

AUDITOR-GENERAL'S REPORT
PERFORMANCE AUDIT

Improving Road Safety: School Zones

Roads and Traffic Authority of NSW



The Legislative Assembly
Parliament House
SYDNEY NSW 2000

The Legislative Council
Parliament House
SYDNEY NSW 2000

In accordance with section 38E of the *Public Finance and Audit Act 1983*, I present a report titled **Improving Road Safety: School Zones - Roads and Traffic Authority of NSW**.

A handwritten signature in black ink that reads 'Peter Achterstraat'.

Peter Achterstraat
Auditor-General

Sydney
February 2010

State Library of New South Wales cataloguing-in publication data

New South Wales. Audit Office

Improving road safety - school zones : Roads and Traffic Authority of NSW / [The Audit Office of New South Wales].
(Performance audit).

978 1921252 358

1. Roads and Traffic Authority of NSW - Auditing. 2. Traffic safety and children - New South Wales - Auditing.
3. Speed limits - New South Wales - Auditing. I. Title: Improving road safety - school zones : Roads and Traffic
Authority of NSW. II. Title: NSW Auditor-General's report : improving road safety - school zones : Roads and Traffic
Authority of NSW. III. Series: Performance audit (New South Wales. Audit Office).

354.7728243909944

363.1257209944

388.314409944

© Copyright reserved by the Audit Office of New South Wales. All rights reserved. No part of this publication may be reproduced without prior consent of the Audit Office of New South Wales.

The Audit Office does not accept responsibility for loss or damage suffered by any person acting on or refraining from action as a result of any of this material.

Contents

Foreword

Audit conclusion and recommendations	1
About the audit	2
Conclusion	2
Recommendations	4
Response from Roads and Traffic Authority of NSW	5
Key findings	9
Are there practical approaches to address road safety issues around schools?	10
Have these approaches contributed to improved road safety around schools?	14
Appendices	23
Appendix 1: Speeding infringements by fixed speed cameras in school zones	24
Appendix 2: Delivery of school zone Government commitments	26
Appendix 3: Status of school zones	28
Appendix 4: About the Audit	29
Performance Audits by the Audit Office of New South Wales	33

Foreword

I am encouraged to find that there has been a significant decrease in casualties involving school age pedestrians in school zones. However, the increase in the 2009 general road toll shows that this road safety achievement could be undone if all parties responsible do not continue to play their parts.

This report shows that despite the 40 km/h school zone having been in place for seven years, motorists continue to exceed the speed limit. It also shows that motorists park illegally and unsafely in school zones. These are the very factors which could bring undone years of good work in reducing school child pedestrian casualties in school zones.

Adults have a responsibility to safeguard school children and to teach and encourage safe road behaviours. Whether they realise it or not, parents and carers are role models for safe behaviour, and provide much of the child's training and practice in crossing real roads.

Motorists also have responsibilities to recognise that school children are vulnerable and inherently unpredictable road users, and to obey the road rules and drive accordingly.

Governments can provide measures to improve the safety of children around schools. But unless laws are properly enforced and motorists, parents and carers all play their parts, the successes that this report reveals will be put at risk.

Peter Achterstraat
Auditor-General

February 2010

Audit conclusion and recommendations

About the audit

The Roads and Traffic Authority (RTA), in conjunction with the NSW Police Force and the Department of Education and Training, has introduced a number of initiatives to improve the safety of children around schools over past decades. These have been mainly focused on making motorists, children and their carers more aware of the risks and on reducing vehicle speeds around schools. The initiatives have also included substantial engineering treatments to improve road safety for students.

Reduced speed limits around some schools were introduced in NSW in 1992 to improve safety of school children. In 2001 the Minister for Roads announced that the Government would implement 40 km/h speed limits on all roads with direct access to schools. By the beginning of 2003 these school zones had been installed at 10,000 school zones around all 3,154 NSW schools.

The objective of this audit is to assess whether school zone initiatives have made a difference to safety around schools. Our lines of inquiry were:

- are there practical approaches to address road safety issues around schools?
- have these approaches contributed to improved road safety around schools?

Conclusion

The RTA has reviewed approximately one quarter of NSW school zones. This analysis shows that road crash casualties - fatalities and injuries - involving school age pedestrians between 5 and 16 years decreased significantly between 1998 and 2008.

The number of school zone casualties is small, ranging between six and 29 each year in the sample reviewed, equivalent to an estimated 60 annually in all NSW school zones. By comparison, on average there were 2,000 school age casualties each year on the NSW road system.

The analysis of school zone casualties found that the largest reduction over the ten years was for school aged pedestrians. This reduction was greater than for overall road casualties and all pedestrian casualties.

In the last decade two child pedestrian fatalities in school zones have been recorded. Another occurred where a school zone was subsequently installed. None of these fatalities was caused by speeding, and one was at least partly due to unsafe parking practices.

Despite the use of school zone signs with flashing lights and fixed speed cameras, motorists continue to exceed the 40 km/h speed limit in school zones. The RTA school zone speed survey in 2008 showed that in only two schools out of 12 surveyed were vehicle speeds close to the speed limit. An NRMA survey of 11 Sydney schools in 2005 found only half of the motorists were obeying the 40 km/h speed limit during school zone hours.

There are two likely reasons for exceeding the 40 km/h speed limit:

- drivers are unaware when and where they should reduce speed to 40 km/h
- enforcement is ineffective and drivers believe that they can speed with impunity.

Motorists awareness

There may be several reasons why motorists are unaware that they are entering school zones:

- some school zone signs are poorly located or in poor condition
- drivers may fail to see signs and road markings or realise that school zone times apply
- there are some anomalies or inconsistencies in school zone times and speed zoning which may confuse motorists.

The RTA plans to eventually install 566 flashing lights in NSW school zones. We are unaware of the rationale for selecting this number of lights. While many jurisdictions use flashing lights or signs to alert motorists to the presence of children in school zones, there is no clear best practice for the optimum use of school zone flashing lights.

Adequacy of enforcement

It is clear that enforcement of the 40 km/h school zone speed limit in school zone times is almost entirely dependent on fixed speed cameras. The 44 school zones fitted with speed cameras represent one per cent of school zones, yet account for 93 per cent of school zone speeding infringements.

Only seven per cent of speeding infringements in school zones are recorded in the remaining school zones without speed cameras.

Unsafe parking

Unsafe parking may also contribute to the hazards around schools, and illegal and unsafe parking can be routinely observed in many school zones. Most councils do little or no enforcement of parking restrictions in NSW school zones.

Improving school zone effectiveness

Since the initial implementation of school zones, the RTA has added extra improvements such as better signage, overhead bridges and fencing, additional crossing supervisors, flashing lights, speed cameras and increased penalties for driving and parking offences in school zones. The RTA has also, in conjunction with the Department of Education and Training, delivered public education to students, parents and the general motoring public.

The 65 speed cameras in school zones generated fines worth \$31.1 million in 2007-08 and \$22.3 million in 2008-09. The Minister had promised in 2006 that all revenue from the initial 50 fixed and mobile speed cameras in school zones would be reinvested in road safety projects. While we have been advised that some of the speed camera revenue is allocated specifically to road safety projects, we have not been able to obtain enough information to form an opinion on whether the balance of the revenue is allocated to road safety.

Recommendations

1. The RTA should retain existing school zone facilities.
2. To improve awareness, the RTA should:
 - ensure that school road safety programs encourage safe behaviour on roads
 - improve the visibility of school zones by increasing use of flashing lights
 - make school zone locations available to GPS users
 - ensure that all school zone signs are correctly installed, of appropriate visibility and in serviceable condition
 - publicise the number of infringements in school zones.
3. To improve compliance, the RTA should:
 - fit flashing lights at all school zones with non-standard operating times
 - consider introducing higher fines for speeding infringements in school zones with flashing lights.
4. To ensure effectiveness, the RTA should:
 - demonstrate that future investment in road safety initiatives is based on transparent assessment of risk
 - inform the public of the effectiveness of its school zone initiatives
 - ensure that school zone speed limits are applied consistently to all schools.
5. The RTA should determine and publish progress on the commitment made by the Minister for Roads in 2006 as to the amount of revenue raised by school zone speed cameras and how much of it is reinvested in road safety projects.
6. The RTA should determine and publish how many of the mobile speed cameras promised in 2006 have been acquired for school zone purposes and how often they have been deployed.

The RTA should be able to demonstrate progress against all these recommendations within 12 months.

7. All organisations, Government and non-Government, private and public, should cooperate to ensure that:
 - new schools are built on roads where the risk of conflict with motor vehicles is minimal
 - school operating hours are standardised wherever possible.

Response from Roads and Traffic Authority of NSW

I refer to the Performance Audit Report prepared on Improving Road Safety : School Zones. The Roads and Traffic Authority (RTA) is pleased to note the Audit observations and findings recognise that fatalities and injuries involving school aged pedestrians has decreased significantly between 1998 and 2008 in line with the introduction of a range of measures targeting safety around schools. The RTA is strongly committed to increasing safety for children across the road network and especially during school travel times.

The RTA completed a detailed analysis of crash and casualty trends relevant to the introduction of the 40km/h school zone measure. The analysis was based on spatial data from a sample of 820 school zones in South West and Sydney RTA Regions and compared the pre school zone period (1998 to 2000) to the post school zone period (2004 to 2008). The analysis highlighted a 45% decrease in average annual pedestrian casualties during school zone times in the selected school zones when comparing the post to the pre period and a 46% reduction for pedestrians aged 5 to 16 years. The results suggested that the benefits of school zones (and the lowering of speeds) applied to all pedestrians and not just school age children.

The data suggests that pedestrian casualties, particularly the 5 to 16 year old age group have decreased in school zones at a far greater rate than at other locations. For pedestrians aged 5 to 16 years, this decrease was present for both school zone times and school days during non school zone times.

The report acknowledges that the RTA has progressively introduced a range of measures to improve school zone effectiveness. School zones commenced with the blanket application of a 40km/h speed limit, however they have evolved over time with layers of additional improvements added to enhance safety around schools. These improvements have included: improved signage and delineation; pedestrian facilities such as crossing points, overhead structures, adjusted traffic signal phasing, pedestrian refuges and fencing to control flow etc; additional crossing supervisor locations; flashing lights; speed cameras; increased penalties for driving and parking offences in school zones; and public educations to students, parents and the general motoring public.

Addressing road safety risks and raising motorist's awareness of vulnerable road users is an ongoing process. Current programs enhancing safety around schools include installation of more flashing lights, the rollout of Dragon's Teeth (pavement marking) to all school zones and fluorescent signage to further improve the visibility of school zones.

The report highlights that motorists still speed in school zones whilst noting that the number of infringements incurred in school zones with speed cameras have progressively reduced since the installation of those cameras. An analysis of traffic volumes and school zone speed cameras that were installed in early 2007 indicates that about 0.06% of vehicles passing the cameras were infringed in the 2008/2009 financial year. The RTA continues to undertake research into motorist's attitudes to speeding, completing a detailed study in 2009 and currently initiating a national survey of attitudes to speeding.

The following comments are provided on the recommendations included in the Report.

1. The RTA should retain existing school zone facilities.

The RTA will retain existing school zone facilities noting that adjustments will be made in line with current criteria (for school zone application) and changes to educational institutions (e.g. a school is closed or the school access points are repositioned).

2. To improve awareness, the RTA should:

- **ensure that school road safety programs encourage safe behaviour on roads**

A key tool in improving safety in school zone areas is through child awareness of road safety risks. The RTA delivers a comprehensive road safety program in NSW Schools and a recent survey highlighted that there is as strong recall of the road safety message for school-leavers.

The RTA in partnership with the three educational sectors (Government, Independent and Catholic) remains committed to the delivery of quality road safety educational programs in NSW schools.

- **improve the visibility of school zones by increasing use of flashing lights**

Improving the visibility of school zones comprises flashing lights as well as signage, delineation, Dragon's Teeth markings, upgraded fluorescent signage and other enhancements. The RTA is continuing the risk based rollout of flashing lights in school zones, with 365 out of the proposed 565 flashing light sites installed to date. The 565 flashing light sites includes:

- *Pre 2008 trial sites;*
- *Additional sites such as, where fixed speed cameras have been installed; and*
- *the \$46.5 million program to install flashing lights at 400 sites (2008 to 2011).*

- **make school zone locations available to GPS users**

The development of the speed zone mapping system using a spatial GPS system has enabled a more precise analysis based on the GPS location of actual school zone signage (which denotes the exact start/finish of school zones). This system was developed in 2007 and data collection is well underway (68% complete including all state roads). When the data collection process is finalised, the RTA plans to distribute the speed zone maps widely and ensure a robust update system is in place.

- **ensure that all school zone signs are correctly installed, of appropriate visibility and in serviceable condition**

The RTA conducted a major audit of school zone signage and facilities in 2008 and is progressively addressing issues raised in these audits. Ensuring that signage is correctly installed, of appropriate visibility and in a serviceable condition is a key priority for the RTA in partnership with Local Councils. The RTA will review the process of monitoring signage condition and placement in school zones.

- **publicise the number of infringements in school zones.**

The RTA will review the value of this proposal in conjunction with the State Debt Recovery Office (SDRO).

3. To improve compliance, the RTA should:

- **fit flashing lights at all school zones with non-standard operating times**

Currently there are 23 schools (out of approximately 3,000) with non standard operating hours. At present 5 of these non standard zones are fitted with flashing lights. The RTA will conduct a review of the existing non standard sites and consider the installation of flashing lights where appropriate.

- **consider introducing higher fines for speeding infringements in school zones with flashing lights.**

The RTA does not support the introduction of higher fines for speeding infringements in school zones. Increased fines and demerit points for certain traffic and parking offences within operating school zones were introduced in May 2007. School zone fines are generally at least 50% higher and incur at least one additional demerit point than normal zones.

It is also important to note that flashing lights are one tool to improve school zone visibility and are advisory only. Flashing lights cannot be used as a regulatory tool.

4. To ensure effectiveness, the RTA should:

- **demonstrate that future investment in road safety initiatives is based on transparent assessment of risk**

The RTA implements evidence based risk management strategies to address road safety risks. The potential risk for children in the school zone environment has been extensively analysed and a range of measures have been implemented to reduce this risk. The analysis shows that the measures have been very effective.

Site selection for the introduction of school zone measures (such as flashing lights) is based on criteria which are known to increase the severity, exposure and likelihood of a child pedestrian fatality or injury. The criteria include; approach speed, pedestrian and traffic volumes and crash history. RTA will seek to further demonstrate that future investment in road safety initiatives is based on a transparent assessment of risk.

- **inform the public of the effectiveness of its school zone initiatives**

The RTA is preparing a paper on the initial school zone data analysis undertaken for the 2010 Australasian Road Safety Research, Policing and Education Conference. This paper will inform practitioners on the use of a spatial system to enable a far more accurate assessment of the crash profile of school zones. A further analysis of all school zones in NSW will be undertaken when the data collection process for the speed zone mapping system has been finalised.

The RTA applies caution in promoting the effectiveness of school zone countermeasures, as we do not want drivers or children to become complacent.

- **ensure that school zone speed limits are applied consistently to all schools.**

Since 2003, all school zones in NSW have 40km/h speed limits. School zone lengths relate to school access points and there are instances where there are other localised factors (e.g. traffic volumes or particular crash history) that also influence the application of speed zones in the vicinity of schools.

5. *The RTA should determine and publish progress on the commitment made by the Minister for Roads in 2006 as to the amount of revenue raised by school zone speed cameras and how much of it is reinvested in road safety projects.*

Revenue from school zone fixed speed cameras has been used to support the large flashing lights program that is currently underway. The RTA will seek advice from NSW Treasury to determine the amount of revenue raised from school zone speed cameras that has been reinvested in road safety projects.

6. *The RTA should determine and publish how many of the mobile speed cameras promised in 2006 have been acquired for school zone purposes and how often then have been deployed.*

The NSW Road Safety Package (released in May 2006) proposed a combination of 50 fixed and mobile speed cameras. The development of implementation plans for this proposal highlighted that the rollout of mobile speed cameras would require a detailed investigation and testing of available technology and an assessment of various models for the operation of these cameras. These investigations could not be undertaken quickly and it was agreed that the most expedient and immediately effective method to achieve improved speed compliance in school zones was to implement the proven fixed camera technology under existing contract arrangements. The rollout of the 50 fixed speed cameras at high risk locations was completed in 2009.

The Government convened a Road Safety Roundtable in July 2009 to address the increasing road toll in 2009. A key recommendation of the Roundtable was to introduce new ways to use camera technology to address speeding. The RTA in conjunction with NSW Police is developing a proposal for the implementation of mobile speed cameras in NSW.

The RTA should be able to demonstrate progress against all these recommendations within 12 months.

The RTA will provide a detailed progress report on the status of actions undertaken to address the recommendations of the School Zone Performance Audit.

7. *All organisations, Government and non-Government, private and public, should cooperate to ensure that:*

- *new schools are built on roads where the risk of conflict with motor vehicles is minimal*

It is important that organisations such as the RTA are consulted during the land use planning process on all new school development proposals.

- *school operating hours are standardised wherever possible.*

The RTA supports the standardisation of school operating times within school zone times. The standardisation of school operating hours could exacerbate traffic flow issues in locations with multiple schools.

(signed)

*Michael Bushby
Chief Executive*

Dated: 16 February 2010

Key findings

Are there practical approaches to address road safety issues around schools?

Conclusion While governments can provide measures to improve the safety of children around schools, parents and carers have responsibilities to teach and encourage safe behaviours, and motorists have responsibilities to recognise that school children are vulnerable road users and to drive accordingly.

The approach used most commonly in school zones around the world is to reduce speeds around schools. Consistent with this the RTA implemented 40 km/h speed limits, with signs and flashing lights to advise drivers.

School crossing supervisors help ensure child safety at many schools. There are also parking restrictions around schools to minimise risk from traffic. School curricula include road safety awareness appropriate to the age of children.

What road safety risks do children face around schools? More than one million school students are enrolled in NSW primary and secondary schools, and each day they travel by different modes of transport to one of the 3,154 schools with over 10,000 school zones.

Children are inherently unpredictable road users:

The most common cause of pedestrian trauma in three to nine year olds is ... not seeing, or misjudging, a gap in traffic. Pedestrians aged under ten years are particularly vulnerable because of their small physical size and underdeveloped abilities for dealing with traffic situations ... children under the age of ten do not have the ability to cross roads without adult help.

It follows, then, that parents and carers have an important role in ensuring their children's safety on and near roads. Whether they realise it or not, parents and carers are role models for safe behaviour, and provide much of the child's training and practice in crossing roads.

Over the last decade pedestrians under 17 years old have become one of the lowest-risk groups of road users in Australia. In 2002, pedestrians aged 70 years or older were four times more likely to be killed than those aged 0 to 16 years. ABS data show that school age children had the lowest fatality rate and the lowest injury rate per 100,000 population of all age groups.

There is much less information which reveals where in the road system crashes involving school age pedestrians occur. Nationally, most deaths and hospital admissions arising from traffic accidents involving children between five and 12 years old happen when they are involved in activities other than travelling between home and school.

Since 1950 the population of NSW has doubled, but the number of drivers has increased nearly sevenfold and the number of vehicles ninefold. Schools built before then on quiet roads may now face higher traffic volumes and increased risks for children.

Are there ways to address these risks? Because of the inability of young school age children to recognise risks on the road, parents and carers have a responsibility to safeguard them and to teach and model safe road behaviours.

The most common countermeasure used around the world has been to reduce speed limits around schools. The risk of fatal injury for pedestrians struck by a vehicle at 50 km/h is more than twice as high as the risk at 40 km/h, and more than five times higher than the risk at 30 km/h. A pedestrian struck by a vehicle travelling at 60 km/h is almost certain to be killed.

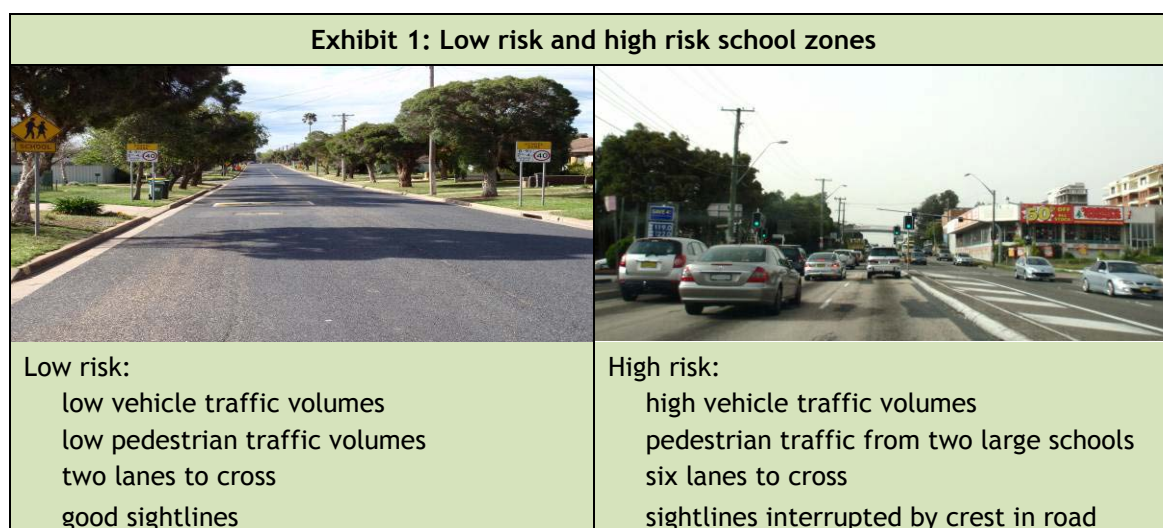
The speed limits used near schools around the world vary between 16 km/h in Florida and 80 km/h for high speed roads in Queensland. School zone operating times also vary, some being only during school start and finish times and others being a round the clock. However we have located no information to indicate which combination of speeds and times is more likely to reduce the risk of injury to school children.

Introduction of school zone speed limits Reduced speed limits around schools were introduced in NSW in 1992 to improve safety of school children by controlling vehicle speeds. Early guidelines provided for school zones only on roads which did not carry heavy traffic, were not multilane highways, and where there were no pedestrian signals or other safe means of crossing the road. School zone speed limits were 40 km/h on 60 km/h roads and 60 km/h on roads with higher speed limits.

Government commitment to school safety The objectives of the Government's school zone initiatives were included in an August 2000 media release by the Minister for Roads:

The Carr Government will introduce new measures worth \$1 million to make roads around schools safer for young children ... the Safety around Schools program would be expanded ... to strengthen the Government's commitment to make school-related travel safe ... We need to continue to look for new ways to make children aware of the risks associated with traffic to ensure that school children are protected from road accidents.

The photos below show typical low risk and high risk school zones.



Source: Audit Office

School zones become universal	<p>In November 2001 the Minister for Roads announced a \$10 million <i>Safety Around Schools</i> package to apply 40 km/h speed zones on all roads with direct access to all NSW schools. By the beginning of 2003 this had been installed at all 3,154 NSW schools.</p>
School zone operating times	<p>The school zone speed limit of 40 km/h applies to all schools in NSW on gazetted school days, which are published on the RTA's website.</p> <p>The 40 km/h speed limit applies from 8am to 9.30am and 2.30pm to 4pm at almost all NSW schools. There are 23 school zones with non-standard times, and five of these have flashing lights. School principals have to apply to the RTA to have their schools assessed for eligibility for non-standard school zone times.</p>
School crossing supervisors	<p>School crossing supervisors employed by the RTA have attended school pedestrian crossings during school hours since the early 1990s. Prior to this the role was filled by 'lollipop people' employed by the Police.</p> <p>There are over 700 sites with school crossing supervisors. The scheme has clear criteria and schools that believe they meet them can apply to the RTA. If an RTA inspection confirms that the school crossing meets the criteria a supervisor will be provided. Additional supervisors continue to be appointed across the state. For safety reasons school crossing supervisors can only work in 40 km/h school zones.</p>
Parking related risks	<p>Staysafe's 1998 report <i>Pedestrian Safety</i> emphasised the hazard which parked vehicles represented:</p> <p>Research undertaken in European countries revealed that 30 to 50 per cent of child pedestrian crashes involved visual obstacles - usually parked cars ... Near side collisions where [the] child emerges from in front of a parked vehicle [represent] 22 per cent of fatal collisions ... Of the 93 pedestrian deaths ... 71 occurred as the child darted out or attempted to cross the road. Of these 71, ten emerged from behind parked cars, and four from behind stationary buses.</p> <p>Parking restrictions around schools predate the rollout of the 40 km/h limit to all schools. The Staysafe report noted that the RTA's child pedestrian safety resources included a Local Government Road Safety Officers Parent Parking Kit which contained information on working with schools, road safety tips for families which can be included in school newsletters and flyers for parents who are parked illegally.</p>
Road safety curriculum in schools	<p>The NSW road safety education program, funded by the RTA, provides road safety education from early childhood to the senior years of schooling. Age appropriate teaching and learning resources are developed in cooperation with each of the education sectors (Government, Independent and Catholic) and the NSW Office of the Board of Studies.</p>
Introduction of speed cameras	<p>In August 2002 the Minister for Roads announced three speed cameras would be rotated between ten primary schools where speeding was a recognised problem. This was superseded later that year by speed cameras at ten dedicated school sites which were part of a larger trial of the effectiveness of speed cameras.</p>

The RTA advises that the following criteria for risk must be met for fixed speed cameras to be installed in a school zone:

- a minimum number of crashes, including at least one crash in school zone times
- a minimum vehicle volume
- potential for conflict between pedestrians and vehicles within the school zone during school zone times
- the site must be physically suitable for the installation of a fixed speed camera.

School zone flashing lights

In his August 2002 media release the Minister for Roads announced that flashing warning lights had been installed at 11 schools, and that they were to be installed at ten more as part of a trial:

[If the trial concludes] that flashing lights are effective in promoting long term compliance by drivers to the 40 km/h school zone then flashing lights will be installed at more locations around the state.

The model developed by the RTA for choosing school zones most appropriate for flashing lights seems sound, and we are aware of only minor apparent anomalies. Almost all fixed speed cameras in school zones are fitted with flashing lights.

Further commitments

In May 2006 the Minister for Roads announced a major NSW school road safety package which would include:

- electronic school safety alert systems incorporating flashing 40 km/h signs and lights
- a combination of 50 fixed and mobile speed cameras rotated between all NSW school zones
- increased fines and demerit points for driving offences in school zones
- a 'drop-off-and-go, pick-up-and-go' system to allow parents to become more involved in student safety and ease congestion around participating schools
- a School Child Safety Roundtable to address further initiatives raised by parents, schools, community groups and the RTA.

In 2007 the government promised an additional 400 flashing light warning systems would be installed in school zones by the end of 2011. We are unaware of the RTA's rationale for selecting this number of lights. The RTA advises that by 2011 NSW will have 566 flashing lights in school zones. Currently there are 366 school zones with flashing lights.

While many motorists favour the use of flashing lights to alert them to the presence of children in school zones, and many jurisdictions use them, there is no clear best practice for school zone flashing lights.

Fixed speed cameras have been installed in school zones. However, no subsequent RTA or government communiqué has mentioned implementation of the mobile speed cameras.

Since 21 May 2007 increased fines and demerit points have applied to certain traffic and parking offences committed within operating school zones.

A 'drop off and pick up' initiative to enhance child safety has been trialled in several schools in NSW. The RTA developed promotional material and provides 'drop off and pick up' signs for No Parking zones outside schools. However it is up to individual schools to adopt the initiative.

The Child Safety Roundtable was held in 2006. Since then four working groups have been formed with nearly 30 Government and non-government agencies invited to participate. The RTA claims to have already implemented recommendations arising from the roundtable.

Other school zone improvements

As well as the school zone enhancements already mentioned, engineering improvements such as pedestrian overbridges have been built near some schools, particularly those on multilane roads. In May 2009 the Minister for Roads announced that triangular road markings ('dragon's teeth') would be installed in every school zone to make them more visible to motorists.

Appendix 2 is a compendium of government commitments to improve child safety in school zones and progress in implementing these. The current status of school zones is outlined in Appendix 3.

Use of technology to warn motorists

Many car-mounted GPS units can detect school zones. The data used to provide these alerts are provided by the private sector, and some users have complained that some GPS school zone alerts are inaccurate.

The RTA has already compiled GPS data for much of the road system. A one-off project completed in 2006 collected GPS data for over 1,400 Sydney primary and secondary schools. It included:

- school speed zone sections
- pedestrian crossings
- roadside parking facilities
- school entrance and exit routes from main roads and side streets.

In 2007 the RTA introduced a Corporate Speed Zone Management System to collect, store and manage speed zone information across the state.

Have these approaches contributed to improved road safety around schools?

Conclusion

School age pedestrian casualties - fatalities and injuries - in school zones during their operating times have reduced significantly in the last decade as the RTA has implemented 40 km/h school zones. The number of casualties is low.

Many motorists persist in speeding in school zones. Enforcement of the speed limits depends almost entirely on speed cameras, and the great majority of school zones without these have little enforcement. Enforcement of parking restrictions around schools also appears poor.

There are some anomalies in school zone speed limits, and some school zone signs are badly placed or in unserviceable condition.

Is the impact of road safety initiatives around schools assessed?	<p>The RTA has progressively developed its ability to analyse crashes and casualties around schools. Previous systems were not sufficiently precise to capture crashes within a school zone accurately enough for valid conclusions or comparisons.</p> <p>The RTA advises that it has now developed a mapping system to locate school zone boundaries that has dramatically improved the quality of speed zone data, enabling more precise analysis. The GPS data, as described previously, has now been collected on almost 1,700 school zones.</p>
What has been the change in road safety around schools?	<p>The RTA has analysed school zone casualties - any person killed or injured as a result of a crash - in its Sydney and South West Regions. This sample represents approximately 25 per cent of school zones in NSW.</p> <p>The analysis showed that five to 16 year old pedestrian casualties in school zones in these Regions have reduced by nearly half between 1998 and 2008. In comparison, casualties involving all road users - drivers, passengers, motorcyclists and pedestrians of all ages - decreased by seven per cent over this period, and school age pedestrian casualties by 41 per cent.</p> <p>However the number of school age pedestrian casualties in school zones during school zone times is small. It has ranged between six and 29 each year in the sample reviewed, with two deaths in the ten years. This is equivalent to an estimated 60 casualties annually for all NSW school zones. In comparison, there were 2,000 school age casualties each year on average on the whole NSW road system.</p>
School pedestrian fatalities	<p>In the last decade two child pedestrian fatalities in school zones have been recorded. Another occurred where a school zone was subsequently installed. None of these fatalities was caused by speeding, and one was at least partly due to unsafe parking practices.</p>
Crashes	<p>Between 1998 and 2008 speed was involved in around 17 per cent of all crashes in NSW, and around 12 per cent in the Sydney and South West Region sample. In school zones during school zone times speed related crashes were quite rare, representing around five per cent of all crashes, and only one per cent of all crashes involving a school age pedestrian were speed related.</p> <p>Total crashes in school zones during school zone times decreased by 35 per cent over the period, and 'sudden slowing down' or 'rear-end' crashes decreased by the same percentage. This evidence contradicts any notion that slowing down for school zones contributes to more accidents.</p>
Have school zone initiatives affected traffic conditions?	<p>Despite the adoption of 40 km/h school zone speed limits across the state, the rollout of fixed speed cameras inside and outside school zones, signs with flashing lights and parking restrictions around schools, motorists still exceed the speed limit and park illegally around schools.</p>

Motorists still speed in school zones

The RTA conducted a school zone speed survey in 2008. This showed that in only two schools out of twelve surveyed were vehicle speeds close to the speed limit of 40 km/h. In four school zones mean speeds were over 47 km/h. A crash at this speed involving a pedestrian is almost twice as likely to result in a fatality as a crash at the 40 km/h legal speed.

Exhibit 2: Speeds in school zones during operating hours		
		Mean speed (km/h)
Sydney metropolitan schools	School 1	46.7
	School 2	46.3
	School 3	43.6
	School 4	45.9
Regional schools	School 5	47.8
	School 6	47.1
	School 7	46.1
	School 8	47.9
	School 9	46.4
	School 10	40.4
	School 11	40.0
Rural school	School 12	49.9

Source: RTA school zone speed survey summary report

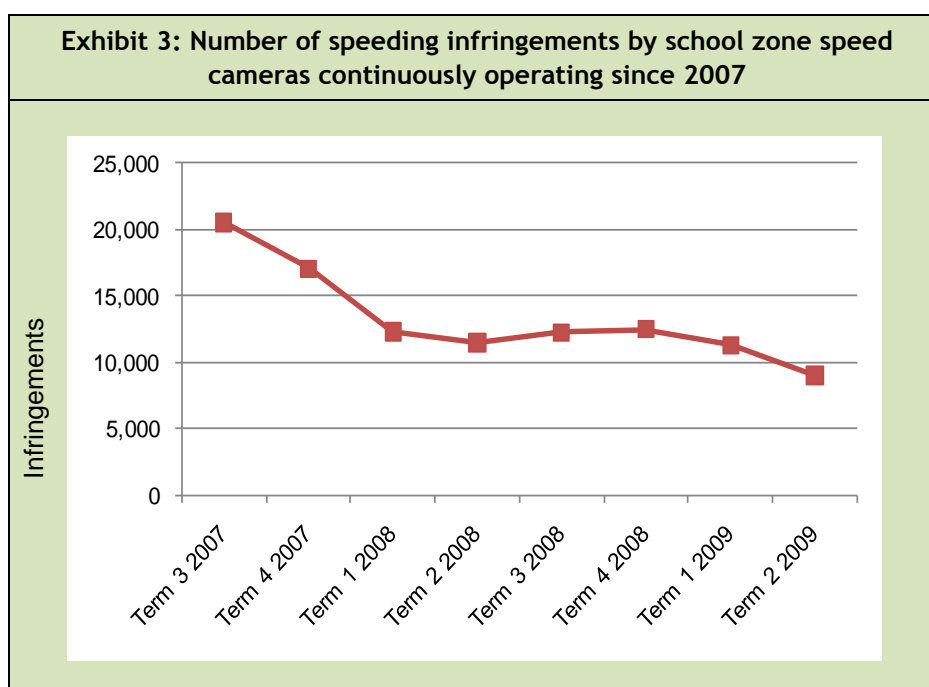
An NRMA survey of 11 Sydney schools in 2005 found similar levels of speeding. Only half of the motorists were obeying the 40 km/h speed limit during school zone hours.

Speed camera impact on speeding

The initial trial of fixed speed cameras across NSW in 2005 showed a statistically significant reduction in mean speeds and in the percentage of vehicles exceeding the speed limit. It also showed that the cameras contributed to statistically significant reductions in crashes, including fatal crashes.

But speed camera infringements, while diminishing over time, show that drivers continue to speed in school zones. Appendix 1 lists all speed cameras in school zones in NSW, along with the number of fines issued and their value for 2007-08 and 2008-09. There are now 65 school zone speed cameras.

The chart below shows the number of speeding infringements recorded by the 32 school zone speed cameras which have operated continuously since 2007. These cameras accounted for one-third of the total number of school zone speeding infringements in 2007-08.



Source: State Debt Recovery Office

This represents a substantial number of speeding drivers for 40 km/h school zones that operate for only three hours a day, five days a week for around 40 weeks every year.

Fixed speed cameras operate in less than one per cent of school zones: 44 out of approximately 10,000 school zones in NSW. These 44 accounted for 93 per cent of speeding infringements in school zones in the first two terms of 2009, with Police accounting for the other seven per cent of infringements.

The number of speeding notices issued by Police in school zones was 13,288 in 2007-08 and 10,460 in 2008-09. The value of these notices was \$3.5 million in 2007-08 and \$2.8 million in 2008-09.

Improving school zone effectiveness

The RTA has not identified why so many motorists continue to speed in school zones despite the extensive use of flashing lights to alert them to the presence of schools and speed cameras to encourage compliance with speed limits. While the 2005 evaluation of fixed speed cameras was favourable the evidence suggests that in practice they are less effective in reducing speeding than the trial promised.

The 2001 Staysafe report *Traffic Control and Safety in the Vicinity of Schools* noted that:

... the Carr Labor Government has committed to conducting an audit of the traffic facilities outside all schools in NSW.

The RTA inspected all school zones during 2005, and developed a database to include details of all schools, with diagrams and photographs and the features of all school zone safety measures installed.

The RTA advises that it has surveyed the effectiveness of the road safety education program for school children and found that school-leavers have a strong recall of road safety messages. However, we are unaware of any evaluation of whether it has modified the behaviour of children and their parents or carers around schools.

Speed camera revenue

School zone speed cameras generated fines worth \$31.1 million in 2007-08 and \$22.3 million in 2008-09. The Minister for Roads had advised in 2006 that:

The [school zone fixed speed] cameras will only operate in school zone hours and all revenue from them will be put straight back into road safety projects.

We have been advised that some of this revenue is funding the program to install school zone flashing lights. However we have not been able to obtain enough information to determine how much of the speed camera revenue is reinvested in road safety projects as the Minister had promised .

Expenditure on school zones

The rollout of 40 km/h zones to all NSW schools since 2003 has cost around \$100 million.

Exhibit 4: RTA expenditure on school zones 2003-2007	
	Expenditure (\$,000)
Facilities around schools	25,467
School crossing supervisors	37,211
School education	14,652
Flashing lights	12,035
School zone fixed speed cameras	8,750
Total	98,115

Source: Roads and Traffic Authority

This excludes expenditure on local area traffic management, traffic control signals, maintenance and upgrading of roads and Local Government Road Safety Officers. While some of this expenditure would have been made on school zones, it is not possible to isolate or estimate the amount.

The RTA estimates that the cost of maintaining flashing lights will be \$10.7 million and maintaining other school zone assets will be \$5.1 million in 2009-10.

The installation of ‘dragon’s teeth’ at the entrance to every school zone in NSW to make them more visible, announced in May 2009, is budgeted to cost \$14 million.

Some school zone signs are not effective

We observed some school zone signs which were inappropriately placed or in poor condition and may not have adequate visibility. Some are obscured by poles or roadside foliage and some have been defaced or have faded. This may be a factor in low compliance with speed limits.



Source: Audit Office

Poor placement or condition of signs around schools have also been reported by Council employees and by the NRMA.

Anomalous 40 km/h speed zones

We have identified some apparent inconsistencies in speed zoning around schools.

One high school has a pedestrian footbridge and a fence along its border with the highway to prevent students crossing the road unsafely. This section of the highway is also a 40 km/h school zone. In contrast, a primary school has a side street entrance in a 40 km/h school zone, and a fenced border with the highway which has a 60 km/h speed limit. The primary school children appear to have less protection for highway crossings than the high school with the footbridge and the 40 km/h speed limit.

We also noted a 40 km/h school zone speed limit over 600 m from the nearest school boundary and separated from it by roads without 40 km/h speed limits. The RTA is apparently reluctant to remove any 40 km/h speed limits because of the possible reaction of local residents.

Parking enforcement

Enforcement of parking and stopping restrictions, including in school zones, is the responsibility of Councils and Police. The RTA establishes parking policies, guidelines and some penalty regimes, but has no role in enforcement.

The Audit Office has no legal authority to conduct audits in local government. However it is important that parents, carers and the school community be aware of the performance of councils in ensuring safe and legal parking around their children's schools.

Enforcement of parking offences in school zones appears to be highly variable across the state. Of the 164 Councils in NSW, 79 did no school zone parking enforcement at all during 2008-09. Most of these councils are in rural areas where there may not be as much congestion around schools as in cities.

Exhibit 6: Council enforcement of parking in school zones			
		2007-08	2008-09
Sydney councils	Number not issuing fines	0	2
	Number issuing fines	38	36
	Number of infringements	12,573	9,322
Regional councils	Number not issuing fines	4	6
	Number issuing fines	24	22
	Number of infringements	2,974	3,505
Rural councils	Number not issuing fines	83	71
	Number issuing fines	15	27
	Number of infringements	784	3,766

Source: State Debt Recovery Office

Of the 38 councils in Sydney, some generate only a few dozen school zone parking infringements per year. A similar pattern is seen in regional councils: some issue no school zone parking infringements while others issue hundreds.

We are unable to say whether the variations are because of the differences in capacity to enforce, different approaches to enforcement, or the compliance with parking restrictions by parents driving to the school. However unsafe or illegal parking practices can be readily observed around schools, as shown below.

Exhibit 7: Unsafe child pedestrian and parking practices in school zones	
	
<p>Parent stops illegally in front of a pedestrian crossing and next to a roadside fence to allow the child to get out of the car.</p>	<p>Parent double-parks and blocks the road while other cars move away from the kerb after letting children off safely.</p>

Source: Council Road Safety Officers

While Police issued around two per cent of all parking infringements, they are far more proactive in school zones, where they issue around eight per cent of all parking offence notices. In 2007-08 they issued 1,450 parking infringements in school zones, and 1,498 infringements in 2008-09.

Community attitudes	<p>The RTA has not reported on motorist attitudes to school zones and enforcement, but the NRMA conducted surveys in 2002 and 2003:</p> <p style="padding-left: 40px;">Support of 40 km/h school zone limits was almost universal, with 83 per cent expressing strong support. Use of speed cameras to enforce school zone limits was supported by 64 per cent of drivers. 76 per cent thought that flashing lights should be used to alert drivers to the operation of the zone. Most of the drivers considered that speed cameras are effective in making them comply with the speed limit, and around two-thirds supported wider use of cameras.</p> <p>However some posts on the NRMA Motoring Blog website show that some drivers disagree with the need for school zones or deliberately flout the laws, emphasising the need for the RTA to understand why school zone speed limit compliance is poor.</p>
Informing the community	<p>The RTA has not published any results to inform the public of whether school zones have reduced school children casualties. The Victorian government, in contrast, has announced reductions in casualty crashes and in crashes involving pedestrians or cyclists outside schools since it introduced school speed zones in 2003.</p> <p>The RTA advises they will make this information public when the analysis is completed for all school zones. It also advised that when its mapping of school zone GPS data is completed the information will be disclosed and updated regularly.</p>
Effect of school zones on travel times	<p>It is likely that some motorists believe that slowing for 40 km/h school zone speed limits will substantially increase travel times. While some trips may take longer, any delay will be less than expected.</p> <p>In its 1996 report on 50 km/h urban speed limits Staysafe noted that:</p> <p style="padding-left: 40px;">Reducing the general urban speed limit is likely to be perceived in some sections of the driving community as an unwarranted addition to the already considerable delays they face on the roads, particularly in Sydney. ... [However] concerns over significant additions to journey times appear to be unfounded.</p> <p>This is supported by an Austroads estimate that a 7 km/h reduction in speed would result in a twenty second increase in travelling time per vehicle per day. Austroads suggests that increases in travel times due to reduced travel speeds on local streets are likely to be so small as to be deemed insignificant.</p> <p>The RTA reports average speeds on the seven major routes around Sydney. In 2008-09 these were 31 km/h in the morning peak and 43 km/h in the evening peak, suggesting that on these routes at least motorists may suffer little impact from slowing for school zones.</p> <p>Reducing speed limits in school zones is a trade-off between the safety of vulnerable school children and the convenience of drivers. The evidence suggests that while children benefit significantly, the inconvenience to motorists is only marginal.</p>

Appendices

Appendix 1: Speeding infringements by fixed speed cameras in school zones

Location of speed camera	Total number of notices		Value of fines (\$)	
	2007-08	2008-09	2007-08	2008-09
Alexandria 2015 Botany Road Northbound	2,689	1,463	390,036	210,480
Ashfield 2131 Hume Highway Eastbound	1,697	1,114	236,794	157,271
Ashfield 2131 Hume Highway Westbound	1,816	1,497	254,550	214,073
Bankstown 2200 Hume Highway Eastbound	8,013	3,296	1,307,894	536,355
Bankstown 2200 Hume Highway Westbound	18,150	5,455	2,955,702	867,905
Bateau Bay 2261 Central Coast Hwy Northbound	3,163	5,674	473,328	867,877
Beverly Hills 2209 King Georges Road Northbound	4,819	2,543	850,850	451,714
Beverly Hills 2209 King Georges Road Southbound	9,396	3,168	1,611,288	527,148
Bonnyrigg 2177 Cabramatta Road Eastbound	3,173	3,080	514,756	499,811
Bonnyrigg 2177 Cabramatta Road Westbound	4,319	3,219	719,140	521,355
Castle Hill 2154 Old Northern Road Eastbound	2,664	2,047	418,485	321,677
Castle Hill 2154 Old Northern Road Westbound	833	661	123,396	100,983
Chester Hill 2162 Woodville Road Southbound	0	383	0	64,304
Condell Park 2200 Edgar Street Northbound	397	363	55,038	50,907
Condell Park 2200 Edgar Street Southbound	426	421	59,805	58,731
Eastgardens 2036 Bunnerong Road Northbound	4,703	2,712	720,971	411,867
Epping 2121 Carlingford Road Eastbound	891	528	136,041	80,244
Epping 2121 Carlingford Road Westbound	1,304	851	197,982	130,950
Fairy Meadow 2500 Balgownie Road Eastbound	161	127	23,490	19,602
Fairy Meadow 2500 Balgownie Road Westbound	170	171	23,007	24,042
Gateshead 2290 Pacific Highway Southbound	1,766	1,636	290,739	271,863
Guildford 2161 Woodville Road Northbound	2,701	1,927	418,563	297,652
Guildford 2161 Woodville Road Southbound	6,644	3,627	1,153,251	639,226
GyMEA 2227 President Avenue Eastbound	414	506	59,319	73,224
GyMEA 2227 President Avenue Westbound	946	1,192	136,790	173,583
Hurstville 2220 Forest Road Northbound	2,198	2,058	337,612	310,294
Hurstville 2220 Forest Road Southbound	1,435	1,402	217,818	214,695
Kingswood 2747 Parker Street Northbound	0	1,563	0	281,596
Kingswood 2747 Parker Street Southbound	0	264	0	45,355
Kogarah 2217 Princes Highway Northbound	2,837	1,683	454,210	277,001
Kogarah 2217 Princes Highway Southbound	5,118	3,773	840,510	608,078
Lindfield 2070 Pacific Highway Eastbound	8,799	4,172	1,455,666	660,582
Lindfield 2070 Pacific Highway Westbound	4,558	1,639	678,525	245,727
Liverpool 2170 Bigge Street Northbound	996	656	143,154	96,687
Liverpool 2170 Bigge Street Southbound	1,014	851	144,174	121,311
Lochinvar 2321 New England Highway Eastbound	723	624	119,001	110,312
Lochinvar 2321 New England Highway Westbound	929	951	156,636	156,569
Maroubra 2035 Malabar Road Northbound	1,081	480	150,915	67,457
Maroubra 2035 Malabar Road Southbound	430	255	59,550	35,388
Maroubra 2035 Bunnerong Road Southbound	9,124	2,496	1,397,974	380,889
Merrylands 2160 Merrylands Road Eastbound	1,239	1,038	188,475	158,268
Merrylands 2160 Merrylands Road Westbound	1,859	1,541	283,575	237,868
Merrylands West 2160 Sherwood Road Northbound	1,034	532	162,171	81,772
Merrylands West 2160 Sherwood Road Southbound	2,128	1,183	339,260	178,712
Miranda 2228 Kingsway Eastbound	1,201	526	191,283	83,163

Location of speed camera	Total number of notices		Value of fines (\$)	
	2007-08	2008-09	2007-08	2008-09
Miranda 2228 Kingsway Westbound	1,846	2,485	307,331	413,633
Moore Park 2021 Cleveland Street Eastbound	2,300	3,314	394,255	555,817
Moore Park 2021 Cleveland Street Westbound	1,566	2,355	257,730	397,409
Mosman 2088 Macpherson Street Northbound	741	460	107,517	66,447
Mosman 2088 Macpherson Street Southbound	381	193	52,362	27,567
Narrabeen 2101 Pittwater Road Northbound	4,155	3,640	653,372	568,215
Narrabeen 2101 Pittwater Road Southbound	3,906	3,855	608,359	589,843
North Curl Curl 2099 Harbord Road Northbound	406	544	61,821	82,961
North Curl Curl 2099 Harbord Road Southbound	2,099	2,291	309,413	341,880
North Narrabeen 2101 Pittwater Road Northbound	0	601	0	98,874
North Narrabeen 2101 Pittwater Road Southbound	0	675	0	107,352
North Parramatta 2151 Pennant Hills Road Northbound	3,250	2,180	523,488	361,345
Oatlands 2117 Pennant Hills Road Southbound	745	554	113,795	81,405
Old Guildford 2161 Woodville Road Northbound	0	408	0	75,515
Old Toongabbie 2146 Fitzwilliam Road Westbound	225	227	32,322	33,681
Ourimbah 2258 Pacific Highway Northbound	962	977	150,427	155,898
Ourimbah 2258 Pacific Highway Southbound	1,158	1,123	167,446	166,050
Parramatta 2150 Great Western Highway Eastbound	3,121	2,411	471,432	362,073
Parramatta 2150 Great Western Highway Westbound	11,291	11,483	1,710,878	1,745,595
Penshurst 2222 Forest Road Eastbound	200	214	28,278	32,044
Penshurst 2222 Forest Road Westbound	1,589	1,649	231,963	239,980
Randwick 2031 Avoca Street Northbound	4,684	2,258	745,816	350,568
Randwick 2031 Avoca Street Southbound	7,453	3,724	1,107,046	553,662
Rosebery 2018 Botany Road Southbound	8,699	5,807	1,424,190	944,680
Rydalmere 2116 Victoria Road Eastbound	0	583	0	106,507
Rydalmere 2116 Victoria Road Westbound	0	170	0	29,256
Ryde 2112 Victoria Road Eastbound	3,027	4,682	483,146	747,150
Ryde 2112 Victoria Road Westbound	1,047	832	168,121	135,648
Strathfield 2135 The Boulevarde Northbound	0	795	0	122,400
Strathfield 2135 The Boulevarde Southbound	0	639	0	103,571
Toongabbie 2146 Fitzwilliam Road Eastbound	788	585	120,408	93,115
Wahroonga 2076 Pacific Highway Northbound	0	348	0	65,783
Wahroonga 2076 Pacific Highway Southbound	0	694	0	125,693
West Wollongong 2500 Princes Highway Northbound	637	670	99,954	103,615
West Wollongong 2500 Princes Highway Southbound	920	735	136,281	109,260
Woy Woy 2256 Blackwall Road Northbound	279	306	40,159	42,580
Woy Woy 2256 Blackwall Road Southbound	55	340	7,857	47,371
Woy Woy 2256 Ocean Beach Road Northbound	263	354	35,853	49,745
Woy Woy 2256 Ocean Beach Road Southbound	284	299	41,241	44,322
Wyoming 2250 Henry Parry Drive Northbound	187	111	26,742	15,753
Wyoming 2250 Henry Parry Drive Southbound	479	644	66,258	90,898
Total school zone offences	196,701	141,563	31,136,985	22,309,729

Source: State Debt Recovery Office

Appendix 2: Delivery of school zone Government commitments

Date of commitment	Government commitment	Progress
November 2001	40 km/h speed zones on all roads with direct access to schools. All zones will have standardised times	All 3,154 schools completed by 2003. More than 10,000 school zones across NSW
November 2001	30 additional school crossing supervisors for infant and primary schools	Ongoing process
November 2001	Additional road safety improvements including fencing for schools located on state and regional roads	Ongoing process
November 2001	RTA database registering and tracking road safety issues at all schools	Database developed in 2005 that included all schools, with diagrams and photographs and the features of all school zone safety measures installed
August 2002	Additional ten schools would get flashing warning lights. Already installed at 11 schools	Currently 366 flashing warning lights have been installed
August 2002	Three speed cameras to be rotated between ten primary schools	Superseded by late 2002 commitment
August 2002	Ten additional school crossing supervisors over the next year	More than 30 additional school crossing supervisor sites created by June 2004
October 2002	Ten school sites to be trialled with fixed speed cameras	11 cameras in school zones by mid-2003; trial to evaluate effectiveness between 2002 and 2004
October 2002	Another 11 schools to have flashing warning lights installed as part of the trial	43 schools (part of a three-year trial) completed by 2006
October 2002	65 schools to be targeted by Police for speed zone enforcement	Outcome unknown
January 2006	RTA emphasises ongoing commitment to train teachers to deliver road safety lessons to students	The RTA's Road Safety Education Program provides educational resources and professional development to teachers and child-care workers throughout NSW

Date of commitment	Government commitment	Progress
May 2006	Electronic school safety alert systems incorporating flashing 40 km/h signs and lights across all schools by the end of 2006 to be funded from speed cameras in school zones	100 school zones had flashing lights installed as part of the trial
May 2006	Combination of 50 fixed and mobile speed cameras rotated between all NSW school zones operating only in school zone hours	More than 50 fixed cameras but no mobile speed cameras in place
May 2006	Increased fines and demerit points for driving offences in school zones	On 21 May 2007 the NSW Government introduced new fines and demerit points for offences committed in school zones.
May 2006	'Drop-off-and-go, pick-up-and-go' system to allow parents to become more involved in student safety and ease congestion around participating schools	Trialled at two schools; unknown how many schools have adopted
October 2006	25 fixed digital school zone speed cameras will be installed and the revenue invested in school road safety	39 cameras in place by December 2007 under this program Currently 65 cameras in 44 school zones
September 2007	400 additional flashing light warning systems (100 every year from 2008) funded by revenue from speed cameras in school zones	201 flashing lights installed under this program; 366 installed in total
May 2009	'Dragon's teeth' markings to be installed at the start of every school zone	To start during 2010 and be completed by end 2011
July 2009	All 22,000 school zone signs to be replaced with fluorescent yellow-green panels	To date 1,000 new fluorescent signs have been installed (including in all school zones with speed cameras)

Appendix 3: Status of school zones

3,154 schools

More than 10,000 school zones, all with school zone signs and road markings

366 school zones with flashing lights

65 fixed speed cameras located in 44 school zones

No mobile speed cameras

School crossing supervisors at more than 700 sites

3,131 schools with standard times school zones

23 schools with non-standard times school zones, five of which have flashing lights

Other enhancements to improve pedestrian safety include:

- 'drop-off-and-go, pick-up-and-go' areas
- overhead bridges
- fencing which separates children from traffic and guides children toward a safer crossing facility
- parking restrictions
- wombat crossings
- pedestrian refuges
- traffic signal controlled pedestrian crossings
- marked foot crossings
- 'dragon's teeth' markings
- fluorescent signage.

Appendix 4: About the Audit

Audit Objective Our objective in this audit is to determine if school zone initiatives have made a difference to safety around schools.

Lines of Inquiry In reaching our opinion against the audit objective, we sought to answer the following questions:

1. are there practical approaches to address road safety issues around schools?
2. have these approaches contributed to improved road safety around schools?

Audit Criteria In answering the lines of inquiry, we used the following audit criteria (the 'what should be') to judge performance. We based these standards on our research of current thinking and guidance on better practice. They have been discussed and agreed with those we are auditing.

For line of inquiry 1, we assessed the extent to which:

- children face road safety risks around schools
- there are ways to address these risks.

For line of inquiry 2, we assessed the extent to which:

- the impact of road safety initiatives around schools is assessed
- there have been changes in road safety around schools
- school zone initiatives have affected traffic conditions.

Audit scope The audit focused on the introduction of school zones and other related initiatives and whether they have been successful in improving safety around schools.

We reviewed:

- processes to identify risk and to determine appropriate measures
- school zone accident statistics and research
- processes used by agencies to monitor, assess and evaluate the effectiveness of these measures
- information on the impact on other road users potentially affected by school zones
- information on general community perceptions of school zones and child safety around schools.

We wrote to 41 stakeholders including accident and injury research organisations, the Local Government and Shires Associations, the Local Government Engineers Association, all Regional Organisations of Councils, representatives of the insurance industry, the Institute of Public Works Engineering Australia, school principals' organisations, NSW Teachers Federation, parents' and citizens' organisations, BUSNSW and the Pedestrian Council of Australia inviting their feedback and comments.

The audit did not:

- question the merits of the Government policy objective
- duplicate any reviews already conducted.

Audit approach

We acquired subject matter expertise by reviewing and auditing:

- policy documents and legislation
- relevant internal policies, procedures, standards, and guidelines
- assessments undertaken on the various initiatives for school zones
- data on infringements and fines
- research reports and studies on child safety around schools from within Australia and internationally
- road user and community surveys on perceptions of school zones
- practices in other jurisdictions nationally and internationally.

We interviewed representatives of:

- the RTA's Centre for Road Safety and RTA regional staff responsible for school zones
- the State Debt Recovery Office
- the NSW Police Force
- the Department of Education and Training
- the Motor Accidents Authority.

We also received submissions from BusNSW, NRMA Motoring & Services, the Insurance Council of Australia, the Association of Independent Schools of NSW, the Pedestrian Council of Australia, Gosford City Council, the Australasian College of Road Safety, the Institute of Public Works Engineering Australia and Road Safety Officers from several councils.

Audit selection

We use a strategic approach to selecting performance audits which balances our performance audit program to reflect issues of interest to Parliament and the community. Details of our approach to selecting topics and our forward program are available on our website.

Audit methodology

Our performance audit methodology is designed to comply with the Standard on Assurance Engagements ASAE3500 Performance Engagements.

We produce our audits under a quality management system certified to International Standard ISO 9001. Our processes have also been designed to comply with the auditing requirements specified in the Public Finance and Audit Act 1983.

Acknowledgements

We gratefully acknowledge the cooperation and assistance provided by the RTA's Centre for Road Safety and its Sydney and South-Western Regions, whose staff participated in interviews and provided material relevant to the audit.

We would also like to thank representatives of the State Debt Recovery Office, NSW Police Force, the Motor Accidents Authority and the Department of Education and Training for participating in interviews and providing relevant material.

We also appreciate the time given by representatives of the Public Accounts Committee and Staysafe (the Joint Standing Committee on Road Safety).

Audit team Our team for the performance audit was Geoff Moran and Sandra Tomasi. Sean Crumlin provided direction and quality assurance.

Audit cost Including staff costs, printing costs and overheads, the estimated cost of the audit is \$197,500.

Performance Audits by the Audit Office of New South Wales

Performance Auditing

What are performance audits?

Performance audits determine whether an agency is carrying out its activities effectively, and doing so economically and efficiently and in compliance with all relevant laws.

Performance audits may review a government program, all or part of a government agency or consider particular issues which affect the whole public sector.

Where appropriate, performance audits make recommendations for improvements.

If you wish to find out what performance audits are currently in progress, visit our website at www.audit.nsw.gov.au.

Why do we conduct performance audits?

Performance audits provide independent assurance to Parliament and the public that government funds are being spent efficiently and effectively, and in accordance with the law.

Performance audits seek to improve the efficiency and effectiveness of government agencies so that the community receives value for money from government services.

Performance audits also assist the accountability process by holding managers to account for agency performance.

What are the phases in performance auditing?

Performance audits have three key phases: planning, fieldwork and report writing.

During the planning phase, the audit team will develop audit criteria and define the audit field work.

At the completion of field work we will meet with agency management to discuss all significant matters arising out of the audit. Following this, we will prepare a draft performance audit report.

We meet with agency management to check that facts presented in the report are accurate and that recommendations are practical and appropriate. Following this, a formal draft report is provided to the CEO for comment. The relevant Minister is also provided with a copy of the final

report. The final report, which is tabled in Parliament, includes any comment made by the CEO on the conclusion and the recommendations of the audit.

Depending on the scope, performance audits can take several months to complete.

Copies of our performance audit reports can be obtained from our website or by contacting our Office.

How do we measure an agency's performance?

During the planning phase, the team develops the audit criteria. These are standards of performance against which the agency or program is assessed. Criteria may be based on best practice, government targets, benchmarks, or published guidelines.

Do we check to see if recommendations have been implemented?

Agencies are requested to report actions taken against each recommendation in their annual report so that we can monitor progress.

The Public Accounts Committee (PAC) may conduct reviews or hold inquiries into matters raised in performance audit reports. These inquiries are usually held 12 months after the report is tabled.

Who audits the auditors?

Our performance audits are subject to internal and external quality reviews against relevant Australian and international standards. This includes ongoing independent certification of our ISO 9001 quality management system.

The PAC is also responsible for overseeing the activities of the Audit Office and conducts a review of our operations every three years.

Who pays for performance audits?

No fee is charged for performance audits. Our performance audit services are funded by the NSW Parliament and from internal sources.

Further information

Further information can be obtained from our website www.audit.nsw.gov.au or by contacting us on 9275 7277.

Performance Audit Reports

No	Agency or Issues Examined	Title of Performance Audit Report or Publication	Date Tabled in Parliament or Published
197	Roads and Traffic Authority of NSW	<i>Improving Road Safety: School Zones</i>	February 2010
196	NSW Commission for Children and Young People	<i>Working with Children Check</i>	24 February 2010
195	NSW Police Force NSW Department of Health	<i>Managing Forensic Analysis - Fingerprints and DNA</i>	10 February 2010
194	Department of Premier and Cabinet Department of Services, Technology and Administration NSW Treasury	<i>Government Advertising</i>	10 December 2009
193	Roads and Traffic Authority of NSW	<i>Handback of the M4 Tollway</i>	27 October 2009
192	Department of Services, Technology and Administration	<i>Government Licensing Project</i>	7 October 2009
191	Land and Property Management Authority Maritime Authority of NSW	<i>Administering Domestic Waterfront Tenancies</i>	23 September 2009
190	Department of Environment, Climate Change and Water NSW Environmental Trust	<i>Environmental Grants Administration</i>	26 August 2009
189	NSW Attorney General's Department NSW Department of Health NSW Police Force	<i>Helping Aboriginal Defendants through MERIT</i>	5 August 2009
188	NSW Department of Health	<i>Tackling Cancer with Radiotherapy</i>	23 June 2009
187	Roads and Traffic Authority of NSW	<i>Improving Road Safety - Heavy Vehicles</i>	13 May 2009
186	Grants	<i>Grants Administration</i>	6 May 2009
185	Forests NSW	<i>Sustaining Native Forest Operations</i>	29 April 2009
184	NSW Police Force	<i>Managing Injured Police</i>	10 December 2008
183	Department of Education and Training	<i>Improving Literacy and Numeracy in NSW Public Schools</i>	22 October 2008
182	Department of Health	<i>Delivering Health Care out of Hospitals</i>	24 September 2008
181	Department of Environment and Climate Change	<i>Recycling and Reuse of Waste in the NSW Public Sector</i>	11 June 2008
180	Follow-up of 2003 Performance Audit	<i>Protecting Our Rivers</i>	21 May 2008
179	NSW Office of Liquor, Gaming and Racing; NSW Police Force	<i>Working with Hotels and Clubs to reduce alcohol-related crime</i>	23 April 2008
178	Greyhound and Harness Racing Regulatory Authority	<i>Managing the Amalgamation of the Greyhound and Harness Racing Regulatory Authority</i>	3 April 2008

No	Agency or Issues Examined	Title of Performance Audit Report or Publication	Date Tabled in Parliament or Published
177	Office of the Director of Public Prosecutions	<i>Efficiency of the Office of the Director of Public Prosecutions</i>	26 March 2008
176*	Better Practice Guide	<i>Implementing Successful Amalgamations</i>	5 March 2008
175	Department of Commerce Department of Primary Industries	<i>Managing Departmental Amalgamations</i>	5 March 2008
174	Department of Education and Training	<i>Ageing workforce - Teachers</i>	13 February 2008
173	NSW Police Force	<i>Police Rostering</i>	5 December 2007
172	Department of Primary Industries	<i>Improving Efficiency of Irrigation Water Use on Farms</i>	21 November 2007
171	Department of Premier and Cabinet Department of Commerce	<i>Government Advertising</i>	29 August 2007
170	RailCorp	<i>Signal Failures on the Metropolitan Rail Network</i>	15 August 2007
169	NSW Police Force	<i>Dealing with Household Burglaries</i>	27 June 2007
168	Ministry of Transport	<i>Connecting with Public Transport</i>	6 June 2007
167	Follow-up of 2001 Performance Audit: Ambulance Service of New South Wales	<i>Readiness to Respond</i>	6 June 2007
166	Follow-up of Performance Audit Department of Education and Training	<i>Using Computers in Schools for Teaching and Learning</i>	9 May 2007
165	Homelessness	<i>Responding to Homelessness</i>	2 May 2007
164	Department of Juvenile Justice NSW Police Force	<i>Addressing the Needs of Young Offenders</i>	28 March 2007
163	Legal Aid Commission of NSW	<i>Distributing Legal Aid in New South Wales</i>	13 December 2006
162	NSW Health	<i>Attracting, Retaining and Managing Nurses in Hospitals</i>	12 December 2006
161	Follow-up of 2003 Performance Audit	<i>The Police Assistance Line</i>	6 December 2006
160	NSW Health	<i>Helping Older People Access a Residential Aged Care Facility</i>	5 December 2006
159	NSW Health	<i>Major Infectious Disease Outbreaks: Readiness to Respond</i>	22 November 2006

* Better Practice Guides

Performance audits on our website

A list of performance audits tabled or published since March 1997, as well as those currently in progress, can be found on our website www.audit.nsw.gov.au.

If you have any problems accessing these reports, or are seeking older reports, please contact our Office Services Manager on (02) 9275 7116.