

It's booster seat time for Kiwi kids

A recommendation for reducing injury for New Zealand children by increasing booster seat use



Summary

Safekids New Zealand recommends that the New Zealand Government urgently begins work to implement regulatory and policy changes that will require the use of booster seats to improve safety for children aged older than five years who are passengers in vehicles.

Each year, on average, twenty New Zealand children are killed while riding as passengers in motor vehicles. At least 267 children aged fourteen years or younger are injured severely enough to be hospitalised. This equates to, every week, five New Zealand children being killed or injured while they were a passenger in a vehicle.[1]

Advice that primary school age children require additional equipment to benefit from the full safety effects of a seat belt was published as long ago as 1983. While seat belts offer some protection in the event of a crash, they are designed to fit the anatomical structure of an adult. Child car restraints and booster seats are essential because they offer the protection necessary for the unique body structure of a child. [2, 3]

Improvements in the use of child car restraints for children aged five years and younger have been achieved, yet booster seat use by New Zealand children older than five years remains low. Research has shown that over half (60%) of the children who require a booster seat, are not using one. [4]

To achieve more effective booster seat use within New Zealand, Safekids NZ recommends that the New Zealand Government urgently initiates a public education programme focussed on the benefits of using booster seats; a robust project to make booster seats readily and widely available; compulsory regulation requiring their use and an enhanced enforcement programme.

Safekids NZ recommends the New Zealand Government;

- Amends the New Zealand Road User Rules to require the compulsory use of booster seats for child passengers.
- Updates booster seat information provided by New Zealand Government agencies.
- Funds booster seat provision within existing child car restraint distribution programmes.
- Provides a widespread public education campaign on the dangers of failing to use correctly fitting child car restraints and booster seats for children.
- Commences routine monitoring and reporting of booster seat use rates in the population.

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Introduction

Each year twenty New Zealand children are killed while they are travelling as passengers in motor vehicles. At least 267 children aged fourteen years or younger are injured severely enough to be hospitalised (on average, 1995-2004). This equates to five children killed or injured every week.[1]

New Zealand's rate of child passenger fatality ranks poorly against equivalent overseas countries including the United Kingdom, Norway and the USA (see Figure one). This indicates a huge additional toll of death and injury for New Zealand families. [5]

Correctly fitting child car restraints are one of the most convincingly effective interventions for the prevention of transport related injury to children. The use of car restraints for children younger than five years old has been compulsory in New Zealand since 1994.[2]

Recommendation that primary school aged children also require additional equipment to benefit from the full safety effect of a seat belt was published as long ago as 1983 (twenty five years ago). While seat belts offer some protection in the event of a crash, they are designed to fit the anatomical structure of an adult. Child car restraints, including booster seats, are essential because they offer the protection necessary for the unique body structure of a child. [2, 3]

The term 'child car restraints' refers to the range of products which are used to provide additional protection for child passengers, these include products such as 'baby capsules' for newborns and infants, rear facing seats and forward facing restraints for older children (see glossary in Appendix one). [6]

Booster seats are designed to provide protection for primary school aged children. They work in conjunction with the seat belt. Advice demonstrating that adult seat belt dimensions do not suit school aged children, and that in the event of a crash they require booster seats for adequate protection, has been known for a long time. [2, 3, 6, 7]

Yet booster seat use rates in New Zealand are low. Fewer than half of the children who require a booster seat for their safety are using one. [4] A major reason booster seats are not used is because many parents simply believe that they are not necessary, this belief is reinforced by the fact that their use is not subject to New Zealand law.[4, 8, 9]

This position paper examines the child injury issues related to booster seats, explains why booster seat use is vital, and for whom; discusses booster seat public policy issues and presents the case for a New Zealand Road User Rule that requires the compulsory use of booster seats, accompanied by a public education and distribution programme.

Safekids New Zealand is the national child injury prevention service based at Starship Children's Health and is a member of Safe Kids Worldwide. Our mission is to reduce the incidence and severity of unintentional injury to children aged 0 - 14 years in New Zealand. Safekids works to raise public awareness of child injury issues and advocates for the adoption of policies and strategies that will improve child safety.

Identifying the Problem

Child passenger fatality and injury

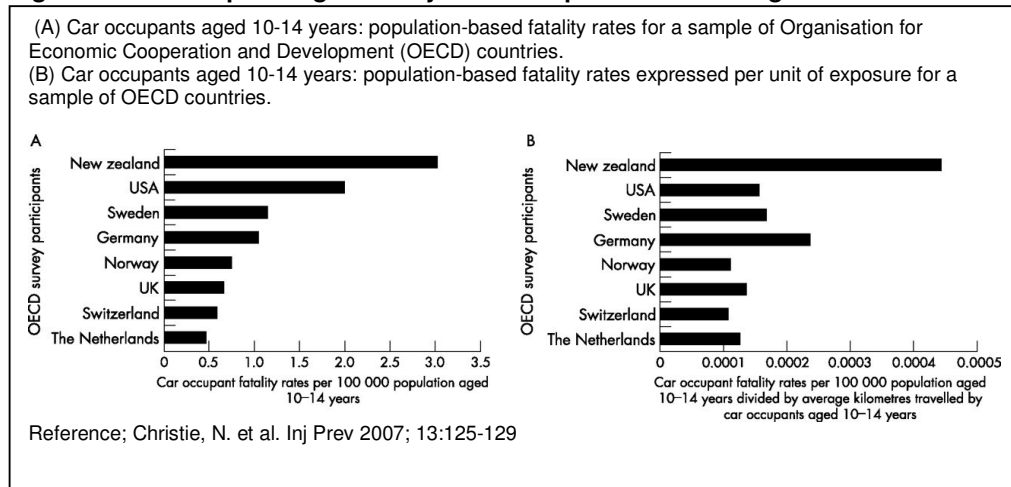
Every year New Zealand has high numbers of child passenger fatalities and injuries. Correctly fitted, age appropriate child car restraints and booster seats are the best way to reduce these statistics. Yet within New Zealand all too often these measures are not used or they are used inadequately.

Each year, on average, twenty New Zealand children are killed while they are riding as passengers in motor vehicles and at least 267 children aged fourteen years or younger are injured severely enough to be hospitalised (1995-2004). [1]

Car passenger fatalities contribute to 22% of all New Zealand unintentional child death. This equates to, every week, five New Zealand children killed or injured while they were travelling in a vehicle.[1]

New Zealand's child passenger fatalities rank poorly against equivalent overseas countries including the United Kingdom, Norway and the USA (see Figure one). This indicates a huge additional toll of death and injury for New Zealand families. [5]

Figure One: Child passenger fatality rates compared between eight OECD countries



Incorrect use of child restraints and seat belts

Ensuring the correct use of child car restraints requires ongoing commitment and focus. During 2005 New Zealand's Accident Compensation Corporation (ACC) reported that as many as 35% of New Zealand families they surveyed were using incorrectly fitted child restraints. [6]

Over five years 66% of the children admitted to the Starship Hospital Paediatric Intensive Care Unit due to injuries received in a car crash were either inadequately restrained, or not restrained at all. For 33% it was not known how they were restrained; only 1% of cases were thought to be correctly restrained (2000-2004). [10]

The premature and inadequate use of adult seat and lap belts to restrain children in vehicles also contributes to this injury picture. [4, 11-14]

Shepherd et al reviewed children who were admitted to Starship Hospital with lap belt injuries over seven years. This study described the types of injuries caused by incorrectly fitting seat and lap belts for 19 subjects, 16 of whom were aged between eight and fourteen years. [13]

These injuries included severe head injury, spinal fractures, bowel transection, severe liver and spleen damage, and paraplegia. Overseas studies also describe similar injuries from the incorrect use of age appropriate restraints. [11, 13, 15]

Booster seats – little known about and under used

Child transport experts have long been aware that booster seats are required to provide protection for children until they are the correct proportion to fit seat belts.

Research conducted in 1994 by Klinich et al for the USA National Highway Traffic Safety Administration (NHTSA), demonstrated the value of booster seats for improving the fit of the seat belt for older children. It was found the minimum size child who should use a three point belt alone had a sitting height of 74cm, standing height of 148cm and a weight of 37 kg.[7]

A later study in 2004 showed that when compared with restraint by seat belts alone, the use of a booster seat has been shown to result in 59% fewer injuries. [16]

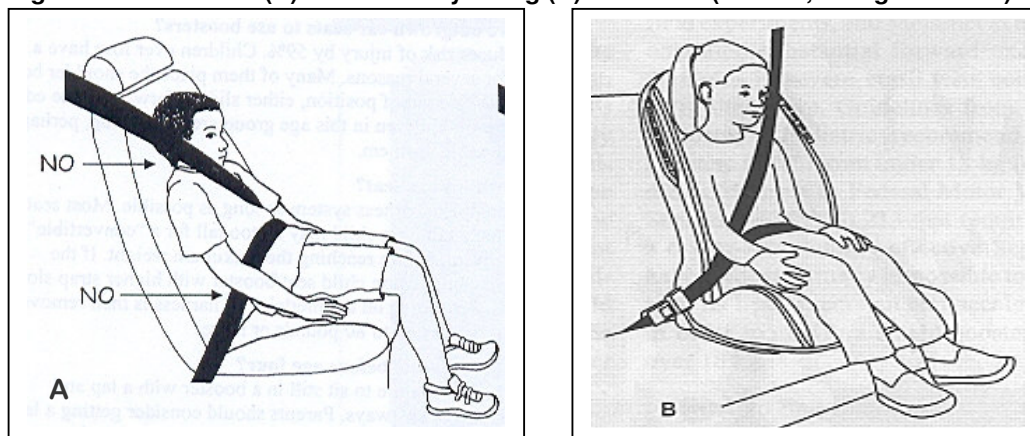
Despite this, booster seat use rates in New Zealand are low. In 2006 Cameron et al identified that as many as 60% of New Zealand children who needed a booster seat were not using one. [4]

The case for booster seats

What is a booster seat?

Because of their smaller size and unique proportions, children do not fit seats and belts designed for adults. They require a booster seat to enable them to fit the seat belt correctly and gain the full safety benefit of the seat belt, in the event of a crash. Their upper legs are not long enough to sit comfortably upright with their knees bent over the edge of the seat and buttocks against the back of the seat, so they slouch backwards allowing the lap portion of the belt to ride up over the abdomen. They are also too short to sit up and reach the anchor point for the sash portion of the belt especially when slouched backwards, allowing the belt to rest over the neck. In addition their overall small size and lack of fit to the belt mechanisms allows some to be completely ejected despite a fastened belt (see Figure two). [17, 18]

Figure two: Incorrect (A) and correctly fitting (B) seat belts (Source; E Segedin 2008)



Booster seats ensure children avoid the types of injuries that can occur due to poorly fitting seat belts. [13-15, 19, 20]

A booster seat is a rigid, fabric covered structure that is placed on top of a normal car seat. While there are many styles and models, it is most frequently used in conjunction with the seat belt. The booster seat positions the child and guides the seat belt across the child's thighs and hips to provide a better fit than if the child was seated on the seat restrained only by the car seat belt. [21]

The booster raises the child higher in the car seat, so that the car's diagonal safety belt fits properly across the child's shoulder and breast bone, and the lap belt is positioned correctly across the top of the legs. This means that during a crash the forces are directed through the solid bony parts of the child's anatomy.

Why should my child use a booster seat - what are their advantages?

Booster seats protect children who no longer fit child car restraints, but because of their size and physical proportions, do not receive adequate protection from using a seat belt alone. The booster seat lifts and re-positions the child within the seat belt. [6]

- Children seated in a booster seat are much less likely to be seriously injured or killed in the event of a crash. When compared with restraint by seat belts alone, the use of a booster seat has been shown to result in 59% fewer injuries. [4, 19]
- Booster seats re-position your child in relation to the seat belt and make the seat belt more comfortable for a child to use correctly. Children who are too small for an adult car seat belt wriggle forward so that their legs are comfortable, and “slouch” rather than sitting up straight. [7, 19]
- Booster seats ensure children avoid the types of injuries that occur due to incorrectly fitting seat belts. These include abdominal, head and neck injuries. [7, 13-15, 20]
- Some booster seats also have ‘side wings’ that also provide lateral support and side impact protection.
- Booster seats are relatively inexpensive and simple to fit and use. In 2006 Cameron et al found that of the children who were using booster seats in their study, 89% were using them correctly. [4]

When does my child need a booster seat?

As children grow taller they no longer fit their forward facing child car restraint. While some authorities refer to age as the determining factor, there are various guides as to when children should graduate from one type of restraint to another (see Appendix one). [22] One suggestion is for a child to be graduated into the next type of seat when their head is taller than the back of their restraint. [6, 22, 23]

Standardised age, height and weight charts show the majority of New Zealand children do not reach ideal dimensions for adult seat belts until they are approximately twelve to fourteen years of age. New Zealand study shows that children require the protection of a booster seat when they are travelling in a vehicle:

All 4 and 5 yr olds;
90% of 6-8 yr olds;
50% of 9 and 10 yr olds
10% of 11 and 12 yr olds [4]

On the basis of developmental age and height and weight normalised charts, you should assume your child may need a booster seat until they are about fourteen years of age. The “Five Step Test” is a list of questions developed to check (see Figure three). [4]

Figure three: The Five Step Test

Five Step Test	
There are five key tests that can be used to check if your child is safe just with a seat belt	
1.	Can they sit right back in the seat without their legs sticking straight out in front of them?
2.	Is the diagonal part of the seat belt over their shoulder and not against their neck?
3.	Is the lap part of the seatbelt staying low over their thighs and not riding up across their tummies?
4.	Are their knees bent comfortably over the edge of the seat?
5.	Can they stay seated like that for the whole trip?

Why seat belts don't fit children - and what happens in a crash

Few people realize that seat belts are specifically designed for adult bodies. At least half of all children do not reach the minimum proportions required to correctly fit a seat belt until they are at least nine years old, often older. [14, 18, 19, 23]

Seat belts are designed to keep people from hitting the inside of the vehicle or being ejected in a crash. In order to hold the person in place, a seat belt must be able to disperse a great deal of force across, or through, the body. The belt is designed to cross over the bones of the shoulder, chest and hips. This is because these bones can absorb the energy of the crash with less injury to the child than the softer more vulnerable parts of the body. [19]

When a child is too small for a seat belt, the belt rests across the wrong places, such as the child's neck and abdomen. Children have difficulty sitting up straight in a seat belt when they are small. This is because their legs are too short to comfortably reach across the edge of the seat. They 'slouch' to become comfortable and this causes the lap belt to rise further up the abdomen. A lap belt that starts out over the child's hips will eventually ride up because the child's hips are not developed sufficiently to keep the belt correctly positioned.

In a crash a child sitting in this way may suffer internal injuries to their liver, kidneys, bladder, spleen and intestines. [12-15, 19]

Children are also at increased risk when they tuck the shoulder belt under their arm or behind their back, or fall asleep and fall out of the sash belt. These situations are more likely to happen when the seat belt is touching the child's neck or face.

In a crash children sitting in this way are likely to 'jack knife' forward – fold in half – over the lap belt. Their spinal cords may be severely injured, and their internal organs crushed and ruptured. Their heads are likely to hit the inside of the vehicle, causing head, brain or facial injuries.

These risks are significantly reduced by sitting the child in a booster seat.

What is the safest way for my child to ride in my car?

Children are safest when seated in an approved, age appropriate restraint or booster seat, in a rear seat of the car. Avoid the use of lap belts only and never use a booster with a lap belt alone (see Figure four).

Figure four demonstrates the way children become incorrectly positioned when they do not have a booster seat.



What are the best ways to achieve booster seat use?

There are two main ways to increase booster seat use, through education and regulation. Promoting the correct use of age appropriate child restraints for younger children through both regulation and education has long been accepted as the way to reduce child passenger death and injury. [2, 4, 21]

While they are yet to move on requiring the use of booster seats for primary school children, or actively promoting their use, the New Zealand Government has required and enforced the compulsory use of child restraints for children under the age of five since 1994. The government also funds an accredited training programme in child restraint use (Safe2Go), which is administered by the Child Safety Foundation. [2, 4, 24]

Internationally the need for booster seats for older children is being increasingly recognised. Legislation requiring booster seat use is being systematically implemented (in conjunction with education programmes) within, for example, the United Kingdom, the USA, Canada and the European Union. [18, 25]

One direct effect of regulation (and education) is to increase the demand for, and supply of, booster seat products. This enables companies to invest in developing a greater product range and to reduce the price.

Why might so few New Zealand families use booster seats?

Seat belts, harnesses and child car restraints are now accepted as a normal part of life by most New Zealanders, and their use is widespread. Booster seats are, however, substantially less commonly used. In one study 60% of children who required a booster seat were found not to be using one. [4, 26]

Many people believe that their child no longer requires a car seat after they reach the age of five. This is when the New Zealand Road Code no longer requires the compulsory use of a child restraint at all times. The Road Code only requires children aged 5 to 14 years to use a child restraint or seat belt if one is available within the car. [23]

The official Land Transport New Zealand Fact Sheet on Child Restraints, published in 2005, recommends booster seats are only used until children are aged seven years of age. This is in contrast to other international recommendations and research that shows as many as 90% of children will still require a booster seat at this age, and older. [4, 23]

In 2006 Cameron et al reported explanations from New Zealand study subjects who were not using a booster seat. These included the following statements;

- Their child was “too big” for a car seat (51%)
- “Don’t own one” (38%),
- “Not enough room in the car” (3%),
- Child resistance to using the seat (2%) and
- Short trip (2%).[4]

Other studies identify factors such as: the cost, child acceptance, parental misinformation and uncertainty about when to move their child into a seat belt. Some studies identified an inverse relationship between the likelihood children would use a booster seat and the number of children in the car. Associations between parental income, the age and make of the car and the likelihood children would be using a booster seat have also been observed. Lower income families, in older model cars, were found to be less likely to use booster seats. [8, 20, 27]

Education – does it work and is it enough on its own?

Community based social marketing programmes coupled with distribution projects have been shown to be effective for increasing the use of booster seats.

The systematic review of 5 studies involving over 3,070 subjects showed that education paired with distribution programmes produced more consistent results that “education only”

interventions. While education only programmes provided more inconsistent results overall, more intensive education programmes are associated with more positive results. [28-31]

In Canada, one study team reported that a one week national media campaign substantially increased self reported use of booster seats. Parents did not remember all details of the campaign content, but did remember implications for their own child. This project resulted in a 44% increase in booster seat use by children aged 5 to 11 years. [27, 29]

A comprehensive education plan that incorporates risk communication and maximum parental participation would achieve improved results for New Zealand families. This should include three essential components;

- (a) Marketing to increase community understanding of the need for booster seats.
- (b) Identifying the best, most effective locations for families to access expert advice about booster seats and a range of booster seat products.
- (c) Making these locations well known to the public. [32]

However not all groups and cohorts can respond equally to educational programmes.

In the USA low socio-economic and demographic characteristics have been associated with the sub-optimal use of restraints for children. The importance of identifying poverty as a predictor of sub-optimal use of child car restraints emphasises the need for adequate booster seat disbursement projects, along with education programmes and regulation. [9, 12, 33]

Within New Zealand, education programmes alone, without legislation, would heighten existing disparities in health outcomes. This is because better educated, higher income families will respond more quickly to child safety messages and more easily secure improved booster seat protection for their children.

Regulation – is it the answer?

To achieve more effective booster seat use within New Zealand, Safekids NZ recommends a public education programme, robust distribution and supply project combined with regulatory action and enforcement.

Within communities where there is a requirement to use booster seats for older children evidence suggests this leads to increased overall awareness of the need for adequate child restraints and compliance rates for younger children also increases. (Winston F; personal communication 2008) [34]

A Monash University study identified parental uncertainty as an issue in reducing booster seat use. Legislation has been shown to have a dramatically positive effect on children's restraint wearing rates by removing parental uncertainty about when to move their child into a seatbelt. [20]

A Tennessee study of 1,247 children transported by 1,191 drivers assessed the recent implementation of enhanced child restraint laws in 2005. The study's authors concluded that enhancing the law to require the use of booster seats for the particular group of children was also effective in increasing the use of child restraints in the wider population. [33]

Overseas research has also indicated that community support for booster seat legislation is possible. The majority of respondents (88%) in a Canadian study of 260 participants in a booster seat education programme said they would support a law requiring the use of booster seats until their children were ready for a seat belt. [27]

There will be concerns expressed about increased costs to individual families. However a primary function of government is to mitigate costs to individuals where the imposition of those costs is justified by a demonstrable improvement for the public good. Because of their proven cost benefit outcomes, child car restraints and booster seats fall into this category. [35]

Booster seat public policy issues

Motor vehicle crashes are the single largest contributor to unintentional child death and injury within New Zealand. There are high numbers of children being injured as pedestrians, cyclists and passengers. Child passenger injury contributes the highest number of hospitalisations and death. [1]

It is likely that this high rate of child passenger fatality specifically contributes to New Zealand's continued ranking as the worst of all OECD countries at protecting children from death by unintentional injury. [5, 36, 37]

Who would pay for the booster seats?

A compulsory requirement for New Zealand families and organisations to purchase and install booster seats for children will create additional costs. The policy questions for government are whether or not the costs are justifiable and where they should be allowed to fall.

Are booster seat costs justified?

Booster seats, and the regulations mandating their use, have been tested in cost outcome terms and show net resource cost savings against child injury, which places them in the top tier of preventative interventions. [35]

The most recent Australian study assessed child car passenger injuries to children in the four to seven year old age group. The treatment costs of injuries received from not providing booster seats (and relying only on adult seat belts) was measured against the combined cost of creating and enforcing the regulation and the direct cost of the booster seats. [35]

The results, based on a total booster seat cost of \$US 197.00, showed a return on investment of 9.4 to 1; providing a saving of \$US 1,854.00 per seat. Even lower bound estimates in sensitivity analysis indicated a social benefit. Booster seat laws alone are shown to offer a return of 8.6 to 1.[35]

This provides an extremely strong case for regulation. The New Zealand Government has a wide range of policy options available and can provide a range of strategic interventions to mitigate costs to families and organisations.

What are the age, weight and height debates?

The only major research into seat belt and booster seat fit was carried out by Klinich et al, for the NHTSA in 1994. This research found the minimum size child who should use a three point belt alone had a sitting height of 74cm, standing height of 148cm and a weight of 37 kg. [7]

These recommendations however, have not been carried forward to all traffic jurisdictions and age, weight and height recommendations for the use of booster seats differ. [22, 30, 33, 38, 39]

For example the US National Highway Safety Administration and European safety agencies recommend that children weighing more than 20 kg should use belt positioning booster seats until they are at least eight years old or 1.40 m tall (4ft 9 in). United Kingdom governments have legislated for compulsory booster seat use until children are 138 cms tall or twelve years of age and British Columbia at 145cm and at least 9 years (see Appendix two). [18]

These differences reflect governments trading off between child safety and the perceived receptiveness of their populations, cost, and the age and quality of the available car fleet. However almost all agree and emphasise that height is the most important feature of seat belt fit. [20]

Decisions about the provision of booster seats for New Zealand children in relation to their age, height, and weight can be resolved through Land Transport Authority's (Land Transport New Zealand) policy development and consultative processes.

Given the overwhelming evidence for booster seat effectiveness in reducing child death and injury, this process will also be an effective way to facilitate more effective community awareness and help existing collaborative partnerships find agreement.

Child car restraint law in New Zealand

Drivers in New Zealand are responsible to ensure all children younger than five years old are properly restrained by an approved child restraint. Children of this age must not travel in the car if they cannot be secured into an approved child restraint. Older children must only use a seat belt or restraint if one is available. [40]

There are a number of agencies involved in child transport safety. These are listed, with a brief description of their functions, in Appendix three.

New Zealand Road User Rules

The Land Transport Act (1998) empowers the Minister of Transport to make Road User Rules. These Rules enable specific traffic requirements to be created without requiring a full Parliamentary vote. Road Rules are a simplified legislative process to enable efficient response to urgent road traffic issues, such as safety. Like regulations, they have legal power and can be enforced by the police. [40]

Land Transport New Zealand produces Rules under an agreement made with the Secretary for Transport. The Responsible Minister seeks the agreement of Cabinet before drafting commences and refers the Rule to Cabinet for noting before signing it into law. Road User Rules are enforced by the NZ Police and subject to penalties. [40]

Road Rules were introduced as a more simple legislative mechanism to full legislative changes.

Current Road User Rules related to child car restraints are quoted in Appendix four.

The New Zealand Road Code

The New Zealand Road Code is a published, user friendly compilation of the statutory requirements (Road User Rules) relating to vehicle use within New Zealand. It is not a statutory document and includes notes and illustrations to provide safety advice and promote understanding of Road User Rules.

In short, the Road Code paraphrases the statutory requirements for child restraint use in New Zealand (Road User Rules 7.4 – 7.10) [40].

The NZ Road Code states child car restraint use must be as follows,

- All children under five years of age must be in an approved child restraint when they are travelling in a car or a van. An adult safety belt is not considered suitable.
- Children between five and seven years old must use an approved child restraint if one is available. Otherwise they must use an adult seat belt. If there is no safety belt available, the child must be in the back seat.
- Older children (older than seven) must use an adult safety belt. If there is no safety belt available, the child must be in the back seat. [6]
- Within the New Zealand Road Code the term an 'approved child restraint' refers to a child restraint that complies with at least one of three standards – AS / NZ 1754, USA standard FMVSS 213, or European Standard ECE44.
- The restraint must be suitable for the age, weight, height and physical development of the child. [6]

The 2006 edition directs readers to the Safe2Go programme web site for additional information on the availability and correct use of child car restraints. See www.Safe2Go.co.nz

How are Road Rules changed?

Safekids strongly urges Government to urgently schedule booster seat policy development work during the 2008/2009 financial year. There are five stages to the development of New Zealand Road User Rules.

- Blue phase: policy development, which may include a discussion paper on policy proposals.
- Red phase (optional): Draft of the legislative provisions sent to registered interest groups.
- Yellow phase: Public consultation (advertised in public notice columns of the major metropolitan and regional newspapers and distributed widely).
- Green (optional): Draft of Rule released for final comment if there's a long delay or major changes after the yellow draft was released.
- White phase: This is the draft which is sent to the Ministry of Transport for government scrutiny. The Ministry and other departments and agencies may make changes before the Rule is submitted to Cabinet and then to the Minister to sign. They are then tabled in Parliament.

The commencement of Ministry of Transport booster seat policy work would enable key stakeholder consultation to begin immediately with wider public education beginning in earnest in 2009. A Road Rule change could then be implemented during that year.

Conclusion

The use of correctly fitting child car restraints is one of the most convincingly effective interventions for the prevention of transport related injury to children. New Zealand Government advice that adult seat belt dimensions do not suit primary school children and recommending that older children are also provided with the additional protection of a booster seat was published as long ago as 1983. [3]

Yet booster seat use rates in New Zealand are low. A major reason booster seats are not used is most likely because parents think their children have outgrown the need for special car seats and that booster seats are not necessary. [4] Government regulation and advice plays a role in this misconception. [23, 41]

To achieve more effective booster seat use within New Zealand, Safekids NZ recommends the urgent implementation of a public education programme, funding to ensure booster seats are available in the same way (and through the same agencies) that currently distribute child restraints and implements compulsory booster seat use through a Road Rule change, supported by appropriate enforcement.

Safekids NZ recommends the New Zealand Government;

- Amends the New Zealand Road User Rules to require the compulsory use of booster seats for child passengers.
- Updates booster seat information provided by New Zealand Government agencies.
- Funds booster seat provision within existing child car restraint distribution programmes.
- Provides a widespread public education campaign on the dangers of failing to use correctly fitting child car restraints and booster seats for children.
- Commences routine monitoring and reporting of booster seat use rates in the population.

Given the overwhelming evidence for booster seat effectiveness in reducing child death and injury, doing nothing is not an option.

Appendices

Appendix one: Example of child car restraint and booster seat transition criteria

Product	Size Range	Transition Criteria	Age Criteria
Rearward facing capsule	Until child too long for capsule (70 centimetres)	Baby is too long to fit in capsule or weighs more than nine to twelve kilograms. If using rear-facing convertible restraint, keep rear facing as long as possible (up to twelve months).	Zero to nine months
Forward facing child seat	Eight – eighteen kilograms	Child's eye level is above the top of the back of the child seat, shoulders are above the top set of shoulder strap slots or when child weighs more than eighteen kilograms.	Nine months – four years
Booster	Eighteen kilograms plus eye level above back of restraint or shoulders too wide	When the child can achieve a good seat belt fit without the booster i.e. child's legs are long enough to have their back firmly against the seat, and their legs bent in front of the seat cushion. This ensures the seat belt fits across the hip bones, and not over the soft abdomen. Usually, this is about 145 centimetres tall and the sash (shoulder strap) passes across the centre of the shoulder, NOT across the bottom or side of the neck	Five years – at least eight years
Adult seat belt	Height > 145 centimetres (and meet belt fit guidelines)		

Australian Road Rules 7th Amendment Package 2007; Prince of Wales Medical Research Institute.

Appendix two: Booster seat legislation around the world

Many countries have legislated for booster seat use to ensure older children are more effectively protected in the event of a car crash.

Australia: Regulations for restraint of children have been reviewed; changes approved by the Federal Government and are to be implemented by each State. Once implemented, children will need to be in a dedicated child seat or infant restraint (each with a built-in harness) up to four years of age and a booster seat will be required up to seven years of age. As part of this package the Australian Standards for child restraints are being revised to cater for older, larger children in booster seats [20].

Britain: Since September 2006 United Kingdom Governments have required the compulsory use of booster seats for children aged over five and younger than twelve years. The Actual wording is 135cm or twelfth birthday whichever comes first, but the British RoSPA website for parents suggests "...it is better to keep them in the booster seat or cushion until they have reached 150cm tall".

Canada: Transport Canada publishes national child restraint recommendations which include advice for families to use booster seats from 18kg (40lb) generally from age four and a half to eight years. Canadian Provinces have individual traffic jurisdictions and many have begun

investigations into implementing booster seat regulation. At the beginning of 2008, five Provinces had mandatory requirements for booster seats in place. The most recent was enacted in British Columbia effective 1 July 2008 mandating booster use for under at least 9 years or 145cm tall. (BCAA Traffic Safety Foundation)
(www.childseatcenter.com/article11.html - accessed Feb. 2008)

European Union: The European Parliament has made a mandatory rule that children less than 150 cm in height occupying vehicles fitted with safety systems must be restrained by an integral or non-integral child restraint system suitable for the child's mass between zero and 36 kg (up to 79 lb). However, until 9 May 2008 Member States could permit the use of child restraint systems approved in accordance with their national standards.

USA: At the beginning of 2008, eleven American States have legislation requiring booster seats be used for children over the age of five. State requirements vary as to the age and size of the child requiring booster seats (see section 3.4). However the National Highway Safety Authority (NHTSA) recommends that children who have outgrown child safety seats, are less than 8 years old, and are less than 4'9" tall should be in booster seats.

Appendix three: Booster seats in New Zealand – Who's Who

While the use of child car restraints for infants and children younger than five has increased over the past ten years, there are still many New Zealand children who are completely unrestrained, restrained by ill fitting and insecure child restraints, or using adult seat belts before they provide an adequate fit [6].

The following organisations work to improve the numbers of children correctly restrained. Each of these organisations would be directly involved in a programme to require children to use booster seats.

Safe2Go

Safe2Go is a national child car restraint training programme jointly funded by the Accident Compensation Corporation and Land Transport New Zealand.

The programme is administered by the Child Safety Foundation, who provides certified training sessions on the correct installation and use of child car restraints.

Advised by a multi agency Steering Group, the programme also acts as an expert reference group, publishes a regular newsletter and maintains a contact list of people who are trained to provide advice in the correct use of car restraints. There are approximately seven Safe2Go trainers nationally.

The Safe2Go website address www.safe2go.co.nz is included as a reference within the New Zealand Road Code publication 2006.

The Accident Compensation Corporation (ACC)

The Accident Compensation Corporation (ACC) is the Crown entity responsible for administering New Zealand's accident compensation scheme, advising government, and providing injury prevention services to people within New Zealand.

In 2005/06, ACC spent about \$41 million on injury prevention programmes in collaboration with employers, community groups, sporting bodies and others. It is also responsible for collecting injury cover levies and ensuring individuals who qualify receive accident cover, case management, medical and other care and rehabilitation services (ACC Fact Sheet, accessed 2008).

The prevention of injury to children while they are car occupants is an integral part of this role. In this capacity it supports the Safe2Go programme and sits on the Steering Group.

Land Transport New Zealand (New Zealand Transport Agency; as at August 2008)

Land Transport New Zealand (Land Transport NZ) was a Crown entity promoting land transport sustainability and safety, allocating government funding for land transport. The organisation, governed by a board of directors appointed by the Minister of Transport, was established under the Land Transport Management Amendment Act 2004.

In August 2008 Land Transport New Zealand will combine with Transit New Zealand under enacted legislation. The new body is the New Zealand Transport Agency (NZTA).

The government's New Zealand Transport Strategy (NZTS) provides the framework within which transport policy is developed. Land Transport NZ is responsible for contributing to the five objectives of the New Zealand Transport Strategy: assisting economic development, assisting safety and personal security, improving access, and mobility ensuring environmental sustainability and protecting and promoting public health.

The NZTA holds expertise in child car restraint technology and will be involved in the development of a Booster seat Road Rule. The NZ Transport Agency also holds a position on the Safe2Go Steering Group.

Advice from NZTA on booster seats is inadequate see Fact Sheet Number 7 from 2003. [42]

The NZTA also provides published advice on its web site (accessed May 2008) which does not mention height or the preference for booster seats as protection in the event of a crash.

The Ministry of Transport

As the government's principal Transport Policy Adviser, the Ministry of Transport is central to the development of a new booster seat Road Rule.

In this policy advisory role, the Ministry of Transport provides policy advice to the Minister, including providing advice on the making of Transport (Road) Rules. Working in collaboration with other Transport Crown entities, the Ministry of Transport is also responsible for contract management; air services agreements; development of legislation and Vote Transport administration.

Plunket

As a nation-wide community based health provider, Plunket supports key national child and family health goals established by the New Zealand Ministry of Health (1998) and provides a wide range of services and activities.

Among its key roles are Plunket's commitments to address the health disparities between New Zealand children and reduce death rates, injury and disability from unintentional injury.

Plunket has a strong child health advocacy role through its Littlies Lobby (a collaboration between Plunket and the Office of the Children's Commissioner), and Every Child Counts (Every Child Counts is a coalition formed by Barnardos, Plunket, UNICEF, Save the Children, and the Institute of Public Policy at the Auckland University of Technology).

The Child Safety Foundation

The activities of the Child Safety Foundation are aimed, principally, but not exclusively at the safety of those children under the age of seven years. Foundation efforts are aimed at parent, caregiver, pre-school and primary school groups.

The Foundation acts as a lobby group who are able to consider, initiate and support by- laws, codes and improvements in the laws calculated to promote child safety.

The Child Safety Foundation operates the Safe2Go child car restraint programme.

Safekids New Zealand

Safekids NZ is the national injury prevention service of Starship Children's Health and a member of Safe Kids Worldwide. Safekids mission is to reduce the incidence and severity of unintentional injury to children aged 0 - 14 years in New Zealand.

Safekids works to raise public awareness of child injury issues and advocates for the adoption of policies and strategies that will improve child safety.

Appendix four: Land Transport (Road User) Rule 2004 (SR 2004/427)

Section on child car restraints...

7.6 Driver must ensure passengers under 5 years use child restraint. A driver must ensure that, while the vehicle is in motion on a road, every passenger under the age of 5 years is properly restrained by an approved child restraint appropriate for that passenger.

7.7 Driver must ensure passengers of or over 5 years but under 8 years use child restraint or seat belt. A driver must ensure that, while the motor vehicle is in motion on a road, every passenger of or over the age of 5 years but under the age of 8 years—

- (a) is properly restrained by an approved child restraint appropriate for that passenger, if such a restraint is available in the vehicle; or
- (b) if such a restraint is not available in the vehicle, is restrained as securely as practicable in the circumstances using any child restraint or seat belt that is available (whether or not that child restraint or seat belt is approved).

7.8 Driver must ensure passengers of or over 8 years but under 15 years wear seat belts. A driver must ensure that, while the motor vehicle is in motion on a road, passengers of or over the age of 8 years but under the age of 15 years occupying a seat that is fitted with a seat belt (whether that seat belt is an approved seat belt or not) wears the seat belt and keeps it securely fastened.

7.9 Driver must not permit passengers under 15 years to sit in front seat without child restraint or seat belt. A driver must not, while the motor vehicle is in motion on a road, permit a passenger under the age of 15 years who is not properly restrained by an approved child restraint or seat belt appropriate for that passenger to be alongside the driver unless—

- (a) the vehicle is not provided with sitting positions behind the driver's seat; or
- (b) all the sitting positions behind the driver's seat are occupied by passengers under the age of 15 years.

7.10 Persons of or over 15 years must wear seat belt and keep it fastened. A person of or over the age of 15 years who is in a motor vehicle in motion on a road and who is occupying a seat that is fitted with a seat belt (whether that seat belt is an approved seat belt or not) must wear the seat belt and must ensure that it is securely fastened.

7.11 Exceptions to application of requirements relating to use of child restraints and seat belts

(1) The requirements of clauses 7.7 to 7.10 do not apply to a driver (whether imposed in respect of himself or herself or any child), or to a passenger in any motor vehicle, if the driver or passenger produces to an enforcement officer, whenever required to do so by that officer, a certificate from a registered medical practitioner certifying that the restraining of the person who would otherwise be required by those provisions to be restrained by a child restraint or seat belt is impracticable or undesirable for medical reasons.

(2) A driver or passenger who seeks to rely on subclause (1) must, if so required by an enforcement officer, produce the certificate to an enforcement officer within 7 days after having been so required.

(3) The requirements of clauses 7.7 to 7.10 do not apply to a driver (whether imposed in respect of himself or herself or any child), or to a passenger in any vehicle, if the person who would otherwise be required by those provisions to be restrained by a child restraint or seat belt—

- (a) is the driver and, while complying with the requirements of those clauses, could not reasonably operate effectively any of the following items of equipment:
- (i) footbrake or handbrake controls:
 - (ii) headlamp or foglamp:
 - (iii) direction-indicator control:
 - (iv) horn:
 - (v) windscreen-wiper control:
 - (vi) choke:
 - (vii) driver's sun visor; or
- (b) is the driver of a vehicle that is travelling in reverse, and would not be able to reverse the vehicle in a safe manner if the driver were to comply with the requirements of those clauses; or
- (c) is the driver of a taxi plying for hire; or
- (d) is a person who—
- (i) is engaged in the course of his or her employment in the delivery or collection of mail or newspapers or other goods, or the servicing of the vehicle, or meter reading or other similar duties, or spraying or other similar duties from the vehicle; and
 - (ii) for that purpose is required to alight from and re-enter the vehicle at frequent intervals, so long as the vehicle is travelling at a speed not exceeding 50 km per hour; or
- (e) is an enforcement officer or prison officer travelling with another person who is not an enforcement officer or prison officer in circumstances in which it is impracticable or undesirable to wear a seat belt.

(4) The requirements of clauses 7.7, 7.8, and 7.10 do not apply to a driver (whether imposed in respect of himself or herself or any child), or to a passenger in any vehicle, if the person who would otherwise be required by those provisions to be restrained by a child restraint or seat belt is the driver of a bus.

(5) The requirements of clause 7.6 do not apply to a driver (whether imposed in respect of himself or herself or any child), or to a passenger in any vehicle, if the driver—

- (a) is driving a passenger service vehicle in which no appropriate child restraints are available; or
- (b) is driving a goods vehicle having an unladen weight exceeding 2 000 kg in which no seat belts are available; or
- (c) is driving a motor vehicle first registered before 1 January 1955 in which no seat belts are available; or
- (d) is driving a motorcycle; or
- (e) is driving a motor vehicle that is being used by an enforcement officer in the execution of the officer's duty.

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