

EXECUTIVE SUMMARY

Introduction

In many OECD countries, road-related crashes are the number one killer of children under the age of 15. Since the last OECD report on children's transport safety was published in 1983, an estimated 100 000 children have perished in road-related crashes. Of course, this level of fatalities is not acceptable.

Considerable advances have been made by most countries, particularly since 1990. Many of the recommendations from earlier OECD work have been implemented with the support of Ministers for Transport in OECD and ECMT countries. In fact, the number of children killed per annum on the roads in OECD countries was halved between 1984 and 2000. Nevertheless, at current rates, one child out of every 2 100 will die before their 15th birthday in a road-related incident, and a considerably higher number will suffer severe injuries or lifelong disabilities. Many such fatalities would be avoided if all OECD member countries adopted practices known to be effective in improving children's road safety.

This *Keeping Children Safe in Traffic* report draws on best practice and research results to show how child casualties can be reduced whilst at the same time encouraging children to develop into safe, active and independent road users. It focuses on the contribution education, training and publicity can make; measures related to the risks children face in the road environment; vehicle and bicycle standards; safety equipment and the importance of appropriate legislation. It outlines the progress that has been made in OECD countries in the last 20 years. It provides the latest statistics on children's injuries, fatalities and trends in transport. The report considers the relative levels of risks in OECD countries and the casualty reduction programmes and strategies that can improve children's road safety. It identifies practices drawn from OECD member country experience that have proven to be most effective in improving children's road safety. It also outlines possible further improvements based on research undertaken.

One of the report's conclusions is that, currently, the best-performing countries have population-based road crash fatality rates for children that are less than half the OECD average and only a quarter of the rate in the worst-performing countries. Therefore, there is considerable potential for improving child road safety in most OECD countries. After examining the most effective strategies, based on the research undertaken, the report makes a series of policy-oriented recommendations for achieving such improvements in children's road safety.

Keeping Children Safe in Traffic is particularly geared towards policy makers, transport planners, regulators and strategists as well as road safety professionals, motorist associations and researchers.

A survey of children's road traffic safety in OECD countries was commissioned by the United Kingdom's Department for Transport and undertaken in 2002 and 2003 to complement and help with the preparation of this report from the OECD's Child Traffic

Safety Expert Group. Responses to the International Survey were therefore an important input to this report. Twenty-one of the 30 member countries responded, and data was supplemented where possible by internationally available data.

Improving children's road safety

The main purpose of the *Keeping Children Safe in Traffic* report is to highlight successful programmes and strategies that could be adopted by OECD countries to improve children's safety on the roads and to identify possible further improvements.

Road safety policy

Best practice for improving child safety needs to incorporate a variety of different measures. The survey findings showed that most OECD countries have had national plans for reducing children's traffic crashes for at least ten years, but the best-performing countries have adopted a holistic approach. These countries use a wide variety of measures covering speed reduction, promotion of secondary safety measures and publicity aimed at children, their parents and drivers.

Where countries have specific targets for casualty reduction, many of these specifically target children. In some countries disadvantaged communities and socially deprived groups may be targeted as well.

The survey results suggested that success in improving safety for children is most likely to be achieved through combining measures to address the behaviour of all road users, to improve the road environment and to design vehicles that better protect both their occupants and those at risk outside the vehicle.

The report reviews road safety policy and practice in three key areas: education, training and publicity; the road environment; and vehicle standards and safety equipment. No one of these areas is more important than the others, and success in improving safety is likely to involve a holistic approach combining measures across all three groups.

1. Education, training and publicity

Educational measures need to be tailored to the child's stage of development, starting with practical pedestrian and then bicyclist skills, but increasingly involving higher-level skills to match children's increasing independence as pedestrians, bicyclists and ultimately young adult drivers.

All road users have a duty to keep children safe, so it is also important to target drivers through training and publicity and to make parents aware of their key role in improving the safety of their children. In particular, parents are important role models for their children and can inculcate safe behaviour through example, for instance in use of seat belts and their behaviour as pedestrians.

As children progress through school, continuing integrated road safety education in several curriculum areas has been advocated in preference to occasional talks on road safety or other less integrated approaches. Well-targeted publicity that raises risk awareness, particularly among young teenagers, can complement school-based education.

Bicycling skills are first learned off-road, but the skills needed to interact safely with traffic are most effectively developed using a supervised problem-solving approach and guided experience. Bicycle helmets dramatically reduce the severity of head injuries, and

many countries have used publicity campaigns targeting both children and parents to promote bicycle helmet wearing.

Best practices related to education, training and publicity

Many examples are provided in the report of current practices known to be effective in improving children's road safety. Examples of best practices include:

- Road safety education that is part of the national education curriculum at all levels from pre-school on, with regular high-quality inputs to develop children's skills, risk awareness, attitudes and knowledge.
- Drivers are made aware of their responsibilities to their passengers and other road users, and they understand the limitations of children's behaviour in traffic. These outcomes can be achieved by effective education, training and publicity. Legislation on driver responsibility is used in some countries.
- Publicity is used in conjunction with other measures as a powerful tool for delivering information and influencing attitudes and behaviour in all areas of road safety, from environmental improvements to changes in legislation to vehicle modifications. It is being used to engage all sectors from policy makers, professionals and businesses to communities and consumers.
- Publicity campaigns targeting drivers that encourage drivers to behave more safely by raising awareness of how children behave, alerting drivers to their legal responsibilities to protect car occupants and child pedestrians and bicyclists, and highlighting such issues as choice of speed.
- Publicity to maintain drivers' awareness of the importance of correct fitting and use of child restraints and seat belts in cars.

Areas for possible improvement

The report outlines a number of areas relating to education, training and publicity where further improvement appears possible. These include:

- The focus of responsibility for child road safety needs to be shifted more towards drivers. However well children may be educated and trained in road safety skills, they remain less able than adults to use their skills and knowledge consistently.
- Drivers must be more aware of children's abilities, and driver training needs to increase novice drivers' awareness of hazards, particularly where children are concerned.
- The status of road safety education needs to be improved through integration with other disciplines and better evaluation of measures.
- Parents need to be involved more effectively in the delivery of road safety education both informally and formally. Parents must be well informed in particular about the safety devices that can protect their children and the need to teach safe behaviour through example.

2. Children in the road environment

Helping children and other road users to adapt their behaviour in order to interact safely with traffic in the road environment is only part of what is needed to keep children safe. Traffic engineers, urban designers and planners have a duty to design systems that take account of children's mobility needs, travel behaviour and differences in perceptual and reactive capabilities in order to maximise their safety and mobility. Children cannot be expected to comprehend aspects of the built environment and react to stimuli in the same way as adults.

The survey of 21 OECD countries showed that a child-centred approach to the road environment distinguished top-performing countries from those that did less well in terms of children's road safety.

Best practices

Many examples are provided in the report of current practices known to be effective in improving children's road safety. Examples of best practices include:

- Traffic calming which reduces vehicle speeds is advocated as a key measure to improve the overall safety of road users, in particular children. Top-performing countries used area wide traffic calming to a greater extent and had a wider range of infrastructure safety measures.
- Children's safe mobility facilitated by the design of residential areas that incorporates traffic calming techniques and low speed zones such as "green districts" and "home zones" to favour walking and bicycling as the dominant modes.
- Making speed reduction a key objective in order to protect vulnerable road users.
- Setting speed limits according to the function of roads within a hierarchy. Roads with high pedestrian and bicyclist activity have designated limits no higher than 30 km/h.
- The whole community, including children, consulted and involved in traffic planning decision making, to ensure that the activities and travel needs of all are fully taken into account.
- Lower speeds on small rural roads and availability of foot and bicycle paths are important.
- Outside residential areas where low speed limits are less feasible and roads are wider with heavier traffic flows, attention is given to designing safe places to cross the road. Safety should be encouraged by use of zebra crossings and signalised intersections, pedestrian islands, and school crossing patrols where necessary. For very busy roads, segregation from motorised traffic and provision of well-lit foot bridges and tunnels may be necessary.
- In the development of new educational facilities, consideration given to safe access using all travel modes, especially bicycling, walking and use of public transport.
- Better maintenance of the road environment and in particular play spaces and safe access to such spaces - as failure to repair damage or clear away obstructions often contributes to further deterioration.

Possible improvements

The report outlines a number of areas where further improvement appears possible in relation to children's safe interaction with traffic in the road environment. These include:

- Designing road environments in ways that recognise children's capabilities as well as their limitations. This will benefit all road users, since what constitutes a safe road environment for children will usually be safe for the general public particularly older road users.
- The built environment constructed in a way that stimulates children's growth and safe interaction with traffic. Urban design features can be used to support and complement children's safety in the road environment.
- Safety audits performed from a child's perspective.

3. Vehicle standards and safety equipment

The third element in a holistic approach to children's road safety is the design of vehicles and safety equipment such as child restraint systems and bicycle helmets. Vehicle standards cover both "primary safety" measures that reduce the risk of a crash occurring and "secondary safety" measures that are designed to prevent or minimise injury in a crash. It is these secondary safety measures that are most likely to be specifically designed to increase child safety.

Restraint systems

The most important measure to protect child occupants of vehicles is the provision and use of suitable child safety restraint systems.

Best practices and possible improvements

- Compulsory seat belt use and high levels of seat belt use in both front and rear seats. Although compulsory seat belt use is a general requirement in OECD countries, actual wearing rates vary. Significant reductions in children's fatalities and serious injuries could be achieved if all countries had the high wearing rates in both front and rear seats of the best performers.
- Correct use of child restraints. Often, the child restraints used are inappropriate for the age of the child, badly fitted, or incorrectly used. In the United States, it has been calculated that an estimated 458 lives could have been saved in 2002 if all children under 5 years of age had used a child safety seat.
- Systems such as ISOFIX, UAS, or LATCH that provide universal fixings for child restraints adopted by car manufacturers, and integrated seating systems developed.

*Vehicle design**Best practices*

- Vehicle design incorporates passive safety systems such as crumple zones, airbags and safety door and window locks.
- Where airbags are fitted, care is taken with the child's seating position as front seat airbags can present a risk to children. In both Europe and North America, parents

are advised that infants and young children should not use the front passenger seat, especially if an airbag is fitted.

- The evidence suggests that combined interventions are effective in improving child passenger restraint use. The recommended interventions include comprehensive legislation and community-wide information and enforcement campaigns, built around the active participation of public safety officials and safety-oriented voluntary organisations.

Possible improvements

- Vehicle manufacturers have an important role to play in developing improvements for the safety of child occupants and other road users in the event of a crash.
- Vehicle manufacturers should work with child restraint manufacturers, parents, those responsible for vehicle standards and others to find a balance in taking responsibility for child safety.
- Simple, universal designs for children's automotive restraint systems which can accommodate a diversity of children with a wide range of height, age and weight variations should be encouraged.
- More attention should be given to improving the safety of pedestrians and bicyclists by designing vehicles that reduce impact in the event of a crash. Such measures, particularly the redesign of car fronts, have significant potential to reduce deaths and injuries to children.

Pedestrians and bicyclists

Best practices and possible improvements

- Bicyclist safety increased by the development of standards for bicycle construction and bicycle helmets. It is most important that bicycle helmets for children fit properly and are comfortable.
- Both child pedestrians and bicyclists benefit from conspicuity aids and the use of light-coloured and retro-reflective clothing. Designers and manufacturers of children's clothing and accessories are well-positioned to incorporate retro-reflective materials into product lines. Parents, as well as public health and safety officials should encourage them to do so, as one component of an ongoing campaign for protecting children in traffic. Dangle tags, armbands, strips on school bags and use of bicycle lamps are all recommended.
- Given the evidence supporting the effectiveness of bicycle helmets in preventing head and brain injuries, it is recommended that bicyclists be strongly encouraged to use bicycle helmets. Further scientific investigation is recommended to study the inter-relationships of legislation, enforcement and outreach programmes in achieving greater bicycling safety through helmet use.

School buses

Best practices

- School buses fitted with seat belts where practicable and where seat belts are provided, the use of seat belts required on buses transporting children.
- In some OECD countries, notably in North America, children travel to school in specially designed buses. The North American school buses use a passive safety system rather than seat belts. School buses also have safety features such as enhanced structural integrity and strict fuel system integrity that increase their crash-worthiness. The windows are designed to reduce the risk of ejection.
- Attention is paid to the safety of children as pedestrians when boarding or disembarking from buses. Various measures such as recognition zones around bus stops, detection and warning systems, and improved mirrors for buses can contribute to safety.
- Proper training for school bus drivers.

Possible improvements

- In view of competing resources and programmes concerning travel to school, it is recommended that school jurisdictions develop and implement risk management policies related to the journey to and from school. Issues of importance to the policy include the use of public transit or dedicated buses, the fitting of seat belts, protective measures for child pedestrians outside the bus, protecting children walking and/or bicycling to school, and public awareness messages and campaigns.
- Protecting children as they use private vehicles, bicycles and buses in traffic is a responsibility shared by all levels of government and many non-governmental organisations, as well as families. Strategic partnerships should be established and nurtured to create innovative and multidisciplinary approaches to keeping children safe in traffic.

Legislation

The international survey considered the role that legislation can play in improving children's road safety. A country's range of legislation can give some indication of the political will to address the burden of injury to children. The key areas considered were child safety restraints and seat belts, bicycle helmet use, child bicyclist behaviour, driver responsibility in a crash involving children and compulsory road safety education.

Seat belt legislation is almost universal, but high wearing rates of seat belts and restraints by children were a characteristic of countries surveyed which were high performers in terms of child safety. This is achieved by active promotion of seat belt wearing involving education and publicity as well as enforcement of legislation.

Only eight countries had bicycle helmet wearing legislation. Experience indicates that legislation is effective in raising bicycle helmet wearing rates. However, increases in wearing rates can be achieved even without legislation through appropriate promotional activities. Some countries also have legislation relating to the age at which children can bicycle on the road and their competence.

Less than a third of the countries had legislation that assumes driver responsibility in a crash involving a child pedestrian; the presence of such legislation distinguished these countries from countries that performed less well in terms of pedestrian safety. Such legislation places the burden of proof on the driver, and the presence of such a law may have modified driver behaviour in residential areas and created a more child-centred approach to safety.

Many OECD countries reported compulsory road safety education, but its presence did not distinguish top performers from countries that performed less well. More important seemed to be the approach adopted, and top-performing countries shared a number of initiatives, such as teaching pedestrian skills at the roadside and providing materials and advice for parents.

Key findings

Key findings of this report include:

- Road safety policy should include specific strategies for improving child safety including specific targets for casualty reduction and monitoring and reviewing the evidence base.
- Road safety education and training is a lifelong learning process that neither begins nor ends in schools. All road users have a duty to keep children safe, and parents have a vital role to play through teaching and example in the early years.
- Driver training is an integral part of the safety education system, and while children need to know how to behave safely on the roads, drivers need to take more care and responsibility and to recognise that children will not behave in the same way as adults.
- Road safety education in schools should use approaches based on sound educational practice with an emphasis on problem-solving and practical skills training. It needs to be an ongoing programme in schools not a one-off activity.
- Publicity needs to address all road users and age groups using a targeted approach for individual audiences to raise awareness of how children will behave in traffic. Publicity should also be aimed at improving driver behaviour, especially in respect of inappropriate speed.
- Traffic engineers and planners have a duty to take children's needs and abilities into account in designing the built environment.
- More priority needs to be given to vulnerable modes through the use of traffic calming and facilities for walking and bicycling.
- All children should be provided with child restraints in vehicles that are suitable for their age and size, and properly fitted and used.
- Vehicle design should incorporate safety features such as crumple zones, airbags and safety locks for doors and windows that take account of the needs of children. Parents need good advice on the correct use of child restraints and the safest seating positions particularly where airbags are fitted.

- Vehicle designers and legislators on vehicle standards should give more attention to protecting pedestrians and bicyclists as well as vehicle occupants from injury and death.

Conclusions and recommendations

This executive summary has set out conclusions on best practices drawn from experience in OECD member countries that can make a significant contribution to reductions in children's transport-related injuries and fatalities. It has also highlighted possible improvements in the key policy and operational areas affecting children's road safety. These key aspects of the executive summary are based on the more detailed conclusions and recommendations for road safety policy set out in full in Chapter 5 of the report.