport children to and from school. This includes buses that are not exclusively for the use of children.

These included 1,378 small buses, which were defined as those with a seating capacity of 25 or fewer. Of these 1,378 buses, only 743 were estimated to have a Gross Vehicle Mass (GVM) greater than 3.5 tonnes. This GVM is relevant because buses with a GVM of 3.5 tonnes or less are required by the Australian Design Rules to have seat belts (for those with more than 12 seating positions this applies only to vehicles manufactured from 1 January 2000). Of the 1,378 small buses, only 743 were counted for the cost estimates.

There was no clear definition of what are country and what are metropolitan roads, therefore the classification used in RTA registration data was used as a basis. The RTA data distinguish between city and country buses for buses with MO number plates. There were 7,222 buses with MO number plates (of which 7,115 were counted for cost estimates). RTA registration data were used to estimate whether the other 459 buses included were country or metropolitan.

Fitting seat belts and prohibiting standing passengers has loss of carrying capacity implications. For the purpose of the Austroads *Investigation of Internal Bus Safety Measures* (2002), the loss of carrying capacity for a large bus was estimated by the NSW Department of Transport to range between 25% and 48% per bus (see page 39 of the Austroads report). For small buses, it has been assumed for the purpose of the calculation, that there might be no loss of carrying capacity if buses are designed new with seat belts or that it might be as great as 20%. For retrofitting on new small buses, it was assumed that there would be a carrying capacity loss of 20%.

In theory, there are two approaches to fitting seat belts. One is to fit them to new buses, as old buses are replaced. The other is to retrofit seat belts to existing buses.

Even if retrofitting were pursued as a strategy, it would have to spread out over many years. The main reasons for this spread for large buses are cash-flow demands and the lack of industry capacity to undertake the retrofits. Over the extended time needed for retrofits, many buses would be replaced. It also appears that retrofitting of certain types of bus may not be possible. This may apply to many types of small bus. In practice, that is, a pure retrofitting strategy is not possible.

The estimates of bus numbers, costs and cash flows are set out in the tables below.

**Summary of estimates based on RTA data and other information as outlined in the text**

**1. Large buses**

**1.(a) Total costs**

Option	Retrofit		New buses		No of buses	
	\$ billion	%	\$ billion	%	No.	%
<b>Country</b>	0.5 to 1.2	46%	0.5 to 1.1	46%	3,162	46%
<b>Metropolitan</b>	0.6 to 1.4	54%	0.6 to 1.3	54%	3,669	54%
<b>Total</b>	1.1 to 2.6	100%	1.0 to 2.5	100%	6,831	100%

**1.(b) Loss of standing and 3 for 2 seating**

<b>Loss of carrying capacity</b>	25% to 48%
<b>Additional buses required</b>	33% to 92% 2,277 to 6,306

**Cost to make up capacity loss**

	\$ billion	%
<b>Country</b>	0.35 to 0.96	46%
<b>Metropolitan</b>	0.40 to 1.12	54%
<b>Total</b>	0.75 to 2.08	100%

**1.(c) Cash flow**

**1.(c) (i.) Retrofit – cost per year**

	Country	Metro	Total
Phase-in period	\$ million	\$ million	\$ million
<b>5 years</b>	103 to 237	119 to 275	222 to 512
<b>10 years</b>	51 to 118	59 to 137	109 to 254
<b>15 years</b>	33 to 78	39 to 90	72 to 168
<b>%</b>	46%	54%	100%

**1.(c) (ii.) New buses – cost per year**

About one in 30 large buses is replaced each year. This is approximately 228 buses, each of which will cost more with seat belts fitted. Additional buses are required each year to make up for capacity loss: approximately 76 if capacity loss is 25% and approximately 210 if capacity loss is 48%.

Country	Metro	Total
\$ million	\$ million	\$ million
16 to 38	18 to 44	34 to 82
46%	54%	100%

**2. Small buses**

**2.(a) Total costs**

The number of buses is the number included in the costings. Many small buses have been excluded from the costings because they are or will be required to have seat belts under current law.

Option	Retrofit		New buses		No of buses	
	\$ million	%	\$ million	%	No.	%
<b>Country</b>	11.0 to 32.1	85%	6.9 to 28.0	85%	630	85%
<b>Metropolitan</b>	2.0 to 5.8	15%	1.2 to 5.0	15%	113	15%
<b>Total</b>	13.0 to 37.9	100%	8.2 to 33.1	100%	743	100%

**2.(b) Loss of standing and 3 for 2 seating**

<b>Loss of carrying capacity</b>	0% to 20%
<b>Additional buses required</b>	0% to 25% zero to 186

**Cost to make up capacity loss**

	\$ million	%
<b>Country</b>	zero to 19.4	85%
<b>Metropolitan</b>	zero to 3.5	15%
<b>Total</b>	zero to 22.9	100%

**2.(c) Cash flow**

**2.(c) (i.) Retrofit – cost per year**

	Country	Metro	Total
Phase-in period	\$ million	\$ million	\$ million
<b>5 years</b>	1.9 to 6.1	0.3 to 1.1	2.2 to 7.2
<b>10 years</b>	0.8 to 2.9	0.1 to 0.5	0.9 to 3.4
<b>%</b>	85%	15%	100%

**2.(c) (ii.) New buses – cost per year**

About one in 12 small buses is replaced each year. This is approximately 62 buses, each of which will cost more with seat belts fitted. Additional buses are required each year to make up for any capacity loss: approximately 15 if capacity loss is 20%.

Country	Metro	Total
\$ million	\$ million	\$ million
0.6 to 2.3	0.1 to 0.4	0.7 to 2.8
85%	15%	100%

The costs are an estimate, one that was possible with the time and resources available. Estimation of the numbers was undertaken with RTA vehicle registration data, which were not intended for that purpose. There was no way of checking the reliability of the division of buses between those that travel on country roads and those that travel

on metropolitan roads. The estimates were done by taking a typical cost for a typical bus, rather than anything more detailed. These estimates might be seen as order-of-magnitude estimates, for the limited purpose of helping to decide what to do next.

If it were decided to proceed towards compulsory seat belt fitting on school buses, the next step would be a detailed costing. A detailed study would be necessary, because of the orders of magnitude estimated in this report, particularly for large buses.

### **Other issues**

A number of issues were raised in the SBSWG meetings. Most of these need further consideration and resolution before implementation of seat belt fitting and prohibition of standing on school buses.

- Prohibition of standing passengers raises the danger of having to leave children at bus stops. This would, however, not be a new problem, because bus carrying capacity is already regulated.
- Seat belts and systems need to be designed to suit use by children on route buses.
- Would legal compulsion be necessary to achieve satisfactory wearing rates? If so, how would this be applied?
- Methods need to be considered to achieve high rates of seat belt wearing by secondary students in school buses.
- Carrying capacity losses from seat belt installation and prohibition of standing would mean an increase in the number of buses around schools. This could have child pedestrian safety implications, depending on the circumstances at each school. Gradual implementation might allow kerb space implications to be dealt with.
- Operating a mixture of seat-belted and non-seat-belted buses in a phased implementation may result in complaints from parents whose children do not have seat belts. This needs careful management.
- Fitting seat belts and prohibiting standing will make bus travel more expensive. This may mean that more travellers (not only children) choose not to use the bus. On the other hand, fitting seat belts might result in more parents choosing to send their children by bus.
- In a bus fitted with seat belts, it would be necessary for the driver at a bus stop to wait for passengers to remove seat belts, go to the door and alight, and for each passenger joining the bus to find a seat and fasten and adjust his or her seat belt. This would slow bus travel times, and needs to be considered.
- The estimated costs of seat belt fitting and prohibition of standing, particularly for large buses, mean that funding sources need to be considered. This would need analysis from a whole-of-government perspective.
- There is a risk of a major school bus crash. The risk is not high, but is certainly non-zero. A high speed head on collision with a heavy vehicle is the type of crash that could result in many casualties. It is almost certain that community concern at the death of many children in one bus crash would be much greater than the death of the same number or even many more children killed, but one at a time. The smaller the bus, the more serious the outcome for its occupants, other things being equal.
- The bus manufacturer representative has expressed a preference for a gradual increase in the number of buses and bus upgrades. Bus manufacturers have expressed a preference for a National approach to regulation.



- The established method of new vehicle regulation is through the Australian Design Rule (ADR) process. There are many matters to take into account in new vehicle regulation and the ADR process is designed to address these matters.
- The B.U.S. Action Group, a member of the SBSWG, presented a proposal to prohibit standing on school buses where the speed limit is 80 km/h or greater, and to introduce seat belts on new and replacement school buses by first term 2005.

### **Conclusions**

Research studies, fatality and injury statistics, and estimated costs together indicate that fitting seat belts on buses and prohibiting standing would not have a high priority relative to other measures to protect children from death and injuries on the road, based on cost-effectiveness considerations.

By concentrating on the costs and likely effectiveness of seat belts in buses, two issues are overlooked. The first is parent concern that children are travelling in buses without seat belts, when these parents believe that fitting belts would significantly improve their children's safety. The second is the major public concern that would follow a crash in which many children were killed.

The main concerns addressed by the Working Group were:

- having seat belts fitted on buses used to convey children to and from school
- prohibiting children standing in school buses
- removing the practice where small children are required to sit three to a seat meant for two adults.

Considered on its own, implementation of the proposals would be likely to have some road safety benefit.

The proposal would, however, cost much more, but have less benefit, than other actions aimed to protect children from injury and death on the road. If funding this proposal had the effect of diverting resources away from other actions, it would have a negative effect on the safety of children.

If through increased costs or increased travel times, the proposal resulted in some children choosing to travel by another mode than bus, it would have a negative impact on safety. On the other hand, perceptions that buses have become safer might cause parents to choose the bus.

It is estimated that the proposal, if implemented State-wide in NSW, would cost between \$1 billion and \$2.5 billion for large buses, and between \$8.2 million and \$33.1 million for small buses (those with 25 seats or fewer).

For large buses, it is estimated that 46% of the costs would apply to country buses. For small buses, it is estimated that 85% of the costs would apply to country buses.

Some Working Group members questioned whether it is realistic to divide the proposal into country and metropolitan areas. It was suggested the types of roads and the traffic flows in outer metropolitan areas would appear to make a serious crash in these areas at least as likely as in metropolitan areas. The RTA representative pointed to the difficulties in imposing vehicle regulations based on whether the vehicle operates in one part of the State rather than another.

These costs do not include additional administration costs of the School Student Transport Scheme of having more buses to administer. Nor has anything been added for additional running costs (such as fuel and maintenance) of the additional buses.

The research studies reviewed and the accident statistics analysed indicate that crashes where a child's life could be saved by a school bus seat belt are very rare; in NSW, there has been one child killed who may have been saved in more than 10 years. Bus travel is by far the safest mode of road transport; large buses provide good protection for their occupants in nearly all crashes.

A user pays approach to this proposal in isolation appears unrealistic. The 2004 Review of Bus Services in NSW (Unsworth Report) discusses the complex issues associated with bus service funding.

The fitting of seat belts on school buses, if it is to proceed, seems most appropriately progressed as a proposed Australian Design Rule:

The reasons to proceed with seat belts on route buses relate to public concern.

There appears to be public concern about the safety of school buses. Parent organisation representatives on the School Bus Safety Working Group have suggested that this relates to the absence of seat belts. If it were decided to progress this proposal, research would have to be conducted to quantify and identify that concern. There is also the much greater public concern that would arise if a large number of children were killed in a bus crash. Nevertheless, public perceptions are important and appropriate responsiveness to such concerns is an important part of modern public sector management.

There were two major coach crashes on the NSW North Coast in 1989. Following these crashes, efforts to improve occupant protection on coaches were accelerated and resulted in Australian Design Rule 68, which applies to heavy buses manufactured on or after 1 July 1994. This Rule does not apply to route buses, the type that transports children to school.

In view of the costs and industry capacity, retrofitting seat belts is not an achievable option. If an ADR were introduced, and when a large number of buses had been fitted, then retrofitting might be considered.

Some Working Group members argued that protection on country roads is more crucial, and that introduction on country roads would make funding of the proposal more feasible. The Roads and Traffic Authority representative expressed doubt, however, whether it would be practical to introduce such vehicle requirements in limited areas and indicated the desirability of introducing requirements through the Australian Design Rule (ADR) process.

If seat belts are to be introduced on route buses, the ADR process has advantages over other approaches:

- It allows a manageable introduction, one that the Australian bus manufacturing industry may be able to manage.

A National approach to transport regulation is favoured by the Bus Industry Confederation, and was supported by the House of Representatives Standing Committee on Transport and Regional Services in its 2004 report on Road Safety in

Australia, which recommended that the Australian Government ask the National Transport Commission to develop such a system.

- The matter is an issue in Queensland and Victoria, as well as NSW, and a consistent approach would benefit Australia.
- The ADR process is well developed, and it takes account of all the complexities of vehicle regulation.

It would be necessary to design a restraint system suitable for small children. Moreover, it would appear to be advantageous to design an occupant protection system suitable for route buses. These are of national, and international, applicability, making the ADR approach even more relevant.

The development of any relevant regulation, including the development of an ADR, would have to include a detailed economic study of the proposal. This would have to be much larger and more detailed than the brief analysis included in this report.

It appears that fitting seat belts to route buses would be less costly for small buses than for large buses. And seat belts should have more safety benefit in small buses than in large buses. This is a reason for giving priority to extending the applicability of the ADR that requires seat belts on small buses. Small buses are, however, manufactured overseas, and there may be other relevant considerations. This issue would be addressed in the ADR development process.

Industry and Government agency members of the Working Group expressed support for the progression of any seat belt proposal through the ADR process.

The first issue is the ability of the Ministry to provide relevant statistics to allow analysis of significant issues such as this. One of the Ministry's representatives on the Working Group explained that improved systems were in place to collect and retrieve relevant data more readily, but the systems were too new, and as yet had collected insufficient data.

### **Recommendations**

The most appropriate actions resulting from the deliberations of the School Bus Safety Working Group would be progressed if:

- The matter of fitting seat belts in route buses were referred to the Australian Transport Council (ATC) to progress the issue nationally through the Australian Design Rule process.
  - It is recommended at the next ATC meeting that NSW gives notice of its intention for this issue to be placed on the agenda by the end of 2005.
  - It is understood that technical aspects of the process are led by the Commonwealth Department of Transport and Regional Services through the Technical Liaison Group (which has representatives from industry and from relevant State and Territory Government agencies, including the NSW Roads and Traffic Authority)
  - The Design Rule would take into account the needs of children with regard to seat belt design and the different usage of route buses compared with coaches.
  - It is understood that passengers could not be required to stand in a bus which is required to have seat belts fitted.

- Among other things, in the development of the ADR, consideration be given to seating of 3 restrained children in a seat designed for 2 adults.
- Priority in the ADR development process might be given to smaller buses.
- Retrofitting existing school buses with seat belts is not considered to be an appropriate option.
- Where appropriate, the Ministry of Transport through operator accreditation, contractual reform, service planning and the School Student Code of Conduct, and the Roads and Traffic Authority address the other issues raised in submissions of parent and community groups:
  - safe storage of luggage
  - child proofing of escape and fire proofing
  - safe pick up and drop off points
  - standards for security, supervision in the “transport hub” particularly at interchanges

## **1. Background**

### **1.1. Establishment**

After meeting with representatives of various parent organisations, the Minister for Transport Services established the School Bus Safety Working Group to consider school bus safety matters, particularly seat belts.

### **1.2. Membership**

The Working Group was chaired by the Independent Transport Safety and Reliability Regulator (ITSRR), and comprised representatives from Government agencies, the bus industry, and parent and community organisations. The following were represented:

#### **Parent and Community Organisations:**

- Federation of Parents and Citizens' Association of NSW
- Council of Catholic School Parents
- Isolated Children's Parents' Association
- NSW Parents Council
- Belt Up for Safety (BUS) Action Group

#### **Industry**

- NSW Bus & Coach Association
- Manufacturer (Custom Coaches)

#### **Government Agencies**

- Independent Transport Safety & Reliability Regulator (chair and secretariat)
- Motor Accidents Authority
- Ministry of Transport
- Roads & Traffic Authority

These agencies have responsibilities that relate to the safety of children on school buses. Their representation on the Working Group allows each stakeholder to respond to and address matters for which it has responsibility.

### **1.3. The Working Group's Purpose and Role**

The Working Group's purpose and role are defined in its Terms of Reference, which are to:

- Identify concerns regarding school bus travel.
- Examine potential and practical solutions.
- Provide a report to the Minister for Transport Services for consideration.

The Terms of Reference also provide the basis and structure for the Working Group's deliberations.

### **1.4. Scope**

The scope entailed:

- ascertaining members' concerns,
- collecting relevant information about these concerns,
- examining, discussing and reviewing members' suggestions and proposals,
- considering the relevant issues in light of the information, and
- making conclusions and recommendations.

The information and data examined included:

- a review of relevant research literature
  - It was necessary to consider the issues in light of current knowledge about the safety benefits to be obtained from seat belts in school buses.
- analysis of injury and fatality statistics
  - This would assist in identification of the issues regarding children's transport safety, particularly when travelling to and from school, by different modes.
- to define options for fitting seat belts to school buses, and estimate costs associated with each.

### **1.5. Consultant's Purpose and Role**

After the first meeting of the Working Group, the ITSRR contracted an independent consultant to provide expert advice to assist the Working Group in addressing the Terms of Reference and in its deliberations, including:

- facilitate Working Group meetings and the exchange of information and views on issues raised;
- provide presentations and briefings based on reviews of existing research studies;
- provide an analysis of cross modal and interstate injury and fatality data for school aged students for the last ten years;
- determine the costs associated with the installation of seat belts in NSW and rural school buses, and
- prepare the final report containing the Working Group's deliberations for Ministerial consideration.

The consultant reviewed the following research literature relating to seat belts on school buses.

Newman S, and Coutts M (2002) *Investigation of internal bus safety measures* Austroads

Other literature included:

Coutts M, Newman S, Roper P, and Styles T (2003) *Evaluation of the seat belt trial in Queensland: final report*, ARRB Transport Research, for Queensland Transport

Henderson M (1996) *Standing in school buses: the strategic and practical issues*, Department of Transport NSW

Henderson M, and Paine M, (1994) *School bus seat belts: their fitment, effectiveness and cost*, Department of Transport NSW

Tziotis M, Newman S, Stephenson W, Attewell R, (2001) *School bus safety in Australia: summary report* Austroads

The analysis of injury and fatality data included children (aged 5 to 18 years) travelling by different modes, during school travel times (7.30 am to 9.30 am and 2.30 pm to 5.00 pm – weekdays):

- bus passengers
- car passengers
- pedestrians
- pedal cyclists
- train passengers.

This was conducted for each State and Territory, for the most recently available 10-year period (1993 to 2002).

The costs of fitting lap-sash belts on new school buses and the costs of retrofitting existing buses in both NSW and in rural NSW were examined, in addition to school buses that travel in different speed zones.

This information, together with the Working Group's deliberations at meetings, and other member contributions, formed the basis of this report.

## **1.6. Meetings**

The Working Group's meetings formed the basis of its deliberations. It met six times, in December 2003, and March, April, May, July and October 2004.

The first meeting was introductory, to provide an overview of the roles of the Working Group, the Independent Transport Safety and Reliability Regulator (ITSRR), and the Ministry of Transport (MoT). The Director General, MoT, stated that "issues raised and/or proposals put forward by the Working Group should be compelling, realistic and operate inside practical parameters<sup>1</sup>. The Chair of the Working Group suggested that "the Group's solutions or proposals should be practical and based on empirical data such as demographics, rather than anecdotal evidence".

The Manager, Safety Projects, ITSRR, provided the Working Group with an overview of school bus safety within NSW and clarified existing legislative and policy requirements for school bus travel. It was noted that school bus safety has been the subject of many State and National reviews which have generally concluded that the most significant risk to school children regarding school bus travel is their behaviour around and in the vicinity of a bus. These findings were also consistent with the analysis of NSW child fatalities (5 -18 years) that occurred over the last ten years, which was presented to the Working Group. That is, school student "pedestrian fatalities" are significantly higher than school student "passenger fatalities".

In the discussion, members requested that more statistics, including non-fatal injuries and other transport modes be presented. Representatives from community and industry groups outlined their issues of concern. Primarily, community concerns included a desire for seat belts to be fitted to school buses, although the details of the proposals varied. (Members concerns are outlined in the next section and at Appendix A.)

In the second meeting Dr D Saffron, the safety consultant engaged to assist the Working Group, provided an overview of recent Australian research that had been conducted on seat belts in school buses, in addition to relevant international research.

He drew attention to several national reviews conducted since 1999. The research is outlined in Chapter 2 below). Additionally, Dr Saffron emphasised to the Working Group the importance of priority setting to ensure that the national road safety budget is used to prevent the most injuries and deaths of children. It was also noted that it is not easy to save one life and therefore, stressed the importance of seeking actions that address a large part of the problem for a reasonable cost and are likely to reduce the problem substantially. Following the presentation, there was further discussion of the issues in light of the research findings.

In the third meeting, Dr Saffron presented statistics from each State and Territory on children aged 5 to 18 years, fatally and non-fatally injured, in school travel times, as a car passenger, a pedestrian, a pedal cyclist or a bus passenger. These statistics are set out in Chapter 3 below. The Manager, Light Vehicle Standards, in the RTA's Road Safety Strategy Branch, informed the Working Group of the processes involved in developing a new Australian Design Rule (ADR), and answered questions about ADRs related to buses. The bus manufacturers' representative informed the Group of the development of ADR 68, which relates to occupant protection for large buses, other than route buses; he spoke from his experience in that development process. He also informed the Group of the costs of retrofitting a large route bus so that it would comply with ADR 68.

The Senior Policy Officer, School Student Transport Scheme, from the MoT, provided information, where available, on non-commercial bus contracts and provided explanations where information is not available. For example, information on the profile of the NSW bus fleet, age profile, numbers of buses and those buses fitted with seat belts are not readily available and or are not captured by MoT. The Working Group was also advised that MoT is moving away from a manual system to a database to collect operator survey information, which will improve the current system. Each presentation was followed by questions and discussion.

The fourth meeting, examined options and estimated costs associated with fitting seat belts to school buses. Dr Saffron presented the Working Group with various options as to which buses could be fitted with seat belts in large and small buses, the age profile of buses in NSW and bus replacement rates. Dr Saffron also drew attention to a number of issues for further consideration and resolution including responsibility for seat belt wearing, priority setting of resources and impact on industry and manufacturers. There was wide ranging discussion.

The fifth meeting focused on a draft report of the Working Group's deliberations. Members were provided with the draft report and a detailed presentation of its contents and conclusions. The Manager, Safety Projects, ITSRR, provided a detailed overview of the process for finalising the draft report. Dr Saffron led a discussion of the draft report and its conclusions. There was extensive discussion. Members were invited to provide comment on the draft report by making written submissions; these submissions are included in Appendix B.

## **1.7. Members' Concerns**

### **1.7.1. Submissions**

Before the first meeting, members of the Working Group were invited to provide submissions outlining their concerns regarding school bus travel.



Parent and community organisations made the following submissions, which are summarised below and attached in Appendix A.

**Joint submission NSW Parents Council, Isolated Children's Parents' Association, and Council of Catholic School Parents**

The concerns expressed in the joint submission of these three parents' groups are briefly summarised below

1. Seat belts should be fitted in school buses that operate in "open road" conditions
  - a. 5 to 7 years for phased implementation
2. No standing in the aisles
3. Scrap the "3 to a seat" rule
4. Safe storage of luggage
5. Safe seat design
  - a. improved head protection and cushioning
6. Design of emergency features
  - a. Child proofing of escape and fire proofing

Other points made in this joint submission were:

- The changes should be funded by revenue from co-payments in the School Student Transport Scheme (SSTS), in addition to other allocations.
- The issue should be raised at the Australian Transport Council.

**Submission from Federation of Parents and Citizens' Associations of New South Wales**

The concerns expressed in the Federation's submission are briefly summarised below

1. Safe pick up and drop off points should be specifically included in bus contracts.
2. Buses throughout the State should be required by law to provide seat belts.
  - a. Usage should be compulsory as for "private vehicles and coaches."
3. Children standing, particularly in high speed rural areas is of concern.
4. Standards for security, supervision and service provision in "transport hub," particularly at interchanges, vary greatly. A common set of management and security protocols is needed.

**Submission from B.U.S. (Belt Up for Safety) Action Group**

The concerns expressed in the Action Group's submission are briefly summarised below.

1. Standing in school buses that travel on roads with speed limits of 80 km/h or greater. (It was clarified at the first meeting that this applies whether or not the bus travels at the higher speed; the concern is with other vehicles travelling at high speed.)

2. Lap sash seat belts and high seats (complying with Australian Design Rule 68) on all bus routes where the speed limit is 80 km/h or higher.
3. Compliance with Australian Design Rule 68 for all school excursions requiring travel on roads with speed limits of 80 km/h or higher.
4. Three for two rule may not allow sufficient space for students to be seated “adequately.” It should depend on the size of the student, not their age.

The Action Group’s submission also suggested that, if McConnell Seats Educator 2-3 seats were installed in all new buses when manufactured, the present three for two rule could be retained, if a weight restriction on three for two seating were introduced, as well as the current age restriction.

### Overall

As can be seen, there were other issues, but the overriding issue, the one that took the Working Group’s attention, was that of fitting seat belts in school buses. This was associated with the issues of allowing children to stand on buses and of seating three young children on a seat meant for two adults.

### 1.7.2. Considering the issues

There were two main ways of considering the question of whether seat belts should be installed in school buses (and the related issues of standing passengers and sitting three small children in a two-person seat).

The first approach could be called a cost effectiveness analytic approach. It starts by recognising that funding for public sector programs is finite. It then seeks to identify:

- what objectives are intended by the proposed actions,
- what the proposed actions would cost,
- whether alternative actions would better address the intended objectives, for the same or a lesser cost.

For example, if the objective is to protect children from death and injury on the road, the proposed action and alternative actions would be considered in terms of the:

- extent of the problem of child death and injury the actions would address
- the likely effectiveness of the proposed actions in mitigating the problem
- possible unintended consequences of the actions considered.

The second approach could be called an ethical-legal approach. Proponents regard the question of seatbelts, standing passengers and three-to-a seat to be an ethical and legal issue. This approach would consider whether children are being transported less safely than they might be. If they are not being transported as safely as possible, this is ethically unsound; it should not happen – the proponents argue.

- Proponents have argued that statistics about child death and injury are therefore irrelevant.

– This view is expressed by Irwin and Faulks<sup>ii</sup>

*regardless of the crash rates of buses, and the injury rates for bus passengers when they do occur, passengers should expect to have access to suitable and effective restraints (page 17)*

- A central argument is, if there is a major school bus crash, which might kill 30 or more children, (the numbers of passengers killed in the North Coast coach crashes

of late 1989) then action will be demanded because of public outrage and condemnation.

- It would be ethical to take the preventative action before the event occurs.
- Such action would avoid the legal implications of running buses that are less safe than they might have been.
- Again, the point is made by Irwin and Faulks

*In the event of a major crash involving a packed school bus, there will be public opprobrium and outrage and a lasting ignominy to the bus operators and safety regulators of the bus industry...(page 17).*

The two approaches are not mutually exclusive.

- Proponents of the cost-effectiveness analytical approach would say it is undesirable ethically to use resources with less efficiency than we could, to protect children from injury.
  - If we spend x dollars to prevent the death of one child, when we could spend the same amount to prevent the death of two, then our choice involves the loss of one child's life unnecessarily.
- Proponents of the ethical-legal approach do not ignore costs altogether.
  - Some proponents have suggested that seat belts on school buses could be implemented in a limited way initially (in higher speed non-metropolitan zones), which would make the resource demands more manageable.

It is understandable that parents are concerned about the lack of seat belts on school buses. NSW people have been told the benefits of seatbelts since the 1960s, and car occupants have been required to wear seatbelts since 1971.

Requirements to fit seat belts and child restraints have been extended to include more vehicles over the years. The most relevant extension is that which applies to coaches. Coaches first manufactured from 1 July 1994 are required to have seat belts, with associated requirements for the structure of the coach and its seats. The requirement does not, however, extend to "route buses." School buses are route buses.

The requirement to have seat belts on coaches seems particularly relevant to parent representatives, since it arose after the two coach crashes in late 1989, where a total of 56 people died. The proponents of seat belts in school buses see it as a way of preventing some of the fatalities that may result from a similar school bus crash. Representatives of parents groups have also suggested the special concern that parents feel in rural areas, where school buses travel on high speed roads with other heavy vehicles. They report a perception by parents that their children are unprotected without seatbelts.

### **1.8. Other actions to improve road safety for children**

NSW has a large and comprehensive road safety program<sup>iii</sup>, most of which helps to protect the safety of children. The programs relate to managing speeding, promoting occupant restraint in lighter passenger vehicles, and treating hazardous locations are particularly relevant to the safety of children.

The RTA's representative on the Working Group provided information about programs that specifically address the safety of children travelling to and from school. These are summarised below:

- All schools now have a 40 km/h school zone on roads with a current school access point.
- School zones have been standardised to 8:00 am-9:30 am and 2:30 pm - 4:00 pm where possible to enhance motorist compliance.
- Flashing lights are being trialed at 41 school zone sites to evaluate their effectiveness in increasing motorists' compliance with the speed limit.
- Fixed digital speed cameras have been installed at ten school zone sites.
- 660 school crossing sites are supervised by school crossing supervisors.
- Schools have received guidelines to help them seek assistance for any road safety concerns around their school.
- An independent Review Panel assesses appeals by a school community to an RTA decision.
- A mandatory Road Safety Education Program is delivered in all NSW schools. This specifically addresses issues regarding bicycle, bus, passenger and pedestrian safety.
- A school road safety advertising campaign is run at critical times throughout the year.

It should also be noted that the Government has implemented a wide range of initiatives aimed at modifying behaviour in the vicinity of a bus including:

- Introduction of a State-wide bus safety package:
  - 40 km/h speed requirement for motorists
  - Static signage and flashing lights for buses
  - Improved school bus stops
  - State-wide education program
- Door safety systems
- Improved mirror systems, padding on bus seats, rails and stanchions
- Wig-wag school lights.

The bus industry reports that it has also undertaken measures aimed at improving bus safety through:

- Enhanced driver training
- Code of Conduct
- Improving education material
- Installation of video cameras in buses
- Bus driving hours and fatigue

## **2. Seat belts in school buses**

### **2.1. Existing Legislation and policy**

#### **2.1.1. Australian Design Rules**

Requirements to fit seat belts to coaches arise under Australian Design Rules (ADRs). Other than the ADRs, there are no requirements to fit seat belts to buses.

The ADRs are administered by the Australian Department of Transport and Regional Services<sup>iv</sup>. They set out standards for vehicle safety, emissions and anti-theft design. They are developed through a consultative process involving government, industry, employee and consumer representatives.

Under the Federal Motor Vehicle Standards Act 1989, the Australian Government has power regarding standards for new vehicles to the market. States and Territories ensure compliance with ADRs when vehicles are in use. The relevant NSW legislation is the Road Transport (Vehicle Registration) Act 1997 and the Road Transport (Vehicle Registration) Regulation 1998.

The ADRs use United Nations vehicle categories and are harmonised to a considerable extent with international standards. The process for development of ADRs is explained in section 5.1.

#### **2.1.2. ADRs for bus and coach seat belts**

In relation to seat belts in buses, the two most relevant ADRs are ADR 4 and ADR 68. Which of these applies depends on the bus's Gross Vehicle Mass (GVM)<sup>v</sup>.

ADR 4 requires seat belts for passenger vehicles with up to 9 seating positions, including the driver. ADR 4 also requires seat belts for light omnibuses up to 3.5 tonnes GVM (an omnibus is defined as a passenger vehicle having more than 9 seating positions, including the driver). ADR 5 specifies anchorages for seatbelts so that they are securely attached.

Most small buses (and of course all large buses) have a GVM greater than 3.5 tonnes.

For omnibuses with a GVM greater than 3.5 tonnes, the requirement to fit seat belts arises under ADR 68. ADR 68 exempts:

- omnibuses with less than 17 seats including the driver
- route service omnibuses
- seats with shorter backs, up to one metre high.

With these exemptions, ADR 68 applies only to long distance and tourist coaches.

In other words, seat belts are not required on school buses, or other route service buses, unless the bus's GVM is 3.5 tonnes or less.

ADR 66 specifies requirements for the strength of seats, seat-anchorages and seat belt anchorages of buses, and for protecting occupants, by padding, from seat backs and accessories.

On buses manufactured from August 1997, hard surfaces, such as hand rails, stanchions and seats, have to be padded. This followed recommendations of a review of passenger safety on school buses.

Under the Passenger Transport Act 1990, administered by the Ministry of Transport, all public passenger vehicles used for hire or reward must be accredited with the MoT. This includes route buses and long distance and tourist buses. Other legislative and policy requirements include:

- The Passenger Transport (Bus Services) Regulation 2000 allows the 3 for 2 seating rule to be applied to children under 12 years.
- Buses are permitted to carry standing school student passengers
- Buses principally used to convey school students are limited to 80 km/h while carrying standing passengers.

In relation to the hiring of buses for school excursions and sporting events, it is the school that determines the type of bus to be used to meet its own requirements (that is with or without seat belts).

## **2.2. Literature and Research Review**

### **2.2.1. Australian Transport Council Involvement**

The Australian Transport Council (ATC) comprises Ministers in transport related portfolios from State Governments, Territory Governments and the Commonwealth Government. The Council works to ensure a national approach to transport issues, including road safety issues.

In recent years, the Australian Transport Council has been active in relation to school bus safety. It has requested that several school bus safety projects be undertaken by Austroads.

Austrroads is an organisation of road authorities from the States, Territories and the Commonwealth, and from New Zealand. The NSW member is the Roads and Traffic Authority. Among other things, Austrroads advises, and performs tasks for, the Australian Transport Council.

The following outlines the Australian Transport Council's involvement in school bus safety:

- 4 December 1998
  - The Australian Transport Council directed Austrroads to examine school bus safety in Australia.
- 2001
  - Austrroads published its report on its examination of school bus safety, which included a National School Bus Safety Action Plan.
- 25 May 2001
  - The Australian Transport Council acknowledged the Austrroads report and agreed to the formation of National School Bus Safety Advisory Group within Austrroads.

- 2002
  - The National School Bus Safety Advisory Group, within Austroads, reviewed the School Bus Safety Action Plan, addressing priorities, and reported.
- 8 August 2002
  - The Australian Transport Council accepted the School Bus Safety Advisory Group's report, and its recommendation to give priority to measures that address accidents involving children struck by cars after leaving the bus or before boarding. The Council also reported that the Advisory Group was looking in more detail at internal bus safety measures, such as seat belts.
- 2002
  - The National School Bus Safety Advisory Group, within Austroads, reported on internal school bus safety measures.
- 30 April 2004
  - The Australian Transport Council noted the continuing strong concern of many parents, and indicated that measures would continue that are likely to be most effective in reducing risks to children.

These reviews, and particularly the Austroads reports, were considered by the NSW School Bus Safety Working Group and are explained in more detail below:

### **2.2.2. Request for Austroads review of school bus safety**

Following community concern over several incidents resulting in the death or serious injury to school children in the early 1990s, the Australian Transport Council requested Austroads in December 1998 to:

- review current practice and research in relation to school bus safety, and
- identify new or proven safety measures that may be used as part of a National approach to school bus safety.

### **2.2.3. School Bus Safety in Australia (2001)**

Austroads published its report on its examination of school bus safety in 2001<sup>vi</sup>.

Key elements of the review included:

- analysis of accident statistics
- identification of existing school bus safety programs
- examination of research literature
- stakeholder consultation (internal and external to Government)

This information was used to prepare a National School Bus Safety Action Plan.

#### **Accident statistics**

The study team analysed accident data, and estimated the number of children killed or seriously injured, associated with bus travel during school travel times. They examined the nine years, 1990 to 1998, inclusive.

Their estimate was that the number of fatalities had fallen from 14 fatalities in 1990 to four in 1998.

Most of the children killed were pedestrians around the bus, and nearly all were killed in the afternoon, after leaving the bus. It was rare for bus occupants to be killed or seriously injured. Where occupants were killed, occupant protection measures such as seatbelts were apparently not relevant; the report refers to children killed when caught in the bus door.

The report made recommendations for improvements in data collection, particularly regarding child pedestrian accidents after getting off or before getting onto buses.

### **Existing programs**

The study team examined road safety actions in various Australian jurisdictions regarding school bus safety. These appeared mainly to relate to the safety of children as pedestrians around school buses. These included such things as flashing warning lights on buses, setting and enforcement of special speed limits, and education of children, parents and the public.

### **Research literature**

The study team reviewed relevant literature to summarise knowledge regarding school bus safety. Of the research that has been conducted, most has been done in the United States of America. It is difficult to generalise from the USA to NSW application, because USA school buses are dedicated to the carriage of school children and managed by the education systems, whereas in NSW it appears that all route buses convey school children. Road safety technical agencies in the USA have not favoured the fitting of seat belts to school buses, but some jurisdictions have introduced requirements. A summary of some recent USA research is included in section 2.3.4.

The study team discussed three Australian studies. Two were studies addressing seat belt wearing and standing in school buses by Henderson and Paine (1994) and Henderson (1996), which will be discussed in section 2.3.1. The third was a study by Professor David Hensher (Director, Institute of Transport Studies, University of Sydney) conducted in 1994 for the Bus and Coach Association. He found that, although parents rated car travel as the safest way for their children to travel to and from school, school bus travel was by far the safest. Risk of death or injury was found to be many times greater when travelling by other modes compared with travelling by bus: car - seven times the risk, walking – 31 times, bicycling – 228 times<sup>vii</sup>.

### **Consultation**

The study team conducted consultations with stakeholders. Stakeholders included public sector road safety, transport and education agencies, in addition to the bus industry and interested parties from non-Government school organisations. Consultation was also conducted with parent groups (from Queensland, Victoria and the ACT – but not NSW).

Community groups thought that responsibility should be shared throughout the community. Generally, they identified the State Road Authority as the appropriate co-ordinator and leader of school bus safety measures.

### **National School Bus Safety Action Plan**

The study team went on to draft a National School Bus Safety Action Plan.

The Action Plan had many elements, mainly addressing the safety of children as pedestrians near school buses.



There were, however, elements relevant to school bus occupant protection. Those relevant to seat belts were (in Austroads, 2001, summary report, page 14):

- Identify the feasibility and related costs of school buses being limited to carrying one person to each single seat and ensuring that all children are seated while the bus is moving.
- Identify the feasibility, effectiveness and cost of installing 3-point seatbelts in school buses in Australia.
- Investigate the feasibility, safety benefits and costs of fitting school buses with higher seat backs.
- Initiate, as part of the Australian Design Rules (ADRs), a critical review of bus design standards.

State Road Authorities were identified as having key responsibility for these actions.

#### **2.2.4. Establishment of School Bus Safety Advisory Group**

The Australian Transport Council issued a media release in May 2001, acknowledging the draft and reporting the establishment of a School Bus Safety Advisory Group. The role of the Advisory Group was to monitor the implementation of school bus safety initiatives and programs and identify best practice, coordinate evaluation and research, and advise on priorities. The Australian Transport Council decided that one of the major tasks of the Group would be setting priorities under the draft National School Bus Safety Action Plan.

#### **2.2.5. Review of the School Bus Safety Action Plan**

Austroads established the School Bus Safety Advisory Group in 2001 and reported on its review of the School Bus Safety Action Plan in 2002<sup>viii</sup>.

The task comprised the following key objectives:

The task had the following key objectives:

1. To review the level of implementation of School Bus Safety Action Plan measures by Australian jurisdictions (through consultation with relevant stakeholders).
2. To review the measures in the School Bus Safety Action Plan and refine proposed measures where appropriate.
3. To prioritise measures included in the School Bus Safety Action Plan.
4. Where necessary for prioritisation, undertake short term actions which require investigation of the feasibility of measures (through literature reviews, review of updated statistics and consultation).

A low priority was allocated to seat belts and associated internal bus safety measures. Higher priority was allocated to other measures, particularly those to improve the safety of child pedestrians after getting off or before getting onto buses.

#### **Tasks**

The study team carried out similar tasks to those of the study published in 2001. They examined updated crash data, reviewed literature again, and consulted with relevant government agencies and stakeholders (by telephone and email).

**Conclusions regarding seat belts on school buses**

Their conclusions regarding seat belts were:

*As exemplified by fatality and injury data, research evidence also indicates that bus travel is a relatively safe mode of transport. Research evidence also suggests that the risk of injury to occupants while travelling as a passenger of a bus is low. The greatest risk to children travelling to or from school is as a pedestrian moving around school buses.*

*Despite the evidence that children as bus passengers are relatively safe, there remains a strong perception in the community, by parents in particular, that buses pose a greater risk than travel in the family car.*

*Debates over the safety of school buses, the benefits of compartmentalisation, the cost of installing seatbelts and other countermeasures relative to the safety gains that are likely to result are well-documented. The debate is discussed in detail in this report, indicating that research is mixed and the evidence is largely inconclusive due to the low crash risk associated with vehicles.*

*Overall, the research indicated that initiatives aimed at increasing driver and pedestrian behaviour, improved vehicle maintenance and roadside environments may offer greater potential for increasing the safety of children travelling in and around buses, as compared to the mandation of seatbelts, the abolishment of standees and the removal of ‘three for two’ seating in Australia. (Austroads, 2002, pages 93 and 94)*

**Priorities allocated to internal bus safety measures**

A major aim of the review was to reconsider each item in the 2001 Action Plan and assign it a priority.

Priorities were allocated according to the following system (pages 50 and 51 of the Austroads report):

Category	Rating	Rationale for rating
Priority	A	Action that addresses the most common cause of school bus related fatalities (based on available fatality data)
	B	Action that may address potential cause of fatalities (where available data is less conclusive)
Effectiveness	1	Proven and effective action
	2	Unproven action offering promising results / some merit
	3	Unproven action, though unlikely to be effective
	4	Action proven to be unsuccessful
	N/a	Action that calls for a study to investigate effectiveness
Resources	High	High level of resources required to undertake action
	Medium	Medium level of resources required to undertake action
	Low	Low level of resources required to undertake action
Implementation	Difficult	Difficult action to implement
	Complex	Complex yet achievable action to implement
	Easy	Easy action to implement

In this scheme, the relevant occupant protection actions were given lower priority than other measures, as follows (see pages 70 to 78 and page 80 of the Austroads report):

<ul style="list-style-type: none"> <li>Identify the feasibility and related costs of school buses being limited to carrying one child to each single seat compared to the current three-for-two policy.</li> </ul>	<b>Priority</b> B <b>Effectiveness</b> N/a <b>Resources</b> High <b>Implementation</b> Difficult
<ul style="list-style-type: none"> <li>Identify the feasibility and related of school buses ensuring that all children are seated while the bus is moving.</li> </ul>	<b>Priority</b> B <b>Effectiveness</b> N/a <b>Resources</b> High <b>Implementation</b> Difficult
<ul style="list-style-type: none"> <li>Identify the feasibility, effectiveness and cost of installing 3-point (lap-sash) seatbelts in school buses in Australia.</li> </ul>	<b>Priority</b> B <b>Effectiveness</b> 2 <b>Resources</b> High <b>Implementation</b> Difficult
<ul style="list-style-type: none"> <li>Investigate the feasibility, safety benefits and costs of fitting school buses with higher seat backs.</li> </ul>	<b>Priority</b> B <b>Effectiveness</b> N/a <b>Resources</b> High <b>Implementation</b> Difficult
<ul style="list-style-type: none"> <li>Initiate, as part of the Australian Design Rules (ADRs), a critical review of bus design standards.</li> </ul>	<b>Priority</b> B <b>Effectiveness</b> N/a <b>Resources</b> Medium <b>Implementation</b> Easy

### **2.2.6. Australian Transport Council response to the Action Plan Review**

The Austroads review had assigned priorities to actions, as set out in the Austroads report, discussed above. Australian Transport Council considered the report and its Communiqué of 8 August 2002 stated that:

*Ministers accepted the report of the Austroads School Bus Safety Advisory Group and its recommendation that jurisdictions give priority to measures that address the most common cause of school-bus related fatalities (children being struck by cars after leaving a bus or before boarding). The Advisory Group is looking in more detail at measures such as seat belts, strengthened seats, roll-over protection, one for one seating and an end to policies permitting standees and will report back to the next ATC meeting.*

That is, priority was to be given to pedestrian safety around school buses, but occupant protection issues would be given more study.

### **2.2.7. Investigation of Internal Bus Safety Measures (2002)**

As indicated by the Australian Transport Council, Austroads' School Bus Safety Advisory Group then undertook a review of internal school bus safety measures. Internal bus safety measures are those that would protect passengers while they are on the bus, rather than as pedestrians around buses, or when they are getting on or off the bus. The report was published in 2002<sup>ix</sup>.

The measures investigated were (page 1 of the report):

- Installing of 3 point (lap-sash) seat belts in school buses in Australia.
- Fitting school buses with higher seatbacks (improving compartmentalisation).

- Requiring school buses to be limited to carry one child to each single seat, compared to current three-for two seating policy.
- Prohibiting standing passengers, thus ensuring that all children are seated while the bus is moving.
- Improving the rollover strength of buses.

The aims of the study were to (page 1 of the report):

- Investigate the costs and associated implications of implementing each of the five vehicle-based countermeasures or actions listed above.
- Determine the economic value of each countermeasure or action.
- Identify the tasks involved and the timing options for implementation.

The investigators examined the crash data and reviewed the research literature. They collected and analysed information from all Australian jurisdictions and from the bus industry.

### **Conclusions regarding the safety priority of internal bus safety measures**

They concluded (pages 7 and 8 of the Austroads report):

- Reaffirmed the finding that, compared with a passenger's, the risk is "considerably greater" as a pedestrian before getting on and after getting off the bus.
- There is "varying evidence" about the safety effectiveness of fitting seat belts, allowing students to stand, allowing three for two seating, or installing higher seat backs.
- There is "conflicting evidence" regarding the effectiveness and costs of fitting seat belts. Lap-sash seat belts may improve protection in side impact and rollover crashes, compared with compartmentalisation alone.
- There is a "lack of evidence" to indicate that seated travel is significantly safer than standing.
- "The research is mixed and the evidence is largely inconclusive due to the low number of crashes associated with school buses."

### **Conclusions regarding costs**

The investigators considered costs associated with the reduced carrying capacity resulting from seat belts, the elimination of standing passengers, and the loss of seating three for two where it applies. They estimated that these would total \$1.8 billion (page 51 of the Austroads report).

They looked at options for implementing the measures and estimated the costs for each.

Option one was to retrofit the Australian school bus fleet with seat belts and replace those where satisfactory retrofitting was not possible. They estimated the costs to be \$440 million for the retrofitting and \$250 million for the replacement, totalling \$0.7 billion (pages 50 and 51 of the Austroads report). They did not include the costs of strengthening bus walls and floors to make them suitable for attaching seatbelts<sup>x</sup>.

If we added the loss of capacity costs (above) the total cost would be \$2.5 billion for option one.

Option two was to replace buses that did not meet rollover strength standards. The Australian Design Rule for rollover strength applies to large buses manufactured from

1 July 1992 and most relevant small buses from 1 July 1993. They also added costs to retrofit seat belts to those that already met the rollover standard. The replacement cost was estimated as \$2.2 billion and the retrofitting at \$250 million, totalling \$2.4 billion (page 51 of the Austroads report).

If we added the loss of capacity costs (above) the total cost would be \$4.2 billion for option two.

Option three was the “worst case scenario” option (page 51 of the Austroads report). This entailed replacing the whole Australian school bus fleet at a cost of \$4.6 billion.

If we added the loss of capacity costs (above) the total cost would be \$6.4 billion for option three.

### **Other considerations**

The timing of the three options was not specified. The timing would be limited by the capacity of the Australian bus building industry (page 46 of the Austroads report).

The investigators concluded that Australian Design Rules would need amendment for the fitting of seat belts to school buses (page 48 of the Austroads report).

Altogether, they saw the study as providing a preliminary estimate. Costs would be very significant, but apparently more detailed studies would be required before implementation of any of the options could proceed.

### **2.2.8. Australian Transport Council April 2004**

The next Australian Transport Council Communiqué to mention school bus safety was that of 30 April 2004. It stated:

*The Council noted that school bus safety was a matter of strong concern for many parents and that jurisdictions will continue to pursue safety measures that are likely to be most effective in reducing risks to children.*

According to the work that Austroads had conducted for the Australian Transport Council up to now, this would focus on work to improve the safety of child pedestrians around school buses, before they get on and particularly after they get off the bus.

## **2.3. Other studies**

As well as the studies undertaken at the request of the Australian Transport Council, several other relevant studies warrant discussion. These are the NSW, Queensland, Victoria, and USA studies.

### **2.3.1. NSW**

In the mid 1990s, the NSW Department of Transport commissioned two important studies of the safety of school bus passengers. These were:

- Henderson, Michael; and Paine, Michael (1994) *School bus seat belts: their fitment, effectiveness and cost*
- Henderson, Michael (1996) *Standing in school buses: the strategic and practical issues*

Dr Henderson is an Australian seat belt pioneer; he was Director of the NSW Traffic Accident Research Unit in 1970 when the first seat belt regulations were written. He has been a national leader in road safety since that time.

**Henderson and Paine (1994)**

Henderson and Paine's is a substantial report. The aim here is to provide a brief overview of main points.

There is no definition of a school bus.

In NSW, school children are carried in route buses. Nearly all route buses are used for transport of school children.

There were 37 accidents during school travel time in which a child aged 5 to 18 years was killed or injured as a passenger in a bus in the years 1989 to 1992. Henderson and Paine examined original police reports of these accidents. They concluded (page 25 of their report):

- Bus crashes in school travel time where child passengers are injured are "exceedingly rare" in NSW.
- Official data overestimated child bus occupant casualties by about 40%.
- 97.5% of the reported injuries were minor.
- The most common injuries were to the face, head and neck, probably as a result of contact with the seat in front.

They compared this situation with that in the USA, where injuries were similar, before new rules on padding of seat backs were introduced in 1977.

They examined research, analysed injury mechanisms and concluded that lap only seat belts would not improve safety. Lap belts would be likely to increase injury in the most common (although still rare) frontal impacts.

If lap-sash belts (rather than lap belts) were worn on large buses, they could reduce risk of injury (page 39 of the report). The benefit would depend on the extent of bus modifications undertaken to fit the belt. There have been no statistical or epidemiological studies of the effectiveness of seat belts in large buses because of the small number of belt equipped buses involved in crashes, and so there is no such basis for estimating the benefits of seat belts in buses. They concluded, nevertheless, that wearing lap-sash belts would be unlikely to reduce the risk of injury by more than 20%.

The smaller the bus the more benefit would arise from wearing lap-sash belts. Benefits are measured in changes to the probability of injury. If the probability of injury is already low, reduction of this probability is more difficult. The benefits are smaller in larger buses because occupants are protected in large buses in most frontal crashes by the size and weight of the bus (see pages 17 and 18 of the report).

Henderson and Paine estimated the number of buses in NSW that were likely to transport children to and from school. It was estimated that there were about 8,000 buses, and more than three quarters were large (pages 49 and 50 of the report).

They reported (page 52 of the report) that manufacturers had begun to produce buses with stronger seat anchorage systems.

They described what would be involved to convert a bus so that it had appropriate seats and seat belts; that is it would comply with Australian Design Rule 68 (page 61 of the report).

- Remove existing seats, floor and wall mounting rail.
- Design, manufacture and install strengthened underfloor structure and wall mounting rails.
- Install new floor and interior side panels (exterior side panels may also sometimes need to be replaced).
- Install seats with integral seat belts (because of limited under-body access, it might still be difficult to anchor some seats adequately).

They pointed out the costs of retrofitting seat belts (Chapter 9 of the report). These included not only the cost of fitting seat belts but also the loss of carrying capacity associated with having no standing passengers and discontinuing the three for two rule for young passengers.

They suggested (page 69 of the report) that no other

*publicly-funded measure would cost so much in return for an equivalent benefit in injury reduction.*

Their recommendations were as follows:(pages 75 to 78 of the report)

- *The mandatory fitting of lap-only or lap-sash seat belts on large route service buses used for transport of children in the School Student Transport Scheme is not recommended.*
- *That the metro style seat typically used in route buses be redesigned so as to ensure that handholds are constructed of impact-absorbing material, or where rails are not used, to replace unyielding seat tops with shock absorbing material such as padding; and that new seats be fitted to replacement buses as they come into service.*
- *That a program of research be undertaken for padding bus seats and stanchions, and that meanwhile a program for retrofitting to existing buses be drawn up.*
- *That the draft National Code of Practice for Improving Occupant Protection in Existing Buses be encouraged and its finalisation expedited, particularly in regard to the fitment of seat belts to new and existing small buses.*
- *That no provision of the Australian Design Rules should have the effect that small buses with less than 17 seats should be exempt from fitting seat belts for all seating positions.*
- *That existing reviews of pedestrian safety take full account of the passenger who is leaving or boarding a bus, and that studies be undertaken of warning and interlock measures that will ensure that doors are properly closed and the bus cannot move if there is an obstruction at the edge of any door that is out of sight of the driver.*

The School Bus Safety Working Group was advised that all of Henderson and Paine's recommendations had now been implemented in NSW. The recommended padding requirements apply to new buses manufactured from August 1997. The Australian Design Rules require that new buses manufactured from 1 January 2000 must have seat belt if they have more than 12 seats and a gross vehicle mass of 3.5 tonnes or less; at the time of the Henderson and Paine study, these buses were required to have seat belts only if they had 12 or fewer seats.

### **Henderson (1996)**

This report addressed the issue of children standing in school buses.

It covered ground similar to that of the Henderson and Paine (1994) report. Again, it was established that it is rare for a school bus occupant to be seriously injured and even rarer for them to be killed.

There appeared to be no reliable information on the safety of standing passengers and that this practice was common in all jurisdictions.

Henderson also examined the cost implications of the loss of capacity by eliminating standing passengers.

Henderson concluded (page 25)

*passengers in school buses are at very low risk, much lower than when travelling in any other way. The additional risk posed by standing in a bus, although it exists, is also very small. To reduce this additional risk to zero by ensuring that all passengers are seated at all times would cost thousands of times more than the "value" of the injuries that would be saved. The money thus expended could reduce road trauma to a vastly greater extent by preventing bus and pedestrian accidents.*

### **2.3.2. Queensland**

There have been a number of relevant school bus safety investigations in Queensland.

#### **Parliamentary Travelsafe investigation into standing on buses**

The Queensland Parliamentary Travelsafe Committee undertook an inquiry<sup>xi</sup> into standing on buses, reporting in 1993.

This study arrived at similar findings to other studies. They concluded: (page 20)

*buses are the safest form of roadbased transport, with fatalities occurring at one sixth the rate of cars.*

*the biggest bus safety problem is off and in the vicinity of the bus rather than on the bus.*

They recognised (page 50) that

*the emotive nature of bus standee safety, ensures that the issue will not easily "go away".*

They therefore called for the collection of better data.

Travelsafe supported seat belts on buses for exposed seats in non-urban areas (page 51).

They recommended some reduction in the maximum number of standees, and a reduction in the distance standees could be carried, from 20 km to 15 km.

They concluded (page 52):

*Ultimately, funds for road safety countermeasures must be directed at those areas of most need and where expenditure can achieve the greatest reduction in the road toll. Quite clearly, the large amounts of government and industry funds required to completely eliminate standee passengers on buses does not represent the best use of these funds, both in road safety and public health terms. Many other bus safety issues must be addressed with the limited funding available; the most notable being enhancing safety off the bus.*



There were many other recommendations intended to improve bus safety. Among other things, they recommended that the bus industry promote to the public the benefits and safety record of bus travel.

### **Queensland School Transport Safety Task Force**

The Queensland School Transport Safety Task Force released its report<sup>xii</sup> in 2001.

The Task Force covered a wide range of issues. Many of the countermeasures relate to children as pedestrians and bicyclists. Here, attention will be restricted to the countermeasures relating to bus occupant protection.

The Task Force took submissions from the public. The report states (page 17):

*concern that school buses do not have seat belts was the issue most frequently raised*

They acknowledged (page 15) that there had been only one school bus passenger killed in the previous decade in Queensland. They suggested, however, that one serious bus crash would alter the conclusions to be drawn from the Queensland statistics.

They referred to the Australian Federal Office of Road Safety report<sup>xiii</sup> into 23 coach crashes, indicating that the number of occupants fatally injured or killed would have been substantially reduced by a combination of safety features including rollover strength, seat and seat anchorage strength, padding and seat belts.

The Task Force recommended the fitting of seat belts to buses that operate in certain more hazardous environments (page 20). These would be part of a system with improved rollover strength and improved seats (to comply with Australian Design Rules). This would also mean the abolition of standees. The measures were recommended to be phased-in.

The Task Force identified three different road environments to allocate priority for the occupant protection phase-in (page 17). Environment 1 was the Queensland Urban Contract Area. Environment 2 was the Queensland Non-Urban Contract Area. Environment 3 was specified roads with long steep or very steep grades. Environment 3 would have highest priority and then those parts of Environment 2 that were on major freight routes.

The Task Force's costings (page 20) appear to relate to buses being replaced over 15 years. The eventual target after 15 years would be to cover all of Environments 2 and 3.

The Task Force did note (page 15 and page 20) that adult seat belts may not be suitable for smaller children (less than 25 kg), and a design solution would be required so that suitable seat belts could be provided for smaller children.

### **Queensland seat belt trial and evaluation**

Following the recommendations of the School Transport Safety Task Force, the Queensland Government approved a trial of seat belts on school buses in mountainous areas of Queensland. The trial was evaluated by ARRB Transport Research, who reported in October 2003<sup>xiv</sup>.

The trial was conducted in the first two school terms of 2003.

It involved 12 buses in 12 areas of Queensland.

The buses had high seat backs and seatbelts, complying with Australian Design Rule 68.

There were three levels of encouragement of seat belt wearing.

- The low level was a sign at the front of the bus to remind students to put on their seat belts.
- The medium level was the sign at the front, bus duty teacher and the driver telling students to wear belts, and an article in the school newsletter.
- The high level included the same elements as the medium, except that there was a series of articles in the newsletter rather than one. Additionally, the local Queensland Transport road safety officer conducted a walk through the bus showing student the belts. The road safety officer also made a presentation at the school assembly on the importance of wearing belts. Students were given a handout on the bus. A letter was sent to parents asking them to encourage use. Posters were placed in the school office and the teachers' common room. An article was placed in the teachers' newsletter.

Data were collected as follows

- Operators were interviewed, and drivers where available.
- Operators were asked to complete log books and questionnaires.
- Parent were surveyed
- Students were interviewed.
- The evaluators made some on-board observations.
- The evaluators also used an automatic monitoring system device, which could record whether a seat belt was fastened. These devices were fitted to six of the 12 buses used in the trial.

Data were collected in three phases, the first before the new buses were introduced.

The evaluators' conclusions were:

- Operator practices varied.
  - Some of the operators who were asked to remind students did not always do so (pages 19 to 21 of the report).
- Student behaviour changed in some buses, with some improvements and some deterioration.
  - The operators did not ascribe this to the seat belts, although at least some of the improvements were said to be due to the higher seat backs and the fact that some of the buses had air-conditioning for the first time and were generally more comfortable.
  - One key benefit of seat belts was the reduction of movement around the bus (page 23 of the report).
- There was some vandalism of seat belts.
  - The poor behaviour was not caused by the seat belts, as there had been vandalism before the seat belts (page 23 of the report).
- Five operators reported significant maintenance issues with seat belts (page 43).
- Two operators reported increased journey times since seat belts were installed. These were the two who reported the greatest wearing rates.

- The report suggests (page 44) that these operators might be spending more time at each stop “ensuring students are prepared before the bus moves away.”
- Drivers typically estimated seat belt use to be approximately double what it was, as estimated from the automatic monitoring systems (page 48).
- Many operators and students reported that seat belts were worn incorrectly.
  - Belts were stretched over the knees, the sash was put behind the back, or the lap belt was sat on (page 48).

The trial’s implications are set out on the second and third pages of the report’s executive summary. The main points were:

- There was a high rate of seat belt use for buses with a larger proportion of primary school students, and a correspondingly low rate for buses with a higher proportion of secondary students.
- Introducing seat belts with encouragement and instructions had limited results.
  - The findings from the trial “clearly indicate the need to provide some form of regulation.”
- The seat belts were found to be uncomfortable and difficult to put on and take off.
  - Consideration would need to be given on the suitability of these belts for children of school age.
- The belts and high backed seats limit student movement and social interaction.
  - Some students did not wear the seat belts so that they could move around the bus to talk to other students (although, as pointed out, the belts appear to have reduced the amount of moving around).
- Parents, school communities, and drivers and operators have an unrealistic view of students’ seat belt compliance.
  - The automatic monitoring system provided a more reliable measure.
- The authors suggested that the most pressing need is to clarify the responsibilities of the different stakeholders – operators, schools and parents – in achieving an effective compliance system.

Overall, the report suggests that the trial was unsuccessful, with inadequate wearing rates, especially among the older children. But the data relate to only a small number of buses. The only reliable data appear to come from the automatic monitoring systems, and this appears to apply to only five buses. (Although the system was fitted to six buses, it appears to have functioned satisfactorily on only five of them – see pages 12 and 13 of the report.)

### **2.3.3. Victoria**

In 2001, the Victorian Government undertook a review of school bus services<sup>xv</sup>. It conducted consultations and received submissions. The review covered many issues, only one of which was safety. Nevertheless, the need for seat belts on school buses was raised at a number of consultation meetings (page 48) and sought in many submissions (pages 49 and 50).

The report concludes, however (page 50)

*The cost of fitting seat belts in all new buses is significant. The current evidence suggests that seat belts may not add significantly to safety in buses*

*while measures to improve infrastructure around bus stops or to slow passing traffic are more likely to improve the safety of bus travellers.*

It called for more research into the implications of fitting seat belts on new buses.

#### **2.3.4. USA**

The United States is different from NSW in that a school bus is a special type of bus dedicated to transporting school children. US school buses are nearly all yellow. They are specially designed for children.

In 2002, the US National Highway Safety Administration reported to Congress on their research on the crashworthiness of school buses. The report is entitled *School bus safety: crashworthiness research*.<sup>xvi</sup> The investigators tested many scenarios in the laboratory, with test runs, on a sled into a barrier, with buses and crash test dummies.

They confirmed the view of other researchers that lap belts are unsuitable. Lap belts can increase the risk of serious injury.

They concluded (page v, Executive Summary) that the use of lap/shoulder (lap-sash) belts could provide some benefit unless misused. “Lap/shoulder belts can be misused and the testing showed that serious neck injury and perhaps abdominal injury could result when lap/shoulder belts are misused.”

They stated (page 40 of the report) that two common types of misuse in passenger vehicles are where children place the shoulder portion of the belt behind their back or under their arm. Apparently, this misuse results from the discomfort for a child in using an adult belt, because it rides too high. The investigators tested these types of misuse in the laboratory. They concluded (page 41) that “when worn improperly, the lap/shoulder belt restraint system can be potentially as dangerous to the passenger as the lap belt restraint system.”

They also pointed out (page v, Executive Summary):

*Other considerations, such as increased capital costs, reduced seating capacities, and other unintended consequences associated with lap/shoulder belts could result in more children seeking alternative means of travelling to and from school. Given that school buses are the safest way to and from school, even the smallest reduction in the number of bus riders could result in more children being killed or injured when using alternative forms of transportation.*

The points made are relevant to NSW, even though the results may not be completely generalisable to NSW buses.

### **2.4. Summary of the studies**

In recent years, the question of seat belt use in school buses and associated issues have mainly been a national issue in Australia, but with important work being conducted in Queensland, NSW, and – to a lesser extent – Victoria. There has also been a recent major report from the United States National Highway Traffic Safety Administration.

The following common features of the studies would tend to imply that seat belts would be fitted to buses only if resources were available after accounting for other expenditure on child health and safety:

- Buses provide the safest form of road transport by far.
- Fatalities are extremely rare.
- Serious injuries are rare.
- Lap only seat belts are unsuitable.
- The safety benefits of lap-sash seat belts are unknown, but are likely to be much smaller in buses than the benefits that they provide for small vehicles.
- The costs of fitting seat belts to buses, with the implications of reduced capacity on buses, would be very high (billions of dollars for Australia).
- There are other safety actions that could be undertaken with road safety resources that would have greater effect in protecting children from death and serious injury.
- Increased costs and demands on school bus operations could result in fewer children using buses and moving to other road travel modes where they would be much less safe.

On the other hand, the following features from the studies are positive aspects of fitting seat belts on buses:

- Many parents are concerned about children travelling without seat belts on buses.
- A major bus crash, in which several children were killed, would change the statistics.
- Lap-sash belts with higher seat backs would provide some additional protection.
- The benefits would be greater on small buses than on large buses.

Other issues were identified that need resolving:

- How many children would actually wear a seat belt if provided? How could the wearing rate be maximised?
- Who would be responsible for children's seat belt wearing?
- There appears to be a need for a specially designed belt that:
  - would be safe for small children
  - would be comfortable and likely to be worn correctly by children for whom the adult seat belt rides high on the neck or the face.

The main issue is cost-effectiveness rather than cost. From the studies considered, it appears likely that the fitting of seat belts to buses would be very costly and have relatively little benefit. The statistics examined in the Austroads studies suggest that implementation of this type of measure may not result in saving one life.

Nevertheless, lap-sash seat belts do provide some safety benefit, and there is a need to be responsive to community concerns.

The following chapters examine injury and fatality statistics further and analyse the options and issues considered by the Working Group.

### 3. Fatality and injury statistics

#### 3.1. Rationale

It is essential to consider the number of deaths and injuries of children travelling to or from school by bus or by other modes, to estimate the relative size of the problem. This provides centrally important information for deciding how to allocate available resources so that child death and injury can be minimised.

In considering the statistics, deaths and injuries of bus passengers should be considered in the context of other main modes by which children travel to and from school: car passenger, pedestrian, bicycle rider and train passenger.

Crash statistics do not indicate the purpose of the trip. The exception is 1999 fatality data from the Australian Transport Safety Bureau (ATSB), discussed in section 3.4.1 below.

Although the purpose of the trip is not recorded, the NSW RTA's crash data provide an indication of the number of accidents that might be associated with school travel by noting whether the accident happened during school travel time. School travel time is defined as:

- 7:30 am to 9:30 am inclusive, and 2:30 pm to 5:00 pm inclusive
- weekdays
- not public holidays or other school holidays.

Obviously, in these broad time periods, not all accidents involving children are related to travel to or from school. For example, in 1999, according to NSW road crash data, one pedestrian and one car passenger (aged 5 to 18 years) were killed in school travel times; but according to the ATSB's more detailed investigations, none was killed in the journey to or from school. Nevertheless, although using such broad times must overestimate the problem of school travel safety, it is the only indication available.

#### 3.2. NSW road accident statistics

##### 3.2.1. Killed or injured in four transport modes

It is important to note that in NSW approximately 1.1 million children<sup>xvii</sup> travel to and from school each day by various modes of transport (car, bus, train, pedestrian, pedal cyclist). Under the School Student Transport Scheme (SSTS), the Government provides an estimated 61% of these children with subsidised travel at a cost of approximately \$450 million. It is estimated that under the SSTS, between 84% and 89% of eligible children travel by bus. This is in addition to students who pay for their school bus travel.

The number of children aged 5 to 18 years killed or injured in school travel times in the four main road modes being considered are displayed in **Figure 1**.

**Figure 1 NSW children aged 5 to 18 years killed or injured in school travel times travelling by four modes 1993 to 2002**

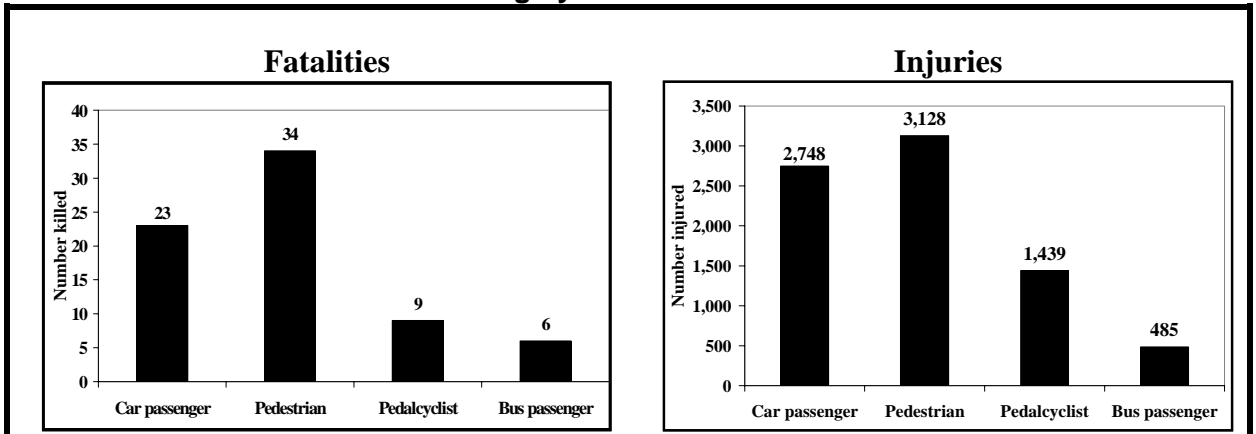


Table 1 shows the numbers of children fatally injured in school travel times, in the age groups 5 to 11 years, 12 to 16 years and 17 to 18 years, travelling by the four main modes considered, in the 10 years 1993 to 2002. Table 2 shows those with other injuries using the same defining criteria as in Table 1.

**Table 1: NSW Number of children fatally injured in school travel times, travelling by four modes, 1993 to 2002**

	Age groups							
	5 to 11		12 to 16		17 & 18		Total	
	No.	%	No.	%	No.	%	No.	%
Car passengers	7	20%	7	32%	9	60%	23	32%
Pedestrians	22	63%	8	36%	4	27%	34	47%
Pedal cyclists	3	9%	5	23%	1	7%	9	13%
Bus passengers	3	9%	2	9%	1	7%	6	8%
<b>Total</b>	<b>35</b>	<b>100%</b>	<b>22</b>	<b>100%</b>	<b>15</b>	<b>100%</b>	<b>72</b>	<b>100%</b>

**Table 2: NSW Number of other injured children in school travel times, travelling by four modes, 1993 to 2002.**

	Age groups							
	5 to 11		12 to 16		17 & 18		Total	
	No.	%	No.	%	No.	%	No.	%
Car passengers	1,193	35%	947	28%	608	57%	2,748	35%
Pedestrians	1,435	42%	1,433	43%	260	24%	3,128	40%
Pedal cyclists	483	14%	777	23%	179	17%	1,439	18%
Bus passengers	287	8%	169	5%	29	3%	485	6%
<b>Total</b>	<b>3,398</b>	<b>100%</b>	<b>3,326</b>	<b>100%</b>	<b>1,076</b>	<b>100%</b>	<b>7,800</b>	<b>100%</b>

### 3.2.2. Bus passengers killed in school travel times NSW

As shown in Table 1, six (8%) bus passengers were killed in school travel times in the 10 years 1993 to 2002. Since this time, there have been no bus passenger fatalities during school travel time.

This information was presented and discussed in detail at several of the School Bus Safety Working Group meetings. Over the last 10 years, a total of 72 student fatalities occurred during school travel time across the four transport modes. Of this total, pedestrians accounted for the highest number of fatalities (47%), followed by car passengers (32%), pedal cyclists (13%) and bus passengers (8%).

Of the six bus child passengers killed, the following five fatalities occurred as a result of other factors such that it is unlikely that a seat belt may have prevented the outcome:

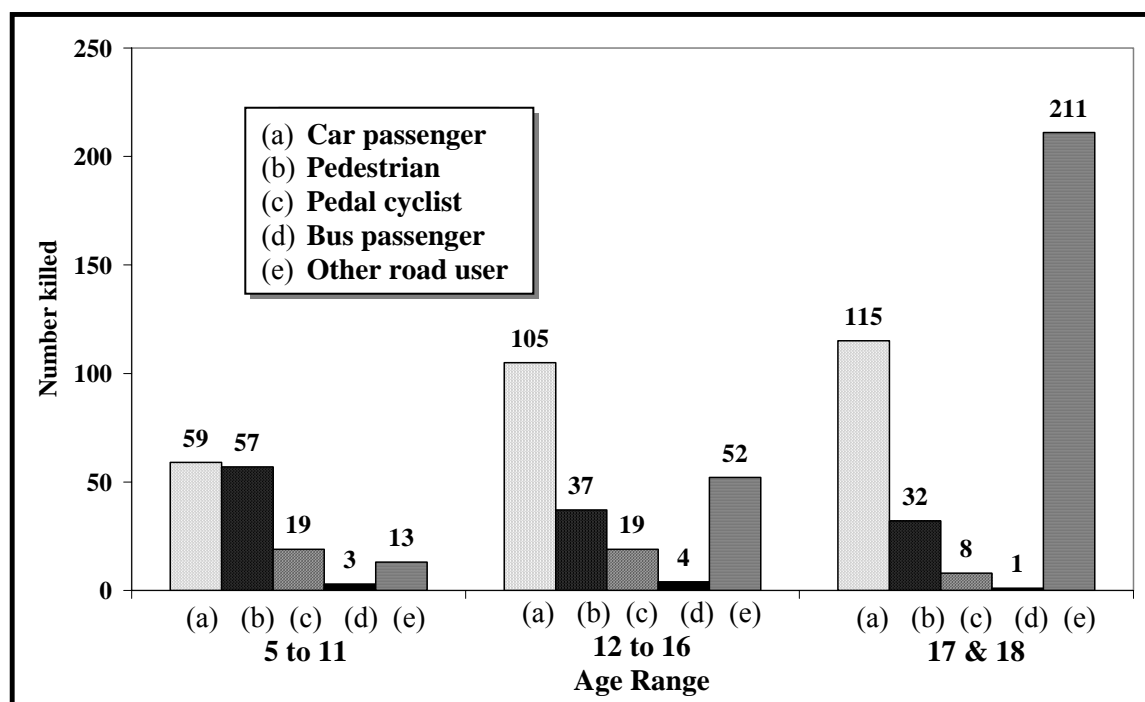
- two fatalities occurred as a result of being trapped in the rear door while alighting and being dragged;
- one fatality occurred while standing near the door (after leaving seat) while waiting to get out;
- one fatality occurred while leaning out the window and being struck by a telegraph pole,
- one fatality occurred while seated and being stuck by an intruding load from another vehicle.

The remaining fatality of the total of six fatalities may have been prevented by a seat belt.

### 3.2.3. All modes all times

If the aim is to prevent injury to children, it is relevant to look beyond school travel times, and beyond the four modes by which children are likely to travel to school. For example, seven car passengers aged 5 to 11 years were killed in school travel times in the years 1993 to 2002, but if all times are considered – school travel time and other times – a total of 59 children were killed as car passengers in the same years.

**Figure 2 NSW Number of children aged 5 to 18 years, fatally injured (at all times of the day) 1993 to 2002.**





**Figure 2** shows the numbers of children fatally injured in three age groups at all times and in all road transport modes. Other road users include truck passengers and others, but are mainly drivers and motorcyclists.

Bus passengers among those killed in these age groups constitute:

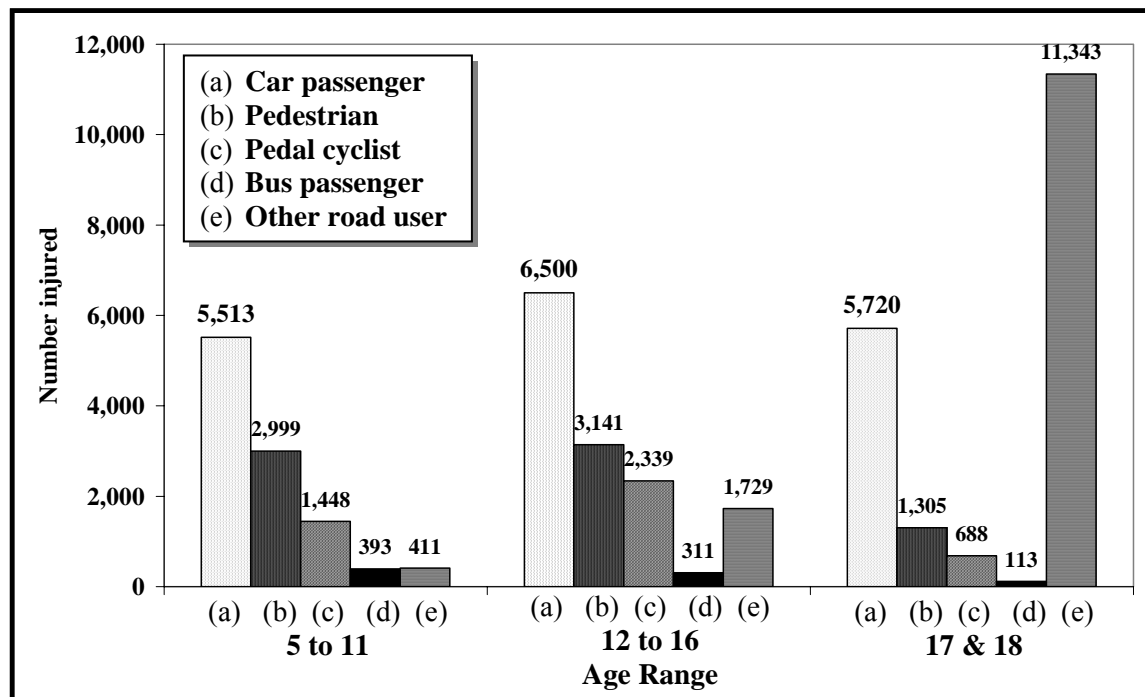
- 2% of children aged 5 to 11 years
- 1.8% of those 12 to 16 years
- 0.3% of those aged 17 or 18 years.

**Figure 3** shows the same for children with other injuries.

Bus passengers among those with other injuries in these age groups constitute:

- 3.7% of children aged 5 to 11 years
- 2.2% of those 12 to 16 years
- 0.5% of those aged 17 or 18 years.

**Figure 3 NSW Number of children aged 5 to 18 years, with other injuries (at all times of the day) 1993 to 2002.**



The small numbers of bus passengers among those killed or injured are not conservative estimates:

- It appears that pedal cyclist injuries are underreported in road crash data, because police reports mainly cover accidents where there is a collision with another vehicle. Hospital data show more bicyclist injuries<sup>xviii</sup>.
- On the other hand, school bus passenger injuries are not over reported. Henderson and Paine (1994, page 25) found that bus passenger injuries were overstated by 40%.
- The NSW RTA does not provide a definition of what constitutes an injury<sup>xix</sup>, and therefore there is no indication of the severity of any reported injury. An injury is included if the police report says it is an injury.

- At the fourth meeting of the School Bus Safety Working Group, the RTA’s Manager School and Youth Programs pointed out that, if a school bus is involved in a crash, children are usually transferred to hospital and counted as injured, even if uninjured (that is, transported to hospital for observation).
- Henderson and Paine (1994, page 25) reported that 97.5% of reported injuries of school children in buses were “minor.”

**3.2.4. Sealed and unsealed roads**

Several members requested at the third meeting of the School Bus Safety Working Group for statistics to be further refined to determine the proportion of the injuries and fatalities that occurred on unsealed roads.

None of the fatalities happened on unsealed roads.

For children aged 5 to 18 years, the proportion of bus passenger injuries that happened on unsealed roads was 7%. Proportions for the three other main modes considered are set out in **Table 3**.

**Table 3: NSW Proportions of children killed and injured that happened on unsealed roads, for children aged 5 to 18 years, travelling by one of four modes in school travel times, 1993 to 2002.**

	Fatal	Other injured	Total
Car passenger	13%	6%	6%
Pedestrian	0%	1%	1%
Pedal cyclist	0%	1%	1%
Bus passenger	0%	7%	7%

**3.2.5. Bus size**

It was also suggested at the Working Group’s third meeting that accident statistics need to be broken down by bus size.

The only information on vehicle size available from the NSW RTA crash data is whether the vehicle had a tare weight up to 4.5 tonnes or over 4.5 tonnes. The tare weight is the weight of the bus before it has any load (for example, people or bags, etc).

The six fatal bus passenger fatalities in school travel time in 1993 to 2002 happened in six different buses, each with a tare weight over 4.5 tonnes.

Of the 485 children with other injuries (Figure 1 and Table 2):

- 405 were in buses of more than 4.5 tonnes tare weight
- 45 were in buses of 4.5 tonnes or less tare weight
- 35 were in buses for which the tare weight was unreported.

Therefore, about 10% of the injured were travelling in smaller buses.

**3.2.6. Metropolitan and country**

From discussion in various Working Group meetings, some members have suggested that there should be phased introduction of seat belts in buses operating in country

areas because country roads are perceived to be more hazardous. Therefore, injury and fatality data was further refined into metropolitan and country areas.

Reported crashes in country areas are on average more serious than in metropolitan areas. For example in 2001, crashes in metropolitan areas<sup>xx</sup> resulted in 64% of the State's non-fatally injured vehicle occupants, but crashes in metropolitan areas resulted in only 34% of the State's fatally injured vehicle occupants. (The data considered in this paragraph relate to all vehicle occupants, not restricted to children.)

**Tables 4 and 5** relate to accidents involving injuries and fatalities to children in the main four modes considered, broken down by whether the accident happened in a metropolitan area or in the country.

**Table 4: NSW Children aged 5 to 18 years fatally injured in school travel times travelling by four modes, 1993 to 2002.**

	Metro-politan	Country	Total
Car passenger	6	17	23
Pedestrian	22	12	34
Pedal cyclist	6	3	9
Bus passenger	4	2	6
<b>Total</b>	<b>38</b>	<b>34</b>	<b>72</b>

The fatality numbers are too small to provide any meaningful assessment.

**Table 5: NSW Children aged 5 to 18 years with other injuries in school travel times travelling by four modes, 1993 to 2002.**

	Metropolitan		Country		Total	
	No.	%	No.	%	No.	%
Car passenger	1,687	32%	1061	41%	2,748	35%
Pedestrian	2,485	47%	643	25%	3,128	40%
Pedal cyclist	824	16%	615	24%	1,439	18%
Bus passenger	246	5%	239	9%	485	6%
<b>Total</b>	<b>5,242</b>	<b>100%</b>	<b>2,558</b>	<b>100%</b>	<b>7,800</b>	<b>100%</b>

There were about the same number of bus passengers injured in metropolitan as in country areas.

It should be noted that of the total injuries, bus passengers comprise 9% of the children injured in the country but only 5% in metropolitan areas. This is relevant to the setting of priorities only if the objective is the safety of country children, rather than children generally, which seems inappropriate. Nevertheless, if the focus were to be only on the country, the statistics suggest that bus passengers are still the smallest proportion, and pedal cyclists would be even more important.

### 3.2.7. Speed limits

**Table 6: NSW Children aged 5 to 18 years fatally injured in school travel times travelling by bus, speed limit of where the accident happened, 1993 to 2002.**

Speed limit	Metropolitan	Country	Total
40 km/h	2	0	2
60 km/h	2	0	2
100 km/h	0	2	2
Total	4	2	6

**Table 7: NSW Children aged 5 to 18 years with other injuries in school travel times travelling by bus, speed limit of where the accident happened, 1993 to 2002.**

Speed limit (km/h)	Metropolitan		Country		Total	
	Count	Percentage	Count	Percentage	Count	Percentage
60 or less	197	80%	116	49%	313	65%
70 km/h	40	16%	5	2%	45	9%
80 km/h	8	3%	24	10%	32	7%
90 km/h	0	0%	7	3%	7	1%
100 km/h	0	0%	85	36%	85	18%
110 km/h	0	0%	1	0%	1	0%
Unknown	1	0%	1	0%	2	0%
Total	246	100%	239	100%	485	100%

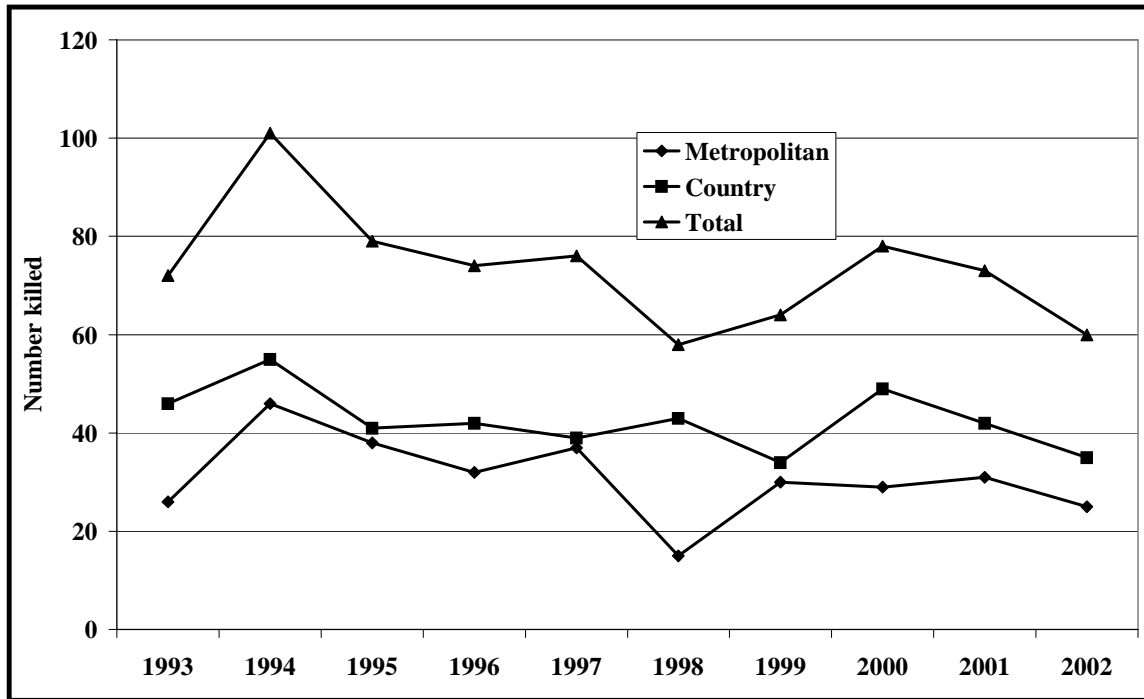
The higher speeds on country roads would make a crash more serious for vehicle occupants, other things being equal. The speed limits for fatal and other injured children are shown in **Tables 6 and 7**. Not surprisingly, a larger proportion of the country accidents were in higher speed zones.

### 3.3. Changes over 10 years in NSW

Despite increasing numbers of vehicles on NSW roads, the number of children killed has not increased in the last 10 years. **Figure 4** shows the number of children aged 5 to 18 years killed on NSW roads in each year 1993 to 2002 (at all times, not just school travel times and in all modes, not just buses).

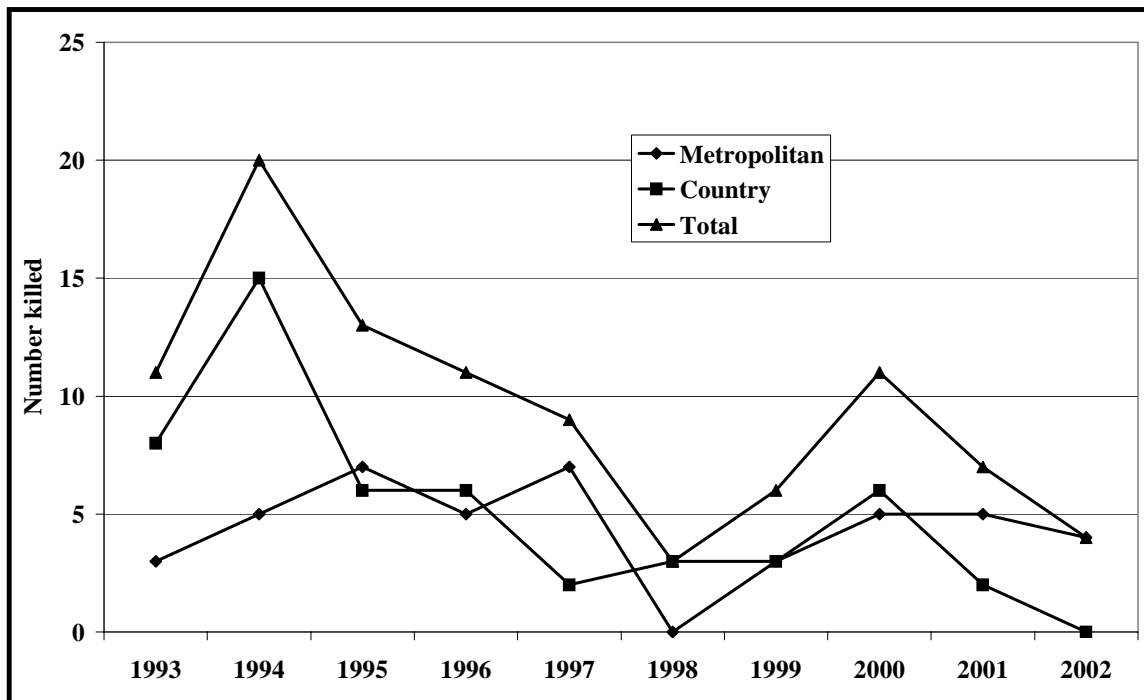
There has been no increase in the number of children aged 5 to 18 years killed each year.

**Figure 4** NSW Number of children aged 5 to 18 years, fatally injured (at all times of the day) across all modes each year 1993 to 2002.



While **Figure 4** shows fatalities at all times of the day, **Figure 5** shows numbers of children aged 5 to 18 years killed during school travel times. This includes all modes (including drivers).

**Figure 5** NSW Number of children aged 5 to 18 years, fatally injured (in school travel times) across all modes each year 1993 to 2002.



For the purposes of statistical analysis, the numbers in school travel times are small, and therefore fluctuate considerably relative to their average. Nevertheless, the

numbers of children aged 5 to 18 years killed in school travel times declined statistically significantly<sup>xxi</sup> over the 10 years.

### **3.4. Interstate cross modal comparisons**

To provide further context for the NSW injury and fatality statistics, statistics from other States and Territories were also examined. This information was also requested by several Working Group members at the first meeting.

#### **3.4.1. Australian Fatality File**

The Australian Transport Safety Bureau (ATSB) maintains a fatal crash database, constructed using coronial documents. The ATSB database involves a much more detailed analysis of each crash and contains more information compared with the databases maintained by individual States and Territories.

The ATSB fatal crash database has been improved so that it now records information on whether a child was travelling to or from school<sup>xxii</sup>. This change was introduced for the 1999 data, but – unfortunately – the last year coded was 1999. Therefore, this is the only year's data available.

To assist with the work of the School Bus Safety Working Group, the ATSB supplied information on fatalities that involved children aged 5 to 18 years, travelling to or from school in 1999. During this period, five fatalities occurred in Victoria, three in Queensland and one in the Northern Territory, a total of nine altogether<sup>xxiii</sup>. One of these fatalities involved a bus, where the child was struck after crossing the road after alighting from the bus. None of the children fatally injured was a bus passenger.

#### **3.4.2. Analysis of Interstate Statistics**

States and Territories were requested to provide statistics on the number of children,

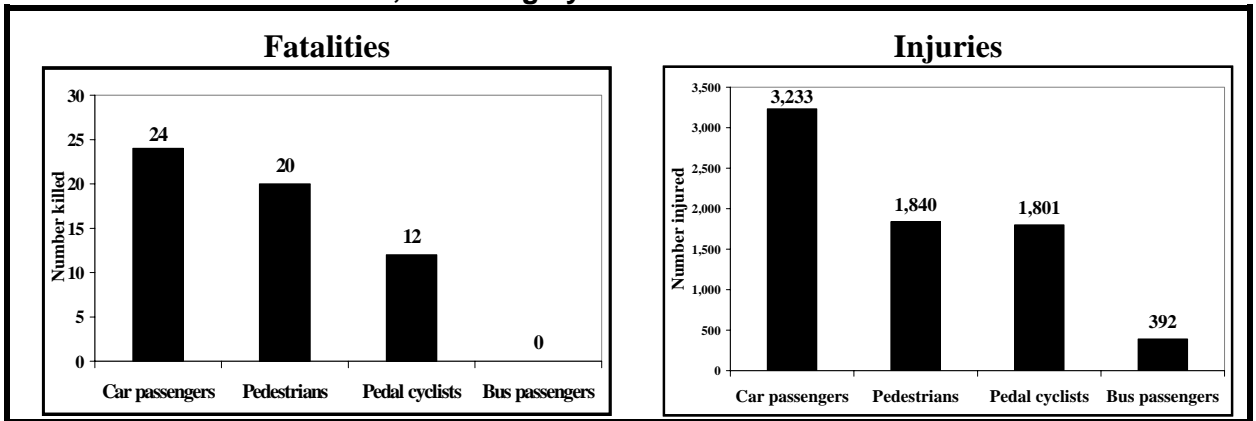
- aged 5 years to 18 years,
- killed or injured in school travel times,
- as a:
  - car passenger,
  - pedestrian,
  - pedal cyclist, or
  - bus passenger.

All jurisdictions provided usable statistics<sup>xxiv</sup>, although not all were able to meet the request exactly. Where this occurs, explanations are provided under each section applicable to the relevant jurisdiction.

#### **3.4.3. Victoria**

Victoria's database does not identify school or public holidays. Instead, the data analysis eliminated accidents happening from 23 December to 31 January inclusive. The database was able to identify times of day, and weekdays.

**Figure 6 Victorian children aged 5 to 18 years killed or injured in school travel times, travelling by four modes 1993 to 2002**



The proportions of children with fatal and other injuries in each mode in Victoria over the 10 year period 1993 to 2002 are set out below:

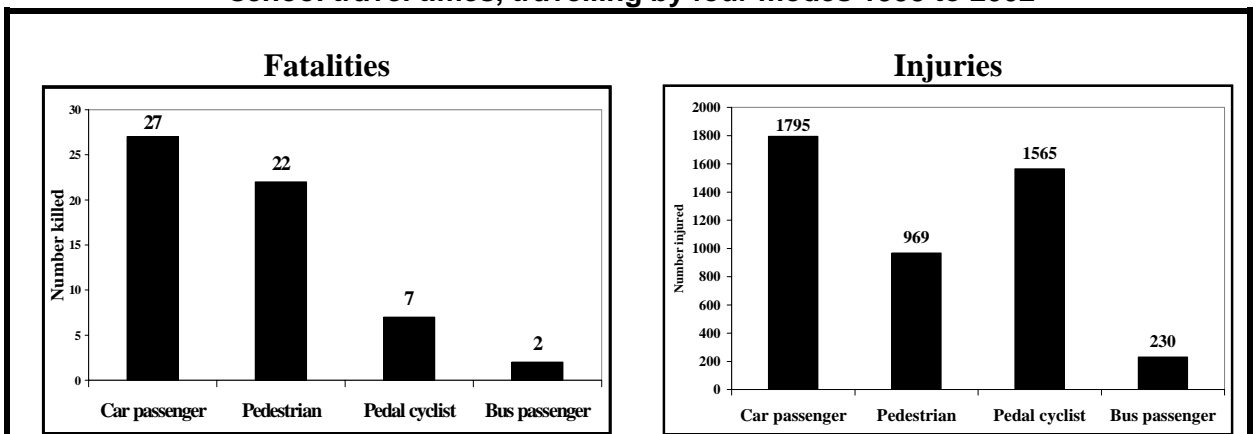
Mode	Fatal	Injury
Car passengers	43%	44%
Pedestrians	36%	25%
Pedal cyclists	21%	25%
Bus passengers	0%	5%

Four fifths of the children killed in school travel time in Victoria were pedestrians or car occupants. No child bus passengers were fatally injured. Bus passengers represented a small proportion (5%) of the total of those children injured during the 10 years.

### 3.4.4. Queensland

Queensland’s database does not record the exact time of the accident. Queensland provided data in time groupings 7 am to 9 am and 2 pm to 4 pm. These were, as requested, weekdays and did not include public holidays or other school holidays.

**Figure 7 Queensland children aged 5 to 18 years killed or injured in school travel times, travelling by four modes 1993 to 2002**



The proportions of children with fatal and other injuries in each mode in Queensland over the 10 year period 1993 to 2002 are set out below:

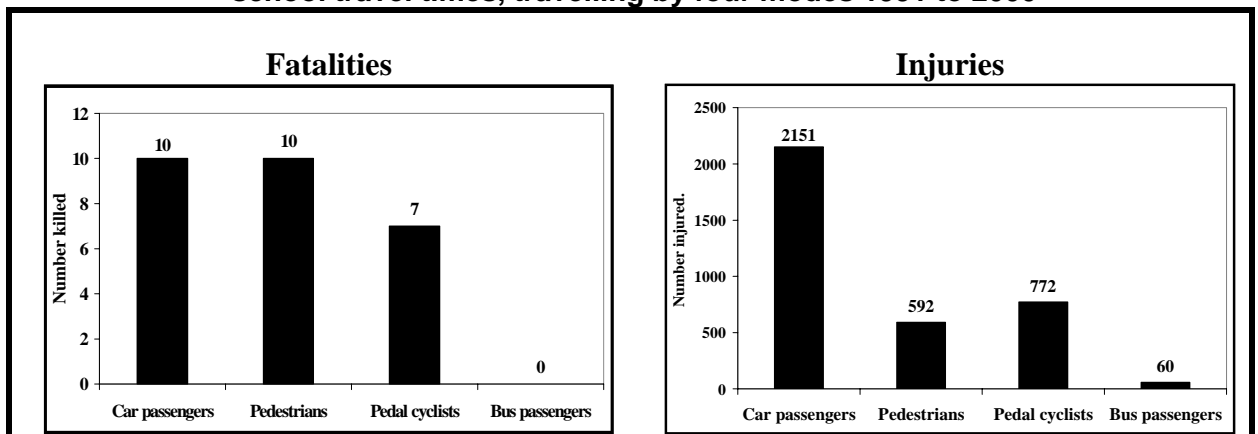
Mode	Fatal	Injury
Car passengers	47%	39%
Pedestrians	38%	21%
Pedal cyclists	12%	34%
Bus passengers	3%	5%

Seven eighths of the children killed in school travel time in Queensland were pedestrians or car occupants. Pedal cyclists were a large proportion (34%) of those injured, particularly compared with NSW. Bus passengers represented a small proportion of the total of those children killed (3%) or injured (5%) during the 10 years.

### 3.4.5. Western Australia

Western Australia was able to provide data in school travel times, as requested, but the most recent year available was 2000, and so the years covered were 1991 to 2000.

**Figure 8 Western Australia children aged 5 to 18 years killed or injured in school travel times, travelling by four modes 1991 to 2000**



The proportions of children with fatal and other injuries in each mode in Western Australia over the 10 year period 1991 to 2000 are set out below:

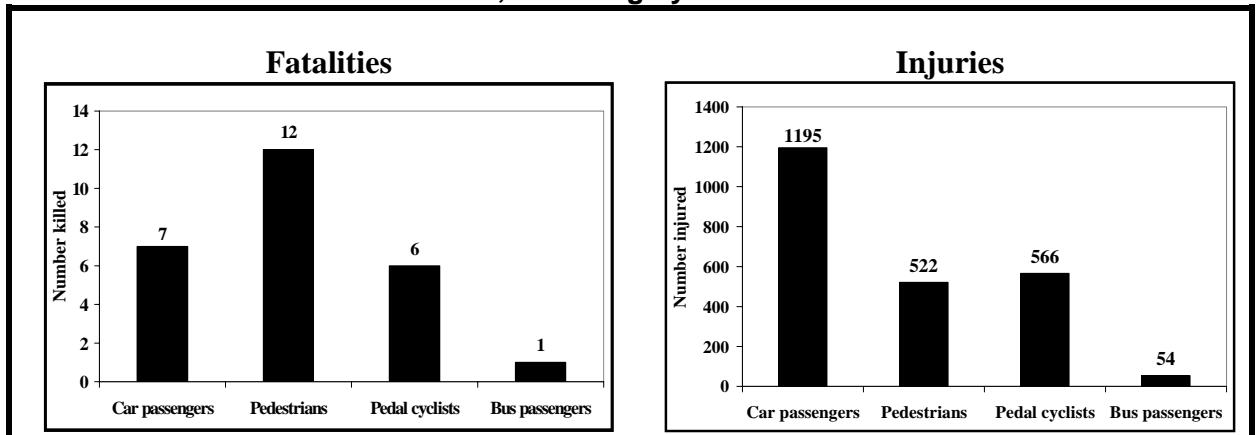
Mode	Fatal	Injury
Car passengers	37%	60%
Pedestrians	37%	17%
Pedal cyclists	26%	22%
Bus passengers	0%	2%

Three quarters of the children killed in school travel time in Western Australia were pedestrians or car occupants. No bus passengers were fatally injured during the 10 years. Bus passengers represented a small proportion of the total of those children injured (2%) during the same period.



### 3.4.6. South Australia

**Figure 9** South Australia children aged 5 to 18 years killed or injured in school travel times, travelling by four modes 1993 to 2002



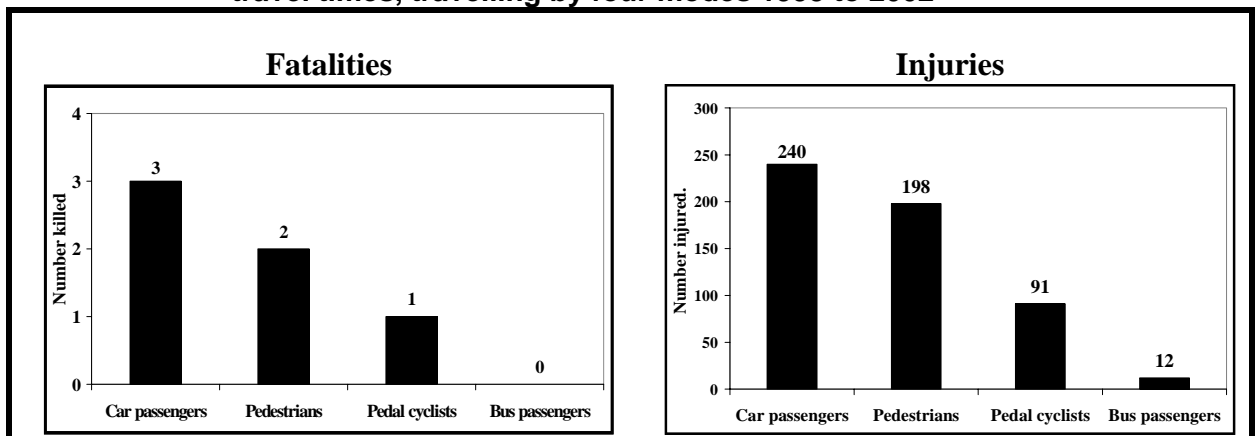
The proportions of children with fatal and other injuries in each mode in South Australia over the 10 year period 1993 to 2002 are set out below:

Mode	Fatal	Injury
Car passengers	27%	51%
Pedestrians	46%	22%
Pedal cyclists	23%	24%
Bus passengers	4%	2%

Nearly three quarters of the children killed in school travel time in South Australia were pedestrians or car occupants. Bus passengers represented a small proportion of the total of those children killed (4%) or injured (2%) during the 10 years.

### 3.4.7. Tasmania

**Figure 10** Tasmania children aged 5 to 18 years killed or injured in school travel times, travelling by four modes 1993 to 2002



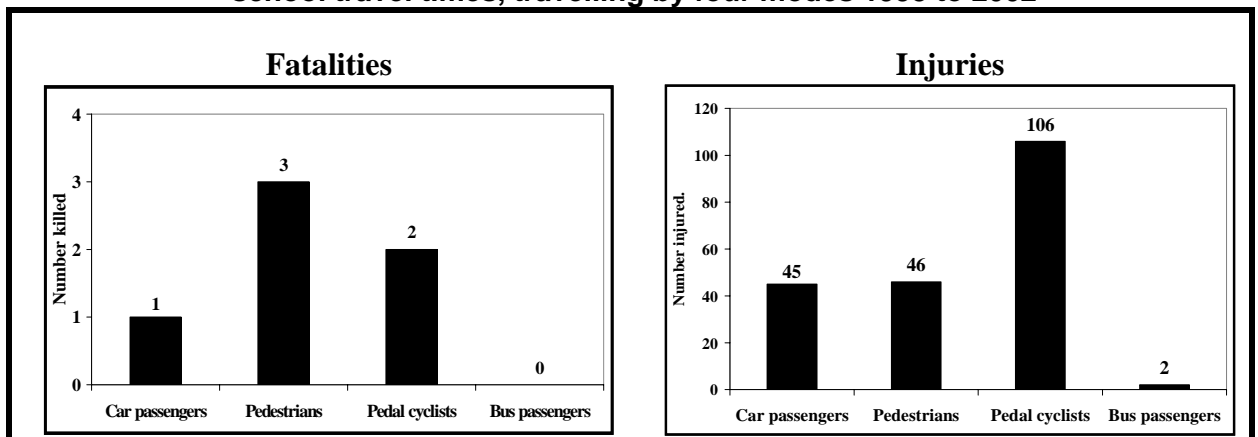
The proportions of children with fatal and other injuries in each mode in Tasmania over the 10 year period 1993 to 2002 are set out below:

Mode	Fatal	Injury
Car passengers	50%	44%
Pedestrians	33%	37%
Pedal cyclists	17%	17%
Bus passengers	0%	2%

Five out of the six children killed in school travel time in Tasmania were pedestrians or car occupants. No bus passengers were fatally injured over the 10 years. Bus passengers represented a small proportion of the total of those children injured (2%) during the 10 years.

### 3.4.8. Northern Territory

**Figure 11 Northern Territory children aged 5 to 18 years killed or injured in school travel times, travelling by four modes 1993 to 2002**



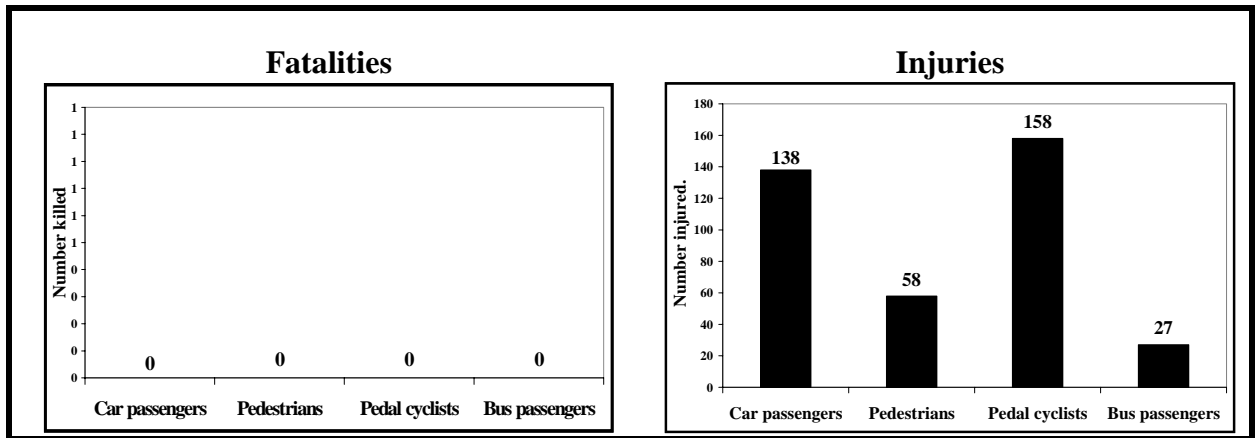
The proportions of children with fatal and other injuries in each mode in Northern Territory over the 10 year period 1993 to 2002 are set out below:

Mode	Fatal	Injury
Car passengers	17%	23%
Pedestrians	50%	23%
Pedal cyclists	33%	53%
Bus passengers	0%	1%

Five out of the six children killed in school travel time were pedestrians or pedal cyclists. No bus passengers were fatally injured over the 10 years. Bus passengers represented a small proportion of the total of those children injured (1%) during the 10 years.

### 3.4.9. Australian Capital Territory

**Figure 12 Australian Capital Territory children aged 5 to 18 years killed or injured in school travel times, travelling by four transport modes 1993 to 2002**



There were no relevant fatalities in school travel time in the Australian Capital Territory. The proportions of children with other injuries in each mode in the Australian Capital Territory over the 10 year period 1993 to 2002 are set out below:

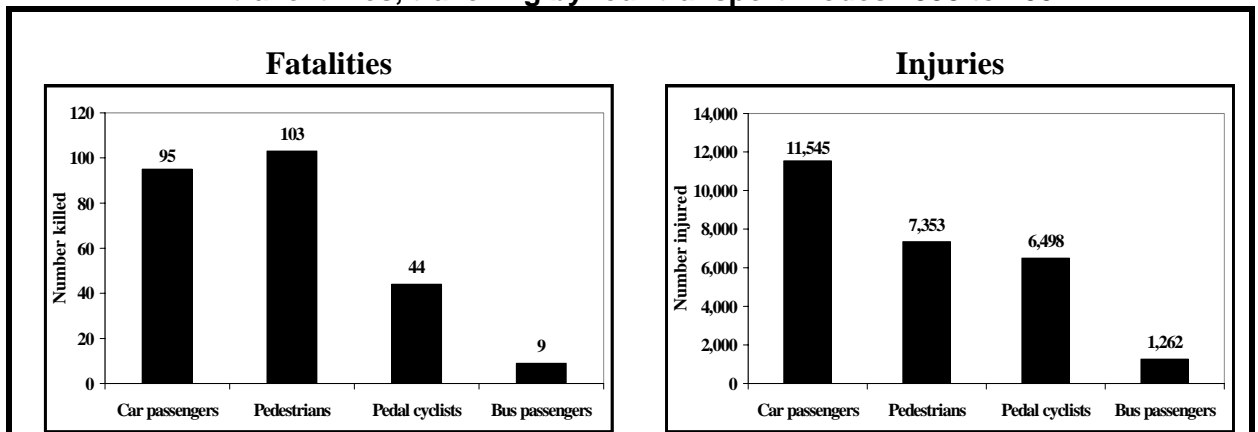
Mode	Fatal	Injury
Car passengers	-	36%
Pedestrians	-	15%
Pedal cyclists	-	41%
Bus passengers	-	7%

Bus passengers represented a small proportion of the total of those children injured (7%) in the Australian Capital Territory during this time.

### 3.4.10. Summary of National statistics

The statistics for each State and Territory were added together, and added to the NSW statistics to produce an aggregate 10 years statistics for Australia, shown in **Figure 13**. Note that, because of the data for Western Australia, this does not correspond exactly with the 10 years 1993 to 2002.

**Figure 13 National children aged 5 to 18 years killed or injured in school travel times, travelling by four transport modes 1993 to 2002**



The proportions of children with fatal and other injuries in each mode Nationally over the 10 year period 1993 to 2002 are set out below:

Mode	Fatal	Injury
Car passengers	38%	43%
Pedestrians	41%	28%
Pedal cyclists	18%	24%
Bus passengers	4%	5%

Nationally, few of the child fatalities were bus passengers (4%). Most were either car passengers or pedestrians. Five times more pedal cyclists than bus passengers were killed. Six of the nine bus passenger fatalities happened in NSW. As discussed previously in section 3.2.2, it appears that only one of these fatalities might have been protected by a seat belt.

Pedal cyclists constitute a smaller proportion of children injured in school travel times in NSW than in other parts of Australia. NSW has the most generous school student transport scheme in Australia, and it may be that this scheme makes it more likely that children will travel by bus, which is by far the safest road transport mode.

### **3.4.11. Rail fatalities and injuries**

Rail fatalities and injuries have been included, to allow a more complete comparison of transport modes. In the analysis of these statistics, it became clear that rail accident statistics are not as easy to use as road accident statistics. NSW rail statistical systems are currently being improved. However, it was not possible to extract information for comparison with road accident data. Moreover, information varied among all the jurisdictions examined.

Reported injuries were included if the injury happened on the train, or getting on or off, or falling or jumping from the train, or climbing on the train, but not including fights or assaults on the train. It was difficult to ascertain the victim's age from the data, as this type of information is not always recorded by the various jurisdictions. Therefore, it is possible that there may have been others in the age range.

For NSW, there appeared to be three children aged between 5 to 18 years killed and 52 injured in school travel time from 1993 to 2002.

Victoria provided data only from November 1999 and including all of 2003. In that time, it appears that 12 children aged between 5 to 18 years were injured in school travel time. It appears that none were fatally injured during this time.

For Queensland, there appeared to have been 30 children aged between 5 to 18 years injured in school travel time from 1993 to 2002. It appears that none were fatally injured during this time.

South Australia provided data only from 1997 to 2003 inclusive. In that time, it appears that 10 children aged between 5 to 18 years were injured in school travel time. It appears that none were fatally injured during this time.

Western Australia did not provide statistics. Except for Western Australia, NSW, Victoria, Queensland and South Australia, it seems that other jurisdictions do not convey school children by rail.

The rail statistics provided reflect the view that rail travel is very safe relative to road travel.

### **3.5. Relative safety of buses**

The studies by Professor Hensher commissioned by the Bus and Coach Association (NSW) have already been mentioned. His most recent estimate (2002)<sup>xxv</sup> is that

*bus travel is overall, the safest form of land passenger transport for all passengers and the safest for school children between 5 and 16 years old if we exclude train ... It is 23 times safer than driving, 1.38 times safer than being driven in a car, 23 times safer than driving a motorbike, 55 times safer than using a bicycle and 4.4 times safer than walking.*

According to a report, based on 1994 and 1997 statistics, by the Australian Transport Safety Bureau (ATSB)<sup>xxvi</sup>:

*Bus travel was clearly the safest mode of road transport with the least number of fatalities and hospitalisations per 100 million passenger kilometres travelled in 1994 and 1997. (page 19)*

Moreover, according to the same ATSB report, bus occupants have constituted a very small proportion of people killed or seriously injured in Australia:

*In Australia between 1990 and 1998, there were 17 840 road fatalities and bus occupants accounted for 0.6 of a percentage point of these fatalities. Bus occupants also accounted for 0.6 of a percentage point of the 178 567 road hospitalisations that occurred between 1990 and 1997. (page 3)*

To say that serious bus casualties are a small proportion of all serious road casualties is not to suggest that they do not matter. To say that a bus is the safest form of road transport is not to suggest that bus safety could not be improved. It should simply draw attention to the fact that there are many other road safety problems. Addressing these problems also demands resources, and they cannot be neglected.

### **3.6. Conclusions**

Buses provide the safest form of land transport. In school travel time, in the years 1993 to 2002, many fewer bus passengers aged 5 to 18 years were killed or injured, compared with other road users in these age groups, both in NSW and elsewhere in Australia.

Based on the safety experience with school buses, the installation of seat belts in school buses could not have a high priority, relative to other road safety work.

## 4. Options and costs

### 4.1. Purpose

The purpose of this chapter is to estimate costs of various options for fitting seat belts to school buses. The options are based on those suggested by members of the School Bus Safety Working Group.

### 4.2. Where the buses operate

In Working Group Meetings, some proponents have suggested that seat belts might not be required in all buses, but should be required where speed limits are higher, because a crash at high speed, - or with another heavy vehicle travelling at high speed – would have worse consequences. The speed zones suggested were 80 km/h or more or 100 km/h or more.

Some members have suggested that seat belts should be required in the country. Others have suggested that they be required in all buses travelling on both country and metropolitan roads.

Table 8 sets out four different options for where seat belts may be required.

**Table 8: Four options for where seat belts may be required in school buses.**

<i>Where</i>	Speed limit zone	
	80 km/h +	100 km/h +
Country	Option 1	Option 2
Country and Metropolitan	Option 3	Option 4

The four options for where seat belts may be required are thus:

1. In country areas, but only where the speed limit is 80 km/h or higher.
2. In country areas, but only where the speed limit is 100 km/h or higher.
3. In both metropolitan and country areas, but only where the speed limit is 80 km/h or higher.
4. In both the metropolitan and country areas, but only where the speed limit is 100 km/h or higher.

### 4.3. Applicable buses under each option

Obviously, if a bus is required to have seat belts when it is travelling in a particular speed limit zone, then it will have seat belts at other times. Any bus that ever transports children to or from school in an applicable area would be required to have seat belts.

There are no useable data from which it is possible to count which buses travel where and in which speed zones. MoT does not maintain this type of information electronically and in many cases may not capture this type of data.

NSW does not have dedicated school buses. These buses are also used to carry other fare paying adult passengers, may be used for charter and also may travel on a mixture of roads covering different speed limits (for example, 60 km/h then 100 km/h and back to 80 km/h). Therefore, it is necessary to estimate.

Almost all, perhaps all, route buses transport at least some children to and from school. Sometimes the passengers may not be all children. The bus may have a few adult passengers and the rest children, vice versa, or any combination in between.

All options would then include all country route buses. Perhaps there are route buses in the country that do not enter 100 km/h zones with children aboard, but there could only be very few, if any. The best estimate seems to be that all options include all country route buses.

Option 3 also includes metropolitan area route buses that carry children in 80 km/h zones. There are many 80 km/h zones in metropolitan areas. Inner city expressways have 80 km/h speed limits. Ordinary arterial roads have 80 km/h speed limits in suburbs a little further out, where a bus simply travelling to the next suburb will travel on an 80 km/h road. Therefore, Option 3 would appear to include all metropolitan route buses, as well as all country route buses – in other words all route buses.

Option 4 also includes some metropolitan route buses. An increasing number of roads in metropolitan areas have 100 km/h speed limits. Some buses carry school children on these roads, but it is not possible to estimate the number.

Table 9 summarises these estimates of the applicable buses under each option.

**Table 9: Applicable buses under the four options for where seat belts may be required in school buses.**

<i>Where</i>	<b>Speed limit zone</b>	
	80 km/h +	100 km/h +
Country	All country buses	All country buses
Country and Metropolitan	All buses	All country buses Some metropolitan buses (how many?)

## **4.4. Number of buses**

### **4.4.1. Need for an estimate**

At the April meeting of the School Bus Safety Working Group, it became clear that statistics on number of buses used by operators to service contracts were not available. The Ministry of Transport’s representative reported that new data capture processes would allow the development of a usable database for such purposes, but the information is not yet available.

Therefore, it was necessary to estimate the number of buses, using the RTA’s vehicle registration data.

#### **4.4.2. Roads and Traffic Authority vehicle registration data**

Following the research conducted by Henderson and Paine (1994, pages 49 and 50), the estimate was made using Roads and Traffic Authority's (RTA) vehicle registration statistics.

The RTA database is used to record vehicle registrations. That is, it is a working system. It contains records for 4 million vehicles.

Snapshots of the records (with no identifiers that would threaten privacy) were obtained from the RTA for vehicles recorded as being buses. The main snapshot used was the one at 31 December 2003. Another snapshot, at 30 June 2000, was obtained for comparison purposes.

There were about 46,000 vehicles recorded as buses.

For research purposes, the RTA has cleaned the data and added some useful transformations. The data are reasonably accurate. They are, however, generated mainly from forms completed by motor dealers and others when vehicles are first registered, and are incomplete or miscoded in some respects.

The data contain no indication of which buses are used to transport school children.

#### **4.4.3. Estimated number of buses**

It is estimated that 8,209 buses are likely to be used to transport children to and from school. The estimate is made as follows.

As pointed out earlier, it appears that all route buses transport children to and from school. Some other buses are also used for school transport, such as buses owned by schools or institutions.

The main number plate style used by route buses is the "MO" plate.

There were 7,222 MO buses.

The RTA vehicle registration data provide a usage code for each vehicle. Although these codes do not appear to be 100% accurate, they provide a useful indication of numbers in the aggregate.

Most of the MO plate buses were classified as route buses (RBUS usage code) or STA bus (OMI usage code), but there were several other usage codes. The most common of the other codes was general business (BUSG usage code).

After including the MO buses, the aim was to decide which other buses to include.

The first step was to exclude buses with "TV" number plates. According to the NSW Ministry of Transport Web site, a tourist bus service is a public passenger service which is either:

- a pre-booked service designed for the carriage of tourists to destinations listed on a publicly available tour itinerary, or
- a service designed for the carriage of tourists where all passengers have a common origin or a common destination (or both).

These are obviously not school services.



At 31 December 2003, there were 1,451 buses with TV plates.

These have been excluded from those likely to transport school children.

The next step was to ensure that all relevant usage codes were included. All the OMNI (STA) buses had already been included. The other three to include were CBUS, PBUS and RBUS. The usage codes are explained below.

<b>Usage Code</b>	<i>Description</i>
CBUS	“Charter/Airways Bus - Let For Hire”
OMNI	“Bus operated by the State Transit Authority”
PBUS	“Licensed public vehicles - not let for hire”
RBUS	“Bus/tourist vehicle for hire”

The number of buses in each of these usage categories and the number plate type are shown in Table 10.

**Table 10: Numbers of buses with CBUS, PBUS or RBUS usage codes at 31 December 2003, and their number plate types.**

	<b>Number plate type</b>			
	<b>MO</b>	<b>TV</b>	<b>Other</b>	<b>Total</b>
<b>CBUS</b>	12	13	36	61
<b>PBUS</b>	198	3	80	281
<b>RBUS</b>	3,066	818	241	4,125
<b>Total</b>	3,276	834	357	4,467

As can be seen, there were 4,467 buses with one of these three usage codes. But 3,267 had already been included, because they had MO plates, and 834 had already been excluded, because they had TV plates. Therefore, there are only 357 more buses to add to the total.

So far, therefore, 7,222 MO buses and 357 other buses, a total of 7,579, have been included.

For the remainder of the buses, it was not always clear that the vehicle classified as a bus was really a bus. So, vehicles with a recorded seating capacity, or an estimated seating capacity if none was recorded<sup>xxvii</sup>, of 12 or fewer were excluded (this does not apply to the 7,579 which had already been included).

After their investigations, Henderson and Paine (1994, page 49) included buses used for handicapped people or by charities. These are identified by usage codes CHAR and HAND in the RTA database.

Nevertheless, the proportion of CHAR and HAND buses used for transporting school children is probably lower than 100%. Most disabled people are older than school age<sup>xxviii</sup>. Moreover, the numbers of buses in these categories has increased sharply, as indicated if we compare the two snapshots used for this study, 30 June 2000 and 31 December 2003, the number of buses in these two usage codes has increased by 50%.

It is possible that the number was smaller in 1994, and thus perhaps the code was interpreted differently.

Nevertheless, to qualify for a seat belt, a bus would only have to transport some children to school sometimes. An estimate that 25% of these buses would be used for the transportation of school students seems conservative (but it remains an assumption).

After excluding buses with a seating capacity or estimated seating capacity of 12 or fewer, and one bus with MO plate already included, there were 827 buses in these two categories. Thus, taking 25%, 207<sup>xxix</sup> buses were included as those likely to transport children for school. Added to the 7,579 already included, this makes 7,786 included so far.

After their investigations, Henderson and Paine (1994, page 49) included “5% of the remaining buses with more than eight seats.” It seems, however, that (in 2003) there are several usage codes that appear unlikely to be miscoded in a way that would include buses that convey children for school. Therefore, the following usage codes were included:

- BUSG (Business General)
- PPG (Primary Producer)
- PNSR (Pensioner)
- PRIV (Private use)

Some buses had MO number plates (2001 BUSG and 15 PRIV), and had been included already.

Of BUSG and PPG usage code buses, 170 were included. This is 5% of those with a seating capacity or estimated seating capacity<sup>xxx</sup> greater than 12.

Of PNSR and PRIV usage code buses, 253 were included. This is 5% of those with a seating capacity or estimated seating capacity<sup>xxxi</sup> greater than 12.

These four categories thus sum to 423 buses.

Adding the 423 to the 7,786 already included gives an estimated total number of buses likely to be used for transporting children to and from school of 8,209 buses.

#### **4.4.4. Estimated sizes of buses**

The aim here was to divide buses into large and small buses. Because of the unknowns and inaccuracies in the data, this was done on the basis of whether the bus had a seating capacity of more than 25 (large) or 25 or fewer (small). Where the seating capacity was not recorded, it was estimated.

Of the 8,209 buses estimated to be likely to transport school children:

- 6,831 had a seating capacity or estimated seating capacity of more than 25;
- 1,378 had a seating capacity or estimated seating capacity of 25 or fewer.

#### **4.4.5. Country or metropolitan**

The RTA data distinguish between city and country buses for buses with MO number plates only. As pointed out, there were 7,222 buses with MO number plates. The

numbers of these buses that were metropolitan or country are shown in **Table 11**, together with an estimated division of other buses into country and metropolitan.

For the buses that were included that had other than MO number plates, the estimate of whether they were metropolitan or country buses was based on the RTA vehicle registration data. The RTA records the address of the registered owner, and the RTA relates this address to one of the RTA's Regions: Sydney, Southern, Hunter, Northern, Western and South Western. This address is not always a correct guide to where it is used. The proportion of MO buses that were metropolitan or country was used as a guide for other buses. The proportions were calculated and applied separately for large and small buses.

**Table 11: Numbers of buses likely to transport school children at 31 December 2003, broken down by size and whether they were metropolitan or country buses, identifying those with MO number plates.**

	Metropolitan	Country	Total
<i>Large buses</i>			
MO plate	3,611	3,096	6,707
Other	58	66	124
Total	3,669	3,162	6,831
<i>Small buses</i>			
MO plate	11	504	515
Other	276	587	863
Total	287	1,091	1,378

**Table 12** summarises Table 11.

**Table 12: Numbers of buses likely to transport school children at 31 December 2003, broken down by size and whether they were metropolitan or country buses.**

	Large (> 25 seats)	Small (25 seats or less)	Total
Country	3,162	1,091	4,253
Metropolitan	3,669	287	3,956
Total	6,831	1,378	8,209

#### **4.4.6. Cost of retrofitting seat belts to a large bus**

Costs depend on the options adopted. Here calculations are based on whether the buses are retrofitted with seat belts or whether seat belts are required only on newly manufactured buses. These are obviously not completely separate options; if retrofitting were required, new buses would also be required to be fitted.

The bus manufacturing industry had a representative on the School Bus Safety Working Group. This representative provided estimates of the costs of retrofitting seat belts to large buses.

The task of retrofitting seat belts to a large bus is a more complex task than it may seem. To improve safety, the seat belts and seats would have to comply with ADR

68, the only existing relevant ADR for large buses. Points made by the industry representative were:

- Most larger buses have a rear engine, and the floor and seats rise over the engine. The rear is mounted on the engine compartment structure. A seat belted seat requires more space than a conventional bus seat. There may be an issue with headroom. In any case, the engine compartment structure will need to be reconstructed. The floor in front of the seat may need to be raised, as the rear-seated passengers would now be sitting higher than they were before the reconstruction and new seats.
- The floor of the bus may need to be reconstructed to provide a structure suitable to accept the loads imposed by a seat belted seat. This would require new flooring timber, new floor covering and a more robust structure under the floor.
- The sidewall of the bus may need to be strengthened to accept seat belted seats. The interior finish will need to be removed and replaced with new material. It has to be replaced, because it would be damaged so much in its removal. In most instances, however, it is possible not to have to remove the external panelling, because - with care - sufficient structure could be welded to the frame without damaging the exterior of the bus.

The Austroads report *Investigation of Internal Bus Safety Measures* (2002) makes similar point:

*research documents that retrofitting seat belts and installing higher seatbacks to school buses will require modification to bus floors, seat anchorages, sidewalls and pillars and other structural changes (page 59).*

However, the Austroads investigators did not include these costs in their assessment, and acknowledged that costs may have been higher than they had estimated (see Austroads, 2002, page 28).

In the Working Group meeting, the bus manufacturing representative also identified that, as well as the reconstruction, there is also a need for testing, before it could be asserted that the seat belts and seats would meet the ADR 68 requirements. The testing is conducted on a crash sled, which is run into a barrier, in a specialised crash testing laboratory. The manufacturer would build a proposed floor and wall section of a bus, and this would be fitted with seats and belts. The testers install instrumented crash dummies. The section would be mounted on a crash testing sled. This is all smashed into the barrier at specified speeds. There are two tests, if all goes well. A testing series is representative of a group of buses built by the same manufacturer, so that each bus does not have to be tested. Nevertheless, the representative reported, a single test costs up to about \$30,000.

The industry representative suggested that the average cost per large bus would be \$42,790 to retrofit the belts. He suggested other costs would include:

- costs of getting the bus to and from the factory
- costs of a replacement bus while the bus is off the road for two or three weeks while the work has been done.

Another member of the School Bus Safety Working Group suggested that the reconstruction and fitting could be done during school holidays. In a large program of retrofitting, however, limiting the work to school holidays would mean the program would take several times longer to complete, and if the construction industry acquired

new plant to undertake the scaled-up activity, the plant would have significant idle time, increasing the unit cost.

An amount of \$45,000 has been estimated as the average cost of retrofitting a large bus. This is the basic average cost of \$42,790 plus an additional \$2,210 for the additional costs mentioned.

#### **4.4.7. Cost of a new large bus with seat belts fitted**

Advice obtained from various bus manufacturers and retailers estimated that a typical 57 seater bus would cost \$330,000 new or \$360,000 if seat belts were fitted. Therefore, the additional cost of seat belts in a new large bus is estimated to be \$30,000.

#### **4.4.8. Cost to retrofit seatbelts to a small bus**

The representative of the Isolated Children's Parents' Association obtained information from a seat manufacturer about retrofitting seats and belts in a small bus. It was suggested that the estimated cost was \$17,500.

#### **4.4.9. Cost of a new small bus with seat belts fitted**

Advice obtained from various bus manufacturers and retailers estimated that a typical 25 seater bus would cost \$134,000 for a new bus with seatbelts or \$123,000 for a new bus. Therefore, the additional cost of seat belts in a new small bus is estimated to be \$11,000.

#### **4.4.10. Implications of capacity loss**

With the fitting of seat belts and new seats to buses, there will be losses in carrying capacity due to:

- No standing passengers.
- No longer having three small children to a seat meant for two adults (although three for two seating is possible in some circumstances, even with seat belts)
- Fewer seats in the bus, because the ADR compliant seats required take more space.

If the carrying capacity has been reduced by 20% per bus, the operator would need to run five buses to do the work previously done by four. In other words, 25% more buses would be required. Similarly, if the carrying capacity had been reduced by 33%, 50% more buses would be needed. If the capacity had been reduced by 50%, 100% more buses would be needed (twice as many)<sup>xxxii</sup>. This is an average, because the circumstances would dictate what would be needed: how many children now and in the future would need to go in what directions.

An alternative would be to operate larger buses, instead of buses of a similar size, but it is not clear that this would always be less expensive, or less expensive on average. For example, it seems that the cost of a 57 seater bus is several times that of a 25 seater. The additional buses approach has been used for the purposes of this estimate.

#### **4.4.11. Aggregate costs for large buses**

For the purpose of the Austroads *Investigation of Internal Bus Safety Measures* (2002), the loss of carrying capacity for a large bus was estimated by the NSW Department of Transport to range between 25% and 48% per bus (see page 39 of the Austroads report).

This means that between 33% and 92% additional buses would be required to effectively carry the same demand.

The number of large buses likely to carry children to school was estimated to be 6,831 - 3,162 in the country and 3,669 in metropolitan areas.

With the loss of carrying capacity, the number of large buses required would then increase to a total of between 9,108 and 13,137 buses – between 4,216 and 6,081 buses in the country, and between 4,892 and 7,056 buses in metropolitan areas.

**The costs for retrofitting at \$45,000 per bus is estimated to be:**

- country                      \$142 million
- metropolitan                \$165 million
- total                            \$307 million

**The additional costs for acquiring new buses fitted (at \$30,000 extra per bus), rather than without belts, are estimated to be:**

- country                      \$95 million
- metropolitan                \$110 million
- total                            \$205 million

**The costs for additional buses, to meet carrying capacity losses, at \$360,000 per bus is estimated to be:**

**if the loss of capacity per bus is 25%**

- country                      \$379 million
- metropolitan                \$440 million
- total                            \$820 million

**if the loss of capacity per bus is 48%**

- country                      \$1.05 billion
- metropolitan                \$1.22 billion
- total                            \$2.27 billion

The total cost is therefore the sum of the cost of retrofitting or the cost of having a seat belt on a new bus, plus the costs of purchasing additional buses to compensate for the carrying capacity loss. The estimates are summarised in **Table 13**. The range of costs depends on whether the capacity loss is 25% or 48%.

**Table 13: Summary of cost estimates for fitting seats and seatbelts to meet Australian Design Rules, for large buses**  
(The range depends on whether the capacity loss would be 25% or 48%)

	New buses \$ billion	Retrofit \$ billion
<b>Country</b>	0.5 to 1.1	0.5 to 1.2
<b>Metropolitan</b>	0.6 to 1.3	0.6 to 1.4
<b>Total</b>	1.0 to 2.5	1.1 to 2.6

#### **4.4.12. Aggregate costs for small buses**

According to ADR 4, all buses with a GVM of 3.5 tonnes or less are required to have seat belts. For those with more than 12 seats, this requirement applies only to those buses manufactured on 1 January 2000 or later. Nevertheless, buses with a GVM of 3.5 tonnes or less have been excluded from the cost estimate.

This means it is necessary to estimate what proportion of the small buses, those estimated as likely to transport children to school, would have a GVM of 3.5 tonnes or less.

According to Henderson and Paine (1994, page 50), there is little standing on small buses, and it is assumed that the loss of standing will have no measurable effect on capacity. A loss of capacity would result from a loss of three-for-two seating. It is possible to fit seats that have a harness for a small child in the centre position, with lap-sash belts on the outer seats. Nevertheless, for buses that carry a mixture of older children, younger children, and adults, together or at different times, it may not be practical to have the centre harness installed. If three-for-two seating were lost, this would mean a loss of capacity 33% on buses that only carried small children, but these would appear to be the buses where three for two seating might be retained. There will also be some loss of capacity if the Australian Design Rule complying seats take more space.

With the above considerations in mind, the costs have been calculated for small buses under two loss of carrying capacity estimates: zero and 20%.

The number of small buses likely to carry children to and from school was estimated to be 1,378 – 1,091 in the country and 287 in metropolitan areas.

With a 20% loss of carrying capacity, 25% more buses would be needed, and the number of small buses required would then increase to a total of 1,723 – 1,364 buses in the country, and 359 buses in metropolitan areas.

Of the 1,378 small buses, 174 metropolitan and 461 country buses had or were estimated to have had a gross vehicle mass of 3.5 tonnes or less. These buses were excluded from the costing as explained, because they would be required to have seat belts in accordance with the Australian Design Rules. Therefore, the costing was applied to 743 buses – 113 in metropolitan areas and 630 in the country.

**The additional costs for purchasing new buses that have seat belts (at \$11,000 extra per bus) rather than those without, is estimated to be:**

- country                      \$6.9 million
- metropolitan                \$1.2 million
- total                            \$8.2 million

**If there is no loss of capacity, this is the total additional cost of buying new small buses with seatbelts rather than without.**

**The costs for retrofitting at \$17,500 per bus is estimated to be:**

- country                      \$11.0 million
- metropolitan                \$2.0 million
- total                            \$13.0 million

**The costs for additional buses, fitted with seatbelts, at \$134,000 per bus, if the loss of capacity per bus is 20%, is estimated to be**

- country                   \$21.1 million
- metropolitan           \$3.8 million
- total                     \$24.9 million

The total cost is therefore the sum of the cost of retrofitting or the cost of having seat belts on a new bus, plus the costs of purchasing additional buses to compensate for the carrying capacity loss. The estimates are summarised in **Table 14**. There is a range of costs for the new bus option, because of the possibility that this does not result in a carrying capacity loss. Otherwise, the average carrying capacity loss is estimated to be 20%.

**Table 14: Summary of cost estimates for fitting seats and seat belts to meet Australian Design Rules, for small buses**

	New buses \$ million	Retrofit \$ million
<b>Country</b>	6.9 to 28.0	11.0 to 32.1
<b>Metropolitan</b>	1.2 to 5.0	2.0 to 5.8
<b>Total</b>	8.2 to 33.1	13.0 to 37.9

## **4.5. Ages and replacement rates of buses**

### **4.5.1. Method**

This was calculated only on buses with MO plates, or with RBUS, CBUS or PBUS usage codes, in the RTA registration data. These constitute 7,559 of the 8,209 (92%) of the buses estimated to be used to transport children to and from school, and 99.8% of the 7,574 buses included in the costing estimates.

Age was calculated from the year of manufacture, which is recorded in the RTA's vehicle registration data.

The replacement rate was estimated, also from the year of manufacture. The vehicle registration data snapshot for 31 December 2003 was compared with that for 30 June 2000, 3 ½ years before. By looking at the numbers in each year of manufacture, it was possible to see how many had disappeared and how many had been added in that period.

### **4.5.2. Average Age**

The average age of large buses was 11.9 years. Fifteen per cent of them were more than 20 years old.

The average age of small buses was 7.5 years. One per cent of them were more than 20 years old.

### **4.5.3. Replacement rate**

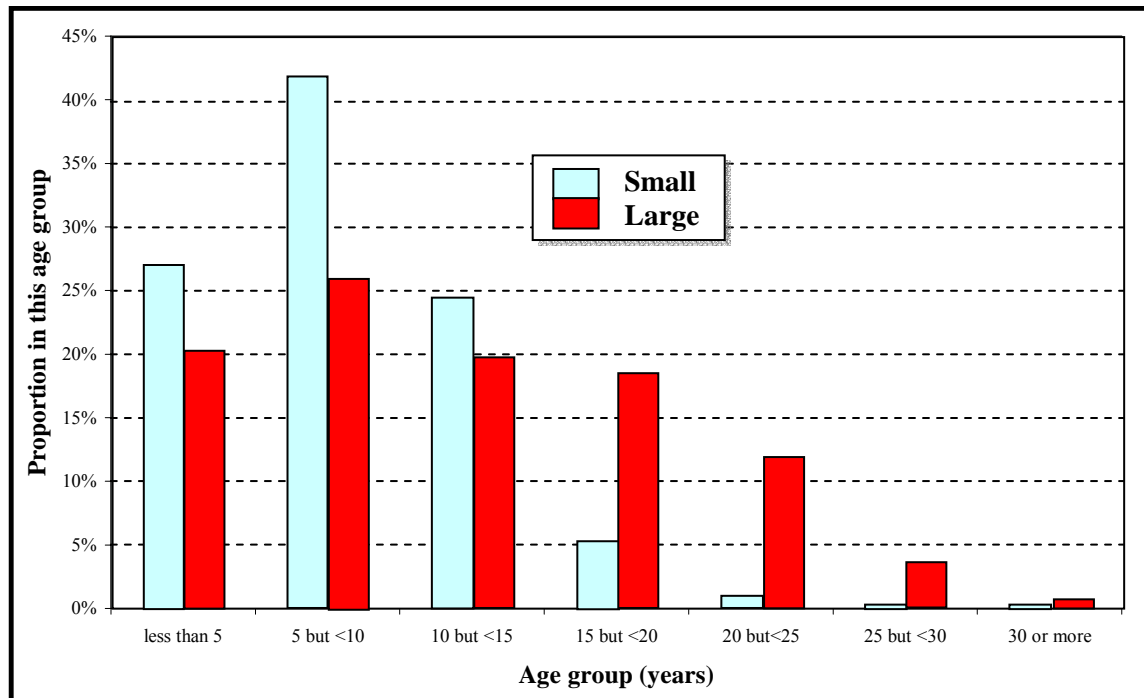
Approximately 3% of large buses were replaced per year; about one in 30.

Approximately 8% of small buses were replaced per year; about one in 12.



It was not necessarily the oldest buses that were replaced. Therefore, these average replacement rates do not give a completely accurate estimate of times to replace the fleet, but are used as an estimate. **Figure 14** sets out the proportions of small buses and proportions of large buses in each of seven age groups.

**Figure 14** Proportion of large buses and small buses in each of seven age groups, 31 December 2003.



On 21 June 2004, the Australian House of Representative Standing Committee on Transport and Regional Services presented the report of its inquiry into road safety<sup>xxxiii</sup>. The Committee's 35<sup>th</sup> recommendation, if implemented, would be likely to result in a reduction in the average age of buses, and an increase in the replacement rate.

#### 4.6. *Timing and constraints*

Whether seat belts would be fitted only to new buses as manufactured or whether there should be retrofitting has been treated as two options. The distinction between the two options is not clear cut. It seems likely that it would take many years for seat belts to be fitted to any substantial proportion of buses, and therefore a large part of the task would have to be achieved through fitting to newly manufactured buses.

Issues raised in the Austroads report on internal bus safety measures are pertinent.

- The bus manufacturing industry has limited capacity.
  - Issues relating to the bus manufacturing industry are discussed in section 5.12
- Retrofitting is not possible on many buses.
  - The Austroads report assumed that Toyota buses would be unsuitable for retrofitting.
  - A large proportion of small buses are Toyotas.

Funding is another issue. As already pointed out, the cost of any proposal is relevant because the proposal has to be considered in the context of other actions which could be funded by the same resources. As well as that, the cost is relevant because consideration has to be given to how the proposal would be funded. The estimated costs imply that funding is a very significant factor in considering the timing of such a proposal.

## **4.7. Cash flow demands**

### **4.7.1. Costs per year for retrofitting**

Funding relates to cash flow. It is necessary to estimate how much per year it would cost to implement a program of seat and seat belt fitting. The aim here is to estimate the cost of a retrofitting program.

Say the program would have seat belts fitted on all large buses in five years. Then, obviously, enough buses would have to be fitted each year to achieve this aim. At first glance, one might assume this is a fifth of the buses each year. But it is fewer than a fifth, because some of the buses will be replaced in any case. Presumably buses due to be replaced would not be retrofitted. Any new buses would be fitted with seat belts.

It was estimated in section 4.5.3, that about one in 30 large buses is replaced each year. Because of the loss of carrying capacity, the retrofitting will generate a need to acquire more buses. Moreover, because of the loss of carrying capacity, when buses are replaced, there is a need to acquire more than is disposed of. It is possible to derive an equation for the cost each year. This is:

#### **Cost of retrofitting per year**

The proportion of buses that need to be retrofitted each year is  $1/y - 1/30$ , where  $y$  is the number of years in which the retrofitting of the whole fleet would be completed. Recall that on average,  $1/30$  of the fleet is replaced each year. For example, if the retrofitting is to be completed in five years, one sixth ( $1/5 - 1/30$ ) of the large bus fleet would need to be retrofitted each year.

The cost of retrofitting a large bus has been taken as \$45,000 (see section 4.4.6).

As an example, take a fleet of 600 buses, to be retrofitted in five years. As explained, one sixth – 100 buses – would be retrofitted each year, at a cost of  $100 \times \$45,000 = \$4.5$  million. Another way of looking at this is, by dividing by 600, as an average cost of \$7,500 per bus. The average cost per bus in the fleet per year depends on the number of years in which the retrofitting is to be completed is as follows:

- 5 years      \$7,500 per year
- 10 years     \$3,000 per year
- 15 years     \$1,500 per year

#### **Cost of additional buses**

The loss of carrying capacity per large bus was estimated to range between 25% and 48% (see section 4.4.11). If the loss of carrying capacity were 25% per bus, on average an extra 33% of buses would be needed. If the loss of capacity were 48%, on average an extra 92% of buses would be needed. Additional buses are required because of the buses retrofitted, and for the buses that are replaced, rather than

retrofitted, additional buses would be required. If the retrofitting is to be completed in five years, one fifth of the buses is either retrofitted or replaced each year. If the loss of capacity were 25% per bus, then an extra third of these buses would be required. Therefore, the fleet size would increase by 1/15 ( $1/5 \times 33\%$ ) each year, until at the end of the fifth year it would have increased by 33%. The cost of a new large bus fitted with seat belts was taken to be \$360,000 (see section 4.4.7). The average cost per bus in the fleet per year depends on the number of years in which the retrofitting is to be completed is as follows:

**If the loss of capacity is 25% per bus:**

- 5 years      \$24,000 per year
- 10 years     \$12,000 per year
- 15 years     \$8,000 per year

**If the loss of capacity is 48% per bus:**

- 5 years      \$66,500 per year
- 10 years     \$33,000 per year
- 15 years     \$22,000 per year

**Extra cost for buses replaced**

It has been taken as costing \$30,000 more to acquire a large bus with seat belts than one without (see section 4.4.7). If one in thirty buses is replaced each year, then the extra cost is \$1,000 per bus in the fleet.

**Costs per bus in the fleet**

Total average cost per year per bus in the fleet depends on the number of years over which the retrofitting would be done and the loss of carrying capacity per bus. The estimates are summarised in **Tables 15 and 16**.

**Table 15: Estimates of costs per year per large bus in the fleet if retrofitting of whole fleet is to be done in 5 years, 10 years or 15 years, with loss of carrying capacity of 25% per bus**

	Number of years to retrofit		
	5 years	10 years	15 years
Retrofitting	\$7,500	\$3,000	\$1,500
Additional buses	\$24,000	\$12,000	\$8,000
Additional cost of replacements	\$1,000	\$1,000	\$1,000
<b>Total</b>	<b>\$32,500</b>	<b>\$16,000</b>	<b>\$10,500</b>

**Table 16: Estimates of costs per year per large bus in the fleet if retrofitting of whole fleet is to be done in 5 years, 10 years or 15 years, with loss of carrying capacity of 48% per bus**

	Number of years to retrofit		
	5 years	10 years	15 years
Retrofitting	\$7,500	\$3,000	\$1,500
Additional buses	\$66,500	\$33,000	\$22,000
Additional cost of replacements	\$1,000	\$1,000	\$1,000
Total	\$75,000	\$37,000	\$24,500

**Total cost per year**

The total cost per year is derived by multiplying the number of large buses, estimated to be 6,831 (see section 4.4.5). The totals are given in **Table 17**.

**Table 17: Estimates of cost per year for large buses in NSW if retrofitting of whole fleet is to be done in 5 years, 10 years or 15 years, with loss of capacity of either 25% or 48% per bus**

Phase in period	Average capacity loss					
	25%			48%		
	\$ million per year			\$ million per year		
	Country	Metro	Total	Country	Metro	Total
5 years	103	119	222	237	275	512
10 years	51	59	109	118	136	254
15 years	33	39	72	78	90	168

After retrofitting was completed, the estimated additional cost of replacement of \$30,000 per bus acquired would continue. This would add \$6.8 million per year, without including the additional buses that would have to be purchased each year with an increased fleet size. It should be noted that estimated costs for the maintenance of the seat belts has not been included. Nor has any cost estimation been added for additional administration costs of the School Student Transport Scheme of having more buses to administer. Nor has anything been added for additional running costs (such as fuel and maintenance) of the additional buses.

The above costs are based on the assumption that, during the phase-in, there would be no carrying capacity loss in old buses until they were retrofitted. That is, standing passengers and three for two seating would be permitted in old buses not yet retrofitted.

In view of the limitations on timing though industry capacity and funding requirements, and the possibility that many buses cannot be retrofitted, the approach of fitting seat belts to new buses may be more feasible than retrofitting.

**Retrofitting on small buses**

The proportion of buses that need to be retrofitted each year is  $1/y - 1/12$ , where y is the number of years in which the retrofitting of the whole fleet would be completed. Recall that on average, 1/12 of the fleet is replaced each year. For example, if the

retrofitting is to be completed in five years, 12% ( $1/5 - 1/12$ ) of the small bus fleet would need to be retrofitted each year.

The cost of retrofitting a small bus has been taken as \$17,500 (see section 4.4.8).

The average cost per bus in the fleet per year depends on the number of years in which the retrofitting is to be completed is as follows:

- 5 years      \$2,000 per year
- 10 years     \$300 per year

The cost per year for the 10 year option is low, because few buses would need to be retrofitted, because most would be replaced in any case.

The loss of carrying capacity per small bus was estimated to range between zero and 20% (see section 4.4.12). If the loss of capacity were 20%, on average an extra 25% of buses would be needed. If the retrofitting is to be completed in five years, one fifth of the buses is either retrofitted or replaced each year. If the loss of capacity were 20% per bus, then an extra 25% of these buses would be required. Therefore, the fleet size would increase by 5% ( $1/5 \times 25%$ ) each year, until at the end of the fifth year it would have increased by 25%. The cost of a new large bus fitted with seat belts was taken to be \$134,000 (see section 4.4.9). The average cost per bus in the fleet per year depends on the number of years in which the retrofitting is to be completed is as follows:

If the loss of capacity is 20% per bus:

- 5 years      \$6,700 per year
- 10 years     \$3,300 per year

If there is no loss of capacity, there is no need for additional buses.

It has been taken as costing \$11,000 more to acquire a large bus with seat belts than one without (see section 4.4.9). If one in 12 buses is replaced each year, then the extra cost is \$900 per bus in the fleet.

Total average cost per year per bus in the fleet depends on the number of years over which the retrofitting would be done and the loss of carrying capacity per bus. The estimates are summarised in **Table 18**.

**Table 18: Estimates of costs per year per small bus in the fleet if retrofitting of whole fleet is to be done in 5 years or 10 years, with loss of carrying capacity of 20% per bus**

	Number of years to retrofit	
	5 years	10 years
Retrofitting	\$2,000	\$300
Additional buses	\$6,700	\$3,300
Additional cost of replacements	\$900	\$900
<b>Total</b>	<b>\$9,600</b>	<b>\$4,500</b>

If there were no loss of capacity, the total average cost bus in the fleet would not include the cost of additional buses. That is, it would include only the cost of retrofitting and the additional replacement costs, totalling per bus in the fleet:

- \$2,900 if the retrofit were done in 5 years
- \$1,200 if the retrofit were done in 10 years.

The total cost per year is derived by multiplying the number of small buses included in the costings, estimated to be 743 (see section 4.4.12). The totals are given in **Table 19**.

**Table 19: Estimates of cost per year for small buses in NSW if retrofitting of whole fleet is to be done in 5 years or 10 years, with loss of capacity of either zero or 20% per bus**

		Average capacity loss				
		zero			20%	
Phase in period	\$ million per year			\$ million per year		
	Country	Metro	Total	Country	Metro	Total
5 years	1.9	0.3	2.2	6.1	1.1	7.2
10 years	0.8	0.1	0.9	2.9	0.5	3.4

After retrofitting was completed, the estimated additional cost of replacement of \$11,000 per bus acquired would continue. This would add \$680 thousand per year, not including any cost relating to an increase in the size of the fleet resulting from any capacity loss. It should be noted that estimated costs for the maintenance of the seat belts has not been included. Nor has any cost estimation been added for additional administration costs of the School Student Transport Scheme of having more buses to administer. Nor has anything been added for additional running costs (such as fuel and maintenance) of the additional buses.

The above costs are based on the assumption that, during the phase-in, there would be no carrying capacity loss in old buses until they were retrofitted. That is, standing passengers and three for two seating would be permitted in old buses not yet retrofitted.

The cash flow demands for small buses are much less than for large buses.

#### **4.7.2. Costs per year for fitting on new buses**

If seat belts were fitted only on new buses, while they were being manufactured, it would of course take many more years than the retrofitting options discussed above, but funding would be more possible. The number of years to replace the buses is based on recent replacement rates, extrapolated forward in time, estimated as described in Section 4.5.1 above. These estimated times are shown in **Table 20**.

**Table 20: Time to replace existing school bus fleet based on estimated replacement rates, as described in Section 4.5.1**

Bus size	50%	75%	90%	100%
Large	15 years	22 years	26 years	29 years
Small	6 years	9 years	11 years	12 years

### **Large buses**

As pointed out, for large buses, the replacement rate per year is estimated to be one in thirty. Each bus acquired has been estimated to cost \$30,000 more, for the seatbelts and appropriate seats and fittings. This averages \$1,000 dollars per bus in the fleet per year.

If the loss of carrying capacity is 25%, there is a need for 33% more buses, when they are replaced, with each bus costing \$360,000. A third of 1/30 is 1/90, or \$4,000 per bus in the fleet. The total cost per bus in the fleet per year is \$5,000.

If the loss of carrying capacity is 48%, there is a need for 92% more buses, when they are replaced. 92% of 1/30 is 30.8%; with each bus costing \$360,000, this is \$11,000 per bus in the fleet per year. The total cost per bus in the fleet per year is \$12,000.

The overall costs are derived by multiplying by 6,831 the estimated number of large buses used to transport children to and from school.

For large buses, if seat belts were fitted to new buses only, the total annual cost is estimated to be:

#### **if the loss of carrying capacity were 25% per bus:**

- \$34 million per year
  - \$18 million for metropolitan buses
  - \$16 million for country buses

#### **if the loss of capacity were 48% per bus:**

- \$82 million per year.
  - \$44 million for metropolitan buses
  - \$38 million for country buses

If new buses were required to be fitted with seat belts based on estimated replacement rates (Table 20), it would be expected that after 15 years, 50% of the buses would have seat belts. To maintain capacity, however, additional buses would be needed and these would be required to be fitted with seat belts. Therefore, more than 50% of the total fleet would be fitted with seat belts. For example, 15 years after introduction of the requirement,

- if the loss of capacity were 25% per bus, 57% of large buses would be fitted with seat belts,
- if the loss of capacity were 48%, 66% of large buses would be fitted with seat belts.

### **Small buses**

As pointed out, the replacement rate for small buses is estimated to be one in 12 per year. Each bus acquired has been estimated to cost \$11,000 more to replace if it has appropriate seat belts and seats. This averages \$900 per bus in the fleet per year.

This may be able to be done without loss of capacity, but the loss of carrying capacity may be 20% and then 25% more buses would be needed. The cost of a small bus has been estimated to be \$134,000. This is an average of \$2,800 per bus in the fleet per year.

The total average cost per bus in the fleet per year is \$900 if there is no carrying capacity loss and \$3,700 if there is a 20% per bus carrying capacity loss.

The overall costs are derived by multiplying by 743 the estimated number of small buses, which have a Gross Vehicle Mass greater than 3.5 tonnes, used to transport children to and from school.

Thus, the cost per year is estimated to be \$700 thousand. To this must be added \$2.1 million, if the loss of capacity is 20% per bus, making the total estimate \$2.8 million per year. Most of this cost (85%) is estimated to be for country buses.

After 12 years, based on the estimated replacement rates, it would be rare for a small bus not to be fitted with seat belts.

#### **4.8. Need for detailed study**

##### **4.8.1. Limitations**

The costs are an estimate, one that was possible with the time and resources available. Estimation of the numbers was undertaken with RTA vehicle registration data, which were not intended for that purpose.

There was no way of checking the reliability of the division of buses between those that travel on country roads and those that travel on metropolitan roads.

The estimates were done by taking a typical cost for a typical bus, rather than anything more detailed.

These estimates might be seen as order-of-magnitude estimates, for the limited purpose of helping to decide what to do next.

##### **4.8.2. Need for detailed study**

If it were decided to proceed towards compulsory seat belt fitting on school buses, the next step would be a detailed costing. A detailed study would be necessary, because of the orders of magnitude estimated in this report, particularly for large buses.

As will be explained, a costing and cost-effectiveness analysis is required before any change to Australian Design Rules or any change to NSW regulations.



## 5. Other issues

### 5.1. Purpose

This chapter addresses issues raised in the School Bus Safety Working Group meetings.

### 5.2. Leaving children at bus stops

Having to leave children at bus stops is a concern.

The Chairman of Queensland's Parliamentary Travelsafe Committee expressed this concern in the Committee's 1993 report (referred to in section 2.3.2 above):

*It would be impossible to ban standees on buses as greater danger could result from leaving passengers behind, particularly children, when a bus is already carrying a full load of seated passengers.*

The report states at page 14:

*66 One of the main non-economic obstacles to banning standees completely is the issue of public safety. With standees banned altogether, drivers would be required to leave passengers at bus stops if they had a fully seated load. It is undesirable, and potentially unsafe, to leave anyone at a bus stop, particularly children and the elderly. Those people living in rural areas of Queensland, where a bus stop may be on a remote stretch of road, would also be affected and safety concerns for children would be even greater.*

*67 Although, in theory, an operator should know how many children he will have on a contracted service, in practice, there are often fluctuations in passenger numbers which may not be expected. A "no standees" policy does not allow for passenger fluctuations.*

Travelsafe's comments may, however, exaggerate the potential problem. Currently, a bus driver is prohibited from carrying more passengers than the number authorised for the bus, under clause 15 of the NSW Passenger Transport (Bus Services) Regulation 2000. Therefore, in any case, the situation can arise where the driver is not permitted to pick up a further passenger.

Would it be seen as a more serious offence to carry one standing passenger, when none is permitted than to carry an additional standing passenger above the authorised number?

### 5.3. Seat belt design for children

The Queensland School Transport Safety Task Force, in its report in 2001 (see section 2.3.2 above) noted that adult seat belts may not be suitable for small children and a design solution would be required so that suitable seat belts could be provided for them.

Australian road safety authorities<sup>xxxiv</sup> recommend booster seats for small children, up to about 26 kg. The United States Highway Traffic Safety Administration recommends booster seat use for children up to at least 8 years of age, unless they are 4 ft 9 inches (about 145 cm)<sup>xxxv</sup>.

The evaluation of the 2003 Queensland seat belt trial on school buses found it common for seat belts to be used incorrectly, with children stretching the belt over their knees, putting the sash part of the belt behind their backs or sitting on the lap part.

The 2002 report by the United States Highway Traffic Safety Administration suggested that common seat belt misuses by children were to have the sash part of the belt behind the back or under the arm. They suggest that this is because the child finds the seatbelt uncomfortable if it is poorly positioned because of body size. With this sort of misuse, the seat belts acted like lap only belts, which appear to have a detrimental effect on safety in buses.

The Queensland trial indicated that children found the seat belts to be uncomfortable and difficult to put on and remove.

The Queensland trial also indicated that there was some vandalism of seatbelts. Vandalism was not caused by the seat belts – there was vandalism in any case – but the seat belts were vandalised. Vandalism can make seat belts unusable, or reduce or eliminate safety benefits of use.

Potential seat belt benefits will not be achieved, unless they are used, and used properly.

If seat belts are to be introduced on buses, it is important to ensure systems are appropriate for children. The bus seat belts that were tested in the USA study were designed so that the seat belt attachment was easily adjusted up or down to suit different body sizes. Seat belts might also be able to be designed that are resistant to vandalism.

Moreover, if seat belts were to be introduced on route buses, different seat belts from a coach's might be suitable. For example, the belts used might have to be more easily cleaned and maintained.

The point is that, if seat belts were to be introduced on buses used to transport children to and from school, there would be a need for some design work, including human factors research, to ensure the belts are suitable for children and suitable for use in route buses.

#### ***5.4. Responsibility for seat belt wearing***

The issue of who would be responsible for seat belt wearing was raised several times in Working Group meetings. Would the child or the driver be responsible? Currently, bus drivers are not responsible for passengers' seat belt use. Passengers under 16 years of age do not commit an offence by failing to wear a seat belt.

Seat belt proponents considered that satisfactory wearing rates could be achieved without regulatory requirements.

The view that satisfactory wearing might be achievable without enforcement may be true, but there is no evidence to support that view. The evaluators of the 2003 Queensland trial suggested that regulatory compulsion might be necessary. It is not clear, however, how this might be enforced.

### **5.5. Secondary students**

In the 2003 Queensland trial, there were several indications that many secondary students saw seat belt wearing as “uncool”, and the wearing rates were lower for secondary students.

This may be an unreliable finding, because the study obtained reliable wearing data from only five buses. Nevertheless, it is an issue to consider.

It was suggested in the Working Group meetings that if young children wore the belts, they would continue to wear them as they moved to secondary school. This may be so, but attitudes to many matters change as children move into adolescence. For example, in relation to sun safety, the Australian Institute of Health and Welfare reports<sup>xxxvi</sup> that:

*it may be easier to protect younger children from the sun than older children and adolescents. Although the level of knowledge among adolescents about the importance of protection is high, the type of sun protection they actually use depends on their perceptions of acceptability and fashion*

There is no reliable evidence on what proportion of secondary students would be likely to wear seat belts under what conditions.

### **5.6. Bus congestion around schools**

With carrying capacity loss following seat belt installation and elimination of standing, there would be a large increase in the number of buses around schools.

When school students are killed or injured in connection with travelling by bus, it is almost always when they are crossing the road near the bus, after getting off or before getting on. A circumstance frequently found in child pedestrian accidents, whether a bus is involved or not, is that the child has stepped out from behind a parked vehicle. This applies at least as much where the parked, or stationary, vehicle is a bus.

The possible safety problems at schools from having more buses depend on several factors. The children who are bus passengers would join the bus on the same side of the road as the school. If there is teacher supervision around buses, children crossing the roads (non-bus passengers) are more likely to cross at a crossing, which will be safer if it is supervised. The safety implications also depend on the road layout and traffic conditions around the school, and how likely the students are to cross at a supervised crossing.

Having the kerb space to deal with more buses will be a problem at many schools. This would appear to be feasible to deal with only if there were a very gradual increase in the number of buses.

### **5.7. Mixture of seat belted and non-seat belted buses**

There appears to be a potential problem where a mixture of buses – some with seat belts and some without – service the same school. How would the decision be made about which children would use the bus with seat belts, if that bus is perceived to be much safer? For example, would parents complain if their child were not selected? This situation would potentially arise with a phased introduction of seat belts.

Proponents of seat belts in the Working Group did not see this as a problem. However, other members were of the view that this issue must be considered particularly in the examination of options that include a phased introduction.

If the issue generates complaints, it will add to costs. Simultaneous replacement or upgrading of all the buses that service a particular school will be impractical or impossible in many cases, perhaps most.

### **5.8. Encouraging bus use**

For both safety and environmental reasons, it is desirable that people should choose to travel by bus rather than private motor vehicle. It is desirable for children's safety that they travel to and from school by bus rather than other modes.

The USA National Highway Traffic Safety Administration (see section 2.3.4 above) expressed concern that fitting seat belts could result in more children travelling by alternative modes. Because the other modes are less safe, they suggested, this would result in more children being killed or injured.

On the other hand, there is evidence<sup>xxxvii</sup> that many parents prefer to drive their children to school or have them driven, because they perceive it is safer than the bus. Fitting seat belts to buses might cause some to change their minds.

In any case, making bus travel slower or more expensive will not help to encourage bus usage.

### **5.9. Travel times for buses**

Fitting seat belts might result in longer travel times for buses, because the bus would have to spend more time at each stop.

This applies to all buses with seat belts, not just those that are carrying school children at the time. Each (child or adult) passenger joining the bus would have to be given time to find a seat, sit, and fasten and adjust their seatbelt. For a passenger leaving the bus, the bus would have to be stopped before the person could be required to unfasten the seat belt and then stand and move to the door.

Increasing travel times will encourage some people to choose private motor vehicle over the bus.

### **5.10. Funding source**

If fitting seat belts on school buses is to be paid for from public funds, it will eventually have to be decided where the funds would come from. Options appear to be the transport budget and the road safety budget.

The Treasury has responsibility for resource allocations across the NSW Government agencies, and in view of the likely amounts involved would have to be consulted early in the process.

User pays does not seem feasible or even meaningful in the current context of bus services in NSW. Consider the current subsidy levels. According to the report of the Review of Bus Services in NSW (2004)<sup>xxxviii</sup>, the NSW Government spends more than \$600 million on bus services (page 32). Subsidies to industry are embedded in the

School Student Transport Scheme. Subsidy to the bus industry in rural NSW for the School Student Transport Scheme was more than \$230 million (page 48). The 2004-05 NSW Budget estimates the cost of the School Student Transport Scheme (bus, train and ferry) to be \$469 million.

An increase in user costs could be considered only in the context of broader policy aims.

Increasing user costs to help pay for seat belts would result in a decrease in safety to the extent that it results in some children travelling by other modes instead of the bus.

### **5.11. Risk of a major school bus crash**

It is almost certain that community concern at the death of many children in one bus crash would be much greater than the death of the same number or even many more children killed, but one at a time. Moreover, any death of a child associated with a school bus is likely to raise more concern than the death, for example, of a child crossing the road when there is no school bus in sight. Henderson and Paine (1994, page 69) and Henderson (1996, pages 10 to 12)<sup>xxxix</sup> provide useful discussions of the perception of risk and public concern.

Consideration has to be given to the likelihood of a major bus crash involving school children.

For issues where there are large numbers of fatal accidents, we can estimate probabilities, and thus be confident that the accident experience will stay between certain limits, unless there are underlying changes. The number killed in each fatal accident is usually one but sometimes a few people are killed in the one crash.

Where buses are involved, however, the number killed in an individual accident can be large, as in the two coach accidents on the NSW north coast in 1989. Because large bus accidents are very rare events, the problem of estimating their probability is different.

A major school bus crash resulting in many fatalities is possible; the risk is not zero.

There has been no such crash in Australia, although school buses have been operating for several decades. The probability must be less than once in 10 years for Australia. The probability that such a crash would happen in NSW in particular is obviously much less than that it would occur somewhere in Australia (including NSW). That is, the probability that such a crash would happen in NSW must be considerably less than one in 10 years.

Considering Australia as a whole, if there had been a school bus crash in which 30 passengers were killed in the 10 years considered, then there would still be fewer school bus passengers than pedal cyclists killed in school travel times in that 10 years. Nevertheless, given that the probability of such a major bus crash is so small, in another 10 years we would expect a similar number of pedal cyclists to be killed but many fewer bus passengers, because there is no reason to expect a major deterioration in school bus safety.

It is not possible to predict with any confidence where or when a major bus crash might happen, where many children were killed. In the past, most serious crashes involving a bus have resulted in fatalities to people other than the bus occupants.

The protection offered to occupants of even moderately large buses is explained by Henderson and Paine (1994, pages 17 and 18).

In a frontal collision, the type most relevant to seatbelt protection, if the vehicle is suddenly stopped by an impact, unrestrained occupants will continue at the original speed of the vehicle until they strike an object in front of them.

Light vehicles are designed to provide protection by increasing the distance in which the passengers' compartment decelerates. The vehicle front is designed to crush, and the maximum force is minimised if the crush can be controlled – neither a non-resistant collapse nor too rigid a resistance. Seat belts hold occupants in position so that they can benefit from this ride-down, and stretching of the seat belt increases the ride down distance slightly. The distances are very small.

A heavy bus in a frontal crash will almost always be decelerated less than a light vehicle. If a large bus hits a lighter vehicle, the heavy bus continues in its path, losing only some of its speed. The lighter vehicle will be forced backwards, and the occupants will experience greater forces than they would in a collision with a fixed object. A heavy bus might break through or dislodge what would be a fixed object for a lighter vehicle. If the bus is still moving forwards when an unrestrained occupant hits an internal object, the impact will be less, because there is less difference between the occupant's speed and the bus's speed.

Nevertheless, a major crash resulting in many bus occupant fatalities is possible, if a bus had a high-speed head-on collision with a vehicle that is just as heavy or heavier. High-speed two-lane roads are common both in rural areas and on the outskirts of metropolitan areas.

As well as speed, it needs also to be considered that the smaller the bus, the more serious a crash would be for bus occupants, again other things being equal.

### ***5.12. Bus manufacturer's perspective***

The bus manufacturing industry representative on the School Bus Safety Working Group has indicated that a rapid increase in the demand for bus upgrades or for new buses could not be met by the manufacturing industry.

The industry could manage an orderly increase. Otherwise, there would be an increase in costs, which would continue.

Some route buses operate across State borders. Second hand buses are sold interstate. The industry representative suggested a national approach to regulation.

The Australian House of Representatives Standing Committee on Transport and Regional Services completed its inquiry into road safety in June 2004. In its submission to the inquiry, the Bus Industry Confederation requested a nationally consistent system of regulation and accreditation. The House of Representatives Committee's recommendation (the 34<sup>th</sup>) was that the Australian Government ask the National Transport Commission to develop such a system.

From the industry input,

- it appears that only a very gradual increase in the demand for buses and bus upgrades would be manageable
- a national approach is important.

### **5.13. ADR process**

An established National approach to introducing safety requirements for vehicles is that of the Australian Design Rules (ADRs).

Under the Motor Vehicle Standards Act 1989 (a Federal Act), it is an offence to sell a new or imported vehicle unless it complies with National vehicle standards, which are prescribed under the Act to be the Australian Design Rules. Section 3 of the Act sets out its objects:

- a) to achieve uniform vehicle standards to apply to new vehicles when they begin to be used in transport in Australia; and
- b) to regulate the first supply to the market of used imported vehicles.

The Commonwealth uses its Constitutional powers in relation to corporations and foreign trade so that its legislation would apply instead of State and Territory legislation with which it might conflict<sup>x1</sup>. States may make additional requirements, for example, the requirements for signs and flashing lights on school buses in NSW.

The following outlines the process for introducing a new or amended ADR. It is based on a presentation to the April 2004 meeting of the School Bus Safety Working Group by a Roads and Traffic Authority representative. This was in turn based on a September 2003 presentation by an officer of the Australian Department of Transport and Regional Services, which administers ADRs.

A new or amended ADR requires approval by the Australian Transport Council (as the Ministerial Council for Road Transport). The proposal therefore has to be in a form required by the Council of Australian Governments (CoAG).

A Regulatory Impact Statement must be prepared, which must:

- define the problem
- demonstrate the need to regulate
- quantify costs and benefits
- consider non-regulatory options
- consider impacts on competition
- include public consultation.

The Office of Regulatory Review assesses the Regulatory Impact Statement.

The proposed ADR would have to comply with the CoAG principles of good regulation. Among other things, this would mean it would have

- to be consistent with competition principles
- to consider compliance and enforcement strategies
- to provide appropriate transition or lead times for introduction.

The proposed ADR must take account of international agreements, obligations and standards. The ADR should not imply a technical barrier to trade.

In answer to questions whether NSW could approach the seat belt issue without the support of other jurisdictions, the RTA representative suggested that it would be necessary to go through the ADR process as explained. It was suggested that buses are not manufactured for use in a specific operating area; buses are built to National design and construction standards.

If seat belts are to be required on new school buses, it appears that this would have to be achieved through the ADR process.

#### ***5.14. B.U.S. (Belt Up for Safety) Action Group's proposal***

##### **The proposal**

A copy of the B.U.S. Action Group's proposal is attached at Appendix C.

The proposal has three stages.

Stage 1 is proposed to be introduced by school term one, 2005. It involves

- eliminating standing on school buses in non-metropolitan areas where the speed limit is 80 km/h or higher
- requiring new and replacement buses to have seatbelts and seats that comply with Australian Design Rule (ADR) 68 if they travel on roads where the speed limit is 80 km/h or higher
- introducing a lower level of payment under the School Student Transport Scheme for buses without lap-sash seat belts

Stage 2 involves requiring all buses (not just newly acquired buses) to have seatbelts and seats that comply with ADR 68 if they travel on roads in non-metropolitan areas where the speed limit is 80 km/h or higher. Timing would depend on costs and be determined by Working Group members.

Stage 3 involves extending the ADR 68 requirement to other areas. The Working Group would reconvene in 2006 to consider the timing.

There were also suggestions about the NSW Government subsidising bus operators, savings being made through reduced third party personal injury insurance claims (through the MAA), the RTA "furthering their aim" to have occupants seat belted, and bus operators being able to use their buses for excursions.

The B.U.S. Action Group's proposal was tabled at several of the School Bus Safety Working Group meetings for consideration and comment by all members. To give Working Group members an opportunity to properly consider the proposal, the Independent Transport Safety & Reliability Regulator wrote to all members seeking their organisation's comments on the proposal, copies of which are also attached at Appendix C. It was also noted that a number of the issues raised in the proposal impact on matters that other agencies has responsibility for administering, that is, the Ministry of Transport, the Roads and Traffic Authority and the Motor Accidents Authority. Comments are summarised below.

##### **Summary of Member Organisation's Comments**

The Isolated Children's Parents' Association agreed with the proposal.

The Council of Catholic School Parents did not agree that there should be a Stage 1. For Stage 2, the Council did not agree with the restriction to non-metropolitan roads.



The Council did, however, suggest that the ADR requirement could initially apply in non-metropolitan areas and be limited to new and replacement buses, but only as part of a phase-in process. Standing would be prohibited on school buses that had been “targeted for the installation of seatbelts.” Therefore, although the Council appears to support most elements of Stage 1 of the B.U.S. proposal, it does not include the timing of first school term 2005. It acknowledges that timing would depend on costs.

The response of the NSW Parents Council Inc. (NSWPC) was “in general support of the elements of the B.U.S. proposal.” NSWPC suggested that relevant laws be introduced in one action; it would be the implementation, rather than the laws, that should be phased-in. It did not support extension of lap-sash seat belts to other areas, as in stage 3 of the B.U.S. proposal “in this current issue of school bus safety.” NSWPC suggested that exact timeframes for implementation are required, for example, by the end of Term 1 2005.

The bus manufacturer’s response raised a number of issues, some of which are outlined in section 5.12 above. He was not convinced that non-metropolitan areas were higher priority. He pointed out that requirements to comply with ADR 68 would affect buses registered in other States and the ACT, and preferred National legislation. This was supported by reasons why a very gradual and managed introduction would be essential.

The Bus and Coach Association’s response suggested that the time frames of the B.U.S. proposal were unrealistic, a National approach would be preferable, the costs of the proposal might be better used to achieve the most benefit, the increased numbers of buses would add to costs and have environmental impacts, it is difficult to define what routes are “rural”, there is no “statutory basis” to discriminate against operators whose vehicles do not have seat belts, bus safety user groups should be coordinated through a National body, and school buses are already used for charter work.

The Ministry of Transport’s response did not address details of the B.U.S. proposal. It pointed out that a major review of bus services in NSW had just been completed, where more than 1,800 submissions were received and an extensive program of community consultation was undertaken. Nevertheless, the issues raised in the B.U.S. proposal were not raised as key concerns. Bus industry reform is underway, with arrangements being made based on cost neutrality. The B.U.S. proposal would entail a significant change in the funding demands, and would require detailed analysis “from a whole-of-government perspective to ensure the best use of funds to reduce road trauma.”

The Motor Accidents Authority (MAA) response commented only on two points from the B.U.S. proposal. It was suggested that the timing for Stage 1 may be unrealistic. The second point was that the MAA does not gain funds from reductions in claims; these are reflected in reduced premiums.

The RTA supports the *Draft Report on the Deliberations of the NSW School Bus Safety Working Group* and requests that this support of this document also be communicated to the members of the B.U.S. Action Group.

### **Discussion**

Stages 2 and 3 of the proposal merely state some of the main issues for the Working Group, which are discussed throughout this report.

The timing proposed for Stage 1 - by school term one, 2005 - is unrealistic.

- It would be impossible to prohibit children from standing by then. There are too few buses, and a large number of children would not have transport to school. Those who use other transport would be less safe.
- A short phase-in time is not feasible, because of industry capacity and cash-flow demands (see Section 4.7).
- Legislation requiring new route buses to comply with ADR 68 could only be undertaken after a detailed study. For NSW, this would have to be a whole-of-government analysis. Moreover, as one of the RTA's representatives pointed out, requiring route buses to comply with ADR 68 would, strictly speaking, be contrary to ADR 68, and so this would require some National consultation.

The process for new and amended ADRs is a developed system, taking account of all necessary aspects in setting vehicle standards, and is therefore the way, if any, most likely to succeed.

### **5.15. *Other issues raised in submissions***

A few other matters were raised in earlier submissions received from parent and community organisations prior to School Bus Safety Working Group meetings. These were:

- child proofing of buses' emergency features (jointly by Parents Council, Isolated Children's Parents' Association, and Council of Catholic School Parents)
- providing safe pick up and drop off points should be included in bus contracts (Federation of Parents and Citizens Associations)
- a common set of management and security protocols for the "transport hub," particularly interchanges (Federation of Parents and Citizens Associations).

## 6. Discussion

The School Bus Safety Working Group focused primarily on the issue of seat belts in school buses.

This is accompanied by the issue of prohibiting standing passengers. Moreover, with seat belts, the policy of allowing small children to sit three to a seat, meant for two adults, would be impractical in many circumstances.

### 6.1. *Cost-effectiveness analysis*

If we spend x dollars to save one life when we might have spent those same x dollars to save two lives, our decision has cost one life. This is the reason we appraise proposals in cost-effectiveness terms.

The technique entails defining our objectives, for example protecting children from injury. We then consider alternative ways to achieve those objectives, estimate their costs and assess the extent to which each would contribute to achieving the objective. We do not have the resources to do everything, and there are competing needs. If we do not have sufficient resources to do everything, then those actions are chosen which will best meet objectives by using the available resources. In other words, actions are chosen based on their cost-effectiveness.

Injury prevention is part of public health. In choosing public health actions, consideration is given to:

- how much of the problem (here, injury and death of children in road accidents) is addressed by the action
- the proportion of the problem addressed that would be prevented by the action.

It is clear, from the statistics examined in this report and the other studies reviewed in this report, that a very small proportion of children killed or injured are bus passengers who might have been protected by wearing a seat belt. In all NSW road accidents (not only bus accidents) between 1993 and 2002 inclusive, there were on average:

- 15 children aged 5 to 11 killed per annum,
- 22 aged 12 to 16 killed per annum,
- 37 aged 17 or 18 killed per annum.

In all those 10 years, in school travel times, a total of one bus passenger in any of these age groups was killed who might have been protected by a seat belt.

It is true that these statistics could be changed suddenly by one accident, where – for example - 30 children were killed. Even if 30 children were killed in one accident, Australia-wide there would still not be as many killed in 10 years as are killed as bicycle riders. And the number killed as bicycle riders is much less than the number killed as car occupants or pedestrians. With the absence of such crashes, and the number of years school buses have been running, the estimated probability of such a crash is much less than one in 10 years. Therefore, any 10 years in which such a mass fatality occurred would be unlikely to be repeated in the next 10 years.

When a large bus is involved in a collision, usually it is the occupants of the other vehicle who are injured. The bus's size provides protection to the occupants, such that an unbelted large bus occupant is much less likely to be seriously injured than a restrained car occupant. Nevertheless, in a high speed head-on collision between a large bus and another vehicle about the same size or greater, many serious injuries or deaths could be expected.

In such a head-on collision, seat belts would provide some protection. According to Henderson and Paine's estimate (see section 2.3.1 above), a seat belt would reduce the risk of injury by 20% on average. Because such a crash is so unusual, it is not possible to rely on averages to estimate an aggregate effect. In a major crash, the other heavy vehicle might intrude into the bus, or be so overwhelmingly heavier that protection makes less difference. Moreover, simply because seat belts are fitted, does not mean they will provide protection. To provide protection, they have to be worn, and worn reasonably correctly. There is little evidence about likely correct wearing rates, except from the Queensland trial (see Section 2.3.2 above), which appeared to be unpromising (but the evidence from the trial may be unreliable).

The costs of fitting seatbelts in buses used to transport children to and from school are estimated to range between \$1 billion and \$2.5 billion for large buses, and between \$8.2 million and \$33.1 million for small buses (those with 25 seats or fewer). The statistics available to make these estimates were not ideal, but even if the cost estimates are simply order of magnitude estimates, it appears that the proposal to fit seat belts would be very costly relative to other road safety actions.

Generally, the costs of introducing seat belts in buses would be very high relative to other road safety initiatives, but its expected benefit is small. On this basis, other road safety actions to protect children from death and injury on the road would have higher priority. This means that resources would be allocated to other road safety measures before seat belts on buses, based on cost-effectiveness considerations.

## **6.2. Parent concerns**

By concentrating on the costs and likely effectiveness of seat belts in buses, two issues are overlooked. The first is parent concern that children are travelling in buses without seat belts, when these parents believe that fitting belts would make a major improvement to their children's safety. The second is the major public concern that would follow a crash in which many children were killed.

The parent groups represented on the School Bus Safety Working Group have raised seat belts as their most important issue. The Australian reviews of school bus safety (Chapter 2) have revealed seat belts to be a common concern. Nevertheless, the Ministry of Transport reported that the recent major review of bus services in NSW, although it took more than 1,800 submissions and engaged in extensive community consultation, did not reveal seat belt fitting as a major concern. If public concern is accepted as a reason to proceed with the proposal, there is an obvious need to conduct research to quantify the concern and specify its nature.

If a major bus crash happens, in which 30 or more children are killed, experience indicates that this will result in much greater public attention and feeling than a much greater number of children being killed individually (as happens annually).

Nothing can eliminate the risk of a major bus crash with many fatalities. Nevertheless, fitting of seat belts should reduce the probability to some extent, and at least any fatally injured children will have been travelling in the safest environment that could have been provided.

The question remains whether this is worth the diversion of resources away from other actions, which would better protect children from injury or death.

## 7. Conclusions

The main concern of the community and parent groups on the Working Group are to have seat belts fitted on buses used to convey children to and from school. This would be combined with a prohibition of children standing in buses. The practice was also criticised where small children sit three to a seat meant for two adults. In any case, although a seat has been designed where a child harness can be fitted to the centre part of a two person bench seat, fitting seat belts would appear to make it difficult to seat three children to a seat in many circumstances.

Considered on its own, implementation of the proposal would be likely to have some road safety benefit.

The proposal would, however, cost much more, but have less benefit, than other actions aimed to protect children from injury and death on the road. If funding this proposal had the effect of diverting resources away from other actions, it would have a negative effect on the safety of children.

If through increased costs or increased travel times, the proposal resulted in some children choosing to travel by another mode than bus, it would have a negative impact on safety. On the other hand, perceptions that buses have become safer might cause parents to choose the bus.

It is estimated that the proposal, if implemented State-wide in NSW, would cost between \$1 billion and \$2.5 billion for large buses, and between \$8.2 million and \$33.1 million for small buses (those with 25 seats or fewer). These costs do not include additional administration costs of the School Student Transport Scheme of having more buses to administer. Nor has anything been added for additional running costs (such as fuel and maintenance) of the additional buses.

The research studies reviewed and the accident statistics analysed indicate that crashes where a child's life could be saved by a school bus seat belt are very rare; in NSW, there has been one child killed who may have been saved in more than 10 years. Bus travel is by far the safest mode of road transport; large buses provide good protection for their occupants in nearly all crashes.

A user pays approach to this proposal in isolation appears unrealistic. The 2004 Review of Bus Services in NSW (Unsworth Report) discusses the complex issues associated with bus service funding.

The fitting of seat belts on school buses, if it is to proceed, seems most appropriately progressed as a proposed Australian Design Rule:

The reasons to proceed with seatbelts on route buses relate to public concern.

There appears to be public concern about the safety of school buses. Parent organisation representatives on the School Bus Safety Working Group have suggested that this relates to the absence of seat belts. If it were decided to progress this proposal, research would have to be conducted to quantify and identify that concern.

There is also the much greater public concern that would arise if a large number of children were killed in a bus crash. This is possible; a large bus carrying school children could have a head-on collision with another large vehicle. In such a crash, seatbelts might prevent many deaths, depending on the circumstances of the crash. Even with such a crash, bus travel would still be much safer than other modes, and deaths of bus passengers would still represent a small minority of children killed in road crashes. Nevertheless, public perceptions are important and appropriate responsiveness to such concerns is an important part of modern public sector management.

There were two major coach crashes on the NSW North Coast in 1989. Following these crashes, efforts to improve occupant protection on coaches were accelerated and resulted in Australian Design Rule 68, which applies to heavy buses manufactured on or after 1 July 1994. This Rule does not apply to route buses, the type that transports children to school.

In view of the costs and industry capacity, retrofitting seat belts is not an achievable option. If an ADR were introduced, and when a large number of buses had been fitted, then retrofitting might be considered.

Some Working Group members suggested that seat belts on route buses might be introduced in rural areas, rather than State-wide. It was argued that protection on country roads is more crucial, and that introduction on country roads would make funding of the proposal more feasible. The Roads and Traffic Authority representative expressed doubt, however, whether it would be practical to introduce such vehicle requirements in limited areas and indicated the desirability of introducing requirements through the Australian Design Rule (ADR) process.

If seat belts are to be introduced on route buses, the ADR process has advantages over other approaches:

- it allows a manageable introduction, one that the Australian bus manufacturing industry may be able to manage
- it is a National approach to transport regulation, and a National approach is favoured by the Bus Industry Confederation, and supported by the House of Representatives Standing Committee on Transport and Regional Services in its 2004 report on Road Safety in Australia
- the matter is an issue in Queensland and Victoria, as well as NSW, and a consistent approach would be of benefit to Australia
- the ADR process is well developed, and it takes account of all the complexities of vehicle regulation.

It would be necessary to design a restraint system suitable for small children. Moreover, it would appear to be advantageous to design an occupant protection system suitable for route buses. These are matters of national, and international, applicability, making the ADR approach even more relevant.

The development of any relevant regulation, including the development of an ADR, would have to include a detailed economic study of the proposal. This would have to be much larger and more detailed than the brief analysis included in this report.

It appears that fitting seat belts to route buses would be less costly for small buses than for large buses. And seat belts should have more safety benefit in small buses

than in large buses. This is a reason for giving priority to extending the applicability of the ADR that requires seat belts on small buses. Small buses are, however, manufactured overseas, and there may be other relevant considerations. This issue would be addressed in the ADR development process.

Industry and Government agency members of the Working Group expressed support for the progression of any seat belt proposal through the ADR process.

The first issue is the ability of the Ministry to provide relevant statistics to allow analysis of significant issues such as this. One of the Ministry's representatives on the Working Group explained that improved systems were in place to collect and retrieve relevant data more readily, but the systems were too new, and as yet had collected insufficient data.



## 8. Recommendations

The most appropriate actions resulting from the deliberations of the School Bus Safety Working Group would be progressed if:

- The matter of fitting seat belts in route buses were referred to the Australian Transport Council (ATC) to progress the issue nationally through the Australian Design Rule process.
  - It is recommended at the next ATC meeting that NSW gives notice of its intention for this issue to be placed on the agenda by the end of 2005.
  - It is understood that technical aspects of the process are led by the Commonwealth Department of Transport and Regional Services through the Technical Liaison Group (which has representatives from industry and from relevant State and Territory Government agencies, including the NSW Roads and Traffic Authority)
  - The Design Rule would take into account the needs of children with regard to seat belt design and the different usage of route buses compared with coaches.
  - It is understood that passengers could not be required to stand in a bus which is required to have seat belts fitted.
  - Among other things, in the development of the ADR, consideration be given to seating of 3 restrained children in a seat designed for 2 adults.
- Priority in the ADR development process might be given to smaller buses.
- Retrofitting existing school buses with seat belts is not considered to be an appropriate option.
- Where appropriate, the Ministry of Transport through operator accreditation, contractual reform, service planning and the School Student Code of Conduct, and the Roads and Traffic Authority address the other issues raised in submissions of parent and community groups:
  - safe storage of luggage
  - child proofing of escape and fire proofing
  - safe pick up and drop off points
  - standards for security, supervision in the “transport hub” particularly at interchanges

## **Appendix A: Concerns of parent and community groups**

Before the first meeting, members of the Working Group were invited to provide submissions outlining their concerns regarding school bus travel.

This Appendix contains the submissions provided, which were from parent groups and the B.U.S. (Belt Up for Safety) Action Group.



L/035

20 November 2003  
Kent Donaldson  
Executive Director  
Transport Safety and Rail Safety Regulation  
Ministry of Transport  
GPO Box 1620  
Sydney 2001

Dear Kent

Thank you for the opportunity to participate in the Bus Safety Working Group. I look forward to working with other stakeholders and the Minister in ensuring greater safety in transport for public school students in NSW. The following is a summary of key issue of concerns relating to matters to be considered by the Working Group.

Student safety on transport is a complex issue and involves the commitment of many stakeholders. Our comments are restricted to specific issues relating to bus safety.

We note that over the years the incidence of death and serious injury to younger students caused by traffic accidents appears to largely be related to drop off and pick up points. Safe sites for drop off and pick up are a key issue in maintaining student safety, and should be specifically included in the bus contracts.

Buses throughout the state should be required by law to provide seatbelts. The compulsory use of these seatbelts should operate in the same way as it does for private vehicles and coaches. Children standing on buses, particularly in rural areas where they are travelling at high speed is also of concern. This issue should be addressed in the contractual arrangements with the bus companies.

Student safety in transport hub, particularly bus interchanges is an issue that has been raised by parents across the State. The systemic problem tends to be a lack of continuity and common framework across the State due to differences between contracts and contract areas. A lack of state wide regulation means that standards for security, supervision and service provision vary greatly.

Often transport hubs such as bus interchanges are very busy places particularly at the peak times of before and after school. In places where large numbers of students gather to access transport, a common set of management and security protocols needs to be established. The situation is further complicated by the fact that transport services, public and private often outsource security arrangements and each of these contracts also has its own set of requirements and compliance issues.

Partnerships need to be formed between government agencies (in this case, Department of Education and Training, Transport, Police, Local Government, and public and private transport providers), public and private schools and the community in order to ensure that the security needs of students at transport hubs are met. The Department of Education and Training through its Safety and Security Unit has already done some important work on these issues but a co-ordinated response across the State is required.

Lastly, P&C Federation suggests that the Working Group have access to relevant data on student safety to assist them in their work, for example data from the NSW Injury Risk management Research Centre based at the University of NSW.

Yours sincerely

Sharryn Brownlee  
PRESIDENT



21<sup>st</sup> November 2003

## **Submission to School Bus Safety Working Group**

### **Purpose of submission**

This submission is lodged at the invitation of the Ministry of Transport letter of 29<sup>th</sup> October 2003 to organizations represented on the recently established School Bus Safety Working Group. The focus of the submission is on the safety matters relating to the bus transport utilised by children to and from school and on other school related activities, with priority to country areas, and as stated in the MOT letter, in particular seat belts.

### **Joint submission**

This is a joint submission from the peak school parent organisations of NSW Parents Council, Isolated Children's Parents' Association and Council of Catholic School Parents. These organizations have taken the action to lodge a joint submission to represent the views of school parents because the organisations have reached an agreed position on the concerns and potential solutions to improve the level of school bus safety in NSW. These organisations, along with Federation of Parents & Citizens Associations, are also members of the NSW Combined School Parents Forum.

The Federation of P&C has chosen to lodge a separate submission to the Working Group.

### **Establishment of School Bus Safety Working Group**

For many years school parents across NSW have been deeply concerned about the level of school bus safety for their children. Their concerns have been submitted to their peak school parent organization for investigation and action. Over more recent years individual school parents, local school parent groups and the peak school parent organizations have sought improvements by taking separate actions.

In late 2002 the NSW Combined School Parents Forum was formed to address the safety issues of mutual concern to parents of children attending government and non-government schools. In the NSW Election period the Forum secured the commitment of the Government to establish a working party of stakeholders to develop a plan of action to improve school bus safety, with priority to country areas.

On 11<sup>th</sup> June 2003 Transport Services Minister Michael Costa at a meeting with school parent group representatives agreed to set the Working Group, to consult on a Terms of Reference and to develop the plan by the end of 2003 to improve safety measures on school buses, with priority to country areas.

From June to the time of receipt of the MOT letter of 29 October 2003 the Forum and individual school parent groups pressed the Minister's office and the MOT to action on the Terms of Reference and the proposed meeting schedule of the Working Group.

The three peak school parent organisations welcome the Government's action to finally establish the Working Group and to commence its important task. There is disappointment, however, that much

time has been lost, that the Minister's accepted timeframe has elapsed and that communications from MOT have not been timely. It is desirable that future co-ordinations be effective and efficient.

### **Membership of the Working Group**

The three peak school parent organisations welcome the broad representation of the key stakeholders in the Working Group that was sought by the action of the NSW Combined School Parents Forum.

It is desirable that each organization is represented by a single representative who is authorised to contribute to the collective work of the Group to develop a proposed plan of action that would be formally circulated to each organization for comment.

The three peak school parent organizations request that the above procedural matter to be placed on the agenda for the inaugural meeting of the Working Group.

### **Terms of Reference**

The NSW Combined School Parents Forum had expected an opportunity to comment on the proposed Terms of Reference (TOR) before the work of the Working Group is undertaken. The TOR were advised in the MOT letter of 29<sup>th</sup> October.

The three peak school parent organizations are of the common view that the TOR are expressed in a shortened yet broad and non-specific nature. It would be helpful for the mutual understanding of all the members of the Working Group for the TOR to be more defining in nature. The three peak school parent organizations have interpreted the TOR in the context of the MOT letter of 29<sup>th</sup> October regarding school bus safety matters, in particular seat belts. Other issues relating to school student travel and the School Student Transport Scheme are acknowledged as not being the focus of the Working Group and are the subjects of the present Ministerial Inquiries being conducted by Dr Tom Parry and the Hon Barrie Unsworth.

Initiatives and safety programs focussing on safety surrounding school buses are applauded but are also not acknowledged as being the focus of the Working Group.

It is requested that the finalisation of the Terms of Reference be placed on the agenda of the inaugural meeting of the Working Group.

### **School Parent Approach**

The three peak school parent organisations regard the Working Group as an important reform activity with the potential to very significantly improve the level of school bus safety in NSW. This submission is a response provided in light of the TOR as interrupted above. The three peak school parent organizations are committed to working cooperatively with the Working Group to develop a plan of action for school bus safety.

### **Concerns**

There is an urgent need to provide all children travelling in buses on "open road" conditions with improved bus safety. For those buses operating in road speed conditions, in excess of the standard 60kph, the speed of other road users in the vicinity of travelling and frequently stopping school buses are serious threats to the safety of the child passengers. The road dangers are increased in time of harvest with the volume of heavy vehicles on country roads and due to the closure of rail line services.

The three peak school parent organizations submit the following six concerns of school parents for the investigation and action by the Working Group:

#### **Concern 1. Seat belts in "open road" conditions.**

Parents seek the highest priority on the fitting and use of seat belts, with a negotiated timeframe of 5-7 years for phased implementation.

#### **Concern 2. No standing in aisles**

Parents seek no child to be standing when the bus is in motion.

**Concern 3. Scrap the “3 to a seat’ rule**

Parents seek variations in seat design such as the “McConnell’ seat and the classification of seating capacity by child weight limits.

**Concern 4. Safe storage of luggage**

Parents seek options for internal storage in overhead racks and under the seat in front like in aircrafts, and also external compartments.

**Concern 5. Safe seat design**

Parents seek improved head protection and cushioning of hard exposed surfaces.

**Concern 6. Design of emergency features**

Parents seek the “child-proofing” of escape and fire equipment features.

**Informed by Research**

The three peak school parent organizations seek that the evaluation of potential solutions be informed by research on the issues. The Working Group could be effectively served by the research sources from the MOT, from member organizations of the Group and from other external agencies.

The three peak school parent organizations request that the matter of being informed by research be placed on the agenda of the inaugural meeting of the Working group.

**Potential Solutions**

The three peak school parent organizations are of the common view that a significant part of any revenue raised by co-payments in the SSTS as proposed by the interim reports of the Parry and Unsworth inquiries be directed to assist with the improvement of school bus safety. This funding would be in addition to other budget specific allocations for the implementation of safety measures.

The three peak school parent organizations request that the inaugural meeting of the Working Group makes a recommendation that Transport Services Minister Costa raises the issue of improving school bus safety at the national level through the Australian Transport Council at the earliest opportunity as a matter of priority.

**The way ahead**

The three peak school parent organizations that have lodged this submission have welcomed the opportunity to put in writing the concerns of school parents from across NSW on school bus safety. We are committed to work cooperatively with the Working Group and the Government to achieve feasible outcomes for all stakeholders, including those of those most precious, the children now and in the future.



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## NSW MINISTER FOR TRANSPORT SERVICES SUBMISSION

### School Bus Safety Working Group

November 2003

By: **B.U.S. (Belt Up for Safety) Action Group**

#### Introduction

In August 2000 Professor P. N. Joubert (see footnote) made the following comments on the likely outcome of a hypothetical front end collision between an overcrowded school bus and a truck on a rural road:

*“The bus you describe loaded with 103 children and 40 standees together with school bags, no seatbelts, low backed seats with no energy absorption in an impact with another vehicle of equal or greater mass would, in my opinion, give rise to an accident greater than the Grafton disaster. In a roll-over that might occur there is great potential for an equally disastrous event. I would forecast a 40-50% death rate and over 90% injury rate for the remaining children.”*

Following the Kempsey and Grafton coach disasters in 1989, which resulted in 55 deaths and 54 injured passengers, the Federal Government introduced ADR 68/00 – Occupant Protection in Buses, which applies to all non exempt heavy buses manufactured after 1st July 1994. ADR 68/00 specifies substantial design changes to improve passenger safety, including stronger bus structure, improved seat design and attachment, and the provision of lap/sash seat belts for all passengers.

Unfortunately thousands of rural school children are still travelling to school daily on rural roads in high speed limits, in buses which do not comply with ADR 68/00. Documents on the Kempsey and Grafton coach accidents outline the risks still faced by rural children on their school bus today.

There is both a moral and legal responsibility, to provide our children with the same level of protection provided to coach passengers, when travelling in the same situation, to introduce ADR 68/00.

Footnote: Formerly the Professor of Mechanical Engineering at the University of Melbourne who reviewed truck and bus safety in February 1974 on behalf of the Federal Department of Transport, and submitted the above to the Queensland BUS Action Committee as part of their submission to the Queensland School Transport Safety Task Force in 2001.

#### Concerns

- 1 School bus passengers standing in the aisle have a very high risk of death or serious injury, even in very minor collisions.
2. Rural school bus passengers travelling without the protection of a lap/sash seat belt have an unacceptably high risk of death or serious injury, particularly in speed limits of 80 kph or higher. Their risk is equal to that of a coach passenger prior to the introduction of ADR 68/00.
3. Buses that do not comply with ADR 68/00 are being used on school excursions, yet they travel on the same dangerous rural roads and highways as coaches. This

places all students at a much greater risk of death or serious injury should an accident occur.

4. Primary aged children presently sit three to a seat, in a seat designed for two, because Government policy only offers payment for two of every three primary aged children, as part of the School Student Transport Scheme. This practice may be dangerous, because depending on the size of the students there may be insufficient space to seat them adequately.

### Recommendations and Potential Solutions

1. Immediate elimination of standing in all school buses that travel on roads with speed limits of 80 kph or higher.
2. Phased introduction, over a short period of time, of school buses which comply with ADR 68/00 on all bus routes on roads with speed limits of 80 kph or higher.
3. Immediate introduction of a policy requiring the use of buses which comply with ADR 68/00 for all school excursions, requiring travel on roads with speed limits of 80 kph or higher.
4. If the McConnell Seats 'Educator 2-3' seats were installed in all new buses at the point of manufacture, the present '3 for 2 rule' policy could be retained, providing that a weight restriction in addition to the current age restriction were applied.  
(see [www.mcconnellseats.com.au](http://www.mcconnellseats.com.au))

### Discussion

The risks to children travelling on rural roads on buses designed for low speed metropolitan routes are well documented. The following extract from the article by J. D. Irwin and I. J. Faulks in 'Roadwise 2000 Vol 12 No. 2' is a good example:-

*"It is a chilling and horrible thought that on Australian roads today there are buses operating in the carriage of dozens of passengers even with more than 100 passengers who are unrestrained. That many of those buses are school buses, filled with children under '3-for-2' seating rules without seatbelts, and with a proportion standing in the aisles and not even able to benefit from the limited safety of a seated position, is from any objective perspective a national disgrace. In the event of a major crash involving a packed school bus, there will be public opprobrium and outrage and a lasting ignominy to the bus operators and safety regulators of the bus industry who have known for the last 25 years of the risks to the safety of bus passengers and the simple remedies that ever have been available."*

We have many other independent and Government reports, along with State and Federal Hansard documents agreeing with our concerns and addressing the urgent need for seat belts on school buses, yet no action has eventuated.

The standard defence of State Government transport departments when requested to implement improved safety features on buses, is to quote statistics which they say indicate that school buses have an excellent safety record compared to other forms of transport. But, what is a school bus and where do most school bus journeys take place? The vast majority of school buses operate in low speed metropolitan areas where the risk of death or serious injury in an accident is relatively low. In rural areas however, many students travel



long distances on poor or high speed roads, in buses designed for low speed urban travel. Statistics for rural travel should be separated and reviewed independently.

A single accident on a rural road equivalent to either the Kempsey or Grafton coach accidents would dramatically change present statistics. Why wait for this to occur, before introducing the known safety protection of ADR 68/00?

The reason that State Governments have avoided the implementation of safety measures, like the elimination of standees and introduction of seat belts, is the cost. While the introduction of these safety measures to all buses would be considerable, the cost of introduction on buses operating on roads with speed limits of 80 kph or higher would be a fraction of that total. The Government cannot afford not to proceed.

Patricia White  
Janice Shalhoub  
Glenda Staniford

## **Appendix B: Comments on the draft report of 21 July 2004**

At the fifth meeting of the SBSWG, on 21 July 2004, a draft report was discussed and members were asked to provide comment by way of written submissions. These submissions are included in this Appendix.



Bus and Coach Industrial Association (N.S.W.)

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18 August 2004

Mr. Kent Donaldson  
Executive Director  
Transport Safety Regulator  
ITSRR  
PO Box A2633  
SYDNEY SOUTH NSW 1235

Dear Mr. Donaldson,

***Re: Draft Report of the School Bus Safety Working Group***

The BCA offer the following comments in response to the draft report of the School Bus Safety Working Group.

Overall we believe that the Draft Report is a very comprehensive document that brings together a wide variety of research about school bus safety. We thank ITSRR for overseeing this project and commend ITSRR for producing a well-balanced draft report. We would just like to re-iterate and clarify the following points.

Urban fringe buses operating in different speed zones

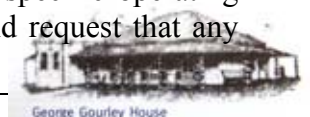
From discussion in various working group meetings, some members suggested that there should be a phased introduction of seat belts operating in areas where there were speed zones of 80kms per hour or higher, and more specifically in country areas, because country areas are perceived to be more hazardous.

It is extremely difficult to define what roads are actually deemed to be “rural” and there are many regions where services operate (for example in urban fringe areas of Sydney, Newcastle, Central Coast and Wollongong) and where services travel long distances covering a variety of speed limits. These services would be captured by the proposal to introduce seat belts where there were speed zones over 80kms per hour.

There are also a large number of speed zones in the metropolitan area (such as the M2, M4, M5 and Victoria Road) where it is possible to drive at or over 80kms per hour, and school services operate on these roads. Therefore, this proposal would effectively apply to all buses. Trying to allocate only seat belted buses to services that encounter 80kms (or above) speed zones is not practical, and would result in the whole fleet needing to be seat belted because of the varied uses buses must meet.

National approach to reform

The Australian Bus Manufacturing Industry builds buses mainly on imported chassis for all states (not just NSW) and supports a national approach to minimum design and safety standards. (This is what ADRs are intended for). As buses aren't manufactured solely for use in a specific operating area, and buses are built to National design and construction standards, we would request that any



change made to vehicle standards be made at a National level. It is evident from the issues raised in the Working Group's meetings, that any decision in relation to seat belts would be better addressed through a national approach. If considered feasible, possibly through the ADR process.

To ensure that a full and proper consultative approach is taken at a National level, Bus Safety User Groups should also be coordinated and consulted through a national body.

#### Loss in carrying capacity due to no standees

There would be a significant increase in the number of buses required to undertake the same transport task, due to no standees on buses and no 3 for 2 rule etc.

As noted in the draft report, if seat belts were fitted only on new buses while they were being manufactured, the replacement rate per year for large buses is estimated to be one in thirty. Each bus acquired has been estimated to cost \$30,000 more, for the seatbelts and appropriate seats and fittings. This averages \$1,000 dollars per bus in the fleet per year.

If the loss of carrying capacity is 25% (due to no standees and no 3 for 2 rule etc), there is a need for 33% more buses, when they are replaced, with each bus costing an average of \$360,000. The total cost per bus in the fleet per year would be \$5,000. This cost would be \$34 million per year across the NSW industry. If the loss of carrying capacity is greater, i.e 48%, there is a need for 92% more buses, when they are replaced. The total cost per bus in the fleet per year would then be \$12,000. This cost would be \$82 million per year across the NSW industry. However it should be noted that this in addition to small buses, which would be a further cost of \$2.8 million per year to account for a 20% loss in carrying capacity for small buses.

These costs do not include a provision for the additional running costs such as fuel and maintenance etc. which would be required for the additional number of buses due to the loss in carrying capacity.

Furthermore there would be other externality costs, such as added costs and environmental impacts. This would not only impact just on school transport but would extend to all bus transport. This is because there are environmental benefits if buses replace cars, however, not if you need more fuel/emissions from more buses to carry the same number of passengers.

The Government needs to assess these costs and decide on where priorities lie.

#### Leaving kids at bus stops

We remain concerned about the possibility of students being left stranded at bus stops if no standees were to be taken on buses travelling on roads with speed zones of 80 km or more per hour and there was not a dramatic increase in the number of buses available. In remote areas there mightn't be alternative services available for students to travel on, and in metropolitan and urban fringe areas, parents might find it unsuitable for their children to spend large amounts of time waiting at a terminus for the next available bus with enough capacity to arrive. Would it be seen to be preferable if a student was a standee passenger on a bus as opposed to waiting, perhaps alone, at a terminus?

#### Student Behaviour

The damage caused to seat belts in buses and coaches (where operators have chosen to fit them at their own expense) cannot be underestimated. Operators report frequent instances of student tying seat belts in knots, refusing to wear them, slashing them with knives and damaging them with chewing gum. This is despite a Code of Conduct for student behaviour being in place. Any phased introduction of seat belts in buses would need to be accompanied by an extensive education campaign to address this behavioural issue (and added expense). This should be taken into consideration when undertaking a cost-effectiveness analysis.

Current SSTS funding arrangements

It is a fact that the current funding arrangements for SSTS don't provide for seat belts to be fitted to buses, and where they are currently fitted, operators have paid for these at their own expense. If the funding model and government contract accounted for this expense, seat belts would be fitted. It is misleading to suggest that operators currently receive "over-payments" that allows for this expense. Where cross-subsidisation occurs in the bus industry is done so on the basis that some services are required to assist the transport disadvantaged and route services in certain areas, where commercial services aren't a viable option.

The best value for the road safety dollar – the importance of education

By implication, spending large amounts of money to reduce bus-related fatalities and serious injuries needs very careful thought – it is hard to produce beneficial results, relative to the cost involved, when the numbers of fatalities and serious injuries are small. Safety around bus stops consistently emerges as the area for most attention. Other jurisdictions have the responsibility to identify road black spots and take a comprehensive approach to passenger/vehicle safety. Seat belts are just one element in a much bigger picture.

Some proposals by members of the School Bus Safety Working Group involve significant costs and it may be better to allocate such funds, if they were available, to where they would achieve the most benefit. From the material produced it would appear concerted action on safety around bus stops would deliver a higher community benefit. Improved educational programs targeted at infants and primary school students could also assist improve safety. A quality partnership established by members of the School Bus Safety Working Group could assist in this process.

Conclusion - The Industry's General Position

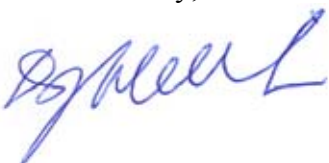
The bus industry supports the use of seat belts in school buses but believes that, in the real world, there are better ways to improve the safety of travel by school children. Research provided to members of the School Bus Safety Working Group reinforces that the behaviour of children, carers and other road users around bus stops is the key to a major improvement in safe travel to school.

The bus industry is a service industry and responds to the demands of its customers. If customers demand seat belted vehicles and are willing to meet the costs through the Government contracts, the industry will meet the contracted requirements as long as they are sustainable.

As buses aren't manufactured solely for use in a specific operating area, and buses are built to National design and construction standards, we would request that any change made to vehicle standards be made at a National level. It is evident from the issues raised in the Working Group's meetings, that any decision in relation to seat belts would be better addressed through a national approach. If considered feasible, possibly through the ADR process.

We thank you for the opportunity to participate in the School Bus Safety Working Group.

Yours sincerely,



**Darryl Mellish**  
**Executive Director.**

DJM.737 / AO468

Custom Coaches  
Final submission  
to  
NSW School Bus Safety  
Working Group  
22 July 2004

Mr Kent Donaldson  
Executive Director  
Transport Safety Regulation  
ITSRR  
PO Box A2633  
SYDNEY SOUTH NSW 1235

Dear Mr Donaldson,

Thank you for providing an opportunity for Custom Coaches to participate on the School Bus Safety Working Group. The following comments are provided in relation to the Draft Report on the Deliberations of the NSW School Bus Safety Working Group.

**Our Position**

Custom Coaches supports the Draft Report on the Deliberations of the NSW School Bus Safety Working Group and agrees that the draft report accurately reflects issues and options discussed at the Working Group's meetings.

From Working Group meetings, it is evident that retro-fitting the existing bus fleet with seat belts has not been an option favored by members of the Working Group. Therefore, should the Government decide to introduce a proposal to implement seat belts in school buses that this decision may effect bus construction and or the number of buses required. In which case the Australian bus manufacturing industry would be seeking a gradual and nationally consistent introduction of any such changes to school buses that allows:

1. Manufacturers a reasonable lead-time;.
2. A nationally phased introduction (not across the board at the one time);
3. A gradual replacement of older buses when they become due for replacement, with a new seat belted bus.
4. A uniform Australian wide approach to bus regulation, which would require such a proposal to become an Australian Design Rule, ("School Bus Specification") and would have to be implemented by DoTaRS.

**Suggested Implementation**

Any proposal to introduce seat belts in school buses would result in a need for new buses both as replacement for ageing fleets and for an expanded fleet. The push to eliminate standing passengers and the further push for seat belted seats will reduce passenger numbers per bus. Seat belted seats are larger then conventional route bus seats as well as being heavier.

The Australian bus building industry builds bus and coach bodies for the +35 passenger market. The small end of the market is services by Japan and Korea. The Australian bus industry builds bus bodies on mainly imported chassis and to national standards, the ADRs.

The Australian bus building industry must have certainty in terms of nationally consistent regulations. Therefore if a "School Bus Specification" was introduced, it must be through an ADR, it must be introduced Australian wide. The bus operators who operate across State and Territory borders must like the Bus Builder have one set of regulations.

NSW has the largest and busiest interface with other States and Territories. No other State faces the same situation as NSW. The North Coast meets Queensland where buses from as far away as 50 Km cross the border in both directions. The Murray River, a very long and populated border. The ACT and the surrounding NSW with its fast growing population.

John Boon.

A handwritten signature in blue ink that reads "John Boon". The signature is written in a cursive style with a large, looped initial 'J'.

---

## Submission to the School Bus Safety Working Group

### *Response to the draft report.*

Thank you for the opportunity for the Federation of Parents and Citizens' Associations to comment on the seat belts on school buses issue.

### **School Student Transport Subsidy Scheme**

The Federation notes with concern that economics regarding the School Student Transport Subsidy Scheme (STSS) seem to have an over-riding influence upon the discussions of the working party. Current school transport provisions are the result of legislation entitled the Passenger Transport Act enacted by the Greiner Government in 1990. Under this legislation the conditions under which school students are transported to and from school are defined in the "Non-commercial Contract" entered into between the Department of Transport and the bus company, which operates the service. The viability of bus operators should not be the principal concern of the working party but aware of the need to be cognisant of the realities. The means to enforce requirements for the introduction of seat belts on the contractors for the School Student Transport Subsidy Scheme could be introduced by renegotiating the contracts to comply with ADR68/00. Claims that the reduction in carrying capacity of buses resulting from the abolition of the 3 to a seat rule and the elimination of student standing will adversely affect the economics of bus companies have implications for the School Student Transport contracts.

However, the Federation asserts that the Government's responsibility to provide free transport for all government school students to their nearest, accessible and appropriate government school is central to our policy. "The safety of children going to and from school is of paramount importance and shall be afforded the highest priority in any town or transport planning." PREMISE 11F)

### **The three-for-two rule**

It is clear that current contract provisions, which allow for school students of 12 years or younger should be deleted to reduce the chronic overcrowding which is a common feature of school student travel. Students are entitled to be secured by a seat belt when on a bus.

Further, the Department of Transport should actively monitor contractors' compliance with licence provisions that determine maximum bus capacity. We also urge that specific issues such as the capacity of buses used, the journey length, the road conditions and speeds as well as the body sizes of students', their bags and equipment they are required to carry should all given particular attention during contract negotiations.

Payment schedules should not differentiate between large and smaller people who should be equally entitled to seat on a non-route bus.

### **No student should be standing on buses travelling at speeds greater than 80kms in rural areas.**

Students are people who are subject to the same laws of physics as every other traveller.

As an interim measure, the students not standing in vehicles travelling at 80kms on rural roads should be introduced as part of a phasing in State-wide policy whereby no student stands on non-route buses. Inevitably, it is the smaller and lighter children who are relegated to the aisle where they are least able to resist the forces of motion at work.

The data supplied in the Report deals only with major injury or death, rather than those small but significant injuries that occur with sudden stops like damaged teeth or broken limbs. These types of injuries do not appear on any database, but are important to the damaged children and their parents. Having said this however, the



Federation has no capacity to evaluate whether the data is accurate and make recommendations taking the figures at face value.

Parents need to have confidence that they are choosing the best and safest mode of travel for their children. Federation is pleased that children have embraced the concept on no' belt – no brains' delivered by the RTA, and want to continue to support this. Buses travelling at high speed with some children standing and others without seatbelts do not inspire confidence in the safety of the passengers.

### **Seat Belts**

All new and replacement buses that travel in 80kph and over speed zones, should with ADR 68/000 in order to be eligible for payment under the School Student Transport Subsidy scheme. School buses should no longer be exempted from compliance with ADR 68/00.

The Federation would agree to a phasing in process for compliance with ADR 68/00, which could be enacted through modifications to the STSS. This would allow for the contractors for new or replacement buses purchased to meet average fleet age requirements time to comply, as well as providing manufacturers the time to build buses to the existing ADR for coaches. The Federation notes that retrofitting of seat belts in older buses is not efficient and would not be economically feasible.

### **Conclusion**

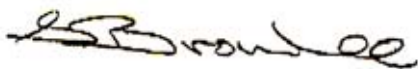
The Federation of P&C Associations of NSW asserts that:

- The abolition of the 3 to a seat rule for primary school students is absolutely essential.
- No student should be standing on buses travelling at speeds greater than 80 kms in rural areas.
- All new and replacement buses that travel in 80 kph and over speed zones, should comply with Australian Design Rule (ADR) 68/00 in order to be eligible for payment under the School Student Transport Subsidy scheme. School buses should no longer be exempted from compliance with ADR 68/00.
- The Federation notes that retrofitting of seat belts in older buses is not efficient and would not be economically feasible.

The modification of the non-route bus contracts for the School Student Transport Subsidy Scheme is essential to bring about compliance with any regulatory changes for school buses. This STSS has the ability to monitor compliance through the regular RTA checks on the buses of fleets. Individual variations per route currently exist, and phased in changes for would be easily manageable through the STSS/RTA process.

The Federation of Parents and Citizens' Associations of NSW look forward to participating in further discussions regarding the implementation of these recommendations.

Yours sincerely,



Sharryn Brownlee  
President



**DETAILED RESPONSE  
BY THE INDEPENDENT TRANSPORT SAFETY & RELIABILITY REGULATOR  
& DR DAVID SAFFRON  
TO JOINT PARENT GROUPS' COMMENTS ON THE 'DRAFT SBSWG REPORT'  
27 August 2004**

**Summary of major issues**

- Misconception by the three parent groups and community group (NSW Parents Council, Council of Catholic School Parents, Isolated Children's Parents' Association and the B.U.S Action Group) that the 'Draft School Bus Safety Working Group Report' is opposed to seat belts in school buses.
- Misrepresentation by the three parent groups and community group of the intent of the Working Group and its deliberations. From the meeting held on 24 August 2004 with the parent groups and ITSRR, it is apparent that it is the parent groups' perception that they have been given responsibility to "plan the implementation of seat belts in school buses".
- The joint parent groups' response contains many statements with regard to the 'Draft SBSWG Report' that are not factually correct.
- These views are not shared or supported in the submission received from the Federation of Parents and Citizens' Association or any other organisation represented on the Working Group.
- Overall, the 'Draft SBSWG Report' has been very well received.
- The majority of submissions received from industry and Government agencies (with the exception of 4 of the 5 parent and community groups), support the 'Draft Report' and the deliberations of the Working Group.
- Many of these submissions indicate support for a longer term, national solution to this issue which may be progressed through the Australian Design Rule process.

**Dr Saffron's general comment**

- The comments appear to be based on the perception that the Draft SBSWG Report is opposed to seat belts on school buses.
- The report does draw attention to the likely costs and uncertain safety benefits relative to other road safety measures to improve the safety of children.
- Nevertheless, the report acknowledges the concerns of parents, acknowledges that seat belts would provide some protection in a major crash, if one should happen, and suggests a national approach to the issue of seat belts in school buses through the Australian Design Rule process.

**Specific issues raised by the joint parent groups' are detailed below:**

***Issue: The parent organizations lodge this strong dissenting response to the Draft Report that seeks major amendments before the Final Report is presented to the Minister of Transport Services.***

**ITSRR's Comment:**

- Other than the 4 of the 5 parent and community groups, no other Working Group members have objected to the 'Draft SBSWG Report' and any of the Working Group's deliberations.
- It is difficult to make amendments to the 'Draft Report' as requested by the four parent groups when their joint response does not identify the nature and extent of these amendments. Hence, the purpose of a 'Draft SBSWG Report'.
- ITSRR met with the parent groups (NSWPC, CCSP, ICPA & B.U.S Action Group), on 24 August 2004 to discuss their concerns contained in the joint response.
- Since the Working Group's inception, despite comprehensive explanation of the purpose of the Working Group and the structure for its deliberations, it is apparent that the joint parent groups' perception is that they have been given responsibility to "plan the implementation of seat belts in school buses". Therefore, they appear to be dismissive to any policy analysis and the review of this issue in a broader context.
- In order to progress the finalisation of the Draft SBSWG Report, Mr Donaldson advised the joint parent groups (on 24 August 2004) that an additional Working Group meeting would be held to discuss in detail the proposed recommendations. Parent and community groups were also requested to provide details of information that was allegedly omitted.

**Issue:** *The parent organizations aim to work to the key objective of The National School Bus Safety Action Plan (Austroads 2001) being to "reduce the total annual number of child fatalities associated with school bus travel to zero by the year 2005." (Page iii, technical report, 2001). The parent organizations are concerned about how this can possibly be achieved while ignoring that children are still unbelted and standing in school buses on NSW country roads.*

**Dr Saffron's Comment:**

- The National School Bus Safety Action Plan was developed as part of the Australian Transport Council-Austroads work, which is discussed on pages 10 to 17 of the Draft Report.
- The Action Plan included many actions to secure the safety of children travelling by bus. In Austroads's review of the Action Plan, low priority was allocated to occupant protection measures, such as seat belts (see pages 13 to 15 of the Draft Report).
- The Australian Transport Council agreed that the highest priority in relation to school bus safety should be given to measures that address children being struck by cars after leaving the bus or before boarding (see page 15 of the draft report).
- The Australian Transport Council did request further study of internal bus safety measures (such as seat belts). The Austroads study of internal bus safety measures is described on pages 15 to 17 of the draft SBSWG report. According to that Austroads report, the benefits would be uncertain and the costs would be great.
- Evidently, the framers of the National School Bus Safety Action Plan considered that they could meet their targets without fitting seat belts on school buses.
- If seat belts on school buses were to be pursued through the Australian Design Rule process, it would be considered nationally again.

**Issue:** *Each parent organisation strongly disagrees with the approach taken in the Draft Report and does not endorse the document or agree to its distribution outside of the SBSWG. The parent organisations totally reject the Draft Report, as it does not reflect the deliberations of the SBSWG.*

**ITSRR's Comment:**

- From the outset, all Working Group meetings have been conducted in a professional and transparent manner.
- Other than the 4 of the 5 parent and community groups, no other Working Group members have objected to the 'Draft Report' and any of the Working Group's deliberations. This is the first time that any objections have been raised.
- The Draft Report represents a balanced view of issues discussed, examined and presented at Working Group meetings including member contributions and is a summary of those deliberations.
- All Working Group members have been afforded the opportunity to freely and equally express their opinions, present and distribute information, participate in the Group's meetings and request issues to be further examined and any other required information.
- Comprehensive Minutes, Agendas, presentations, research and other information have always been disseminated to all members, at all times. This information at no time has been filtered or withheld by ITSRR or Dr Saffron.
- At the 3<sup>rd</sup> meeting, members were provided with a draft outline of the content of the draft report. Presentations on all issues contained in the draft report have been previously discussed in detail at each of the Working Group meetings and members provided with copies of those presentations.
- Members were invited to make a formal submission on behalf of their organisation with regard to their concerns prior to the first Working Group Meeting. It was agreed that these submissions, members' responses to the B.U.S. Action Group's proposal and members' comments on the draft report would be appended to the final report.
- The B.U.S. Action Group's proposal was considered and examined in detail as part of the Working Group's deliberations (tabled as an agenda item at Meetings 3, 4 & 5, discussed in detail in the Minutes of Meeting No.'s 3, 4 & 5. ITSRR (Chair) also wrote to all members seeking their comments and organisation's position on the proposal). Furthermore, the B.U.S Action Group's proposal is discussed in detail in the Draft SBSWG Report. The B.U.S Action Group member presented her group's proposal and other information at several of the meetings.
- The Draft SBSWG Report was provided to all members at the meeting on 21 July 2004 and Dr Saffron discussed in detail the contents and conclusions contained in the draft report at this meeting. Members were given 4 weeks to review the Draft Report and requested to provide their comments by 18 August 2004. It was agreed that these comments would be appended to the final report.

**Issue: Intentions of Minister Costa.**

*The parent organisations met with Minister Costa on 11<sup>th</sup> June 2003 and outlined their concerns. The parent organisations stated they were happy to phase in seat belts and that the priority was rural areas first. The Minister expressed his approval and agreed to a “task force”.*

*The parent organisations believed that, in their initial consultations with Minister Costa, the Minister’s intentions were honourable and informed by a belief that there was a legitimate need to establish a working party to examine school bus safety and not just pay “lip service” to the issue. The parent organisations have been somewhat alarmed that no interim reports have been given to the Minister throughout the life of the working party.*

**ITSRR’s Comment:**

- As communicated in the Minister’s first correspondence in July 2003, parent organisations were invited to participate on the School Bus Safety Working Group and to nominate a single representative. It was also stated in this correspondence that the Terms of Reference would be provided to members after all nominations had been received.
- The Terms of Reference were provided to members in October 2003 after they had been approved by the Director General, MOT, in consultation with the former Transport Safety Regulator. Members were also advised that the Terms of Reference provide the basis and structure for the Working Group’s deliberations.
- It was also agreed that the Working Group should be extended to include representatives from industry, manufacturers and other relevant agencies.

**Issue: Finally, and arguably, most importantly, the second aim of the TOR (as determined by MOT) - to examine potential and practical solutions - was not achieved in the process of this Working Group.**

**ITSRR’s Comment:**

- All of the issues raised by parent groups and other members have been discussed and examined in detail and the Terms of Reference achieved.
- This process has involved examination of options and estimated costs associated with retro-fitting and fitting seat belts to new school buses in large and small buses in NSW, metropolitan and rural areas (80kph & 100kph and above), the age profile of buses in NSW, bus replacement rates, the ADR process, literature reviews, analysis of national injury & fatality statistics and potential phasing periods have been explored in detail and are contained in the Draft SBSWG Report.

**Issue: SBSWG membership.**

*The lack of continuity of chairpersons and members in attendance resulted in a lack of consistent deliberation, fragmentation of discussion and a lack of mutual understanding of the issues and direction of the Group.*

**ITSRR’s Comment:**

- Of the five meetings held, Mr Donaldson was unable to attend Meetings No. 2 & 3 due to his urgent attendance at the Special Commission of Inquiry into the Waterfall Accident. In his absence, these two meetings were chaired by senior officers of ITSRR.

**Issue:** *Working group members did not agree to Dr Saffron's appointment, had no say in his terms of reference and have never seen his brief or contract. A copy of his brief was requested but was refused. The perception is that Dr Saffron is not the Group's consultant, but solely that of ITSRR.*

**ITSRR's Comment:**

- Issue has been previously commented on and is not representative of the opinions of the majority of Working Group members.
- Dr Saffron was engaged by ITSRR to provide expert advice to assist the Working Group in addressing the Terms of Reference and its deliberations.
- Dr Saffron's role included the facilitation of Working Group Meetings (commencing Meeting No. 2), provide expert advice on research, a comparative analysis of cross modal and interstate school student injury and fatality data, determine option and costs associated with the installation of seat belts in NSW and rural school buses, and the preparation of the report to the Minister for Transport Services (containing the Working Group's deliberations).
- Dr Saffron's Terms of Reference for his engagement were provided to members on 2 April 2004. At no time has any relevant information been refused, filtered or suppressed from any member.
- Dr Saffron is a well regarded specialist in safety research, evaluation and strategy development and has over 17 years of experience in senior managerial roles and as a consultant for his own company, (Dr David Saffron Pty Ltd). Dr Saffron has formal qualifications in behavioural research, transport & traffic management and accountancy and has been responsible for overseeing the development, implementation & evaluation of major behavioural initiatives in Australian Road Safety for both the Government and private enterprise including the Australian Transport Safety Bureau, NSW Premier's Department, State Rail Authority, NRMA, Roads & Traffic Authority, Bureau of Crime Statistics and ARRB Transport Research.
- Regardless of the consultant or consultancy engaged the same road safety data would be used for the analysis of injury and fatality statistics and options and costs. Working Group Members were advised at the first meeting that ITSRR would be engaging a safety specialist to assist the Working Group with its deliberations.

**Issue:** *The Minutes from past meetings were received just prior to the next scheduled meeting, clearly leaving insufficient time to discuss and reply with amendments prior to the next meeting. Similarly the arrival of agendas did not provide adequate time for pre-meeting preparation. Agenda's allowed little time for discussion.*

**ITSRR's Comment:**

- Comments are primarily based on the opinions of the B.U.S. Action Group member. These opinions are not shared by other members of the Working Group. Comprehensive Minutes of meetings were documented in accordance with proper protocols.
- Minutes and other correspondence were sent prior to scheduled meetings and allowed reasonable time for review.

**Issue: Issues with the handling of BUS Proposal.**

***No evaluation or discussion of responses to the BUS Action Group's proposal was conducted by the Group; rather the Group was advised that the responses were to be merely appended to the Draft Report. These were also mis-quoted and mis-represented by Dr Saffron in his verbal commentary and in the Draft Report.***

***At the time of writing there were still a number of responses that were not signed, not dated or not on official letterhead.***

**Dr Saffron's Comment:**

- The B.U.S. Action Group's submission was discussed in detail at the meeting of 21 July 2004 and its representative led the discussion. Dr Saffron did not misrepresent it verbally, or present the proposal in any way.
- The proposal does not appear to have been misrepresented in the Draft SBSWG Report. If it has, it would be helpful if the misrepresentation could be explained, so that it could be corrected.

**ITSRR's Comment:**

- Minutes, Agenda Items and correspondence received and sent by ITSRR do not support this view.
- The B.U.S. Action Group's proposal was considered, discussed and examined in detail as part of the Working Group's deliberations (tabled as an agenda item at Meeting No.'s 3, 4 & 5, discussed in detail in the Minutes of Meeting No.'s 3, 4 & 5. The Chair of the Working Group (Mr Donaldson, ITSRR) also wrote to all members seeking their comments and organisation's position on the proposal as comments had not been received). Furthermore, the B.U.S Action Group's proposal is discussed in detail in the Draft SBSWG report. The B.U.S Action Group member presented her group's proposal and other information at several of the meetings.
- All official correspondence in relation to this proposal has been received by ITSRR. Members' comments on the proposal were contained in the Agenda Papers for the Final Meeting (21 July 2004) which was provided to all members.

***Issue: It is also the view of parent organisations that the Draft Report contained information that had not been discussed at meetings and that it omitted important information that was discussed. It is understood by parents that in writing a report information has to be sifted through and decisions made over content, but parent organisations do not feel that the Draft Report truly reflects the deliberations of the Group and despite information given to the Group by ITSRR that the Draft Report was discussed by Dr Saffron in detail, it was not. In this respect the Draft Report has failed.***

**ITSRR's Comment:**

- The statement is a misrepresentation of the Working Group's deliberations. These opinions are not representative of the other Working Group members.
- All information contained in the Draft SBSWG Report is representative of issues discussed, examined and presented at meetings, including member contributions and is a summary of those deliberations.

**Issue:** *Dr Saffron's presentations only focussed on the arguments against the wearing of seatbelts and omitted the reasons why we should have belts and no standing. He omitted to report on reviews of documents in favour of seatbelts such as Qld Task Force (although he did comment on the negative aspects of the trial). Evidence that contradicts his findings was not included in the report. For example:*

- *If a crash should occur, the use of seat belts will reduce the probability of death (and the severity of injuries) to children correctly seated;*
- *Seat belt usage improves passenger behaviour and reduces driver distractions;*
- *Seat belts offer protection against injuries in rollover or side impact crashes;*
- *Many buses currently in use have low-backed, unpadded seats with steel handrails at face level;*
- *Seat belt usage in school buses has a carryover effect to future use when riding in other vehicles – a very important fact considering the relatively high number of teenage automobile accident fatalities in Australia caused by not wearing seatbelts.*
- *The cost to install seat belts is affordable and can be phased in over a period of time;*
- *Governments and transport providers have a duty of care to all passengers to provide the highest possible form of protection to the risks already recognised;*
- *Given the current public knowledge about the need for seatbelts in buses it is likely that negligence claims will become more prevalent in the event of injury or death to a passenger in a bus crash involving a bus not fitted with seatbelts.*

**Dr Saffron's Comment:**

Some of the points relate to evidence and some are opinions:

- *If a crash should occur, the use of seat belts will reduce the probability of death (and the severity of injuries) to those correctly seated.*
  - The above statement is true. This statement is acknowledged on pages 18, 24, 25 (twice), 71, 72 and 74 of the Draft Report. The point is that it is difficult to estimate the reduction in probability.
- *Seat belt usage improves passenger behaviour and reduces driver distractions*
  - There was some improvement in passenger behaviour in the Queensland trial. This is pointed out on page 22 of the draft report.
- *Seat belts offer protection against injuries in rollover and side impacts crashes*
  - See the first point. This is not at issue.
- *Many buses currently in use have low backed unpadded seats with steel handrails at face level.*
  - Again, this statement is true, but is not evidence of anything. Route buses have low seat backs. If seat belts were installed, these would have to be replaced by high seat backs. The lack of padding is being phased out, as pointed out on page 19 of the Draft SBSWG Report.
- *Seat belt usage in school buses has a carryover effect to future use when riding in other vehicles – a very important fact considering the relatively high number of teenage automobile accidents fatalities in Australia caused by not wearing seatbelts*
  - If there is evidence on this issue, it would be good to know about it. The claim is made in argument, but there is no apparent evidence. Is the claim that by fitting seat belts in buses, teenagers that would not wear a seat belt in a car would nevertheless wear a seat belt in a bus, and as a result of wearing the seat belt in a bus would wear it in a car?



- *The cost to install seat belts is affordable and can be phased in over time.*
  - Again, there is no evidence that has been suppressed. The Draft SBSWG Report contains preliminary estimates of costs and considers phase-in times (Chapter 4 - pages 42 to 57 – of the Draft SBSWG Report). It has not been claimed that installation is unaffordable.
  - In view of the magnitude of the preliminary cost estimates contained in the Draft SBSWG Report, however, it was suggested that a detailed study would be required before a regulation, such as an ADR change could proceed.
- *Governments and transport providers have a duty of care to all passengers to provide the highest possible form of protection to risks already recognised.*
  - This point does not refer to evidence. It appears to be a legal or ethical point of view. Attention is drawn to this view on pages 6 and 7 of the Draft Report.
- *Given the current public knowledge about the need for seat belts in buses it is likely that negligence claims will become more prevalent in the event of injury or death to a passenger in a bus crash involving a bus not fitted with seat belts.*
  - Again, this point does not refer to evidence.

**Issue:** *The skewed focus of the Draft Report is expressed at page 71: “Generally, the costs of introducing seat belts in buses would be very high relative to other road safety initiatives, but its expected benefit is small. On this basis, other road actions to protect children from death and injury on the road would have higher priority. This means that resources would be allocated to other road safety measures before seatbelts on buses, based on cost-effectiveness considerations.” Is it not the opinion of the SBSWG, nor was it the opinion of the Queensland Task Force in 2001.*

**Dr Saffron’s Comment:**

- There is a claim that a view on the cost-effectiveness is a “skewed focus.” This paragraph is a conclusion from a discussion of crash statistics, which summarises details that are covered in a large part of the Draft Report.
- The paragraph does state that resources would be allocated to other road safety measures before they would be allocated to seat belts on buses, based on cost-effectiveness considerations.
- The cost-effectiveness approach is criticised in the very next paragraph of the draft report. The Draft Report criticises the cost-effectiveness approach as overlooking parental concerns.
- To say that comment on cost-effectiveness is not the view of the School Bus Safety Working Group relates more to the commentators’ perceptions of the purpose and membership of the Working Group than to any evidence. My view was that these commentators were not the only members of the Working Group. The debate within the Draft Report reflects debate within the Working Group.

**Issue:** *The Austroads Investigation of Internal Bus Safety Measures (2002), referred to in Draft Report, examines much of the same issues without the same degree of bias. At page 53 of the Austroads Report, it is recognised that this issue “can not be entered into lightly. The impacts are widespread...Further consultation with roads authorities, industry representatives and other key stakeholders would be required to determine suitable options to address the issues raised”. This level of investigation did not occur in the context of the SBSWG.*

*Dr Saffron’s analysis or brief should have been to carry on from the Austroads Report not to rehash the negative arguments and provide skewed statistical and cost analysis for all situations. In the context of the reports that have gone before (and referred to in Dr Saffron’s Report in a cursory manner), this SBSWG Draft Report does not further the debate, nor does it provide for a way of going forward or recognising its own faults or shortcomings. In terms of progressing the issue, which the SBSWG was charged to do, not just its wide membership, by the Minister’s comments, the Terms of Reference of the Working Party, but also significantly by previous research documents. The SBSWG has failed to deliver this desired progress.*

#### **Dr Saffron’s Comment:**

- The view that “selective research” has been used is unfounded and offensive.
- The words on page 53 of the 2002 Austroads Internal Bus Safety Measures report (“can not be entered into lightly”) relate to the problems of attempting to implement seat belts on school buses: loss of carrying capacity, funding, manufacturing industry ability to do the work, implementation planning, and resolution of issues relating to responsibility and liability. All these matters are discussed in the Draft SBSWG Report. They are among the matters that these commentators perceive as negative to seat belts in buses.
- Again, this comment appears to reflect a particular opinion of these commentators about the purpose of the SBSWG. They appear to think that the purpose of the SBSWG was to plan implementation; any policy analysis would therefore be irrelevant.

**Issue:** *The cost-benefit analysis of Dr Saffron gives a new meaning in the context of his report – what was the cost of his appointment both in a pecuniary sense and where is the benefit?*

*The request for independent research sought at the first meeting (from research units at UNSW and Sydney University) would have been very useful, but was not sought or utilised.*

#### **ITSRR’s Comment:**

- Dr Saffron was engaged by ITSRR to provide expert advice to assist the Working Group in addressing the Terms of Reference and its deliberations. Dr Saffron’s role included the facilitation of Working Group Meetings (commencing Meeting No. 2), provide expert advice on research, a comparative analysis of cross modal and interstate school student injury and fatality data, determine option and costs associated with the installation of seat belts in NSW and rural school buses, and the preparation of the report to the Minister for Transport Services (containing the Working Group’s deliberations).
- Dr Saffron’s Terms of Reference for his engagement were provided to members on 2 April 2004.
- Dr Saffron is a well regarded specialist in safety research, evaluation and strategy development and has over 17 years of experience in senior managerial roles and as a consultant for his own company, (Dr David Saffron Pty Ltd). Dr Saffron has formal qualifications in behavioural research, transport & traffic management and accountancy and has been responsible for overseeing the development, implementation & evaluation of major behavioural initiatives in Australian Road Safety for both the Government and private enterprise including the Australian Transport Safety Bureau, NSW Premier’s

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Department, State Rail Authority, NRMA, Roads & Traffic Authority, Bureau of Crime Statistics and ARRB Transport Research.

- Regardless of the consultant or consultancy engaged the same road safety data would be used for the analysis of injury and fatality statistics and options and costs. Working Group Members were advised at the first meeting that ITSRR would be engaging a safety specialist to assist the Working Group with its deliberations.

**Issue:** *The review of literature on the subject appears to be very narrowly focussed on that which does not support seatbelts or selections of documents which do not support seatbelts. There is a lack of reference to key studies from USA, United Kingdom and Europe.*

**Dr Saffron's Comment:**

- The Austroads Internal Bus Safety Measures report includes some references from North America, but none from Europe.
- These commentators have not drawn attention to any significant European studies.
- After pointing out the differences between Australian and USA school buses, the draft SBSWG report discusses the latest USA report from the National Highway Traffic Safety Administration (page 24).

**Issue:** *At page 16 of the Draft report Dr Saffron states that the conclusions from the Austroads report state there is "varying evidence", "conflicting evidence", "lack of evidence" and "inconclusive evidence" about the safety, effectiveness and costs of fitting seatbelts and safety or otherwise of standing in the aisles and allowing three for two seating. This conclusion should not be interpreted, however, as "no evidence".*

**Dr Saffron's Comment:**

- "Varying evidence" etc are direct quotes from the Austroads report (Internal Bus Safety Measures).
- I agree that the quotes do not imply "no evidence". It has already been acknowledged that seat belts on school buses would have some safety benefit.

**Issue:** *At section 1.8 a reference is made to the seat-belting policies for the heavy vehicle industry. However, the Draft report fails to recognise that buses are classed as heavy vehicles and are required to be inspected twice each year. The attention of Dr Saffron is directed to the communiqué of the Country Roads Safety Summit at Port Macquarie on 27-28 May 2004.*

**Dr Saffron's Comment:**

- I cannot recall any mention of general heavy vehicle policy. It is not in Section 1.8.
- The comment does not seem relevant.

**Issue:** *Though Dr Saffron reviewed the research document commissioned by the USA group NHTSA, "School Bus Safety: Crashworthiness Research", he omitted to report on other key findings such as:*

*at page 38: "...the lap/shoulder belt restraint keeps the occupant restrained to the bench portion of the school bus seat. In addition the shoulder belt of the restraint system keeps the upper torso of the occupant restrained to the seat back of the seat. As a result there is limited forward rotation of the upper body of the dummy. This limited, or prevented entirely, head impact into the seat back in front of the dummy."*

and at page 42:

*“The lap/shoulder belt restraint systems restrain the dummy and keeps femur loading well under pass/fail tolerance limit.”*

and at page 47:

*“Lap/shoulder belts systems could provide benefits to the passengers of school buses. Based on sled testing lap/shoulder data indicate potential for fewer injuries in frontal crashes of selected severities compared to the other restraint systems (compartmentalisation and lap belts). This is especially true for the neck injury...”*

*“...the potential exists for reducing the average passenger fatalities in frontal crashes of school buses from two to one, assuming 100% proper use of the lap/shoulder belt system. There would be a companion reduction in the number of injuries in frontal crashes. Additionally, properly used lap/shoulder belt systems have the potential to be effective in reducing fatalities and injuries in other (non-frontal) crashes. Belt systems are particularly effective in reducing ejection in rollover crashes.”*

#### **Dr Saffron’s Comment:**

- The Draft SBSWG Report deals briefly with the USA NHTSA report.
- The Draft SBSWG Report quotes from the NHTSA report’s executive summary, giving the authors interpretation of their own report. To quote:

*The use of combination lap/shoulder belts could provide some benefit unless misused.* (page v).
- It is not denied that lap-sash seat belts can have some benefit. The commentators’ quotes are consistent with that view.

**Issue:** *At page 21 of the Draft Report in referring to the Queensland School Transport Safety Task Force Report, there are key findings and recommendations ignored by Dr Saffron such as:*

*“4.8.1 National data show that injuries and fatalities in school-transport related bus crashes are more likely in rural or regional areas with speed limits greater than 80kph(Overview p.11) The typology of buses by Environment used to prioritise a fleet upgrade in this report characterises buses by highest risk areas - buses on steep and higher speed routes to be upgraded first. These routes are more common in rural and remote areas which also tend to be further from major emergency services.”*

*4.6 The Task Force recommends that the Queensland Government adopt a subsidised program to upgrade buses carrying students to and from school and thereby increase safety, with the following targets:*

- (ii) Five-yearly targets to be established to ensure that by 2017 at least every bus operating in Environments 2 and 3 is fitted with lap-sash style seat belts.*
- (iii) Five-yearly targets to be established to ensure that by 2017 at the latest, standees are not permitted on any bus operation in Environment 2. Note: Standees are currently not permitted on buses operating in Environment 3”*

#### **Dr Saffron’s Comment:**

- The commentators claim that the points regarding school bus seat belts in different environments has been omitted. This is clearly covered on page 21 of the draft SBSWG report. It is also pointed out that the Queensland Task Force recommended that all for environments 2 and 3 be covered by 15 years.
- The Queensland Task Force did recommend a subsidy program (which has apparently not been implemented, as yet). This relates more to funding options than to the safety benefits to be achieved.

**Issue:** *For an alternate critique on the work of the Queensland School Transport Safety Taskforce, see Attachment 1.*

**ITSRR's Comment:**

- This "critique" is new information which has been provided by the B.U.S Action Group that has not been raised at any of the meetings or with the Chair. The B.U.S. Action Group member has never requested for this information to be discussed or distributed for the consideration of other members of the Working Group.
- ITSRR only became aware of this information after receipt of the joint parent groups' response (19 August 2004).

**Issue:** *Some statistics presented in the Draft Report focuses solely on school students in school travel time and totally excludes consideration at all of the mechanisms of death/injury in bus crashes that involved "route" buses, if that particular vehicle was not operating specifically in the carriage of school children. A "route" bus is a school bus – there is no difference in any safety or design feature. This is a misrepresentation of the actual bus accident data as any safety features fitted to route buses for the primary aim of safeguarding children would also benefit the general community.*

**Dr Saffron's Comment:**

- Statistics relating to children travelling in school travel time were included because that is what was requested by the SBSWG.
- Statistics relating to children travelling at all times were also included (see pages 28 to 30 of the draft SBSWG report). This is because SBSWG participants suggested that the aim was the safety of children. These statistics are not meant to show that there is little road trauma to be prevented in bus travel. The statistics do show that bus travel represents a relatively small part of the overall death and injury of children on the road. There are other problems in children's road safety. This in turn becomes relevant when considering the allocation of priorities.
- The comment appears to suggest that the draft SBSWG report should consider bus travel in relation to all other modes of travel. If we look at people of all ages, all modes and all times, bus passengers constitute a much smaller proportion of road users killed and injured than they do for children. In 2001, the latest RTA statistics on the Internet, one of the 524 fatalities was a bus passenger (0.2%) and 195 of 29,913 people non-fatally injured were bus passengers (0.7%). The approach of including all people was not adopted in the draft SBSWG report because it might have been interpreted as unfair to the case for seat belts in school buses. Children are given a special value in our society, and therefore it was decided to concentrate on children.

**Issue:** *For additional independent opinion refer to the statement from Professor Peter Joubert (See Attachment 2).*

**ITSRR's Comment:**

- Professor Joubert's comments as contained in the "Attachment 2" were included as an Agenda Item at Meeting No. 3 for discussion to be led and presented by the B.U.S. Action Group member, contained in the Agenda Papers distributed to all members and minuted in the Minutes of Meeting No. 3.

**Issue:** *The parent organizations are of the opinion that in relation to the responses to the BUS proposal, the Draft Report contains inadequate paraphrasing and misinterpretation of the submissions from the parent organizations.*

**Dr Saffron's Comment:**

- The B.U.S. proposal is to be included as an appendix to the report, and attention is drawn to the attachment in the report. It does not appear to be misrepresented.
- If the B.U.S. proposal or comments on it are inadequately paraphrased, then suggest new wording. It can be fixed.

**Issue:** *There are also major omissions in the minutes of the meetings and in the Draft Report, in regard to the comments and documents (see Attachment 3) contradictory to Dr Saffron's summaries of research, especially when from the BUS Action Group member.*

**Dr Saffron's Comment:**

- Where the B.U.S. Action Group member made some comment on the research, it was not always clear what she was referring to. In referring to research in the draft SBSWG report, I have been careful to refer to page numbers of reports, so that the reader can check.

**ITSRR's Comment:**

- "Attachment 3" refers to a paper prepared by the B.U.S. Action Group. ITSRR emailed this paper to all members of the Working Group for consideration prior to Meeting No. 4. Furthermore, the paper was included as an Agenda Item at Meeting No. 4 for consideration and discussion to be led and presented by the B.U.S. Action Group member, contained in the Agenda Papers distributed to all members and minuted in the Minutes of Meeting No. 4.
- It should be noted that since this meeting, the B.U.S. Action Group member has made revisions to the paper and added new information which has not been provided to the Chair or other members for further consideration.
- Again, ITSRR only became aware of these revisions after receipt of the joint parent groups' response (19 August 2004).

**Issue:** *Information provided by the ICPA member on retrofitting a small bus (Toyota Cruiser) with seatbelts and separately with the McConnell Educator 2/3 seats were incorrectly stated in the Draft report at sections 4.4.8 and 4.4.12 respectively.*

**Dr Saffron's Comment:**

- Section 4.4.8 simply says the cost would be \$17,500. The information provided says the cost would be between \$17,150 to \$17,800 plus an engineer's certificate of \$350 to \$1,000.
- If anything, it appears the draft SBSWG report may underestimate the cost, but only slightly.
- In section 4.4.12, I may have estimated the loss of capacity incorrectly. Re-considering the information provided, it is not clear what the loss of capacity would be.

**Issue:** *Lack of development of implementation options and solutions. The second arm of the Terms of Reference (examine potential and practical solutions) was not sufficiently undertaken or achieved.*

*Some concept of options were emerging from discussions at the July 2004 meeting and these are not contained in the Draft report.*

**ITSRR's Comment:**

- Misrepresentation of the intent of the Working Group and its deliberations.
- All of the issues raised by Working Group members have been discussed and examined in detail and the Terms of Reference achieved.
- This process has involved examination of options and estimated costs associated with retro-fitting and fitting seat belts to new school buses in large and small buses in NSW, metropolitan and rural areas (80kph & 100kph and above), the age profile of buses in NSW, bus replacement rates, the ADR process, literature reviews, analysis of national injury & fatality statistics and potential phasing periods have been explored in detail and are contained in the Draft SBSWG Report.

**Issue:** *Matters of input of parents ignored or regarded as ill-informed.*

*In many exchanges in the discussions, the concerns and contributions from the parent organizations were regarded as mere possible suggestions and treated in a frivolous manner.*

**ITSRR's Comment:**

- The Draft SBSWG Report and Minutes of all Working Group meetings clearly do not support this opinion.
- All Working Group meetings and proceedings have been conducted in a professional and transparent manner. All Working Group members have been afforded the opportunity to freely and equally express their opinions, present and distribute information, participate in the Group's meetings and request issues to be further examined and any other information.
- Copies of Minutes, Agendas, presentations, research and other information have always been disseminated to all members at all times.
- In addition to Dr Saffron's presentations, other presentations have been given by other Working Group members (ie. parent groups, industry and Gov't agencies) on issues examined as part of the Working Group's deliberations.

**Issue:** *Lack of proper cost-benefit analysis.*

*The Draft Report does not provide an adequate "cost analysis". Therefore the whole approach fails because the opinions/conclusions are based on poorly interpreted or inadequate data. The Draft Report fails to reach the desired standard of analysis by not giving due consideration to other models or ways of thinking about this issue (ie moral-ethical).*

**Dr Saffron's Comment:**

- There are two points in this paragraph. The first is vague.
- The second states that the draft SBSWG report does not give "due consideration to other models or ways of thinking about this issue (ie moral-ethical)."

- This comment is unfounded. The report does strongly present the ethical-legal approach on pages 6 and 7.
- The other theme is that of parent and public concern, both now and in the event of a major school bus crash; see page 6, 7, 11, 14, 17, 21, 25, 71, 73 and 74.
- Public concern was seen as a good reason to proceed with the ADR process. See page 73 of the draft SBSWG report:

*“public perceptions are important and appropriate responsiveness to such concerns is an important part of modern public sector management”.*
- Contrary to this comment, other ways of thinking about the issue are strongly presented in the draft SBSWG report.

**Issue:** *At section 3.2.2. in the Draft Report: Bus passengers killed in school travel times NSW, the Report examines the fatalities that occurred on buses and argues that 5 of the 6 deaths occurred as a result of factors other than lack of seat belts. But the Report fails to recognise that if seatbelts were in place, children would not be able to stick their heads out of windows, nor should they be able to approach the doors while the bus is still in motion. These things are directly affected by the lack of child restraints.*

**Dr Saffron’s Comment:**

- It is true that children would not lean out of the window or stand up if they were wearing a seat belt. Nevertheless, simply fitting seat belts would not bring these about.
- Who could ensure that a child would remain in his or seat belt and not lean out of the window. The assumption is that a child, who - contrary to safety instructions - would lean out of the window, would remain in his or her seat belt – compliant with safety instructions.
- This is obviously better achieved through window design.
- The relevant measure to prevent standing until the bus is completely stopped is to prohibit standing. Seat belts do not have to be fitted for that purpose.

**Issue:** *At section 3.2.6 in the Draft Report: Metropolitan and Country, the Report provides data to support the hypothesis that rural children are only marginally more at risk than metropolitan children on buses. But the analysis fails to take into account the differences in passenger volume from metropolitan to rural. The Group was not presented with incidence rates. We know that 246 school children were injured during school travel times in metropolitan areas (representing 5% of total injuries in metropolitan areas only) and 239 children were injured in country areas (representing 9% of country injuries). There is no analysis of country injury rates represented as a proportion of the number of children travelling on buses in country areas and compared with their metropolitan counterparts. If this was the case, it would be very clear that rural children are at a far greater and significant risk of injury (and death). Dr Saffron has treated the two areas as if they are the same in population, in distribution and risk.*

**Dr Saffron’s Comment:**

- The draft SBSWG report does not suggest that rural children are “only marginally more at risk than metropolitan children on buses.”
- The statistics presented relate to relative sizes of problems not risks. Relative sizes of problems are relevant to resource allocation.
- The second paragraph of section 3.2.6 (page 31 of the draft SBSWG report) suggests that crashes are generally more severe on country roads.



**Issue:** *At page 71 of the Draft Report, the following statements are made: "Generally, the costs of introducing seat belts in buses would be very high relative to other road safety initiatives, but its expected benefit is small. On this basis, other road actions to protect children from death and injury on the road would have higher priority. This means that resources would be allocated to other road safety measures before seatbelts on buses, based on cost-effectiveness considerations." These statements are made in the Draft report as though they are the opinions of the Working Group, when in fact they are not.*

**Dr Saffron's Comment:**

This is the same comment as discussed above in previous comment.

**Issue:** *This section begins by concentrating on all the impediments to seatbelt installation and does not once mention the benefits to be gained (in addition to the obvious safety improvements) such as:*

*Reduced financial costs in terms of medical bills, insurance premiums, pay-outs and legal actions*

*Reduced human costs in terms of emotional and psychological trauma of victims and their families*

*Increased passenger comfort*

*Increased parent satisfaction and peace of mind*

*Improved student behaviour*

*Reduced driver distractions and anxieties.*

*The carry-over effect to other vehicles*

*Increased employment for manufacturers and drivers*

*Increased peace of mind for drivers knowing their passengers are better protected*

**Dr Saffron's Comment:**

- *Reduced financial costs in terms of medical bills, insurance premiums, pay-outs and legal actions*
  - This applies to any effective road safety measure. From cost-effectiveness approach aims to get as much effect as possible for the available resources.
- *Reduced human costs in terms of emotional and psychological trauma of victims and their families*
  - The same comment would apply as for the previous point.
- *Increased passenger comfort*
  - There is no apparent basis for this view.
- *Increased parent satisfaction and peace of mind*
  - The draft SBSWG report points out that parental concern is important. It is obvious that, if seat belts were introduced, concern about lack of seat belts would be abated.
- *Improved student behaviour*
  - This is a repeat from point 3, above. In the Queensland trial, behaviour changes were mixed: some improved; some deteriorated.
- *Reduced driver distractions and anxieties.*
  - This is speculative.
- *The carry-over effect to other vehicles*
  - This appears to be a repeat of the point about teenagers in Point 3, above.

- *Increased employment for manufacturers and drivers*
  - Money spent in this area would be diverted from somewhere else, and this would have social and economic implications. In any case, the spending decisions would have to be determined at a whole-of-government level.
- *Increased peace of mind for drivers knowing their passengers are better protected*
  - There is no apparent evidence that this is an issue.

**Issue:** *At page 43 of the Draft Report the statement that “all route buses travel in 80 or 100km/hr zones” is wrong as there would be many in the large regional centres that only travel in the urban streets and many buses restricted to routes in inner city metropolitan areas. To correctly ascertain this number, each individual bus contract should be examined for the route taken. It was also agreed in meetings that STA buses would not be subject to any new regulations mandating the installation of seatbelts.*

**Dr Saffron’s Comment:**

- The Draft SBSWG Report does not contain the statement. Table 9, on page 43 of the Draft SBSWG Report, summarises the options as they relate to speed zones.
- The comment about STA buses appears unfounded.

**Issue:** *In section 6.2, the concerns of parents are discounted because such concerns did not arise from the recent Inquiries conducted by Dr Tom Parry and Hon Barrie Unsworth. These Inquiries choose not to investigate such concerns submitted by NSWPC and MOT has been requested to follow up on these outstanding matters.*

**Dr Saffron’s Comment:**

- See page 71 of the draft SBSWG report. Parent concerns are not discounted. The MoT comment on the B.U.S. Action Group’s proposal drew attention to a lack of information about parental concerns. The report goes on to say that

*If public concern is accepted as a reason to proceed with the proposal, there is an obvious need to conduct research to quantify the concern and specify its nature.*

- This is simply a sound way to proceed with such policy decisions.

**Issue:** *Conclusions in Draft Report*

*The potential for a catastrophic accident causing the death of 30 children or more is acknowledged, but not considered important enough to prevent when compared to the choice of spending in other areas.*

*The Draft Report has failed to acknowledge that public reactions in the wake of such a tragedy would be overwhelming. This is a quote from Kevin Waller, the New South Wales State Coroner, in the aftermath of the Kempsey coach tragedy: -*

*“It is obvious from the literature that surveys on this and other subjects have been made and rejected. It is regrettably true that it often takes a major catastrophe to precipitate Government and Government authorities into action. Matters of cost and inconvenience often have been allowed to take precedence over matters of personal safety. Promising suggestions are deflected for investigation elsewhere and largely forgotten”.*

**Dr Saffron’s Comment:**

- This comment could only arise from the assumption that the Draft SBSWG Report is opposed to seat belt on school buses.

- Use of the words “spending in other areas” is disingenuous. The “spending in other areas” considered in the draft report is spending on the road safety of children.
- In any case, spending related only to cost-effectiveness analysis and cash flow considerations. Parental concern is seen in the report as very important (see points above relating to the importance of public and parental concerns).
- The problem of the risk of a major school bus crash and the likely public response are expressed strongly in the draft SBSWG report, on pages 6, 7, 64, 65, 71, 72 and 74.

**Issue: No Recommendations given to consider.**

***It is abnormal and unacceptable for the members of the SBSWG to be asked to endorse an incomplete Draft Report with no Recommendation or Executive Summary.***

#### **ITSRR's Comment:**

- At the final Working Group meeting, members were provided with a detailed overview of the process for the ‘Draft and Final Reports’. It was emphasized that the Draft SBSWG Report is a “draft” only, as it has not been finalised. Therefore, the ‘Draft Report’ does not contain an executive summary or recommendations. However, the Draft Report contains conclusions.

Members were advised that the executive summary would be a summary of the Draft Report and would not contain any new information. The recommendations would be based on the “Conclusions” referred to in the Draft Report and on those contained in member submissions.

- Furthermore, Dr Saffron provided a detailed presentation on the Draft SBSWG Report and discussed possible recommendations ie progression of addressing the issue through the Australian Design Rule process, for national consideration. Dr Saffron’s presentation and subsequent discussion was the primary focus of the final meeting.
- It was agreed that members would provide comment on the Draft SBSWG Report by 18 August 2004 and their submissions appended to the Final Report. This was also discussed and agreed to at previous meetings and reflected in the Minutes of various meetings.



## **JOINT RESPONSE TO DRAFT REPORT OF SCHOOL BUS SAFETY WORKING GROUP**

### **1. STATEMENT OF JOINT POSITION**

- This is a joint response prepared by four member organizations of the School Bus Safety Working Group (SBSWG), being NSW Parents Council, Council of Catholic School Parents, Isolated Childrens Parents Association and Belt Up for Safety Action Group. . The Federation of P&C Associations has chosen to lodge a separate submission.
- This response consists of an opening Statement of Joint Position endorsed by the parent organizations, followed by comments on the process and content of the Draft Report contributed by the parent organisations to focus on their individual concerns.
- The parent organizations lodge this strong dissenting response to the Draft Report that seeks major amendments before the Final Report is presented to the Minister of Transport Services.

#### **1.1 Major Concern in Country NSW**

- School bus safety is a major concern of parents and they seek more action for improvement, with priority to country roads. Parents across country NSW continue to be deeply concerned about the level of school bus safety provided to their children. This concern is reflected in the feedback that peak parent bodies receive from their members. These concerns are real and are related to the higher risk of death and injuries that occurs on country roads.
- The parent organizations aim to work to the key objective of The National School Bus Safety Action Plan (Austroads 2001) being to “reduce the total annual number of child fatalities associated with school bus travel to zero by the year 2005.” (Page iii, technical report, 2001). The parent organizations are concerned about how this can possibly be achieved while ignoring that children are still unbelted and standing in school buses on NSW country roads.

#### **1.2 Strong Disagreement with SBSWG Approach**

Each parent organisation strongly disagrees with the approach taken in the Draft Report and does not endorse the document or agree to its distribution outside of the SBSWG. The parent organisations totally reject the Draft Report, as it does not reflect the deliberations of the SBSWG.

#### **1.3 Joint Parent Response**

The parent organisations are united in their position on the Draft Report and willingly entered into this joint response to the Draft Report.

#### **1.4 Way forward**

The parent organisations seek major revisions of the Draft Report through a further meeting of the SBSWG and the circulation of another draft of the Report to members for consideration.

## 2. COMMENTS ON THE PROCESS

### 2.1. Original Intentions of Parents

- The original intentions of the parent organisations are reflected in the initial joint submission made in November 2003. Matters raised in initial submissions of parent organisations were categorised into 6 main concerns:

#### Concern 1. Seat belts in “open road” conditions.

Parents seek the highest priority on the fitting and use of seat belts, with a negotiated timeframe of 5-7 years for phased implementation.

#### Concern 2. No standing in aisles

Parents seek no child to be standing when the bus is in motion.

#### Concern 3. Scrap the “3 to a seat” rule

Parents seek variations in seat design such as the “McConnell” seat and the classification of seating capacity by child weight limits.

#### Concern 4. Safe storage of luggage

Parents seek options for internal storage in overhead racks and under the seat in front like in aircrafts, and also external compartments.

#### Concern 5. Safe seat design

Parents seek improved head protection and cushioning of hard exposed surfaces.

#### Concern 6. Design of emergency features

Parents seek the “child-proofing” of escape and fire equipment features.

- Essentially, the priority of parent groups on the issue of school buses has been and continues to be the *safety* of the children. More specifically parents were and still are most concerned about those children travelling in buses on roads with speed limits in excess of 60kph on rural and country roads as a priority.
- Parents, having reached an agreed position on the concerns of bus safety in NSW, entered into the School Bus Safety Working Group (SBSWG) united, in good faith and committed to the exploration of practical solutions.
- The parent organisations appreciated that their concerns had been acknowledged by the Minister and welcomed the establishment of the working group as a step forward.

### 2.2 Intentions of Minister Costa.

- The parent organisations met with Minister Costa on 11<sup>th</sup> June 2003 and outlined their concerns. The parent organisations stated they were happy to phase in seat belts and that the priority was rural areas first. The Minister expressed his approval and agreed to a “task force”.
- The parent organisations believed that, in their initial consultations with Minister Costa, the Minister’s intentions were honourable and informed by a belief that there was a legitimate need to establish a working party to examine school bus safety and not just pay “lip service” to the issue. The parent organisations have been somewhat alarmed that no interim reports have been given to the Minister throughout the life of the working party.

- The parent organisations were so convinced that the Government and the Opposition were committed to this issue that a media release was issued prior to the 2003 election stating:

*“Minister for Transport Carl Scully and his Coalition counterpart Peter Debnam have both given commitments to establish a working party of key stakeholders, including peak school parent groups, to develop a plan to improve safety measures on school buses.*

*The agreed plan would be drawn up by the end of the year and would examine the abolition of students standing in aisles, removal of the ‘three to a seat’ rule and a phased introduction of seatbelts on school buses travelling in traffic speed conditions in excess of 60 kph.”*

### **2.3 Issues with Terms of Reference**

- Concerns over the Terms of Reference (TOR) relate firstly to the fact that there was no consultation. In the initial joint submission, the NSW Combined School Parents Forum had expected an opportunity to comment on the proposed Terms of Reference (TOR) before the work of the Working Group was undertaken. However, the TOR were *advised* in a MOT letter of 29<sup>th</sup> October. The parents requested that the finalisation of the TOR be placed on the agenda of the inaugural meeting of the Working Group. This did not happen and there was no consultation or consensus achieved over the TOR before commencement of the Group’s work.

- Secondly, a related concern was that the TOR were expressed in a broad and non-specific way, leaving open the possibility of multiple interpretations or emphasis. The peak school parent organizations interpreted the TOR in the context of the MOT letter of 29<sup>th</sup> October regarding school bus safety matters, in particular the emphasis on seat belts. Other issues relating to school student travel and the School Student Transport Scheme were acknowledged as not being the focus of the Working Group but rather would be subjects of the Ministerial Inquiries conducted by Dr Tom Parry and the Hon Barrie Unsworth. These other safety issues remain a focus for parent organisations and they continue to lobby for them in other forums and by other means, but essentially parent groups acknowledged that they were not the focus of the Working Group.

- Had consultation taken place, the parent organisations would have argued for the TOR to be expressed in a more specific way, limiting the scope of the discussion to rural and country roads and those roads with speed limits in excess of 60kph as a means of moving this issue forward and addressing the higher risk associated with these conditions. Parents expected some parity with the Minister Scully’s election statement on this issue especially in relation to speed zones.

- Finally, and arguably, most importantly, the second aim of the TOR (as determined by MOT) - *to examine potential and practical solutions* - was not achieved in the process of this Working Group.

- The fact that the concerns of the NSW Combined Parents Forum were not addressed, tainted the entire process which has now led to an unsatisfactory and unfortunate outcome.

### **2.5 Issues with SBSWG membership.**

The lack of continuity of chairpersons and members in attendance resulted in a lack of consistent deliberation, fragmentation of discussion and a lack of mutual understanding of the issues and direction of the Group.

### **2.6 Issues with the appointed consultant and coordination.**

Working group members did not agree to Dr Saffron’s appointment, had no say in his terms of reference and have never seen his brief or contract. A copy of his brief was requested but was refused. The perception is that Dr Saffron is not the Group’s consultant, but solely that of ITSRR.

### **2.7 Issues with conduct and content of meetings.**

- The Minutes from past meetings were received just prior to the next scheduled meeting, clearly leaving insufficient time to discuss and reply with amendments prior to the next meeting. Similarly the arrival of agendas did not provide adequate time for pre-meeting preparation. Agenda's allowed little time for discussion.
- The perception of parent organisations is that more time was spent listening to presentations (that were not viewed as entirely helpful) than was spent discussing the important issues.
- Furthermore, despite requests from parent organisations for an *Injury Risk Management Research Centre Presentation*, which was seen by parents to be valuable for the purposes of proper deliberation of the issues, this request was ignored.

### **2.8 Issues with the handling of BUS Proposal.**

- No evaluation or discussion of responses to the BUS Action Group's proposal was conducted by the Group, rather the Group was advised that the responses were to be merely appended to the Draft Report. These were also mis-quoted and mis-represented by Dr Saffron in his verbal commentary and in the Draft Report.
- At the time of writing there were still a number of responses that were not signed, not dated or not on official letterhead.

### **2.9 Issues with the conduct of final meeting.**

- At the meeting on the 21 July 2004, the Draft Report was delivered and read through in brief. This does not constitute due process. There was not enough consultation and input obtained prior to the Draft Report and certainly no opportunity to discuss the Draft Report in depth. The Draft Report should have been sent out in advance of the meeting so that a meaningful reading of the document could take place followed by a meaningful discussion at the meeting. From this point of view, the Draft Report is not seen as "the deliberations of the Working Group", but those of Dr Saffron and ITSRR alone.
- It is also the view of parent organisations that the Draft Report contained information that had not been discussed at meetings and that it omitted important information that was discussed. It is understood by parents that in writing a report information has to be sifted through and decisions made over content, but parent organisations do not feel that the Draft Report truly reflects the deliberations of the Group and despite information given to the Group by ITSRR that the Draft Report was discussed by Dr Saffron in detail, it was not. In this respect the Draft Report has failed.
- There was also a reluctance of the Group to acknowledge the short amount of time given to members to respond to the Draft Report and in particular to recognise that the "make-up" of parent organisations can preclude or hinder the tight turn-around times that well resourced and staffed bureaucracies often work to. Parent organisations are largely "volunteer" based organisations with small secretariats (some paid, some not). Consideration also has to be given to the often highly democratic nature of these organisations and the fact that consultation needs to take place with members or Council in preparing responses and submissions. Also given the nature of these peak organisations, the membership is geographically dispersed.

- At the end of the 21 July meeting the Group had reached a consensus about the feasibility of retrofitting and the possible timelines for natural replacement. This paved the way for real discussion on time frames for seat belt implementation, yet the Group was advised that was to be the final meeting.
- The SBSWG has been asked to endorse a Draft Report that does not contain a report on the final meeting. The omitted sections of the Executive Summary and the Recommendations, along with the proposed wording to report on the final meeting, has not as yet been forwarded.
- The parent organizations are most disappointed that the process has been one of ITSRR commissioning the writing of a report with a collection of written submissions and responses merely attached as appendices. The body of a report should present an inclusive and critical view of the deliberations of the appointed task group.

### **3. COMMENTS ON THE CONTENT**

#### **3.1 Issues with context and focus of the Report.**

- The Report to the Minister must focus on school buses on country roads. This is not evident in the Draft Report due to the Minister's initial intentions not being conveyed to the Ministry of Transport. The parent groups sought from the outset to influence and then to amend the Terms of Reference. This critical focus was not acknowledged from parent initial joint submission or from their comments made at the first meeting of the Group. "Country roads" is not mentioned as an issue until Page 7 of the Draft Report.
- The second arm of the Terms of Reference (examine potential and practical solutions) was not achieved. Much more must be drawn from the analysis of country data and focus on cost/benefit analysis.
- Dr Saffron's presentations only focussed on the arguments against the wearing of seatbelts and omitted the reasons why we should have belts and no standing. He omitted to report on reviews of documents in favour of seatbelts such as Qld Task Force (although he did comment on the negative aspects of the trial). Evidence that contradicts his findings was not included in the report. For example:
  - If a crash should occur, the use of seat belts will reduce the probability of death (and the severity of injuries) to children correctly seated;
  - Seat belt usage improves passenger behaviour and reduces driver distractions;
  - Seat belts offer protection against injuries in rollover or side impact crashes;
  - Many buses currently in use have low-backed, unpadded seats with steel handrails at face level;
  - Seat belt usage in school buses has a carryover effect to future use when riding in other vehicles – a very important fact considering the relatively high number of teenage automobile accident fatalities in Australia caused by not wearing seatbelts.
  - The cost to install seat belts is affordable and can be phased in over a period of time;
  - Governments and transport providers have a duty of care to all passengers to provide the highest possible form of protection to the risks already recognised;
  - Given the current public knowledge about the need for seatbelts in buses it is likely that negligence claims will become more prevalent in the event of injury or death to a passenger in a bus crash involving a bus not fitted with seatbelts.



• The skewed focus of the Draft Report is expressed at page 71: “Generally, the costs of introducing seat belts in buses would be very high relative to other road safety initiatives, but its expected benefit is small. On this basis, other road actions to protect children from death and injury on the road would have higher priority. This means that resources would be allocated to other road safety measures before seatbelts on buses, based on cost-effectiveness considerations.” Is it not the opinion of the SBSWG, nor was it the opinion of the Queensland Task Force in 2001.

### 3.2 Issues with use of selective research.

• The Austroads Investigation of Internal Bus Safety Measures (2002), referred to in Draft Report, examines much of the same issues without the same degree of bias. At page 53 of the Austroads Report, it is recognised that this issue “can not be entered into lightly. The impacts are widespread...Further consultation with roads authorities, industry representatives and other key stakeholders would be required to determine suitable options to address the issues raised”. This level of investigation did not occur in the context of the SBSWG.

• Dr Saffron’s analysis or brief should have been to carry on from the Austroads Report not to rehash the negative arguments and provide skewed statistical and cost analysis for all situations. In the context of the reports that have gone before (and referred to in Dr Saffron’s Report in a cursory manner), this SBSWG Draft Report does not further the debate, nor does it provide for a way of going forward or recognising its own faults or shortcomings. In terms of progressing the issue, which the SBSWG was charged to do, not just by the wide membership or by the Minister’s intentions or by in part the Terms of Reference of the Working Party, but also significantly by previous research conducted. This desired progress, the SBSWG has failed to deliver.

• The cost-benefit analysis of Dr Saffron gives a new meaning in the context of his report – what was the cost of his appointment both in a pecuniary sense? And, where is the benefit?

• The review of literature on the subject appears to be very narrow and to be only that which does not support seatbelts or selections of documents which do not support seatbelts. There is a lack of reference to key studies from USA, United Kingdom and Europe.

• The request for independent research sought at the first meeting (from research units at UNSW and Sydney University) would have been very useful, but was not sought or utilised.

• At page 16 of the Draft report Dr Saffron states that the conclusions from the Austroads report state there is “varying evidence”, “conflicting evidence”, “lack of evidence” and “inconclusive evidence” about the safety, effectiveness and costs of fitting seatbelts and safety or otherwise of standing in the aisles and allowing three for two seating. This conclusion should not be interpreted, however, as “no evidence”.

• At section 1.8 a reference is made to the seat-belting policies for the heavy vehicle industry. However, the Draft report fails to recognise that buses are classed as heavy vehicles and are required to be inspected twice each year. The attention of Dr Saffron is directed to the communiqué of the Country Roads Safety Summit at Port Macquarie on 27-28 May 2004.

• Though Dr Saffron reviewed the research document commissioned by the USA group NHTSA, “School Bus Safety: Crashworthiness Research”, he omitted to report on other key findings such as:

at page 38: “...the lap/shoulder belt restraint keeps the occupant restrained to the bench portion of the school bus seat. In addition the shoulder belt of the restraint system keeps the upper torso of the occupant restrained to the seat back of the seat. As a result there is limited forward rotation of the upper body of the dummy. This limited, or prevented entirely, head impact into the seat back in front of the dummy.”

and at page 42:

*“The lap/shoulder belt restraint systems restrain the dummy and keeps femur loading well under pass/fail tolerance limit.”*

and at page 47:

*“Lap/shoulder belts systems could provide benefits to the passengers of school buses. Based on sled testing lap/shoulder data indicate potential for fewer injuries in frontal crashes of selected severities compared to the other restraint systems (compartmentalisation and lap belts). This is especially true for the neck injury...”*

*“...the potential exists for reducing the average passenger fatalities in frontal crashes of school buses from two to one, assuming 100% proper use of the lap/shoulder belt system. ..there would be a companion reduction in the number of injuries in frontal crashes. Additionally, properly used lap/shoulder belt systems have the potential to be effective in reducing fatalities and injuries in other (non-frontal) crashes. Belt systems are particularly effective in reducing ejection in rollover crashes.”*

- At page 21 of the Draft Report in referring to the Queensland School Transport Safety Task Force Report, there are key findings and recommendations ignored by Dr Saffron such as:

*“4.8.1 National data show that injuries and fatalities in school-transport related bus crashes are more likely in rural or regional areas with speed limits greater than 80kph(Overview p.11) The typology of buses by Environment used to prioritise a fleet upgrade in this report characterises buses by highest risk areas - buses on steep and higher speed routes to be upgraded first. These routes are more common in rural and remote areas which also tend to be further from major emergency services.”*

*4.6 The Task Force recommends that the Queensland Government adopt a subsidised program to upgrade buses carrying students to and from school and thereby increase safety, with the following targets:*

*(ii) Five-yearly targets to be established to ensure that by 2017 at least every bus operating in Environments 2 and 3 is fitted with lap-sash style seat belts.*

*(iii) Five-yearly targets to be established to ensure that by 2017 at the latest, standees are not permitted on any bus operation in Environment 2. Note: Standees are currently not permitted on buses operating in Environment 3”*

- For an alternate critique on the work of the Queensland School Transport Safety Taskforce, see Attachment 1.
- Some statistics presented in the Draft Report focuses solely on school students in school travel time and totally excludes consideration at all of the mechanisms of death/injury in bus crashes that involved “route” buses, if that particular vehicle was not operating specifically in the carriage of school children. A “route” bus is a school bus – there is no difference in any safety or design feature. This is a misrepresentation of the actual bus accident data as any safety features fitted to route buses for the primary aim of safeguarding children would also benefit the general community.
- For additional independent opinion refer to the statement from Professor Peter Joubert (See Attachment 2).

### **3.3 Matters of misquoting and incorrect para-phrasing.**

- The parent organizations are of the opinion that in relation to the responses to the BUS proposal, the Draft Report contains inadequate paraphrasing and misinterpretation of the submissions from the parent organizations.

- There are also major omissions in the minutes of the meetings and in the Draft Report, in regard to the comments and documents (see Attachment 3) contradictory to Dr Saffron's summaries of research, especially when from the BUS Action Group member.
- Information provided by the ICPA member on retrofitting a small bus (Toyota Cruiser) with seatbelts and separately with the McConnell Educator 2/3 seats were incorrectly stated in the Draft report at sections 4.48 and 4.4.12 respectively.

### **3.4 Issues with lack of development of implementation options and solutions.**

- The second arm of the Terms of Reference (examine potential and practical solutions) was not sufficiently undertaken or achieved.
- Some concept of options were emerging from discussions at the July 2004 meeting and these are not contained in the Draft report.

### **3.5 Matters of input of parents ignored or regarded as ill-informed.**

- In many exchanges in the discussions the concerns and contributions from the parent organizations were regarded as mere possible suggestions and treated in a frivolous manner.

### **3.6 Issues with lack of proper cost-benefit analysis.**

- The Draft Report does not provide an adequate “cost analysis”. Therefore the whole approach fails because the opinions/conclusions are based on poorly interpreted or inadequate data. The Draft Report fails to reach the desired standard of analysis by not giving due consideration to other models or ways of thinking about this issue (ie moral-ethical).
- At section 3.2.2. in the Draft Report: *Bus passengers killed in school travel times NSW*, the Report examines the fatalities that occurred on buses and argues that 5 of the 6 deaths occurred as a result of other factors apart from lack of seat belts. But the Report fails to recognise that if seatbelts were in place, children would not be able to stick their heads out of windows, nor should they be able to approach the doors while the bus is still in motion. These things are directly affected by the lack of child restraints.
- At section 3.2.6 in the Draft Report: *Metropolitan and Country*, the Report provides data to support the hypothesis that rural children are only marginally more at risk than metropolitan children on buses. But the analysis fails to take into account the differences in passenger volume from metropolitan to rural. The Group was not presented with incidence rates. We know that 246 school children were injured during school travel times in metropolitan areas (representing 5% of total injuries in metropolitan areas only) and 239 children were injured in country areas (representing 9% of country injuries). There is no analysis of country injury rates represented as a proportion of the number of children travelling on buses in country areas and compared with their metropolitan counterparts. If this was the case, it would be very clear that rural children are at a far greater and significant risk of injury (and death). Dr Saffron has treated the two areas as if they are the same in population, in distribution and risk.
- At page 71 of the Draft Report, the following statements are made: “Generally, the costs of introducing seat belts in buses would be very high relative to other road safety initiatives, but its expected benefit is small. On this basis, other road actions to protect children from death and injury on the road would have higher priority. This means that resources would be allocated to other road safety measures before seatbelts on buses, based on cost-effectiveness considerations.” These statements are made in the Draft report as though they are the opinions of the Working Group, when in fact they are not.

- The SBSWG did not deliberate over other safety measures and therefore no comparison should be made.

Section 5 Other Issues – This section begins by concentrating on all the impediments to seatbelt installation and does not once mention the benefits to be gained (in addition to the obvious safety improvements) such as:

- Reduced financial costs in terms of medical bills, insurance premiums, pay-outs and legal actions
  - Reduced human costs in terms of emotional and psychological trauma of victims and their families
  - Increased passenger comfort
  - Increased parent satisfaction and peace of mind
  - Improved student behaviour
  - Reduced driver distractions and anxieties.
  - The carry-over effect to other vehicles
  - Increased employment for manufacturers and drivers
  - Increased peace of mind for drivers knowing their passengers are better protected
- At the SBSWG meeting on 21<sup>st</sup> July, the chairperson requested members to make an analysis of risks, hazards and consequences from the information presented to the SBSWG. This response is at Attachment 4.

### **3.7 Matters of irrelevant issues in report.**

- At page 43 of the Draft Report the statement that “all route buses travel in 80 or 100km/hr zones” is wrong as there would be many in the large regional centres that only travel in the urban streets and many buses restricted to routes in inner city metropolitan areas. To correctly ascertain this number, each individual bus contract should be examined for the route taken. It was also agreed in meetings that STA buses would not be subject to any new regulations mandating the installation of seatbelts.
- In section 6.2, the concerns of parents are discounted because such concerns did not arise from the recent inquiries conducted by Dr Tom Parry and Hon Barrie Unsworth. These inquiries choose not to investigate such concerns submitted by NSWPC and MOT has been requested to follow up on these outstanding matters.

### **3.8 Conclusions in Draft Report**

- The potential for a catastrophic accident causing the death of 30 children or more is acknowledged, but not considered important enough to prevent when compared to the choice of spending in other areas.

The Draft Report has failed to acknowledge that public reaction in the wake of such a tragedy would be overwhelming. This is a quote from Kevin Waller, the New South Wales State Coroner, in the aftermath of the Kempsey coach tragedy: -

*“It is obvious from the literature that surveys on this and other subjects have been made and rejected. It is regrettably true that it often takes a major catastrophe to precipitate Government and Government authorities into action. Matters of cost and inconvenience often have been allowed to take precedence over matters of personal safety. Promising suggestions are deflected for investigation elsewhere and largely forgotten”.*

**Fifteen years later it appears we still have a lot to learn.**

- The Draft Report has done nothing to prevent such an accident and nothing to towards achieving the National School Bus Action plan in NSW (as stated earlier at 1.1).

**3.8 Issues with no Recommendations given to consider.**

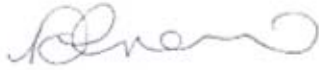
It is abnormal and unacceptable for the members of the SBSWG to be asked to endorse an incomplete Draft Report with no Recommendation or Executive Summary.

Date: 18<sup>th</sup> August, 2004

Signatures



Duncan McInnes  
Representative  
NSWPC



Danielle Cronin  
Representative  
CCSP



For Jenny Caughey  
Representative  
ICPA



Glenda Staniford  
Representative  
BUS Action Group

**Attachments:**

1. Critique on work of Queensland School Transport Safety Taskforce.
2. Statement by Professor Peter Joubert.
3. Omissions from meeting minutes.
4. Analysis of Risks, Hazards and Consequences.

**Critique on QUEENSLAND SCHOOL TRANSPORT SAFETY TASK FORCE – SEPTEMBER 2001  
Max Staniford (BUS Action Group)**

In his numerous presentations to the SBSWG, Dr Saffron failed to report on the most recent major investigation into school bus transport safety carried out in Australia – The Queensland School Bus Safety Task Force final report.

The Queensland Government established an independent task force on school transport safety in March 2001, chaired by Dr. Cherrell Hirst.

“The Task Force endorses the Australia Road Research Board’s goal to reduce the total number of child fatalities associated with school bus travel to zero across Australia.”

Over a 6-month period the commission met 22 times, including 4 full day sessions. It conducted a preliminary review of current national and international research in school transport safety, analysed data on fatalities and injuries in school transport over the decade, to 2000 in Queensland and nationally, and examined policies and practices on school transport safety at national and state levels in Australia and internationally. It called for an examined 185 public submission, met individually with 9 respondents and met with 25 researchers and practitioners in road safety, road engineering, education, policing, emergency services and the transport industry.

While the Task Force examined all aspects of school bus safety, the issues of standees and introduction of seat belts were a major part of its deliberations and recommendations.

**Analysis of Public Submissions – The Task Force report includes the following comments:**

“Seat belts were raised in 127 submissions (of 185) with 109 of these concerned that school buses do not currently have seat belts. This is a significant expression of the will of the community.”

“Parents and carers, students, school communities and health professionals were virtually unanimous in their support for seatbelts on school buses.”  
(Community Input P8)

“The Queensland Law Society justified their argument (for seat belts) on ‘duty of care’ grounds suggesting that the Government’s failure to mandate and install seatbelts on school buses is ‘a clear breach of the United Nations Declaration of Human Rights (1948)’.”  
(Community Input P8)

45 submissions referred to standees, overcrowding and three for two seating. These issues overlapped with the issue of seat belts. The research typically cited, was a letter from Professor P.N. Joubert forecasting that “a bus loaded with 103 children and 40 standees in a rollover accident would result in a 40-50 per cent death rate with a 90 per cent injury rate for survivors.”

and

“Bus operators and transport planners and policy makers favour a review of current standee limits to reduce overcrowding.”  
(Community Input P9)

**Meetings With Respondents and Researchers**

The following comments were made during meetings:

- a) “Intuitively standees appear to be at greater risk” (Austroads 2001 report)  
The issue of standees in high-speed zones should be addressed before looking at compartmentalisation and padding” Mr Michael Zotes Principal Consulting Engineer for ARRB Transport Research. (Research and Practitioner Input P4)
- b) “Due to their high centre of gravity buses have a high propensity to rollover, and therefore embankments pose a risk”, and “there are few barriers in use that will redirect a bus, generally only those used on bridges. Most guard rails should be treated as it would have no effect on buses at all.”

- 
- (Professor Rod Troutbeck, head of School of Civil Engineering QUT. Research and Practitioner Input P2).
- c) "Fitting seatbelts to buses, like most health initiatives, appears not to be feasible from a cost benefit perspective because of the low risk, but from an emotive point it is."  
And  
"Supports seat belts on all buses."  
And  
"There are benefits in developing a life long habit of buckling up."  
And  
"Standeers are at greater risk."  
Dr. Fred Leditschke, Retired Professor in Paediatric Surgery University of Queensland, Chairman of Child Restraint Education and Safe Transport Committee. (Research and Practitioner Input P6)
- d) "Standeers are over represented in injuries and fatalities are much more likely to occur when the bus rolls over."  
And  
"Seatbelts unquestionably provide protection in a rollover crash."  
And  
"Seatbelts would save lives (about 20 per cent)."  
Professor Drew Richardson, NRMA ACT Trust, Associate Professor of Trauma and Emergency Medicine in Canberra Clinical School of University of Sydney. (Research and Practitioner Input P7)
- e) "While most major bus crashes to date have involved coaches, the government has a duty of care to protect children. If there is a horrific accident and children are injured, the government will be liable."  
And  
"Standeers are at greater risk in a crash (contrary to the Henderson report) and should be banned in higher speed and higher risk areas."  
And  
"Once the issue of standees is managed there can be a measured implementation of seat belts in high risk areas."  
Emeritus Professor Peter Joubert, Senior Mechanical Engineer at University of Melbourne and a leading researcher in the field of bus and crash safety. (Research and Practitioner Input P12)
- f) "In a frontal collision between a bus and a car, the heavier vehicle will experience less deceleration, and therefore the injury to passengers is less. However in the case of a bus hitting a vehicle of the same size this does not apply."  
Mr. Henry Schluner, Queensland Transport
- g) "A workshop was conducted in the 1990's examining the amount the Mt Tamborine and Boondall bus crashes to determine what the outcome would have been had the buses met current seat strength, seatbelt and rollover ADR requirements. ....new buses with lap/sash belts would have saved up to 80 per cent of lives." (at Mt. Tambourine).  
Superintendent Grant Pitman and Sergeant John Ruller, Queensland Police Service (Research and Practitioner Input P19)
- h) "One view expressed by AMA Queensland and health and law enforcement practitioners.....is that people are more likely to adopt safe road use behaviour in one form of transport if they adopt it in another, so seat belts in buses would have an added benefit of encouraging people to wear seat belts in cars." (P14)

## RECENT DATA

The task force examined in detail, national data from the recent (Austroads 2001b) study of school transport by bus and Queensland data.

This data is similar to that presented to the SBSWG by Dr Saffron, but the conclusions reached by the Queensland Task Force are very different. For example:

- a) P. 15 "Bus passengers face greatest risk of injury if a bus rolls over in a crash or if a bus collides with another heavy vehicle at high speed."
- b) P. 15 "Although only one of the students killed.....in Queensland in the decade to 2000 was a bus passenger, the total number of fatalities across all modes of transport (65) is a small absolute number. One serious crash between a bus and another heavy vehicle on a high speed road could dramatically alter any conclusions drawn from the Queensland data."
- c) P. 3 "The Task Force was unable to determine relative safety of various modes of transport because data are not presently collected on the total number of students using each mode nor on the kilometers travelled on each mode."
- d) P. 2 "Task Force members share the community desire to ensure that bus passengers are safe."
- e) P. 11 "Fatalities and hospitalisations among bus passengers were more likely (61 per cent) to occur in areas with a posted speed limit of 80 kph or above. While the overall number is small, this difference

is of concern considering that population differences would suggest that the balance would be the other way. This is also consistent with national trends (Austroads 2001b).”

- f) P. “A Federal office of road safety analysis of 23 long distance crashes pointed out that the number of fatalities could have been substantially reduced by a combination of a number of safety features including rollover strength, seat and seat anchorage strength, padding and seat belts (Smith 1998).”

## RECOMMENDATIONS

P. 20

(ii) “Achieving seat and seat anchorage strength and fitting seat belts.

A program commencing July 2002 for buses meeting ADR 59/00 to be fitted with ADR 68/00 – compliant seats (including seat and seat anchorage strength and seat belts) in the following priority order:

- . Buses operating in Environment 3
- . Buses operating in Environment 2, starting with those operating on major freight routes.”

(iii) “Standees.

A program introduced concurrently with the introduction of seat belts from July 2002, to abolish standee practices on buses meeting ADR 59/00 fitted with seat belts operating in Environment 2, starting with those operating on major freight routes. Five-yearly targets to be established to ensure that by 2017 at the latest, standees are not permitted on any bus operating in Environment 2. Note: Standees are currently not permitted on buses operating in Environment 3.”

NOTE: Bus classification by operating Environment is shown on P.17

The Queensland bus fleet can be categorised by the level of risk of the environment in which a bus operates:

### ENVIRONMENT 1

Buses in an urban contract area  
High population density  
Lower vehicle speed limits and average vehicle speed  
Shorter journeys  
Predominantly sealed roads which are generally not steep/winding  
Identifiable peak periods of slow dense traffic  
Standees common  
Three-for-two seating common

### ENVIRONMENT 2

Buses in a non urban contract area  
Lower population density  
Many roads with speeds greater than 60 kph-110 kph  
Longer journeys  
Sealed and unsealed variable (to undulating/winding) roads  
Range of traffic volume and vehicle types  
Fewer standees  
Three-for-two seating common

### ENVIRONMENT 3

Buses on specified roads  
Long steep or very steep roads  
Standees are banned  
Three-for-two seating common

### COSTS FOR QUEENSLAND (P20)

“Bus replacement (based on full replacement costs only) to meet targets below for rollover strength, seat and seat anchorage strength and seat belts will cost between \$450 million and \$500 million over a 15 year period.”

### B.U.S. COMMENTS

Why was this recent comprehensive independent study from Queensland ignored during Dr Saffron’s many presentations to the SBSWG. As parent group members have been refused details of Dr. Saffron’s brief, we can only speculate on what his instructions were. The non-reporting of studies such as this, suggest that his brief was not to present a balanced summary of arguments for and against the introduction of seat belts on school buses. What other important studies in favour of seat belt introduction have also been ignored?

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Comments by

**PROFESSOR P. N. JOUBERT OAM, B.E., M.E., FIE Aust., FSAE, MSNAME, FTSE**

For Submission To  
NSW School Bus Safety Working Group

APRIL 2004

1. My name is Professor Peter Numa Joubert and I reside at 33 Walbundry Avenue, Balwyn North, 3104, Victoria. I was formerly the Professor of Mechanical Engineering at the University of Melbourne and currently still work there as a non-salaried Professorial Fellow supervising research of two PhD students.
2. Of pertinent interest is that I was a foundation member of the various titled advisory committees in vehicle design which were responsible for forming and introducing the vehicle design rules (ADR's). For many years I chaired sub-committees on occupant protection, trucks and buses and brakes. I left the committee when I retired in 1989. I continue motor accident activity as a consultant.
3. After I reviewed the literature on truck and bus safety in February 1974, on behalf of the Federal Department of Transport, it became obvious that seat strength was the immediate obvious source of weakness in the event of bus crashes. I discovered certain buses where the seats were attached by screws into the plywood floor; their resistance to impact was negligible. It is useless thinking about seatbelts if the bus structure including seats are not strong enough to carry the loads imposed in an impact by the seatbelts or by the unbelted seated occupants against the back of the seat in front of them.  
  
One particularly nasty accident in the UK involved a head-on resulting in the sheer failure of all the cast aluminium seat supports leaving sharp jagged edges, which tore gaping wounds on the passengers as they were flung forward to the front of the bus. There have been many similar accidents where the seats have become loose.
4. I was then supported by the Government in a study of bus seats and anchorages. A knowledgeable colleague, Dr. Williams, helped with the project. Mr. Dixon was a research student. After this I agitated for increased bus seat strength, seat belts on exposed seats and a seat belt for the driver but was always put off by arguments such as those put forward by Dr. Henderson, where he has stated "...costs thousands of times more than the value of the injuries saved".
5. Then came the accident on the 20th of October 1989. A semi-trailer ploughed head-on into a coach on the Pacific Highway at Grafton, NSW. Twenty passengers died and 15 were injured. Of particular note was the effect on injuries due to seat and seat mountings breaking free. However, this was not quite bad enough to cause positive action until 2 months later, on 22nd December 1989, two coaches collided head-on at Kempsey, NSW. Thirty-five people died and 39 were injured. Thereafter design rules for seat belts in coaches; improved seat and seat anchorage strength and emergency exits became the most urgent priority.
6. This brings us to one of my main points, namely, bus accidents with school children and especially coaches on freeways at high speed may be rare events but when they occur they are so horrific as to bring the wrath of God and especially the wrath of the parents of the children upon the heads of the bureaucrats and the members of the investigating committees who hide behind statistics for their lack of proper protection of school children.
7. When committees such as yours are confronted with statistics they may be blinded from alternative views. Pak Poy was a well-known Victorian Engineer involved in road safety. He looked at bus accident statistics (see my 1973 report), by considering the number of buses which shows a much higher involvement for buses compared to cars. This is the opposite of what is told to us about bus accident involvement, because these are usually worked out on the basis of accidents per

passenger mile. Because of the large numbers of passengers per bus compared to cars, the result is a low involvement of buses compared to that of cars.

Whatever the statistical measure the results of a bus accident at high speed are most likely to be horrific.

It was the occurrence of the two such horrific events, Grafton and Kempsey, which cause the sudden switch to bus safety early in 1990 led by the political reaction of the NSW Government.

I suggest to you, members of the committee, if buses are allowed to take large numbers of standing children at high speeds down freeways in due course there will be a nasty accident. It would be better in my opinion to act before the accident.

8. I now wish to comment on the paper by Dr. Michael Henderson, 1996, where some of his remarks have been given the incorrect meaning and where I consider he has been misleading in other remarks.
  - a) He does not say standees are as safe as seated passengers, rather he does say "Unless the bus seats are designed to increase safety the standing passenger is at no greater risk of injury than one who is seated". This qualification is critical.  
 His opinion may have had some basis in a low speed impact with older buses, but as your State have now implemented that "all new buses manufactured since August 1997 are required to be fitted with specially designed seats with extra padding, improved padding on interior rails and stanchions, improved mirror and door safety systems and the maximum speed of school buses with standing passengers has been restricted to 80km/hr", this aspect, the padding of the seat, is being solved. It needs to be expedited.
  - b) With a high-speed crash the standing passengers have no chance whatever of maintaining their equilibrium and move forward with the pre-impact velocity of the bus while the bus structure has come forcible to rest. If there are a number of standing passengers then the forces on the first passenger on impact with the front of the bus, are increased by the number of passengers standing behind him. So if there are say, 6 passengers standing together in a row down the aisle of the bus, then the impact force on the first standee is,
 
$$F1 = (m1+m2+m3+m4+m5+m6) \times \text{deceleration}$$
 Where m is the persons' mass.  
 The impact force on the second person is,
 
$$F2 = (m2+m3+m4+m5+m6) \times \text{deceleration}$$
 and so on.  
 It is only the last person, number 6, who receives the lowest force,
 
$$F6 = m6 \times \text{deceleration}$$
 Dr. Henderson's concept that "the risk per standee in a crash will be lower if there are a large number of standees on the bus", is not only misleading it is incorrect. It should be noted that his training is medical and not that of an engineer or applied mathematician.
9. It is my firm opinion that carrying standees in buses on freeways at high speeds is a situation to be avoided.

10. I would draw attention to the contradictory attitudes to vehicle safety for school children. Every time our children travel in a car they are exposed to road safety measures. As babies they travel in specially restrained cots. As mobile children they are restrained in a safety harness, and as they grow larger, in the adult seatbelt. The chances of being involved in an injury producing accident takes on average fifty years of driving which is a low risk. To be involved in a death takes 150 years. Yet the children adapt completely to the situation. Opposed to this when they travel on a bus they don't wear seatbelts, and are even forced to stand while the bus is travelling at high speed, which is a much more risky situation on the face of it, than travelling in a car with a seatbelt.

Your committee might think about this inconsistent attitude.

11. I note that you have been presented with the opinion of Dr. David Saffron. I would be happy to be interviewed, and would welcome the chance to comment on school bus safety.

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## School Bus Safety Working Group

by Belt Up for Safety Action Group

Glenda Staniford

### The case FOR seat belts in buses travelling on rural roads with speed limits of 80 kph & over

There is a **compelling case** for introducing seat belt legislation for rural buses:-

- **Fact:** Lap/Sash seat belts reduce injuries and prevent deaths to bus passengers in all accidents, as shown by F.O.R.S. Report (Feb. 1996) "Cost Benefit Analysis of Retrofitting Occupant Protection Measures to Existing Buses – Analysis of Bus Crashes 1987-1994 and Estimates of Injury Reduction". It examines 19 bus accidents in rural areas over 7 years, and concludes that 109 deaths would have reduced to 60 deaths, and 438 injuries reduced to approximately 90 if the bus passengers had been wearing a lap/sash seat belt.
- It is imperative that the government legislate known safety measures to reduce the risk of death and injury. The Government is presently exposed to the possibility of litigation claims, as the SSTS provides school travel and therefore have a Duty of Care to protect their passengers.
- Discrimination is also an issue with regard to bus passengers on rural roads.
- Although statistics reveal more deaths around buses, this should not obstruct measures to implement legislation to protect rural bus passengers, who have the same risk of death or serious injury as coach passengers. They travel on the same roads and highways with the same speed limits. This anomaly should be addressed urgently and existing legislation introduced to protect these high risk passengers.
- The risk of death or injury in a high speed bus accident is far greater than for low speed accidents in metropolitan areas.
- Prof. P. N. Joubert (Melbourne Engineer who headed the committees responsible for all the current ADR's applicable to Australian long-distance coaches) stated in August 2000 - "A bus you describe loaded with 103 children and 40 standees together with school bags, no seatbelts, low backed seats with no energy absorption in an impact with another vehicle of equal or greater mass would, in my opinion, give rise to an accident greater than the Grafton disaster. In a roll-over that might occur there is a great potential for an equally disastrous event. I would forecast a 40-50% death rate and over 90% injury rate for the remaining children."

The horrific outcome of the high speed Kempsey head on accident in 1989, involving two coaches not complying with ADR 68/00 demonstrates the urgent need for rural buses to comply with ADR 68/00. The Federal Office of Road Safety analysis of bus crashes 1987-1994, found that in the Kempsey coach accident, the 35 fatalities would have been reduced to 9, and the 39 critically or seriously injured passengers (all

hospitalised) would have been reduced to minor injuries if the passengers were wearing lap/sash seat belts.

- We are told that children are safer on their school bus than when travelling in the family car. This is untrue. Buses travel more frequently than the average family car, as taxis do, and the small number of bus accidents compared to car accidents reduces the risk in statistical terms because data is worked out on the basis of accidents per passenger mile. Therefore bus passengers have a higher risk of being involved in an accident than car passengers. School children face a higher risk because of the large number of bus trips per year – 404 per year, plus excursions. (risk analysis by Pak Poy – well known Victorian Engineer involved in road safety – see 1973 report by Prof. P. N. Joubert)
- Many students travel long distances (often greater than 500 or even 1000 kms per week, for 40 weeks of the year, therefore their exposure is similar to a coach passenger travelling between capital cities, but repeated 40 times per year.

### **The case AGAINST seat belts in buses travelling on rural roads with speed limits of 80 kph & over**

State governments have argued against the introduction of seat belts in school buses on the basis that:-

1. Analysis of accident statistics show that school bus travel is one of the safest forms of travel, and
2. That the cost of fitting seat belts is therefore not justified.

Neither of these arguments applies to school buses travelling on rural roads with speed limits 80 kph and over, because:-

1. The statistics quoted are for school bus travel in metropolitan and non-metropolitan areas. As the majority of school bus travel is within metropolitan areas, the higher risk of rural travel is hidden by the relatively safe results for low speed metropolitan travel.
2. If the cost of fitting seat belts to rural school buses is compared to the injury risk, the results would be quite different.

Therefore there is no justification to exclude rural school buses from ADR 68/00 legislation, and the F.O.R.S. report (Feb 1996) supports this view.

Most reports used to justify the present unsafe situation for bus passengers, are not relevant for buses travelling in rural areas. The Henderson/Paine (1994) report for example is not an independent analysis, as it was commissioned by the government and carried out by consultants well known to and appointed by the government.

#### **Research**

##### **School Bus Seat Belts - Their fitment, effectiveness and cost**

(Henderson/Paine 1993)

LAP belt research which concluded lap/sash benefits:

“rollover & side impact crashes, seat belts of especial value”

- “improved student behaviour”
  - “reduce injury, ~~dis~~benefits are trivial”
  - “cost to convert buses small, against high value of child safety”
  - “value of child’s life incalculable - grief & suffering extends beyond family”
  - “imperative to educate seat belt use - need for consistency”
- + see 3 pages of comments and quotations submitted to 7/4/04 meeting.

***Evaluation of Seat Belt Trial in Queensland: Final Report 2003***

- discouraged movement, reduced rowdiness & behavioural problems
- only 3 acts of seat belt vandalism, students had prior problematic behaviour
- students felt privileged to have seat belts provided to protect them
- McConnell 3/2 seat harnesses are easy to use & enable the ‘3 for 2 rule’ to remain
- Students concluded that compulsory legislation is required, along with education when seat belts were introduced
- abolishment of standees a first priority
- study had higher number of secondary students - primary students had higher usage rates
- no standard in trial– no conclusive evidence why seat belts shouldn’t be introduced

**Review of the School Bus Safety Action Plan – Final Report** (*Austroads 2002*)  
**- a national report**

- Page 15 – Examining bus crashes over 5 years 1992, 94, 96, 97 & 98 -  
Fifty two per cent of crashes were in rural areas. Only one crash occurred in a 40 km/h school zone. Over half occurred in areas with speed limits of at least 80 km/h. Eighty per cent occurred on 2-way undivided roads. Approximately half occurred in NSW (48%).

**Advantages for everyone**

**BUS DRIVERS -**

- less distraction /increased focus on driving
- less rowdiness /better concentration
- safer passengers /less stress if involved in accident
- decreased risk of death or injury to driver, when distracted less
- less noise /fewer passengers

**BUS OWNERS**

- dual use buses (charter & school)
- safer drivers (employees)
- lower Workcover premium?

**BUS PASSENGERS**

- reduced risk of death or injury
- positive reinforced education
- less stress /feel safer

**GOVERNMENT**

- clear conscience that passenger safety is highly regarded
- reduced administrative costs – less accident claims
- positive education for future adults

## PARENTS

- less stress knowing children are safer on school bus
- confidence in government legislating safety improvements

### Technology

#### **Seat belt**

- not new technology – in cars since 1972, coaches since 1994, minibuses since
- proven record - saves lives & reduces injuries
- inexpensive compared to cost of a new bus
- provide the highest level of safety
- safety device available
- legislation overdue in rural areas - coach anomaly
  - children have the right to equal protection on a bus

#### **Cost the ONLY negative, phased introduction the answer**

#### **Australian Transport Council Meeting 30/4/04** (Page 4 of Communique)

1. *“National Heavy Vehicle Safety Strategy – Jurisdictions supported the need for a cultural change within the industry in relation to heavy vehicle speeding and urged industry and governments to get behind the new initiatives to lessen the road toll.”*

Heavy vehicles pose the highest risk for buses, if involved in an accident with one another. Bus passengers need the best safety devices available to reduce the risk of death or injury if involved in an accident with a heavy vehicle, which is a lap/sash seat belt.

2. *“Seatbelts In School Buses – The Council noted that school bus safety was a matter of strong concern for many parents and that jurisdictions will continue to pursue safety measures that are likely to be most effective in reducing risks to children.”*

Governments should also be strongly concerned, and the introduction of seat belts for rural school buses would be pursuing a safety measure that would be most effective in reducing risks to children.

#### **School Buses Overseas**

1987 – New York mandates the installation of seat belts & 28” seat back height.

1992 – New Jersey mandates the installation and the usage of seat belts, including 28” seat back height.

1999 – Florida mandates the installation of seat belts & 28” seat back height on all new school buses, effective Jan 1, 2000. The law will also require seat belt use.

1999 – California Bill requires lap & shoulder restraints in all new school buses purchased after Jan 1, 2002

1999 – Louisiana require that every bus used primarily for the transportation of students shall be equipped with occupant restraint systems by not later than June 30, 2004.

2000 – Minnesota passed the Bill authorizing seat belts to be installed in new school buses, education of proper use, model training and addresses liability issues.

2002 – United Kingdom passed legislation for the compulsory installation of seat belts in some buses used for the transportation of children.

Ardsley, NY, West Orange NY, and Entobicoke, Canada have installed seat belts for over 20 years.



Additionally there are over 200 individual school districts in the US mandating the installation and usage of seat belts in large school buses.

### **Reply to Dr. David Saffron's 11<sup>th</sup> March Presentation**

We acknowledge the research done by Dr. David Saffron in the 3 weeks prior to his presentation on 11<sup>th</sup> March, but our group has been studying Australian government reports, overseas research studies and countless web sites over the last 3 years.

#### Page 8 – “Why priority setting”

##### 1. *“It is not easy to save one life” –*

It is very easy to save one life and perhaps many lives, if the Government recognise the fact that seat belt legislation has reduced death and injury for coach passengers (since 1994). The same benefits will apply for bus passengers when seat belt legislation for buses is introduced – especially for travel on high speed roads and highways.

##### 2. *“Seek actions that – address a large part of the problem”*

Bus passengers travelling on high speed roads and highways, if involved in an accident with a vehicle of equal or greater mass, have a high risk of death or injury. This is why ADR 68/00 was introduced for coach passengers, to reduce the known high risk of death or injury. It is a well known fact that lap/sash seat belts save lives, and the anomaly for bus passengers travelling on the same roads and highways as coach passengers has been ignored. Why wait for bus passengers to become “a large part of the problem”?

##### 3. *“Seek actions that – address a large part of the problem and for a reasonable cost”*

The cost to introduce seat belts is a small part of the overall cost of a new bus. Seat belt technology is available and retro fitting late model buses is also achievable for a reasonable cost. It is unreasonable to have bus passengers standing in the aisle and without the protection of a seat belt – especially on high speed roads and highways.

##### 4. *“Seek actions that – are likely to reduce the problem substantially”*

The fact that not one seat belted coach passenger has died since 1994 proves that seat belt legislation has saved lives. Bus accidents on average occur more than once a day, therefore providing bus passengers with a seat belt will protect them from possible death and injury on a daily basis.

#### Page 15 – “Investigation of internal bus safety measures (findings)”

##### 4. *“The evidence regarding the benefits of seat belts in buses is varying and conflicting”*

This report also states, “The known risks and benefits associated with the countermeasures under investigation have been documented in this report. The debate over the safety of school buses, the benefits of compartmentalisation, the cost of installing seat belts and other countermeasures relative to the safety gains that are expected to result is well-documented.”

Plus, the evidence for seat belt introduction for coach travel was justified and the benefits after 10 years have shown a reduction in fatalities and injuries. Rural school buses travel on the same roads and highways as coaches, and bus passengers in rural areas would also benefit from the introduction of seat belts.

##### 5. *“Lack of evidence that seated travel is significantly safer than standing”*

Austrroads 2002 is based on statistics nationally, not just those travelling on rural/open roads, where there is ample evidence that standing is an unsafe practice. Professor P. N. Joubert states the forces of impact on standing passengers (point 8 of submission) and

says "It is my firm opinion that carrying standees in buses on freeways at high speeds is a situation to be avoided".

Page 17 – "Why is seat belt benefits evidence unclear?"

6. "The Investigation report suggest that this is because there are few relevant crashes" and "Perhaps safety benefits are not great"

Again, this is a national report and the statistics do not relate to rural bus travel.

There was enough evidence of the benefits of seat belts for coach travel and rural buses travel on the same roads and highways as coaches, therefore the benefits are equal to both modes of travel.

In 10 years of seat belted coaches, not one seat belted passenger has died, therefore the safety benefits have been proven, especially as there have been a higher number of accidents over that 10 year period.

Page 18 – "Larger vehicles are safer for their occupants"

7. "Because bus occupants are already much safer than occupants of other vehicles it is difficult to prove a further benefit"

Statistics use the number of passenger miles to determine risk, rather than the number of accidents per vehicle. Bus passengers have a higher risk of being involved in an accident than a car passenger, as buses (like taxis) are on the road more frequently and there are less of them travelling on roads.

Page 20 – "Injuries on school buses"

8. "Henderson and Paine (1994) looked at bus crashes in detail  
- Injuries were over-reported by 40% in crash statistics  
- 97.5% of the injuries were minor"

Injuries still occurred, and will continue to occur in the future. Minor injuries should be prevented if at all possible (and seat belts do this effectively), and some serious injuries may become a minor injury if the bus passenger is provided with a seat belt.

Page 21 – "Unintended consequences"

9. "Henderson and Paine (1994) on costs  
- Where is money from?  
- Taxpayer funded to protect our children  
- No need for user pays or restricted access  
- Savings from fewer accident claims, to Motor Accident Authority

10. "User pays or restricted access to Scheme  
- Fewer children travelling by bus, the safest way to travel by road"

See point 7 above regarding safest way to travel.

Users may be prepared to pay, to have their children safer.

11. "More buses (if no standees) – Congestion, pollution and delays"

Congestion – if buses had seat belts there would be less congestion, as many parents presently drive their children to school. We are constantly reminded that seat belts save lives, and parents rightly believe that their children are less safe in a bus without them.

Pollution – insignificant in comparison to the safety benefits.

Delays – each bus will have fewer passengers, reducing the time for passengers to get off and on the bus, with maybe fewer stops as well. No delays.

The above unintended consequences are insignificant compared to the huge unintended consequence of educating students for over a decade during their formative years, to not wear a seat belt on an almost daily basis. We then wonder why many 17 – 25 year olds are not wearing a seat belt when involved in accidents. The NRMA 'Open Road' (Nov/Dec 2002) stated that 26% of drivers and 25% of passengers were not wearing seat belts in fatal accidents in 2001.

Page 26 – Queensland “Trial findings”

12. *“Belts uncomfortable and difficult to use”*

Lap/sash seat belts are used in every form of road transport except buses, but it is still compulsory to wear them because they are known to save lives and reduce injury. The trial seat belts were no more uncomfortable or difficult to use than those used in the family car. Many car passengers also complained that seat belts were uncomfortable when introduced in 1972.

Would the Government continue to exempt bus passengers from seat belt protection because a few children expressed their displeasure? These children were probably unhappy about being unable to move around the bus and voiced a negative reply to avoid having seat belts installed.

Page 29 – “Conclusion”

13. *“Based on the available evidence, we can have no confidence that fitting seat belts to buses would save any lives”*

Dr. Saffron states “we” can have no confidence etc.. “We” is definitely not the School Bus Safety Working Group, and I would like this opinion clarified.

Based on available evidence, seat belts on buses would certainly save lives and reduce injuries as well – especially those travelling on open/rural/non urban roads. This conclusion is wrong.

**Dr. Saffron’s consultancy was not approved by, nor was his brief decided by all members of the School Bus Safety Working Group.**

**As a consultant to the School Bus Safety Working Group, it would have been informative for Dr. Saffron to list the many positives for seat belt introduction in rural areas – from the vast array of decades of research, not just selective negative reporting.**

### **Reply to John Boon’s 7<sup>th</sup> April Presentation**

#### **Retro fitting of Seat Belted Seats To Route and School Buses**

This report appears to support the view that retro fitting is not a viable option, although the difficulties listed “may” affect only some buses. Perhaps late model buses with adequate structure could be retro fitted.

(All new buses manufactured since August 1997 are required to be fitted with specially designed seats with extra padding, improved padding on interior rails and stanchions, improved mirror and door safety systems. Perhaps these buses have adequate structure for retro fitting.)

#### Logistics

The cost of replacement buses while retro fitting is undertaken, would be unnecessary if retro fitting was carried out during school holidays.

Practicality/Conflict of interest

1. The journey time may increase as suggested, but the extra time would be marginal, and preferable to having injuries and deaths in transit.
2. "The increase in journey time may mean that fewer passengers will want to use the bus". Would anyone really believe that school children will not catch the bus because the trip will be longer because of seat belts?
3. "There are existing problems with curb space particularly in the city". We are considering rural areas, where curb space is not a problem. Again, safety should be paramount and have preference over decisions that "may" have a small impact.

**Conclusion**

**The cost to fit seat belts will not reduce. The problem will not go away, and as each day goes by children in NSW face an increased risk of death or serious injury, as our roads become more congested with traffic.**

**Ultimately the cost of safety needs to be viewed in the context of a fundamental goal to reduce to zero the number of school bus related deaths and injuries in New South Wales.**

**Safety for children is imperative and should be a high priority.**

All that is required is to remove the exclusion from ADR 68/00, for buses travelling in 80 kph and over speed zones in non-metropolitan areas.

ATTACHMENT 4

HAZARDS on NSW Roads			RISKS for Bus Passengers	
<u>Speed Zone</u>	<u>Roads &amp; Conditons *</u>	<u>Vehicles</u>	<u>Accidents/Incidents</u>	<u>Passengers</u>
S1 - 110 kph	R1 - Winding/Undulating	V1 - Greater Mass than bus - trucks	* - A1 - Head On	P1 - Standing
S2 - 100 kph	R2 - Mountainous	V2 - Equal Mass to bus - trucks, buses	A2 - Rollover	P2 - 3/2 Seating
S3 - 90 kph	R3 - Long Steep/Very Steep	V3 - Lesser Mass than bus - cars	A3 - Side Impact	P3 - Seated, no seat belt
S4 - 80 kph	R4 - Untarred		A4 - Rear Impact	P4 - With lap/sash seat belt
S5 - 70 kph	R5 - Snow & Ice		A5 -	
S6 - 60 kph & less	R6 - High Speed/High Traffic Volume		Braking/Swerving	
	R7 - Undivided Road		A6 - Driver Distraction	
			A7 - Driver Illness	

\* Not in order of Hazard/Risk severity

CONSEQUENCES - FROM ABOVE DATA

The risk increases, the higher the SPEED ZONE the bus travels in, for all passengers and the bus driver

The risk increases, the greater the MASS OF THE VEHICLE involved in the accident, for all passengers and the bus driver

All roads & conditions listed increase the risk for all passengers and the bus driver, compared to straight, wide, tarred and low speed roads

P1 - Highest probability of death or serious injury in all speed zones, on all roads and in all accidents and incidents

P2 & P3 - High probability of death or serious injury in all speed zones above 80 kph, on all roads & conditons and in all accidents and incidents

P4 - Has the highest probability of surviving any accident or incident, on any road and in any condition.

P2 - Installation of the McConnell Seats Educator 2-3 seating would enable the "3 for 2" policy to remain & ensure increased passenger safety

Recent research supports the installation of lap/sash seat belts and no standing passengers in rural areas.

See attached critique of Queensland School Transport Safety Task Force Final Report - September 2001



MINISTRY OF TRANSPORT

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ABN 25 765 807 817

Mr Kent Donaldson  
Executive Director  
Independent Transport Safety & Reliability Regulator  
Level 22, 201 Elizabeth Street  
SYDNEY NSW 2000

Dear Mr Donaldson

I refer to the Deliberations of the NSW School Bus Safety Working Group Seat Belts on School Buses draft report dated 21 July 2004.

I have been advised by officers of the Ministry who have been involved in the School Bus Safety Working Group that the draft report accurately reflects past reports made available and statistical analysis undertaken for consideration of the Group.

On the basis of information available it is clear that the relative safety of school bus travel school bus travel is high. This conclusion is drawn from all of the information made available, in particular the fatality statistics of 5-18 year olds whereby in NSW 6 deaths occurred on buses during school travel time over the ten-year period 1993 – 2002. It is noted that only one of these fatalities might have been avoided by a seat belt. By comparison, of this 5-18 year old group travelling during this time there were 34 pedestrian fatalities, 23 car passenger fatalities and 9 cyclist fatalities.

Notwithstanding the relative safety of bus travel a considerable effort has been undertaken in recent years to further improve the safety of school students travelling on buses.

Recent measures to improve safety on school buses include:

- installation of door safety systems and wig-wag lights;
- improved mirror systems and padding on buses, rails and stanchions;
- introduction of 40km/h speed zones around schools;
- establishment of an enhanced bus driver training;
- an RTA state-wide publicity campaign; and
- installation of static signage around schools

I have been advised that the installation of seat belts on school buses would have a significant impact on the bus passenger capacity. This impact has been estimated at a capacity reduction of 25% - 48% for larger buses and 20% for smaller buses. This increases the cost of seat belt implementation through the need for additional buses.

The estimated costs of retro-fitting all buses in NSW is estimated at between \$1.48billion and \$2.98billion, inclusive of additional buses required. Further to this is the additional variable cost of operating the increased fleet.


In an industry where financial viability has already been recognised as an issue of concern, these further costs cannot be absorbed by the industry. As a result significant Government funding would be required.

In my letter of 13 August I provided detail of the scope of bus reform in NSW emanating from the Unsworth Review of Bus Services. Cabinet approval to proceed with bus reform was conditional upon cost neutrality.

Any proposal for Government funding of safety initiatives such as the installation of seat belts in school buses would involve a significant change from the current and the proposed funding arrangements for school bus transport. Given that this would not be cost neutral Cabinet approval would be required to proceed.


Prior to seeking Cabinet approval a thorough analysis of issues including safety data and risk elements would need to be undertaken from a whole of government perspective to ensure the best use of funds to reduce road trauma and prevent accidents.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'John Lee', with a stylized flourish at the end.

John Lee  
Director General

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 **Motor Accidents Authority of NSW**

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MAA Ref:03/111

17-8-04

Mr Kent Donaldson  
Executive Director  
Transport Safety Regulation  
Independent Transport Safety and Reliability Regulator  
Level 22, 201 Elizabeth Street  
Sydney NSW 2000.

Dear Mr Donaldson

**RE: Report on “Deliberations of the NSW School Bus Safety Working Group: Seat Belts on School Buses”**

I note your request for written comment to be provided in relation to this draft report, in particular the process of developing the report as well as the findings.

The Motor Accidents Authority, (MAA), is satisfied that the process was open and inclusive including regular meetings and the opportunity to discuss submissions. The employment of an independent consultant to undertake further research into the area and to prepare a draft report defining options and estimated costs was considered particularly valuable.

The MAA has no objections to the draft report. The report is very comprehensive and covers;

- a review of the relevant research literature and current knowledge about the safety benefits to be obtained from seat belts on school buses
- an examination of injury and fatality statistics to help identify children’s transport safety when traveling to and from school by different transport modes, and
- options for the fitting of seat belts to school buses and estimating associated costs.

Importantly, the report presents a balanced view acknowledging two different ways of approaching the issue of whether seat belts should be installed in school buses, that is, a cost effective analytic approach and an ethical – legal approach.

The MAA supports in principle that every vehicle occupant should have the protection of a seat belt.



The MAA acknowledges that this is one of many road safety initiatives competing for resources and may not provide the most effective use of the substantial funds that would be required to fit seat belts in buses. However this needs to be balanced against increasing parental concern about the safe transport of their children.

The Authority considers that the best option to progress the proposal would be through the Australian Design Rules process as many of the issues raised would require a national approach.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'D Bowen', with a long horizontal flourish extending to the right.

David Bowen  
General Manager



Mr Kent Donaldson  
Executive Director  
Transport Safety Regulator  
PO Box A2633  
SYDNEY SOUTH NSW 1235

Dear Mr Donaldson

I write in response to your request for feedback on the proposal submitted by Belt Up for Safety (BUS) Action Group about seatbelt requirements on school buses and the Draft Deliberations of the NSW School Bus Safety Working Group, prepared by Dr David Saffron on behalf of the Independent Transport Safety and Reliability Regulator regarding Seat Belts on School Buses.

The Roads and Traffic Authority (RTA) supports the Draft Report on the *Deliberations of the NSW School Bus Safety Working Group* and request that the RTA's support of this document also be communicated to the members of the BUS Action Group in response to their submission.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'P. Forward', written over a horizontal line.

Paul Forward  
Chief Executive



## **Appendix C: B.U.S. Action Group Proposal**

This Appendix contains a proposal from a member of the SBSWG, the B.U.S. (Belt Up for Safety) Action Group, and comments on the proposal received from other members.

## Proposal for Members of School Bus Safety Working Group

### For School Buses within New South Wales

by Belt Up for Safety Action Group

**STAGE 1** – To be implemented by Term One, 2005

1. **Eliminate standing** on school buses, where the bus travels on roads and highways in **80 kph and over** speed zones in **non-metropolitan** areas i.e. rural or 'open roads'.
2. Legislate that all **new and replacement buses** that travel in **80 kph and over** speed zones, comply with Australian Design Rule 68/00.
3. Introduce **two rates of payment** for School Student Transport Scheme, with a reduced payment for buses without lap/sash seat belts - an incentive to upgrade buses sooner.

**STAGE 2** - To be implemented within a time frame set by working group members which will depend on costing to School Student Transport Scheme and bus owners.

**Legislate that all buses travelling on roads and highways in 80 kph and over speed zones in non-metropolitan areas to comply with Australian Design Rule 68/00.**

ADR 68/00 allows the use of McConnell Seats 'Educator 2/3' seating).

### **STAGE 3**

School Bus Safety Working Group to reconvene during 2006 to discuss possible timetable for further implementation of lap/sash seat belts to school buses in other regions.

Ministry of Transport will be asked to document implementation of Stage 1 and 2. This will provide an informative study for discussion, along with RTA data on numbers of new buses registered with seat belts and MAA data on reduced number of claims.

### Funding & Considerations

1. NSW Government could provide a subsidy to bus operators for nominated period (as Qld Government has implemented).
2. Savings will be made through reduced claims to Motor Accident Authority.
3. Roads & Traffic Authority will further their aim to have all road users safely seat belted.
4. Bus operators will have the option of using school buses for charter work – buses with a dual use will reduce costs.



Bus and Coach Industrial Association (N.S.W.)

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12 July 2004

Kent Donaldson  
Executive Director of Transport Safety Regulator  
ITSRR  
PO Box A2633  
SYDNEY SOUTH 1235

Dear Mr Donaldson

**Re: *BCA comments on Belt up for Safety Action Group Proposal***

### **Background**

- Buses are reportedly the safest form of motor vehicle transport in Australia.

A report by the University of Sydney indicates bus travel is overall, the safest form of land passenger transport for all passengers and the safest for school children between 5 and 16 years old if we exclude train. It is 23 times safer than driving, 1.38 times safer than being driven in a car, 23 times safer than driving a motorbike, 55 times safer than using a bicycle and 4.4 times safer than walking.

Mode	Relative Risk of Bus
<b>Bus/coach</b>	<b>1.00</b>
Car driver	23.41
Car passenger (include taxi)	1.38
Train and ferry	0.02
Motorcycle rider	23.62
Motorcycle passenger	9.71
Bicycle	55.27
Pedestrian	4.39

- The BCA supports initiatives to improve the safety of its workers and passengers, and recognises the Government's responsibility of setting parameters when resources are limited.
- The Australian Bus Manufacturing Industry builds buses mainly on imported chassis for all states (not just NSW) and supports a national approach to minimum design and safety standards. (This is what ADRs are intended for).
- Other jurisdictions have the responsibility to identify road black spots and take a comprehensive approach to passenger/vehicle safety. Seat belts are just one element in a much bigger picture.
- Dr Saffron's presentations on "recent literature studies" and "Injury and Fatalities" are seen as reasonable and are supported by the BCA.
- Considerable work is ongoing with the industry on improving safety, such as:
  - enhanced driver training
  - calling for improved infrastructure for bus transport
  - improving education material (video/brochures)
  - fitting video cameras in selected fleets
  - improved vehicle and seat designs



- promoting bus priority measures
- road blackspots identification
- seeking better funding models for bus services
- calling for better statistics/data
- making representations to Staysafe and Parliamentary Accounts Committees
- providing suitable alternatives to more dangerous means of transport (car)
- quality partnerships with schools/Department of Education, NRTC, MoT, etc.

### **Action Group's Proposal**

- With regard to the specific BUS Action Group's proposal, the BCA's views are:
  - the time frames suggested by the Action Group are completely unrealistic and do not allow sufficient lead time for operators to purchase the required numbers of buses. In addition to involving significant capital outlay.
  - It is evident from the issues raised in the Working Group's meetings, that any decision in relation to seat belts would be better addressed through a national approach. If considered feasible, possibly through the ADR process.
  - The proposal involves significant costs and it may be better to allocate such funds, if they were available, to where they would achieve the most benefit.
  - Furthermore, there would be a significant increase in the number of buses required to undertake the same transport task (due to no standees and no 3 for 2 rule etc) and added costs and environmental impacts. This would not only impact just on school transport but would extend to all bus transport. (There are environmental benefits if buses replace cars, however, not if you need more fuel/emissions from more buses to carry the same number of passengers).
  - It is extremely difficult to define what roads are actually deemed to be "rural" and a typical bus route may cover a range of speed limits. Therefore, this proposal would effectively apply to all buses.
  - There is no statutory basis to discriminate against operators because their vehicles do not have seat belts (ie. to support two rates of payment). It should be noted that buses in NSW do comply with the relevant ADR's and legislative requirements.
  - Bus Safety User Groups should be coordinated through a national body.
  - In relation to point 4 of the BUS Action Group's proposal, "bus operators will have the option of using school buses for charter work – buses with a dual use will reduce costs". This already occurs within the bus industry.



Darryl J Mellish  
Executive Director  
Bus and Coach Association



# Council of Catholic School Parents

Level 11 Polding Centre, 133 Liverpool Street, Sydney NSW 2000  
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Response from the

**Council of Catholic School Parents NSW & ACT**

to the proposal from the

**Belt Up for Safety Action Group**

The Council of Catholic School Parents (hereafter referred to as the Council), welcomes the opportunity to respond to the proposal put forward by the BUS Action Group and wishes to recognise the work done by the BUS Action Group in putting together the proposal.

## **STAGE 1**

The Council believes that the best way forward is to move directly to STAGE 2 and that the elements outlined in STAGE 1, on their own, may unnecessarily prolong the process. The full implementation of the group's objectives is at risk if the process is "staged" in this way. It would be more appropriate for these elements to be incorporated into one piece of legislation (see STAGE 2).

*The Council's response is that STAGE ,1 as an independent set of actions , should be removed.*

## **STAGE 2**

**"Legislate that all busses travelling on roads and highways in 80kph and over speed zones in non-metropolitan areas to comply with Australian Design Rule 68/00"** (BUS Action Group)

The Council's response to STAGE 2 is that this is the most important element of the proposal as it represents the primary objective. However, the Council recommends the removal of "in non-metropolitan areas to". The new statement would read:

*Legislate that all busses travelling on roads and highways in 80kph and over speed zones comply with Australian Design Rule 68/00.*

The Council recommends that contained within this legislation is provision for a "staging " or "phasing in" period until ALL buses are compliant, starting with new and replacement busses that travel in 80kph and over speed zones in non-metropolitan areas (rural and open roads). In other words, the Council recommends an implementation process based on identified risk, affecting busses travelling in high risk areas first and followed by busses travelling in lower risk areas. Other factors to be considered as part of this legislation would be the elimination of standing on school busses that have been targeted for the installation of seatbelts across metropolitan and non-metropolitan areas.

The timing of the process will, no doubt, be affected by the costs involved.

**STAGE 3**

The Council supports the proposition that the Bus Safety Working Group reconvene at a later stage to examine/evaluate the process.

Signed:

A handwritten signature in black ink, appearing to read 'Danielle Cronin', with a large, decorative flourish at the end.

Danielle Cronin  
Executive Coordinator  
Council of Catholic School Parents

Dated:

5 July 2004



Custom Coaches Response  
to  
B.U.S. Action Group proposal  
7<sup>th</sup> June 2004

**Our Position**

Custom Coaches is a bus manufacturer and it is in our interest to agree to all the proposals. All proposals will result in a need for new buses both as replacement for ageing fleets and for new buses for an expanded fleet.

The push is to eliminate standing passengers and the further push for seat belted seats will reduce passenger numbers per bus. Seat belted seats are larger than conventional route bus seats as well as being heavier.

The Australian bus building industry builds bus and coach bodies for the +35 passenger market. The small end of the market is serviced by Japan and Korea. The Australian bus industry builds bus bodies on mainly imported chassis.

The Australian bus industry looks forward to increased orders, for both new buses and to modify existing fleets.

**The reality of the situation.**

Addressing the proposal in the order as laid out in the document attached to a letter from Mr. Donaldson, dated 31<sup>st</sup> May 2004.

**Stage 1**

**No. 1**

We see no difference between the Metropolitan and the Non Metropolitan area. We understand the argument to be.

On non-divided roads, higher opposing speeds but less numbers of students than nearer the City where the roads are more often divided but far greater numbers of student and much greater traffic density.

If only one area is to have the improved safety then a survey of the accident reports should be undertaken to determine the black spots.

**No. 2**

This proposal would also affect buses registered in other states and the ACT, which operate across state borders. Ideally the legislation should be National.

**No. 3**

Even if there was no legislation but the P & C of a particular school offered the bus provider a bonus of say \$50 per child per year this may be the incentive needed in some instances.

**Stage 2**

Please see item 1 of stage one for our comment.

### Stage 3

Any implementation should be a phased introduction. We have argued that the Black Spots should get the first attention. There is a selfish motive in this argument;

- 1 There is insufficient industry capacity to produce an inordinate number of new buses to meet a unilateral introduction of retrospective legislation.
- 2 The Australian bus industry builds about 700 to 900 new buses a year. The NSW market absorbs about 40% of the new buses. There is some export of secondhand buses from NSW to other states.
- 3 If there was a wholesale introduction of upgrades school buses it could near destroy the Australian bus building industry. An increase of 100 new buses a year could be absorbed by the existing industry. The bus building industry could be expanded at the rate of say 100 buses a year. This would be a manageable and orderly growth of the industry.
- 4 The unilateral introduction of seat belted school buses in NSW could lead to a feast and famine situation. If by some miracle the Australian industry could double production for say, two or three years to meet a sudden demand, then we, the industry would move from a glut to a famine. This would lead to a much reduced demand for remainder of the 15-year bus build cycle.
- 5 An industry boom would lead to higher prices. The Australian bus building industry finds it very difficult to obtain skilled labor. Training people cost lots of money. This would increase the cost of buses built at short notice and then a retrenchment package would increase the cost of future buses.
- 6 The turn down in the industry following the initial peak would take away some of the economy of scale that we currently enjoy, again increasing the future cost of buses.
- 7 The best possible introduction is a gradual replacement of older buses, 15 or more years old when they become due for replacement, with a new seat belt equipped bus. There would also have to be a legislative requirement that mandated all new school buses in NSW to be seat belt equipped. This legislation would also ban the importation of second hand non seat belt equipped buses into NSW.
- 8 The Australian bus industry seeks a larger market as we have said at the introduction however a boom bust approach will destroy the industry

John Boon.





**FEDERATION OF PARENTS AND CITIZENS' ASSOCIATIONS  
OF NEW SOUTH WALES**

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26<sup>th</sup> June 2004

K/174

Kent Donaldson  
Executive Director  
Transport Safety Regulation  
Level 22  
201 Elizabeth Street  
Sydney NSW 2000

Dear Mr Donaldson,

The Federation of Parents and Citizens' Associations have been considering a number of issues in relation to road safety.

In relation to the Proposal for School Buses in New South Wales, the Federation, in principal, supports most of the proposals in relation to stages 1 to 3 of the document of the 31<sup>st</sup> May 2004.

In particular Federation is happy to support STAGE 1, Point 1 in that there should be an elimination of standing on school buses, where the bus travels on roads and highways in 80kph and over speed zones in non metropolitan areas. It should be noted however, that our policy states that "No school student shall be required to stand on school buses" Policy 11.44 (o). We understand that the standing on buses clause is an interim measure, however, we should be mindful that the Federation would like our policy to be enacted.

In relation to STAGE 3, the Federation understands that the 2 for 3 seat belt rule will take some time to move to a 1 for 1 rule but actively supports the phasing in of seat belts for all children in buses in the future. It supports the idea that this topic remain on the agenda for discussion and implementation.

Federation continues to discuss 40km speed zones outside of schools and the hours that these should extend. It is clear that there needs to be an extension of such hours. However, Federation would like to pursue this directly in discussions with the RTA.

Yours sincerely,

Sharryn Brownlee  
*President*

Response from  
**The Isolated Children's Parents' Association of NSW Inc.**  
to the proposal for  
Members of the School Bus Safety Working Group  
by the  
**Belt Up for Safety Action Group**

*\*Preamble: The Isolated Children's Parents' Association of NSW Inc. welcomes the opportunity to comment on the proposal by the Belt Up for Safety (BUS) Action Group and would like to acknowledge and congratulate the BUS Action Group on the work it has done to formulate this proposal.*

**STAGE 1** – To be implemented by Term One, 2005

*\*ICPA-NSW agrees with the implementation of the three (3) points in Stage 1 by the beginning of Term 1, 2005.*

1. **Eliminate standing** on school buses, where the bus travels on roads and highways in **80 kph and over** speed zones in **non-metropolitan** areas i.e. rural or 'open roads'.  
*\*ICPA believes that standing on school buses in rural areas should be eliminated. In the event of an accident at 80 km/hr standing passengers are at higher risk of serious injury or death.*
2. Legislate that all **new and replacement buses** that travel in **80 kph and over** speed zones, comply with Australian Design Rule 68/00.  
*\*This is a logical start to phasing in seat belts in school buses the same way that seat belts were introduced into cars.*
3. Introduce **two rates of payment** for School Student Transport Scheme, with a reduced payment for buses without lap/sash seat belts - an incentive to upgrade buses sooner.  
*\*ICPA believes that a new increased rate of payment for buses fitted with seat belts be introduced. Those operators with contracts in place should have their current pay formula maintained i.e. not have their payments reduced because they haven't got seat belts.*

**STAGE 2** - To be implemented within a time frame set by working group members which will depend on costing to School Student Transport Scheme and bus owners.

**Legislate that all buses travelling on roads and highways in 80 kph and over speed zones in non-metropolitan areas to comply with Australian Design Rule 68/00.**

ADR 68/00 allows the use of McConnell Seats 'Educator 2/3' seating).

*\*ICPA believes this is reasonable, fair and flexible. The time frame is dependent on the cost of implementation. Buses will not have a reduced capacity if the McConnell Seats are used.*

### STAGE 3

School Bus Safety Working Group to reconvene during 2006 to discuss possible timetable for further implementation of lap/sash seat belts to school buses in other regions.

Ministry of Transport will be asked to document implementation of Stage 1 and 2. This will provide an informative study for discussion, along with RTA data on numbers of new buses registered with seat belts and MAA data on reduced number of claims.

#### Funding & Considerations

1. NSW Government could provide a subsidy to bus operators for nominated period (as Qld Government has implemented).
2. Savings will be made through reduced claims to Motor Accident Authority.
3. Roads & Traffic Authority will further their aim to have all road users safely seat belted.
4. Bus operators will have the option of using school buses for charter work – buses with a dual use will reduce costs.

***\*ICPA agrees with this summary of proceedings and would be happy to provide a representative when the School Bus Safety Working Group reconvenes in 2006. The MoT is already investigating using school buses in isolated rural communities to provide community transport services. If seat belts are fitted into these school buses then operators have more flexibility for work options.***

***\*ICPA response is in italics and bold.***

***Isolated Children's Parents' Association of New South Wales Incorporated***

Signed  .....ghey, Vice President, ICPA-NSW



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Ms Carolyn Walsh  
Chief Executive Officer  
Independent Transport Safety & Reliability Regulator  
Level 22, 201 Elizabeth Street  
SYDNEY NSW 2000

Dear Ms Walsh

I refer to your letter advising of the proposals of the Belt Up for Safety (BUS) Action Group relating to funding and contractual arrangements for bus services.

As you know, in July 2003 the Minister for Transport Services initiated the first major review of bus services in NSW since 1961. The final report of the Review, undertaken by the Hon. Barrie Unsworth, was released in March this year. It proposed 48 recommendations for improved planning, funding and contracting arrangements to ensure better outcomes for passengers and sustainable bus services.

Over 1,800 submissions were received in relation to the Unsworth Review and an extensive program of community consultation was undertaken, including visits by the review team to rural and regional centres. While the Review's terms of reference included aspects relating to school student travel, the specific issues of the BUS Action Group were not raised as key concerns. The main SSTS issues identified were:

- the policy of providing free travel to students travelling long distances to their school of choice;
- the need to pay bus operators on the basis of actual travel undertaken; and
- the proposal to charge an annual "co-payment" fee for school bus passes.

Consequently, the final report did not contain recommendations concerning the elimination of standing on school buses in 80kph and over speed zones, the need for compliance with Australian Design Rule 68/00 and the introduction of seatbelts.

The Review's recommendations were considered by the NSW Government and in-principle approval was given to the implementation of bus industry reform. Consistent with the Review's terms of reference, Cabinet's endorsement of the Unsworth recommendations specified the need for cost neutrality. As a result, this is the basis on which the new contracting, funding and planning arrangements are now being developed, in consultation with the industry and other key stakeholders.


The BUS Action Group proposals are therefore not part of the bus reform agenda or implementation plan as currently endorsed by Cabinet. As they would involve a significant change from the current and the proposed funding arrangements, analysis of issues including safety data and risk elements would need to be undertaken from a whole of government perspective to ensure the best use of funds to reduce road trauma and prevent accidents. As a result, a separate Cabinet approval would be needed to progress such proposals.

Yours sincerely



**John Lee**  
**Director General**

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 **Motor Accidents Authority of NSW**

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MAARef:03/111

17-6-04

Mr Kent Donaldson  
Executive Director  
Transport Safety Regulation  
Independent Transport Safety and Reliability Regulator

Dear Mr Donaldson

**RE: School Bus Safety Working Group**

I note your letter requesting comment on the proposal received from the Belt up for Safety Action Group ( B.U.S.) by the School Bus Safety Working Group.

In relation to the proposal received the feasibility of Stage One would be dependent on advice received from the relevant agencies involved and on consideration of other relevant information currently being researched and collated for the final report. It would appear that the current time frame i.e. for implementation by Term One 2005, may be unrealistic.

In relation to point 2 under Funding and Considerations, “ Savings will be made through reduced claims to the Motor Accidents Authority,” the following comments are made.

The Motor Accidents Authority’s role in road safety stems from its legislative requirements to contribute to injury prevention and management. As the insurance regulator, the MAA also has an interest in, and responsibility for, reducing accident costs and subsequent costs for the Compulsory Third Party ( CTP) personal injury insurance Scheme.

The Authority has limited funding for injury prevention and therefore supports road safety by targeting groups that are high risk and/or high cost to the Scheme including youth, children, motorcyclists and pedestrians.

Green Slip premiums are set for different classes of vehicles based on the cost of claims associated with that vehicle class. In the event of reduced numbers/costs of claims for any vehicle class any “saving” made would be reflected in reduced premium for that vehicle class and would not result in increased funding being available to the Authority.

Yours sincerely



Gill Browne  
Principal Advisor Road Safety





## **N.S.W. PARENTS COUNCIL Inc.**

Representing Parents with Children at Non-Government Schools since 1962

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### **SCHOOL BUS SAFETY WORKING GROUP**

#### **RESPONSE TO PROPOSAL FROM BELT UP FOR SAFETY(B.U.S.) ACTION GROUP**

##### **INTRODUCTION**

NSW Parents Council (NSWPC) is a peak organisation representing parents with children at non-government schools. In recent years NSWPC has been tasked by its membership to strive to maximise the safety of students in all school situations. Members have raised major concern with the safety of children travelling in buses on country roads. Accordingly NSWPC has played an active role with other peak school parent organisations and with the NSW Government in seeking to improve the safety of students travelling on school buses, with priority to roads in country NSW.

NSWPC is a member of the School Bus Safety Working Group (SBSWG) set up to advise the NSW Government on an action plan to improve school bus safety, in particular the introduction of seat belts. NSWPC makes this submission to the SBSWG to respond to a proposal put by the Belt Up for Safety Action Group (BUS). The submission comments on the background and context of the proposal; and details the NSWPC position on the proposal. It is understood that this submission will form part of the final report to the NSW Government.

##### **BACKGROUND TO PROPOSAL**

There are many matters to recognise which set the scene for the coming forward of the BUS proposal. The establishment of the SBSWG came about by the joint effort of the peak school parent organisations during and in the aftermath of the 2003 NSW Elections. The school parent organisations are very appreciative to get their issues to a formal advice status by the Government and to be part of the formal process.

Transport Services Minister Michael Costa gave a positive approach to the task ahead for the SBSWG at a meeting with school parent representatives on 11th June 2003. The Minister gave a clear and enthusiastic message that he wanted to find solutions and get on with improving school bus safety in country areas. The Terms of Reference, which were prepared without consultation with the parent organisations, do not reflect the same level of the Minister's intentions.

The SBSWG has taken on a character of being more of a technical working party than a steering committee. NSWPC had not expected to be a member of a technical working party and to be immersed with the evaluation of transport data detail. BUS, as a single-issue interest group, has been active in school bus safety for a number of years and joined the SBSWG with much investigative work done on the issue. NSWPC appreciates the knowledgeable input and on-going evaluation of technical material by the BUS that has been discussed at the SBSWG.

There have been numerous delays to the initial timeframe for the SBSWG. While the ITSRR is providing secretarial support, that organization has also act as a filter for almost all information coming to the SBSWG. The parent organizations had no input into the selection and briefing of the expert consultant, Dr David Saffron. Presentations on research aspects were expected also from other relevant agencies. There appears to be no clear logical methodology applied to the Terms of Reference in the meetings of the SBSWG. Some issues raised in the initial submissions from the parent organizations have not been addressed. Members are to await the draft report being prepared by the consultant as the first indication of the nature of possible recommendations.

### **CONTEXT OF PROPOSAL**

NSWPC is of the view that from the matters identified in the discussion of the Background above comes a rationale for the BUS proposal. Essentially, NSWPC sees the proposal borne out of frustration with the perceived low status, skewed focus, poor methodology and lack of progress of the SBSWG.

There has not been a commitment by some member organizations to have consistent and senior representation at the meetings. There have been numerous timeframe delays caused by administrative arrangements and no progress reports to the Minister nor formal instructions from him to extend the timeframe. Concerns have been expressed with the balance of the consultant's advice. The right questions are not being investigated. The work to date has focussed on the "why question" of seatbelts on school buses, not on the "how question" to get seatbelts on school buses. The latter is the message the Minister has given to the school parent representatives. Little work has been done to explore and evaluate options to get seatbelts on school buses.

### **NSWPC POSITION ON PROPOSAL**

NSWPC sees the BUS proposal as an attempt to create a sharp focus on the issues and to get the key elements of the action plan progressed. NSWPC shares the frustration of BUS and supports their action to make an alternate approach to the work of the SBSWG.

NSWPC is in general support of the elements of the BUS proposal.

However, NSWPC is of the opinion that an initial policy decision must be taken to implement changes to the full scope of the elements and that laws be introduced in one action, but allow a phase-in approach. NSWPC does not support, in this current issue of school bus safety, the Stage 3 of 'further implementation of lap/sash seat belts to school buses in other regions'. NSWPC does not support a phase-in approach that allows the detail of Stage 2 to be formulated at a later time.

NSWPC views the definition by Stages as appropriate for planning & implementation. NSWPC is of the opinion that the definition of the target road settings should not be weakened by a few exceptions. NSWPC is of the opinion that the Stages require exact timeframes to be implemented, eg Stage 1 by the end of Term 1, 2005.

NSWPC views the BUS comments on "Funding & Considerations" as matters for the development of options and NSWPC gives no comment on these matters at this time.

NSWPC seeks the future focus of the SBSWG be on developing and evaluating the possible options to achieve Stages 1 and 2.



Duncan McInnes  
Executive Officer  
2 July 2004



Mr Kent Donaldson  
Executive Director  
Transport Safety Regulator  
PO Box A2633  
SYDNEY SOUTH NSW 1235

Dear Mr Donaldson

I write in response to your request for feedback on the proposal submitted by Belt Up for Safety (BUS) Action Group about seatbelt requirements on school buses and the Draft Deliberations of the NSW School Bus Safety Working Group, prepared by Dr David Saffron on behalf of the Independent Transport Safety and Reliability Regulator regarding Seat Belts on School Buses.

The Roads and Traffic Authority (RTA) supports the Draft Report on the *Deliberations of the NSW School Bus Safety Working Group* and request that the RTA's support of this document also be communicated to the members of the BUS Action Group in response to their submission.

Yours sincerely

A handwritten signature in purple ink, appearing to read 'P. Forward', written over a horizontal line.

Paul Forward  
Chief Executive



## Endnotes

- <sup>i</sup> From Minutes of first meeting, page 1.
- <sup>ii</sup> Irwin J D, and Faulks I J (2000) Seat belts and buses: a comment on the issues. *RoadWise Vol 12 No 2*, pages 11-18, EMU Press, Armidale
- <sup>iii</sup> See for example the RTA's Road Safety 2010 (URL: <http://www.rta.nsw.gov.au/roadsafety/downloads/rs2010.pdf>)
- <sup>iv</sup> See URL: [http://www.dotars.gov.au/transreg/str\\_adrindx.htm](http://www.dotars.gov.au/transreg/str_adrindx.htm)
- <sup>v</sup> "Gross vehicle mass" means the maximum loaded mass of the vehicle, usually specified by the manufacturer (see *Road Transport (Vehicle Registration) Act 1997*, section 4 – Definitions)
- <sup>vi</sup> Tziotis M, Newman S, Stephenson W, and Attewell R *School bus safety in Australia: technical report* (Austroads Publication No. AP-R186A/01), Sydney (URL: [www.austroads.com.au](http://www.austroads.com.au)), and summary report entitled *School bus safety in Australia: summary report* (Austroads Publication No. AP-R186/01)
- <sup>vii</sup> Hensher updated the study in 2002, concluding again that *for the carriage of school children, buses are overwhelmingly safer than any other road mode. Train is the only safer mode.*
- <sup>viii</sup> Newman S, Catchpole J, Tziotis M, Attewell R, and Neeman T *Review of the School Bus Safety Action Plan — Final Report* (Austroads Publication No. AP-R207/02), Sydney (URL: [www.austroads.com.au](http://www.austroads.com.au))
- <sup>ix</sup> Newman S and Coutts M Investigation of internal bus safety measures (Austroads Publication No. AP-R213/02), Sydney (URL: [www.austroads.com.au](http://www.austroads.com.au))
- <sup>x</sup> It appears that this is a major part of the cost of retrofitting; see section 4.4.6.
- <sup>xi</sup> Report on the safety and economic implications of permitting standees on urban and non-urban buses (URL: <http://www.parliament.qld.gov.au/comdocs/travelsafe/tsafe11.pdf>)
- <sup>xii</sup> URL: <http://www.carrsq.qut.edu.au/schooltransportsafety/FinalReport.pdf>
- <sup>xiii</sup> Reference from the Queensland Task Force Report: Smith, K. B. (1998). *Bus Crashes and Occupant Protection: A Brief Summary and Analysis of Crashes Involving Long Distance Coaches*, Australia 1988 to 1994. Federal Office of Road Safety (now the Australian Transport Safety Bureau), Canberra.
- <sup>xiv</sup> Coutts M, Newman S, Roper P, and Styles T (2003) *Evaluation of the seat belt trial in Queensland: final report*. ARRB Transport Research. Available on Queensland Transport Road Safety Web page (URL: <http://www.roadsafety.qld.gov.au>)
- <sup>xv</sup> Department of Education, Employment and Training, Victoria (2001) *Review of school bus services: final report and recommendations* Available from Victorian Student Transport Web site (URL: <http://www.sofweb.vic.edu.au/studenttransport/busreview.asp>)
- <sup>xvi</sup> Hinch J, McCray L, Prasad A, Sullivan L, Willke D, Hott C, and Elias J (2002) *School bus safety: crashworthiness research*. Research and Development National Highway Traffic Safety Administration (Report URL: [www-nrd.nhtsa.dot.gov/departments/nrd-11/SchoolBus/SBReportFINAL.pdf](http://www-nrd.nhtsa.dot.gov/departments/nrd-11/SchoolBus/SBReportFINAL.pdf))
- <sup>xvii</sup> See NSW Department of Education and Training (2003) *Schools and students in NSW 2002* (URL: [http://www.det.nsw.edu.au/media/downloads/reports\\_stats/statsbulletin/stat2002.pdf](http://www.det.nsw.edu.au/media/downloads/reports_stats/statsbulletin/stat2002.pdf))
- <sup>xviii</sup> See, for example, page 1 of Federal Office of Road Safety (1997) *Helmet wearing and cyclist safety*. Australian Transport Safety Bureau, Canberra (URL: <http://www.atsb.gov.au/road/pdf/mgraph19.pdf>)
- <sup>xix</sup> The classification of injury into serious injury and other injury was discontinued in 1998 because the police report of "admitted to hospital" was considered to be unreliable. See page xi of the RTA's Road Traffic Accidents 2001 (although the page numbers are quite consistent from year to year) (URL: <http://www.rta.nsw.gov.au/roadsafety/downloads/accidentstats2001.pdf>).
- <sup>xx</sup> Metropolitan is defined, here, as the Sydney Metropolitan Area (which does not include Hawkesbury or Blue Mountains LGAs) plus Newcastle, Lake Macquarie, Gosford, Wyong, Wollongong, and Shellharbour LGAs.

<sup>xxi</sup> Linear regression of the total number of fatalities against year and the log of the total number of fatalities were statistically significant ( $p < 0.03$  for the fatalities, and  $p < 0.05$  for the log of the fatalities).

<sup>xxii</sup> It appears that the ATSB (or Federal Office of Road Safety, as it was then) was able to identify trip purpose by re-examining Coronial documents. An example is the 1999 monograph entitled *Road fatalities amongst children travelling to and from school in Australia* (Monograph number 26), which used 1994 data from the fatalities database.

<sup>xxiii</sup> There was a case of a pedestrian killed in NSW, where the ATSB were unsure whether it was a school journey. The NSW crash data indicates no pedestrian killed of the sex or in the age group indicated by the ATSB database.

<sup>xxiv</sup> For Western Australia, the statistics were provided by the University of Western Australia, rather than a road or transport authority.

<sup>xxv</sup> Hensher D (2002) *How safe are buses carrying school children? Supporting evidence*

<sup>xxvi</sup> Australian Transport Safety Bureau (2001) *Australian Bus Safety* Australian Transport Safety Bureau, Canberra

<sup>xxvii</sup> Where seating capacity was not recorded, it was estimated from the GVM or estimated GVM. GVM was estimated where missing from tare weight. These were linear estimates from the data for the buses that had been included 100% (MO plate, RBUS, PBUS and CBUS, but not TV plate), for which the relevant parameters were known. For light weight buses (defined as those that weigh up to 4.5 tonnes GVM and under 2.5 tonnes tare weight) the coefficients could not be estimated with sufficient statistical confidence. The buses that were in this weight category, and for which the capacity was known, varied in seating capacity; 24% had a capacity of 12 or less, and this proportion was used as an estimate for other buses in this category.

<sup>xxviii</sup> See Australian Bureau of Statistics, 4443.1 *Disability, New South Wales* Available at URL: <http://www.abs.gov.au>

<sup>xxix</sup> Of these 207 buses, 18 were included because of an estimated seating capacity, where none was recorded. Because of the decision to exclude buses with a gross vehicle mass of 3.5 tonnes or less from the costing, only 5 of these 18 buses were included in the overall costs.

<sup>xxx</sup> Of these 170 buses, 30 were included because of an estimated seating capacity, where none was recorded. Because of the decision to exclude buses with a gross vehicle mass of 3.5 tonnes or less from the costing, only 4 of these 30 buses were included in the overall costs.

<sup>xxxi</sup> Of these 255 buses, 160 were included because of an estimated seating capacity, where none was recorded. Because of the decision to exclude buses with a gross vehicle mass of 3.5 tonnes or less from the costing, only 3 of these 160 buses were included in the overall costs.

<sup>xxxii</sup> If  $N$  is the original number of buses,  $p$  is the proportional loss of capacity per bus, and  $M$  is the new number buses required, then the increase in the number of buses is

$$M - N = [p / (1 - p)]N$$

<sup>xxxiii</sup> House of Representatives Standing Committee on Transport and Regional Services (2004) *National Road Safety – Eyes on the road ahead* Parliament of the Commonwealth of Australia (URL: <http://www.aph.gov.au/house/committee/trs/roadsafety/report/fullreport.pdf>)

<sup>xxxiv</sup> See, for example page 9 of *A simple guide to child restraints*, Australian Department of Transport and Regional Services (URL: [http://www.atsb.gov.au/public/pdf/child\\_restraints.pdf](http://www.atsb.gov.au/public/pdf/child_restraints.pdf))

<sup>xxxv</sup> See NHTSA (2002) *Occupant protection for children: safety information* (URL: <http://www.nhtsa.dot.gov/CPS/safetycheck/MinuteChecklist/>)

<sup>xxxvi</sup> See page 235 of Australian Institute of Health and Welfare: *Australia's young people: their health and wellbeing 2003* (URL: <http://www.aihw.gov.au>)

<sup>xxxvii</sup> See page 27 of Austroads (2001) *Bus safety in Australia: technical report*

<sup>xxxviii</sup> Unsworth B (Chair) (2004) *Review of Bus Services in New South Wales* (URL: <http://www.transport.nsw.gov.au/busreview/>)

<sup>xxxix</sup> Henderson M, and Paine M (1994) *School bus seat belts: their fitment, effectiveness and cost* and Henderson (1996) *Standing in school buses: the strategic and practical issues*. Both reports for the NSW Department (now Ministry) of Transport

<sup>xi</sup> Barry Moore and Kirsty McIntyre (National Road Transport Commission) (2002) *Road transport reform in a federal system – a reflection on ten years in the process* 25<sup>th</sup> Australasian Transport Research Forum Bureau of Transport and Regional Economics, Canberra