

Final Report

**Evaluation of flashing lights in 40 km/h
school speed zones**



With comparison of different sign types

*by Philip Roper, Thorolf Thoresen, Michael Tziotis
and Kelly Imberger*

for Roads and Traffic Authority of NSW

Evaluation of flashing lights in 40 km/h school speed zones

for Roads and Traffic Authority of NSW

| Reviewed | |
|------------------------|--|
| Project Leader |  |
| | Michael Tziotis |
| Quality Manager |  |
| | David Bennett |

Although the Report is believed to be correct at the time of publication, ARRB Group Ltd, to the extent lawful, excludes all liability for loss (whether arising under contract, tort, statute or otherwise) arising from the contents of the Report or from its use. Where such liability cannot be excluded, it is reduced to the full extent lawful. Without limiting the foregoing, people should apply their own skill and judgement when using the information contained in the Report.

Contents

| | |
|---|-----------|
| SUMMARY | i |
| BACKGROUND | i |
| OBJECTIVES | i |
| METHOD | i |
| DESIGN | i |
| ANALYSIS | iv |
| KEY FINDINGS | iv |
| DESCRIPTIVE ANALYSIS | iv |
| HEAVY VEHICLES | iv |
| INFERENCE ANALYSIS – MEAN AND 85TH PERCENTILE SPEEDS | v |
| EFFECTIVENESS OF DIFFERENT TYPES OF FLASHING LIGHTS | v |
| OPERATIONAL PERFORMANCE OF DIFFERENT TYPES OF FLASHING LIGHTS | vi |
| SUMMARY | vii |
| 1 INTRODUCTION | 1 |
| 1.1 BACKGROUND | 1 |
| 1.2 OBJECTIVES | 1 |
| 2 METHOD | 1 |
| 2.1 FLASHING LIGHTS AND STATIC ‘SLOW DOWN’ ONLY SIGNS | 1 |
| 2.2 DESIGN | 3 |
| 2.3 PROCEDURE | 7 |
| 2.3.1 Speed data collection method and equipment | 7 |
| 2.3.2 Analysis of speed data | 8 |
| 3 RESULTS | 11 |
| 3.1 DESCRIPTIVE ANALYSIS | 11 |
| 3.1.1 Recorded speed characteristics | 11 |
| 3.1.2 Interpreting speed surveys | 11 |
| 3.1.3 Trends in speed characteristics – all vehicles | 12 |
| 3.1.4 Summary tables of key speed parameters – all vehicles | 15 |
| 3.1.5 Impact of flashing lights and static ‘Slow Down’ only signs at school zones on heavy vehicle speeds | 22 |
| 3.1.6 Summary tables of key speed parameters by approach speed limit – all vehicles | 28 |
| 3.1.7 Comparison of sites according to approach speed limit – heavy vehicles | 37 |
| 3.2 INFERENCE ANALYSIS | 46 |
| 3.2.1 Group A – analysis of speeds at school zones with flashing lights | 47 |
| 3.2.2 Group B - analysis of speeds at school zones with static ‘Slow Down’ only signs sites | 52 |
| 3.2.3 Group C - analysis of speeds at school zones with previous flashing light sites | 53 |
| 3.2.4 Summary of the effectiveness of different types of flashing lights | 57 |
| 4 SUMMARY OF DESCRIPTIVE ANALYSIS | 59 |
| 4.1 COMPARISON BETWEEN GROUPS A, B, C AND D – ALL VEHICLES | 59 |
| 4.1.1 Mean speeds | 59 |
| 4.1.2 85 th percentile speeds | 59 |
| 4.1.3 Proportion of vehicles exceeding the 40 km/h speed limit | 59 |
| 4.1.4 Proportion of vehicles exceeding the 40 km/h speed limit by more than 10 km/h | 60 |

| | | |
|----------|---|-----------|
| 4.1.5 | Proportion of vehicles exceeding the 40 km/h speed limit by more than 20 km/h | 60 |
| 4.1.6 | Proportion of vehicles exceeding the 40 km/h speed limit by more than 30 km/h | 60 |
| 4.2 | COMPARISON BETWEEN GROUPS A, B, C AND D – HEAVY VEHICLES | 60 |
| 4.2.1 | Mean speeds | 61 |
| 4.2.2 | 85 th percentile speeds | 61 |
| 4.2.3 | Proportion of vehicles exceeding the 40 km/h speed limit | 61 |
| 4.2.4 | Proportion of vehicles exceeding the 40 km/h speed limit by more than 10 km/h | 61 |
| 4.2.5 | Proportion of vehicles exceeding the 40 km/h speed limit by more than 20 km/h | 62 |
| 4.2.6 | Proportion of vehicles exceeding the 40 km/h speed limit by more than 30 km/h | 62 |
| 4.3 | COMPARISON BETWEEN GROUPS A, B, C AND D ACCORDING TO APPROACH SPEED LIMITS – ALL VEHICLES | 62 |
| 4.4 | COMPARISON BETWEEN GROUPS A, B, C AND D ACCORDING TO APPROACH SPEED LIMITS – HEAVY VEHICLES | 63 |
| 5 | SUMMARY OF INFERENCE ANALYSIS | 64 |
| 5.1 | CHANGES IN MEAN SPEEDS FOR GROUPS A, B AND C | 64 |
| 5.2 | CHANGES IN 85 TH PERCENTILE SPEEDS FOR GROUPS A, B AND C | 64 |
| 5.3 | EFFECTIVENESS OF DIFFERENT TYPES OF FLASHING LIGHTS | 65 |
| 6 | OPERATIONAL PERFORMANCE OF THE FLASHING LIGHTS SIGNS | 66 |
| 7 | DISCUSSION AND CONCLUSIONS | 67 |
| 8 | REFERENCES | 70 |
| | APPENDIX A – FULL SPEED SURVEY TABLES AND CHARTS | 71 |

Tables

| | | |
|-----------|--|----|
| Table 1: | Site groupings | 4 |
| Table 2: | Summary information – Group A flashing lights schools and matched control schools | 5 |
| Table 3: | Summary information – Group B ‘Slow Down’ signs and Group C and D flashing lights – treatment schools and their matched control schools | 6 |
| Table 4: | Recorded speed survey results for sites in Group A, and their controls, during school speed limit hours (all vehicles) | 13 |
| Table 5: | Recorded speed survey results for sites in groups B, C and D and their controls, during school speed limit hours (all vehicles) | 14 |
| Table 6: | Speed characteristics for all Group A sites (32 sites, 31 controls) – all vehicles, in the school zones | 18 |
| Table 7: | Speed characteristics for all Group B sites (5 sites, 5 controls) – all vehicles, in the school zones | 19 |
| Table 8: | Speed characteristics for all Group C sites (6 sites, 4 controls) – all vehicles, in the school zones | 20 |
| Table 9: | Speed characteristics for all Group D sites (5 sites, 5 controls) – all vehicles, in the school zones | 21 |
| Table 10: | Speed characteristics for all Group A sites (32 sites, 31 controls) – heavy vehicles, in the school zones | 24 |
| Table 11: | Speed characteristics for all Group B sites (5 sites, 5 controls) – heavy vehicles, in the school zones | 25 |
| Table 12: | Speed characteristics for all Group C sites (6 sites, 4 controls) – heavy vehicles, in the school zones | 26 |
| Table 13: | Speed characteristics for all Group D sites (5 sites, 5 controls) – heavy vehicles, in the school zones | 27 |
| Table 14: | Speed characteristics for the Group A sites with 50 km/h approach speed limits (12 sites, 12 controls) – all vehicles, in the school zones | 29 |
| Table 15: | Speed characteristics for the Group A sites with 60 km/h approach speed limits (13 sites, 12 controls) – all vehicles, in the school zones | 30 |
| Table 16: | Speed characteristics for the Group A sites with 70 km/h approach speed limits (2 sites, 2 controls) – all vehicles, in the school zones | 31 |
| Table 17: | Speed characteristics for the Group A sites with 80 km/h approach speed limits (3 sites, 3 controls) – all vehicles, in the school zones | 32 |
| Table 18: | Speed characteristics for the Group B sites with 50 km/h approach speed limits (3 sites, 3 controls) – all vehicles, in the school zones | 33 |
| Table 19: | Speed characteristics for the Group B sites with 60 km/h approach speed limits (2 sites, 2 controls) – all vehicles, in the school zones | 34 |
| Table 20: | Speed characteristics for the Group C sites with 60 km/h approach speed limits (2 sites, 1 control) – all vehicles, in the school zones | 35 |
| Table 21: | Speed characteristics for the Group C sites with 70 km/h approach speed limits (3 sites, 2 controls) – all vehicles, in the school zones | 36 |
| Table 22: | Speed characteristics for the Group A sites with 50 km/h approach speed limits (12 sites, 12 controls) – heavy vehicles, in the school zones | 38 |
| Table 23: | Speed characteristics for the Group A sites with 60 km/h approach speed limits (13 sites, 12 controls) – heavy vehicles, in the school zones | 39 |
| Table 24: | Speed characteristics for the Group A sites with 70 km/h approach speed limits (2 sites, 2 controls) – heavy vehicles, in the school zones | 40 |
| Table 25: | Speed characteristics for the Group A sites with 80 km/h approach speed limits (3 sites, 3 controls) – heavy vehicles, in the school zones | 41 |
| Table 26: | Speed characteristics for the Group B sites with 50 km/h approach speed limits (3 sites, 3 controls) – heavy vehicles, in the school zones | 42 |
| Table 27: | Speed characteristics for the Group B sites with 60 km/h approach speed limits (2 sites, 2 controls) – heavy vehicles, in the school zones | 43 |

| | | |
|-----------|--|----|
| Table 28: | Speed characteristics for the Group C sites with 60 km/h approach speed limits (2 sites, 1 control) – heavy vehicles, in the school zones | 44 |
| Table 29: | Speed characteristics for the Group C sites with 70 km/h approach speed limits (3 sites, 2 controls) – heavy vehicles, in the school zones | 45 |
| Table 30: | Group A: School zone flashing light speed signs mean Speeds (Unweighted) | 48 |
| Table 31: | Group A: School zone flashing light speed signs mean speeds (weighted) | 49 |
| Table 32: | Group A: School zone flashing light speed signs 85 th percentile speeds (unweighted) | 50 |
| Table 33: | Group A: School zone flashing light speed signs 85 th percentile speeds (weighted) | 51 |
| Table 34: | Group B: School zone static ‘Slow Down’ only sign sites (unweighted) | 52 |
| Table 35: | Group B: School zone static ‘Slow Down’ only speed sign sites (weighted) | 53 |
| Table 36: | Group C: School zone flashing light speed signs mean speeds (unweighted) | 54 |
| Table 37: | Group C: School zone flashing light speed signs mean speeds (weighted) | 55 |
| Table 38: | Group C: School zone flashing light speed signs 85 th percentile speeds (unweighted) | 56 |
| Table 39: | Group C: School zone flashing light speed signs 85 th percentile speeds (weighted) | 57 |
| Table 40: | Changes in mean speeds at treatment sites in Groups A, B and C | 64 |
| Table 41: | Changes in 85 th percentile speeds in Groups A, B and C | 64 |
| Table 42: | Electronic sign faults | 66 |

Figures

| | | |
|-----------|---|----|
| Figure 1: | School zone flashing light and static signs | 3 |
| Figure 2: | Layout of speed surveys – Type 1 and Type 3 signs (lights on regulatory speed limit signs) | 7 |
| Figure 3: | Layout of speed surveys – Type 2 (lights on school zone warning sign) and static ‘Slow Down’ only signs | 8 |
| Figure 4: | Hypothetical distributions of speed | 11 |

Tables in Appendix A

| | | |
|------------|---|----|
| Table A 1: | Recorded speed survey results for sites in Group A, and their controls, during school speed limit hours (heavy vehicles only) | 71 |
| Table A 2: | Recorded speed survey results for sites in groups B, C and D, and their controls, during school speed limit hours (heavy vehicles only) | 73 |
| Table A 3: | Recorded speed survey results for approaches to sites in Group A, and their controls, during school speed limit hours (all vehicles) | 74 |
| Table A 4: | Recorded speed survey results for approaches to sites in groups B, C and D, and their controls, during school speed limit hours (all vehicles) | 77 |
| Table A 5: | Recorded speed survey results for approaches to sites in Group A, and their controls, during school speed limit hours (heavy vehicles only) | 80 |
| Table A 6: | Recorded speed survey results for approaches to sites in groups B, C and D, and their controls, during school speed limit hours (heavy vehicles only) | 83 |

Figures in Appendix A

| | | |
|--------------|--|----|
| Figure A 1: | Changes in mean speeds (control-adjusted) at Group A sites, sorted by approach speed limit (all vehicles) | 84 |
| Figure A 2: | Changes in mean speeds (control-adjusted) at Group B and C sites, sorted by approach speed limit (all vehicles) | 85 |
| Figure A 3: | Changes in 85 th percentile speeds (control-adjusted) at Group A sites, sorted by approach speed limit (all vehicles) | 86 |
| Figure A 4: | Changes in 85 th percentile speeds (control-adjusted) at Group B and C sites, sorted by approach speed limit (all vehicles) | 87 |
| Figure A 5: | Changes in proportion over 40 km/h (control-adjusted) at Group A sites, sorted by approach speed limit (all vehicles) | 88 |
| Figure A 6: | Changes in proportion over 40 km/h (control-adjusted) at Group B and C sites, sorted by approach speed limit (all vehicles) | 89 |
| Figure A 7: | Changes in proportion over 50 km/h (control-adjusted) at Group A sites, sorted by approach speed limit (all vehicles) | 90 |
| Figure A 8: | Changes in proportion over 50 km/h (control-adjusted) at Group B and C sites, sorted by approach speed limit (all vehicles) | 91 |
| Figure A 9: | Changes in proportion over 60 km/h (control-adjusted) at Group A sites, sorted by approach speed limit (all vehicles) | 92 |
| Figure A 10: | Changes in proportion over 60 km/h (control-adjusted) at Group B and C sites, sorted by approach speed limit (all vehicles) | 93 |
| Figure A 11: | Changes in proportion over 70 km/h (control-adjusted) at Group A sites, sorted by approach speed limit (all vehicles) | 94 |
| Figure A 12: | Changes in proportion over 70 km/h (control-adjusted) at Group B and C sites, sorted by approach speed limit (all vehicles) | 95 |

Summary

Background

Speeding has been identified as a major factor in the causation and severity of road crashes. Speeding in New South Wales has been identified as the single most important factor in road fatalities. It has been estimated that it contributes to about 40% of all road fatalities in the State.

In an endeavour to improve road safety outside schools by lowering vehicle speeds, the RTA installed 40 km/h regulatory speed limits at school access points during school start and finish hours in December 2002. As well, a standardisation of school zones to 40 km/h was implemented state-wide.

To encourage increased compliance with this lower limit, the RTA has undertaken a trial of the installation and operation of three different types of flashing lights and static 'Slow Down' only signs at 40 km/h school speed zones. The RTA commissioned ARRB Group Ltd to conduct an evaluation of the flashing lights and static 'Slow Down' only signs.

Objectives

The objectives of the evaluation were to:

- identify and measure the effectiveness of flashing light and static 'Slow Down' only signs used to promote driver speed compliance with the 40 km/h speed limit
- compare the effectiveness of flashing lights with that of static 'Slow Down' only signs.

Method

Design


The study involved the installation of three different type of flashing lights units and static 'Slow Down' only signs at selected school zones. The flashing lights were installed at forty-three 40 km/h school speed zone sites. Forty matched control sites (sites with school zone signs but without flashing lights) were also selected for use as part of the evaluation.

Static 'Slow Down' only signs were also installed at five school zone sites, with five matched control sites (sites with school zone signs but without the static 'Slow Down' signs) being selected for the evaluation.

The purpose of using speed data at control sites was to adjust changes in speed that may have occurred as a result of other factors (i.e. climatic changes, police speed enforcement blitzes, etc).

Caution should also be exercised when considering the study outcomes of sites in isolation. While every endeavour was made to match control sites with treatment sites, this was in some cases difficult to achieve. To therefore gain a more accurate picture of the effectiveness of the flashing lights and the static 'Slow Down' only signs at school zones it is more appropriate to look at the sites in aggregate.

Details of the flashing lights and static 'Slow Down' only signs are as follows:

| | |
|--|--|
|  |  |
| <p>Type 1 - Solar powered flashing lights in a black panel above the school zone sign.</p> | <p>Type 2 - Solar powered flashing lights school zone warning sign located in advance of the regulatory school zone sign.</p> |
|  |  |
| <p>Type 3 - School zone regulatory sign with solar powered flashing lights built into the top panel. Flashing LEDs surround '40' and the red annulus.</p> | <p>Static 'Slow Down' only sign.</p> |

Type 1 flashing lights

- two flashing lights are attached to the top of the existing school zone sign
- the flashing lights are installed to advise drivers of the commencement of a school zone, the 40 km/h speed limit and times of operation.

Type 2 flashing lights

- designed as an advance warning sign to notify drivers that they are about to enter a school zone
- bears the phrases 'SLOW DOWN' and 'SCHOOL ZONE' on an orange background with two orange flashing lights
- positioned up to 200 metres before a school zone sign but this is dependent upon the traffic environment.

Type 3 flashing lights

- two flashing lights are installed within the existing school zone static sign placed at the commencement of a school zone
- the flashing lights are located within the 'SCHOOL ZONE' top panel
- flashing LEDs surround the numeral 40 and the red annulus.

Static 'Slow Down' only signs

- designed as an advance warning sign to notify drivers that they are about to enter a school zone
- similar in appearance to the Type 2 sign, but without flashing lights
- positioned up to 200 m before a school zone sign but this is dependent upon the traffic environment.

The sites investigated were split into four study groups:

Group A: Thirty-two flashing lights (all types) sites at school zones with thirty-one matched control sites.

Group B: Five static 'Slow Down' only signs at school zones with five matched control sites.

Group C: Six flashing lights (all types) sites, installed at an earlier time, with four matched control sites and with 'before' speed data.

Group D: Five flashing lights (all types) sites, installed at an earlier time, with five matched controls but without 'before' speed data.

Analysis

Two separate statistical analyses of the crash data were performed: descriptive and inferential analyses. The descriptive analysis gave an indication of the impact of flashing lights and static 'Slow Down' only signs on observed travel speeds at treatment sites. Inferential statistical analysis subjected observed speed changes to rigorous statistical analysis, which determines the extent to which speed changes reflect flashing light impacts, as opposed to impacts of other factors, and sampling variability associated with survey techniques.

The descriptive analysis investigated changes in:

- mean and 85th percentile speeds
- % of motorists travelling > 40 km/h school speed limit
- % of motorists travelling at 10 km/h, 20 km/h and 30 km/h > 40 km/h school speed limit.

The inferential statistical analysis examined mean and 85th percentile speeds.

Key Findings

Descriptive analysis

- Group A – Flashing lights sites

The proportion of vehicles exceeding the speed limit fell by 7.2%, from 57.7% to 50.5% during school zone hours, while the proportion of vehicles exceeding the speed limit by more than 10 km/h and 20 km/h fell by 9.8% (24.7% to 14.9%) and 4.3 % (9.2% to 4.9%) respectively after 9 months of operation. The proportion exceeding the speed limit by more than 30 km/h remained unchanged at 0.2%.

- Group B - Static 'Slow Down' only signs

Unlike the Group A sites, the proportion of vehicles exceeding the speed limit increased at the static 'Slow Down' only signs by 5.5%, from 45.4% to 50.9%. The proportion of vehicles exceeding the speed limit by more than 10 km/h and 20 km/h increased by 3.5% (17.4% to 20.9%) and 1.6% (5.2% to 6.8%) respectively after 9 months of operation. The proportion exceeding the speed limit by more than 30 km/h remained unchanged at 1.6%. These results should be treated cautiously as the sample size was small for this treatment type.

- Group C - Previously installed flashing lights sites with 'before' speed data

The proportion of vehicles exceeding the school zone speed limit fell by 5.5%, from 50.9% to 45.4%, while the proportion of vehicles exceeding the speed limit by more than 10 km/h, 20 km/h and 30 km/h fell by 15.9% (44.6% to 28.7%), 14.6% (24.5% to 9.9%) and 10.4% (12.4% to 2%) respectively after 18 months of operation.

Heavy vehicles

Heavy vehicle speeds and speeding rates reduced in a similar manner to all vehicles, but the reductions in speed were more substantial for heavy vehicles.

Inferential analysis – mean and 85th percentile speeds

The more statistically robust inferential analysis provided the following major findings associated with mean and 85th percentile speeds.

- **Group A - Flashing lights sites**

Mean speeds and 85th percentile speeds were reduced with the operation of the flashing lights alone by 1.3 km/h (45.0 km/h to 43.7 km/h) and 3.2 km/h (54.6 km/h to 51.4 km/h) respectively after a 9 month period of operation, after statistically removing or adjusting for the impacts of other variables including travel speeds on approaches to school zones. Each of the reductions was statistically significant ($p < 0.05$).

- **Group B – Static ‘Slow Down’ only signs**

Vehicle speeds increased at static sign sites. The analysis found increases in mean and 85th percentile speeds by the static signs alone of 2.5 km/h (43.8 km/h to 46.3 km/h) and 2.9 km/h (53.6 km/h to 56.5 km/h) respectively after a nine month period, after adjusting for the effects of other factors. These changes were statistically significant ($p < 0.05$).

As Group B is relatively small (i.e. 5 sites), and possibly not representative of the performance of the use of the static signs, and with mean speeds close to the 40 km/h school speed limit, great caution should be exercised with these findings.

- **Group C – Previously installed flashing lights sites with ‘before’ speed data**

The analysis found that this smaller group of flashing lights sites, which had been commissioned at an earlier date, achieved a reduction in mean speed with the operation of the flashing lights alone of 3.8 km/h (50.4 km/h to 46.6 km/h) over an 18 month period of operation. Eighty-fifth percentile speed fell with the operation of flashing lights alone by 6.3 km/h (61.2 km/h to 54.9 km/h). Each of the changes was statistically significant ($p < 0.05$), with the impacts of other factors, such as speed trends over time having been first removed.

Similar to Group B, this group of sites was small (i.e. 4 sites). It may not be representative of flashing lights sites, and therefore caution should be exercised when drawing conclusions about the longer term effects of flashing lights at school zones.

Effectiveness of different types of flashing lights

Analysis of Group A sites, which contains all three types of flashing units, revealed that:

- After 9 months of operation reductions in mean and 85th percentile speeds were achieved by Type 1 and Type 3 flashing lights. For Type 2 flashing lights mean and 85th percentile speeds were observed to increase.
- For Type 1 and Type 3 flashing lights mean speeds fell by 3.5 km/h and 2.2 km/h respectively. For Type 2 flashing lights mean speeds were observed to increase by 1.3 km/h. In all cases the changes were statistically significant ($p < 0.05$).

- For Type 1 and Type 3 flashing lights 85th percentile speeds reduced markedly by 6.3 km/h and 4.3 km/h respectively. For Type 2 flashing lights 85th percentile speeds were observed to increase slightly by 0.8 km/h. In all cases the changes were statistically significant ($p < 0.05$).
- When considering the effectiveness of flashing lights as a whole, results observed for Type 2 flashing lights detracted from overall results achieved.
- A feature of Types 1 and 3 flashing lights, both of which achieved speed reductions, is that the flashing lights were located on regulatory 40 km/h school zone speed limit signs. For Type 2 flashing lights, the lights were located on advisory 'SLOW DOWN SCHOOL ZONE' signs.
- Analysis of Group C sites, despite a small sample size indicated that speed reduction effects continued over an 18 month after period.

Operational performance of different types of flashing lights

RTA records reveal that the in-service performance of the flashing light units was poor. Eighty faults were reported during an approximate 18 month time frame. This number represents about 2 faults per site for this study period. This rate of failure is considered to be high, particularly as it may have adverse safety implications for school children during 'fault' periods.

While the analysis reveals that some types of flashing lights significantly reduce vehicle speeds within school speed zones, thus providing substantial reductions in crash risk, the units need to be investigated with the view to improving their operational performance.

Summary

The major findings of the evaluation were that:

- Flashing lights were effective in reducing vehicle speed outside schools during the operation of the 40 km/h school speed zone. Statistical analysis indicated speed reductions were statistically significant, and not due to other factors.
- For Group A sites, Type 1 and Type 3 flashing lights sites achieved reductions in speeds, while for Type 2 flashing lights sites they increased.
- The use of static 'Slow Down' only signs was associated with an increase in travel speeds, over and above that exhibited by control sites. This finding, however, should be treated with caution as the relatively small number of 5 sites may not provide a true representative of the performance of static signs.
- Flashing lights placed on regulatory 40 km/h school speed zone signs were most effective in reducing vehicle speeds, while the use of flashing lights on advisory signs proved ineffective in reducing vehicle speeds.
- For Group C sites reductions in speeds over a longer 18 month period were continued to be observed.
- The operational performance of flashing lights units needs to be improved.

I Introduction

1.1 Background

Speeding has been identified as a major factor in the causation and severity of road crashes. Speeding in New South Wales has been identified as the single most important factor in road fatalities. It has been estimated that it contributes to about 40% of all road fatalities in the State (Roads and Traffic Authority NSW 2001).

In an endeavour to improve road safety outside schools by lowering vehicle speeds, the RTA installed 40 km/h regulatory school speed limits at school access points during school start and completion hours in December 2002. As well, a standardisation of school zones to 40 km/h was implemented state-wide.

To encourage increased compliance with this lower limit, the RTA has undertaken a trial of the operation of three different types of flashing light signs (flashing lights) and static 'Slow Down' only signs at 40 km/h school speed zones. The RTA commissioned ARRB Group Ltd (ARRB) to conduct an evaluation of the flashing lights.

1.2 Objectives

The objectives of the evaluation were to:

- identify and measure the effectiveness of flashing lights and static 'Slow Down' only signs used to promote driver speed compliance with the 40 km/h speed limit
- compare the effectiveness of flashing lights with that of the static 'Slow Down' only signs.

2 Method

2.1 Flashing lights and static 'Slow Down' only signs

School zones in general operate between 8:00 and 9:30 am and 2:30 and 4:00 pm during school days in NSW. School zones consist of a minimum of two static signs – one for each direction. These signs inform drivers of the school zone times (left panel of sign), incorporate 40 km/h regulatory speed limit signs (right panel of sign) and have a 'school zone' banner (top panel of the sign). School zones on wide or multi-lane roads have a minimum of four signs. Long zones (precincts) that cover several schools may have extra signs through the zone.

This study involved the installation of three different types of solar powered flashing lights and a static 'Slow Down' only sign at selected school zones to warn drivers of the presence of child pedestrians at school times.

Description of the flashing lights trialled (each manufactured by a different company) and the static 'Slow Down' only signs is provided below and depicted in Figure 1.

Type 1 flashing lights

- two flashing lights are attached to the top of the existing school zone sign
- the flashing lights are installed to draw attention to the sign advising drivers of the commencement of a school zone, the 40 km/h speed limit and times of operation.

Type 2 flashing lights

- designed as an advance warning sign to notify drivers that they are about to enter a school zone
- bears the phrases 'SLOW DOWN' and 'SCHOOL ZONE' on an orange background with two orange flashing lights
- positioned up to 200 metres before a school zone sign but this is dependent upon the traffic environment.

Type 3 flashing lights

- two flashing lights are installed within the existing school zone static sign placed at the commencement of a school zone
- the flashing lights are located within the 'SCHOOL ZONE' top panel
- flashing LEDs surround the numeral 40 and the red annulus.

Static 'Slow Down' only sign

- designed as an advance warning sign to notify drivers that they are about to enter a school zone
- similar in appearance to the Type 2 sign, but without flashing lights
- positioned up to 200 m before a school zone sign but this is dependent upon the traffic environment.

The static ‘Slow Down’ only and Type 2 signs are additional to the School Zone sign. Type 1 and Type 3 are modifications of the original sign and are the only signs at the site.



Figure 1: School zone flashing light and static signs

2.2 Design

The flashing lights were installed at forty-three 40 km/h school speed zone sites. Forty matched control sites (sites with school zone signs but without flashing lights) were also selected for use as part of the evaluation.

Static ‘Slow Down’ only signs were also installed at five school zone sites, with five matched control sites (sites with school zone signs but without the static ‘Slow Down’ only signs) being selected for the evaluation.

The purpose of using speed data at control sites was to adjust changes in speed at the treatment sites that may have occurred as a result of other factors (i.e. climatic changes, police speed enforcement blitzes, etc.). The process attempts to screen out changes that may have occurred for 'other' reasons so as to more accurately measure the effectiveness of the treatments.

The study sites were split into four study groups (Groups A, B, C and D) in the following manner.

Group A: Thirty-two flashing lights (all types) sites at school zones with thirty-one matched control sites.

Group B: Five static 'Slow Down' only signs at school zones with five matched control sites.

Group C: Six flashing lights (all types) sites, **installed at an earlier time** prior to Term One 2003, with four matched control sites - **with 'before' speed data**.

Group D: Five flashing lights (all types) sites, **installed at an earlier time** prior to Term One 2003, with five matched controls - **without 'before' speed data**.

Table 1 shows the periods during which speed surveys were carried out, while Table 2 and Table 3 list the schools at which speed surveys were conducted, and where flashing lights were used, the type of lights operated.

A combination of urban and rural locations was chosen. The RTA matched the flashing light sites to the control sites as closely as possible based on factors such as speed limit, number of lanes, abutting land development and road alignment.

Table 1: Site groupings

| Group | Flashing light and control groups | Timing of speed surveys (school terms and year) | | | | | |
|-------|--|---|-----------------------------|--------------------------|---------------------------|--------------------------|----------------------------|
| | | Term 4 Nov-Dec '02 | Term 1-2 Mar-June '03 | Term 4 Nov-Dec '03 | Term 2 Mar-June '04 | Term 4 Oct-Dec '04 | Term 1-2 Feb-May '05 |
| A | 32 flashing light sites 31 control sites | | | | before | 3-month after | 9-month after |
| B | 5 static 'Slow Down' only sites 5 control sites | | | | before | 3-month after | 9-month after |
| C | 6 earlier flashing light sites 4 earlier control sites | before | 3-month after | 12-month after | 18-month after | | |
| D | 5 earlier flashing light sites 5 earlier control sites | | | | 18-month after | 21-month after | 27-month after |

Table 2: Summary information – Group A flashing lights schools and matched control schools

| Site number | Sign type | School | Speed zone (outside school zone hours) | Road type ^{***} | Control school | Control road type ^{***} |
|---|-----------|---|--|--------------------------|---|----------------------------------|
| Period 1 (before) = March/Jun-04, Period 2 (3-month after) = Oct/Dec-04, Period 3 (9-month) = Feb/Mar-05 | | | | | | |
| 1A | 1 | Great Lakes College | 60 | 2LU | Forster HS | 2LU |
| 2A | 2 | St Mary's | 50 | 2LU | Our Lady of the Rosary PS | 2LU |
| 3A | 1 | Tuggerah PS | 60 | 2LU | Ettalong PS | 2LU |
| 4A | 2 | St Joseph's PS | 60 | 4LD | St Benedict's PS | 4LD |
| 5A | 3 | School of Performing Arts | 60 | 4LD | Lambton PS | 2LU |
| 6A | 1 | Glen Innes PS & St Joseph's PS | 80/60* | 2LD | Coffs Primary and Christ Community | 2LD |
| 7A | 2 | Hillvue PS | 50 | 2LU | Ballina HS | 2LU |
| 8A | 1 | Sandon PS | 50 | 2LU | Pottsville PS | 2LU |
| 9A | 2 | Westdale PS | 80 | 2LU | St Mary's School | 2LU |
| 10A | 3 | Westport PS | 60 | 4LD | St Carthage's & Trinity College | 2LU |
| 11A | 2 | Oxley Vale PS | 100/80/60* | 2LU | St Mary's | 2LU |
| 12A | 1 | Gralee School & St Francis De Sales | 50 | 2LU | Griffith Catholic HS & Griffith East PS | 4LD |
| 13A | 2 | Scots School | 60 | 4LD | Mount Austin PS | 4LD |
| 14A | 1 | South Wagga PS | 60 | 4LD | North Albury School | 2LU |
| 15A | 3 | Illaroo PS | 60 | 2LU | Corrimal East PS | 2LU |
| 16A | 1 | Jamberoo PS | 50 | 2LU | St Paul's PS | 2LU |
| 17A | 3 | St Joseph's PS | 50/80** | 2LD | Corrimal East PS | 2LU |
| 18A | 1 | Towradgi PS | 50 | 2LU | Tarrawanna PS | 2LU |
| 19A | 1 | Cringila PS | 50 | 2LU | Farmborough Road PS | 2LU |
| 20A | 1 | Avoca PS | 70 | 2LU | Penrose PS | 2LU |
| 21A | 2 | Lake Heights PS | 60 | 2LU | Picton PS | 2LU |
| 22A | 2 | St Mary's PS | 50 | 2LU | North Bathurst PS | 2LU |
| 23A | 1 | Orange PS | 50 | 2LU | Orange Infants | 2LU |
| 24A | 2 | Sherwood Hills Christian School & Bradbury PS | 60 | 2LU | Our Lady of the Way Primary & Emu Plains PS | 2LU |
| 25A | 3 | Turramurra North PS | 60 | 2LU | Hornsby North PS | 2LU |
| 26A | 2 | Rossmore PS | 60 | 2LU | Luddenham PS | 6LD |
| 27A | 2 | Epping Boys HS | 80 | 6LD | Colyton HS | 2LU |
| 28A | 2 | Macarthur Girls HS | 60 | 2LU | St George's HS | 2LU |
| 29A | 3 | Merrylands PS & Fowlers Rd Special School | 50 | 2LU | St Johns Park PS | 4LD |
| 30A | 2 | Carlingford HS | 70/60** | 4LD | Ravenswood Girls High | 2LU |
| 31A | 2 | Bellimbopinni School | 100 | 2LU | Rukenvale PS | 2LU |
| 32A | 1 | Middle Harbour School | 50 | 4LU | No control | |

* Different non-school times limit depending on direction of travel

** Higher speed zones finish a short distance before the school zone, which is 60 km/h in non-school zone times

*** U = undivided road, D = divided road, 2L = 2-lane, 4L = 4-lane, 6L = 6-lane

Table 3: Summary information – Group B ‘Slow Down’ signs and Group C and D flashing lights – treatment schools and their matched control schools

| Site number | Sign type**** | School | Speed zone (outside school zone hours) | Road type*** | Control school | Control road type*** |
|--|---------------|-------------------------------|--|--------------|--|----------------------|
| Group B sites - static ‘Slow Down’ signs ONLY | | | | | | |
| Period 1 (before) = March/June-04, Period 2 (3-month after) = Oct/Dec-04, Period 3 (9-month after) = Feb/Mar-05 | | | | | | |
| 1B | Slow | Brigadine College | 60 | 4LD | Narrabeen Lakes Primary School | 4LD |
| 2B | Slow | Chatswood PS | 50 | 2LU | Christ the King | 2LU |
| 3B | Slow | Annandale North PS | 60 | 2LU | Orange Grove Primary | 2LU |
| 4B | Slow | Uranquinty PS | 100 | 2LU | Yerong Creek PS | 2LU |
| 5B | Slow | Muswellbrook South PS | 60 | 2LD | Scone PS | 2LU |
| Group C sites - Flashing light sites that commenced operation earlier WITH BEFORE speed survey data | | | | | | |
| Period 1 (before) = Nov/Dec-02, Period 2 (3-month after) = Mar/June-03, Period 3 (12-month after) = Nov/Dec-03, | | | | | | |
| Period 4 (18 month after) = March/June-04 | | | | | | |
| 1C | 3 | Chatham PS | 70 | 4LU | St Benedict's PS | 4LD |
| 2C | 3 | Tomaree PS | 60 | 2LU | Elernmore Vale PS | 2LU |
| 3C | 2 | Mount Terry PS | 70 | 2LU | No control | |
| 4C | 3 | Edmund Rice College | 60 | 2LU | St Paul's PS | 2LU |
| 5C | 1 | Blaxland PS | 80 | 4LD | No control | |
| 6C | 1 | Dundas PS | 70 | 6LD | Gordon West PS | 6LD |
| Group D sites - Flashing light sites that commenced operation earlier WITHOUT BEFORE (Period 1) speed survey data | | | | | | |
| Period 2 (18-month after) = March/June-04, Period 3 (21-month after) = Oct/Dec-04, Period 4 (27-month after) = Feb/March-05 | | | | | | |
| 7D | 2 | Holbrook PS & St Patrick's PS | 50 | 2LU | Griffith East & Griffith Catholic School | 2LU |
| 8D | 2 | Holmwood PS | 100 | 2LU | Bullarah PS | 2LU |
| 9D | 1 | Bredbo PS | 60 | 2LU | Ando PS | 2LU |
| 10D | 1 | Helensburgh PS | 50 | 2LU | Oxford PS | 2LU |
| 11D | 3 | Waitara PS | 60 | 4LU | Punchbowl PS | 4LU |

* Different non-school times limit depending on direction of travel

** Higher speed zones finish a short distance before the school zone, which is 60 km/h in non-school zone times

*** U = undivided road, D = divided road, 2L = 2-lane, 4L = 4-lane, 6L = 6-lane

**** Slow = “Slow Down” signs (not flashing lights)

2.3 Procedure

2.3.1 Speed data collection method and equipment

Speed surveys were carried out in the following mode as specified by the RTA:

- platoon
- 15 minute intervals
- three second headway.

Data for the before surveys were collected using RTA Trafficorder Mark 2 devices. Data for the after surveys were collected using Metrocount devices, and their output was converted to Trafficorder format before analysis.

Speed surveys were conducted at three locations in relation to the school zone for each of the flashing lights and static 'Slow Down' only sign sites (unless a site lacked one or more approach lengths). Figure 2 (Type 1 and Type 3 signs) and Figure 3 (Type 2 and static 'Slow Down' only signs) show the locations at which speed data was collected, namely at:

- one location in the school zone (both directions) – SS2
- one approach just outside school zone – SS1
- the other approach just outside school zone – SS3

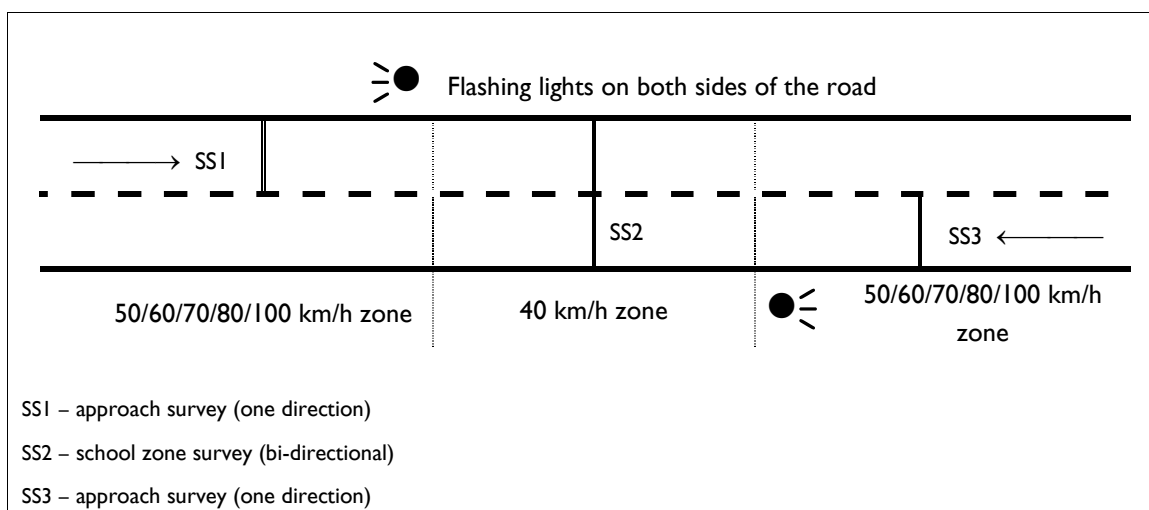


Figure 2: Layout of speed surveys – Type 1 and Type 3 signs (lights on regulatory speed limit signs)

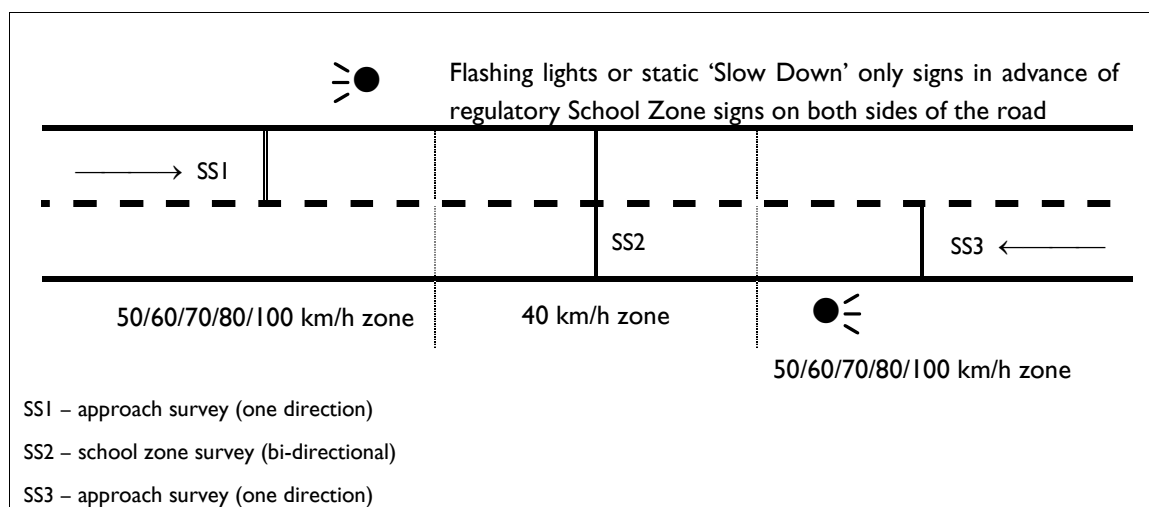


Figure 3: Layout of speed surveys – Type 2 (lights on school zone warning sign) and static 'Slow Down' only signs

To assess changes in speeds, speed data were collected at the same three locations at each of the matched control sites. At multi-lane sites, all lanes were surveyed.

Speed surveys were conducted during the periods outlined in Table I and each survey was approximately seven days in duration at each site. All speed surveys were conducted during non-school holiday and public holiday periods.

The flashing lights were displayed in both directions of travel in the school zone. Accordingly, speed surveys have been conducted for both directions of travel adjacent to the school zone. Data for the two directions of traffic flow within the school zone at each site were combined to create a single group of vehicles.

Data were also collected on each approach to the site, in a single direction only. The individual directions of travel are displayed separately for the approaches because they are from two separate sections of the road.

2.3.2 Analysis of speed data

Two separate statistical analyses of the crash data were performed for the evaluation: descriptive and inferential analyses. The descriptive analysis was carried out to give an indication of the impact of flashing light and static 'Slow Down' only signs on travel speeds, while the inferential statistical analysis, was conducted to give a more accurate indication of changes in speeds.

The inferential analysis was a more robust analysis and involved:

- pooling individual vehicle speed observations across like sites to examine the statistical significance of variations in mean speed associated with the fitting of flashing light and static 'Slow Down' only signs
- aggregating the speed data for specified periods for each day of the survey. This facilitated statistical analysis of variations in 85th percentile speeds, statistical control of variations in numbers of observations between sites caused by geographic

variations in traffic levels, and incorporation of speed observations on approach of slow down zones into the analysis. Comparisons between pooled and aggregated data based results were compared to ensure results were not biased by the aggregation process adopted.

2.3.2.1 Descriptive analysis of speed data

The descriptive analysis examined for all vehicle types and for heavy vehicles (e.g. semi-trailers, B-doubles, et.):

- the percentage of vehicles travelling above the speed limit
- the percentage of vehicles travelling at least 10 km/h above the speed limit
- the percentage of vehicles travelling at least 20 km/h above the speed limit
- the percentage of vehicles travelling at least 30 km/h above the speed limit
- mean and 85th percentile speed (for definition see Section 3.1.2).

All descriptive analyses were undertaken in Microsoft Access 2003 and Excel 2003.

Application of control ratios

For each of the analysis methods listed above, control data have been used to create control ratios. The control ratios were applied to the baseline data from each control site to generate 'expected' values for various parameters at follow-up surveys. Actual follow-up data from control sites were then compared with expected values to determine how much, if any, change in the parameter could be attributed to the presence of the treatment (flashing lights or static 'Slow Down' only signs).

For example, if a site recorded a baseline mean speed figure of 60 km/h and a first follow-up figure of 54 km/h, this would be a reduction of 10 per cent if control data were ignored. However, if the site's corresponding matched control site recorded a drop from 62 km/h to 57 km/h (8%) in the same time, a 'control ratio' of 92 per cent would then be allocated to Site A because if the treatment had not been installed at Site A, then, all other factors being equal, the speed at the follow-up survey could be expected to be 92 per cent of the speed at the baseline survey.

When selecting matched control sites every endeavour was made to select locations that resembled their matched treatment site. This allowed more accurate adjustments to measured speeds at the treatment sites to be made as a result of 'other' factors (i.e. changes in climatic conditions, police enforcement programs, etc.). When selecting matched control sites both the matched control and treatments sites should have had the following similar characteristics:

- vertical and horizontal alignment
- cross-section (i.e. divided or undivided, and number of lanes)
- non-school hour speed limit

- nature and density of abutting development
- traffic composition (i.e. similar proportions of cars and commercial vehicles)
- regional area.

In some cases it was not possible to ideally match a control site with a treatment site. Caution should be exercised when considering the outcomes of the analysis for those individual treatment sites.

2.3.2.2 Inferential analysis of speed data

Inferential analysis was undertaken using data where individual observations had been aggregated into hourly groupings. This allowed direct comparisons to be made between average and 85th percentile speed observations, as well as incorporation into the analysis of speeds observed on approach zones preceding school zones. Comparisons with pooled data sets, where individual speed observations were present, were undertaken to ensure use of aggregated data did not bias outcomes.

It should also be noted that Sites 31A and 32A were excluded from analysis. Site 31A was excluded because there was no before speed data available, while for Site 32A there was no control speed data.

ANOVA and ANCOVA analysis was applied to the aggregated test and control site data to:

- ensure average and 85th percentile speed estimates provided statistically acceptable estimates of speed measures applying outside survey periods, and to similar signed sites
- confirm/not confirm that flashing light signs in school zones reduced speeds by more than conventional signage, and that observed changes were not due to other factors
- in the case of ANCOVA analysis, to estimate and correct for the extent to which average and 85th percentile speeds were affected by variations in speeds on approaches to school zones.

Analysis was tailored to suit the structure of the surveys and data collected. The ANOVA models contained three independent variables, a Before and After variable, a Treatment variable, and a non-school hours speed limit variable. The Before and After variable had three levels (before, 3 months after installation, 9 months after installation), while the Treatment variable had two levels (treatment site (flashing light sign installed) and static 'Slow Down' only signs). For Group C sites only, an additional after level, 18 months after installation applied. Statistical models incorporated an interaction between treatment, and Before and After variables. The ANCOVA model included an approach speed variable as a covariate, while otherwise maintaining the same structure as the ANOVA model. Approach speeds were derived from coordinated speed surveys carried out on sections immediately preceding school zones.

3 Results

3.1 Descriptive analysis

3.1.1 Recorded speed characteristics

The assessment of the impact of the flashing lights on observed speeds was based on the changes recorded in each of the speed parameters at each survey.

It should be noted that in this analysis, the speed limit is taken as 40 km/h for all observations carried out in the school zones during the times of operation of the school speed limits. The various sites have speed limits of 50, 60, 70, 80 or 100 km/h at other times of the day but those times are not the subject of this evaluation. Where survey results for the approach lengths of road are discussed, the speed limits used are the normal speed limits for those lengths of road – the speed limits on the approach lengths are permanent and do not change with school zone operation. Time periods of the surveys are shown in Table I.

3.1.2 Interpreting speed surveys

Figure 4 depicts two hypothetical distributions of vehicle speed. The solid line shows the original speed distribution whilst the dashed line represents the speed distribution following the introduction of a successful countermeasure to speeding. However it should be noted that the example depicted is exaggerated. The distinctions between two ‘real’ distributions are likely to be more subtle than the changes depicted.

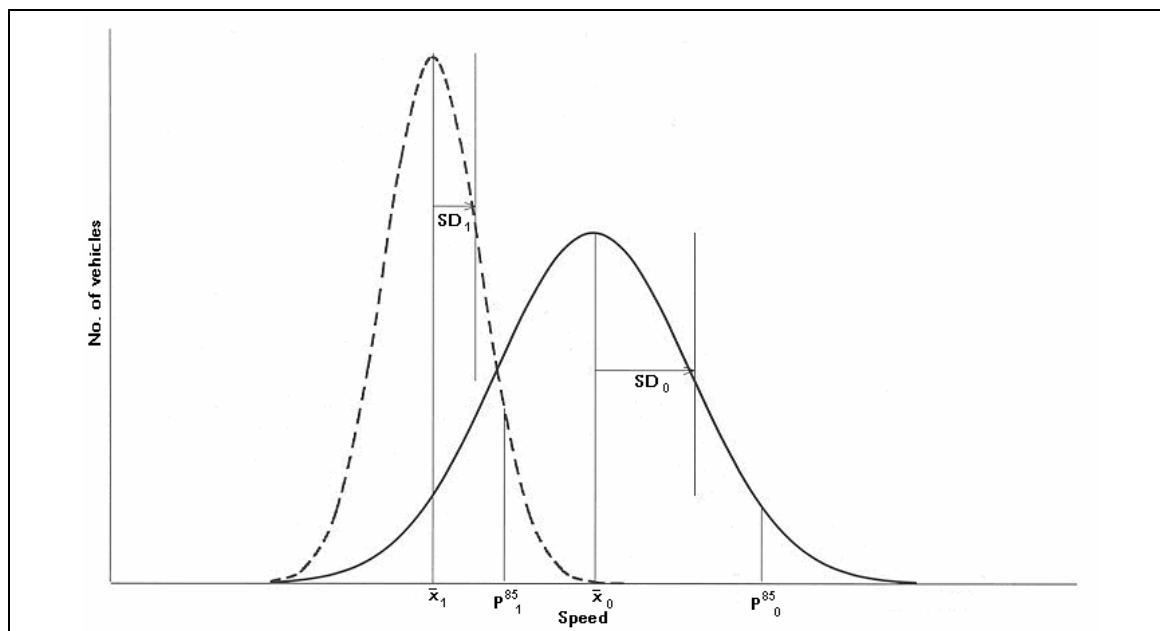


Figure 4: Hypothetical distributions of speed

$\bar{x}_{0,1}$ = mean speed (km/h)

$P_{0,1}^{85}$ = 85th percentile speed (km/h)

$SD_{0,1}$ = standard deviation (km/h)

Note: 0 = baseline data, prior to the introduction of the countermeasure (solid line);
 1 = post-installation introduction of countermeasure (dashed line).

85th percentile speed

The 85th percentile speed is the speed up to which 85% of vehicles are travelling.

Standard deviation

The standard deviation is a measure of the spread of speeds about the mean speed. A high standard deviation will be the result of a large proportion of vehicles travelling at speeds that are much higher or lower than the mean speed. When a larger proportion of vehicles are travelling at speeds closer to the mean, the standard deviation is smaller.

Smaller standard deviations are associated with safer traffic conditions because they represent a more uniform flow of traffic.

Sections 3.1.3 to 3.1.7 deal with the sites in groups according to their survey dates and the speed limits on their approaches. For full details of the survey results and control-adjusted changes in speeds and speeding rates at each site, refer to the charts in Appendix A. The charts in the appendix are grouped according to survey periods (Group A, B, C) and are sorted by the speed limits on the approaches to the sites.

3.1.3 Trends in speed characteristics – all vehicles

3.1.3.1 Recorded speed data by site during the operation of the 40 km/h school speed limit

Tables 3 and 4 show the recorded speed results for all flashing light sites and their control sites during the hours of operation of the school speed limit (8:00 am - 9:30 am, 2:30 pm - 4:00 pm, School Days). Flashing light site and control site data are shown in cells with white and grey backgrounds, respectively.

The sites are grouped according to the time periods over which they were monitored. The survey dates for each group are shown in the first row of that group. For example, the first survey period for Group A was June 2004, but the first period for Group C was December 2002. The first survey period for Group D was also December 2002, but no data were available for that survey period at those sites because they were not selected for evaluation until after their flashing lights had begun operating.

Similar tables for the approaches to the sites and for heavy vehicle traffic are presented in Appendix A.

Table 4: Recorded speed survey results for sites in Group A, and their controls, during school speed limit hours (all vehicles)

| Site No. | Non-school time speed limit | School | Sign type, or control site | Mean speed (km/h) | | | | 85 th percentile speed (km/h) | | | | Standard deviation (km/h) | | | | % travelling above speed limit | | | | % ≥10 km/h above speed limit | | | | % ≥20 km/h above speed limit | | | | % ≥30 km/h above speed limit | | | |
|---|-----------------------------|--|----------------------------|-------------------|------|------|---|--|------|--------|---|---------------------------|------|------|---|--------------------------------|------|------|---|------------------------------|------|------|---|------------------------------|------|------|---|------------------------------|------|------|---|
| | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | |
| | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Sites with one of three types of flashing lights: Period 1 (Before) = Mar/Jun-04, Period 2 (1st after – 3 months) = Oct/Dec-04, Period 3 (2nd after – 9 months) = Feb/Mar-05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1A | 60 | Great Lakes College, Tuncurry | 1 | 46.0 | 48.7 | 46.7 | | 56.5 | 60.0 | 57.0 | | 9.5 | 9.7 | 8.8 | | 69.7 | 81.8 | 76.5 | | 26.2 | 32.8 | 25.4 | | 9.8 | 14.2 | 10.1 | | 1.8 | 4.0 | 1.8 | |
| 1A | 60 | Forster HS, Forster | control | 48.6 | 44.9 | 50.2 | | 59.5 | 52.0 | 64.0 | | 10.1 | 7.6 | 10.9 | | 79.0 | 71.7 | 80.7 | | 32.9 | 18.2 | 40.3 | | 14.3 | 4.8 | 20.7 | | 4.7 | 0.7 | 6.4 | |
| 2A | 50 | St Mary's, Norville | 2 | 45.2 | 41.8 | 41.5 | | 54.0 | 49.5 | 48.5 | | 8.6 | 7.7 | 7.0 | | 71.5 | 56.6 | 54.2 | | 28.1 | 12.5 | 9.8 | | 3.9 | 1.4 | 1.0 | | 0.1 | 0.0 | 0.1 | |
| 2A | 50 | Our Lady of the Rosary PS, Shelley Beach | control | 39.0 | 37.8 | 38.0 | | 49.5 | 46.5 | 46.5 | | 9.7 | 8.9 | 8.6 | | 41.0 | 35.0 | 36.4 | | 13.3 | 8.8 | 8.6 | | 1.8 | 1.6 | 1.4 | | 0.1 | 0.1 | 0.1 | |
| 3A | 60 | Tuggerah PS, Tuggerah | 1 | 43.3 | 38.9 | 38.8 | | 55.0 | 46.0 | 45.5 | | 11.1 | 8.2 | 8.1 | | 55.3 | 38.8 | 39.1 | | 23.8 | 8.4 | 7.3 | | 9.9 | 1.4 | 1.5 | | 1.8 | 0.2 | 0.1 | |
| 3A | 60 | Ettalong PS, Ettalong | control | 44.3 | 45.9 | 45.7 | | 53.5 | 56.0 | 55.0 | | 8.2 | 9.1 | 9.0 | | 64.6 | 69.7 | 70.4 | | 23.7 | 30.2 | 29.3 | | 2.6 | 6.1 | 5.6 | | 0.3 | 0.8 | 0.5 | |
| 4A | 60 | St Joseph's PS, Maitland | 2 | 47.2 | 43.7 | 42.3 | | 59.5 | 54.0 | 49.0 | | 10.8 | 10.4 | 8.9 | | 73.2 | 57.1 | 56.7 | | 30.3 | 19.5 | 12.8 | | 13.9 | 9.0 | 4.7 | | 3.8 | 2.4 | 1.2 | |
| 4A | 60 | St Benedict's PS, Edgeworth | control | 55.7 | 50.4 | 48.5 | | 70.5 | 64.0 | 60.5 | | 13.1 | 11.3 | 10.7 | | 88.7 | 84.1 | 79.0 | | 59.0 | 40.3 | 34.1 | | 40.9 | 21.2 | 15.4 | | 16.7 | 6.8 | 4.5 | |
| 5A | 60 | School of Performing Arts, Broadmeadow | 3 | 46.1 | 43.9 | 40.5 | | 59.5 | 55.5 | 48.0 | | 11.4 | 10.6 | 8.7 | | 69.2 | 62.6 | 51.5 | | 34.0 | 23.5 | 10.5 | | 12.5 | 8.4 | 2.3 | | 1.5 | 1.2 | 0.3 | |
| 5A | 60 | Lambton PS, Lambton | control | 45.1 | 44.2 | 42.9 | | 57.5 | 56.5 | 53.5 | | 11.4 | 11.2 | 10.3 | | 66.1 | 62.8 | 59.6 | | 32.3 | 29.4 | 22.0 | | 8.8 | 7.7 | 4.6 | | 1.2 | 0.9 | 0.6 | |
| 6A | 80/60 | Glen Innes PS & St Joseph's PS, Glen Innes | 1 | 40.3 | 39.0 | 38.5 | | 48.0 | 46.0 | 44.5 | | 7.7 | 7.2 | 6.8 | | 46.8 | 39.7 | 36.8 | | 9.9 | 5.6 | 4.2 | | 0.8 | 0.3 | 0.3 | | 0.0 | 0.0 | 0.0 | |
| 6A | 80/60 | Coffs Primary and Christ Community, Coffs Harbour | control | 42.7 | 43.4 | 41.8 | | 53.0 | 54.0 | 52.5 | | 10.1 | 10.3 | 10.2 | | 61.5 | 64.3 | 57.5 | | 20.9 | 24.1 | 19.3 | | 3.9 | 4.7 | 3.4 | | 0.2 | 0.3 | 0.2 | |
| 7A | 50 | Hillvue PS, Tamworth | 2 | 38.7 | 38.4 | 36.4 | | 47.5 | 47.5 | 43.5 | | 8.8 | 9.1 | 7.9 | | 37.7 | 39.1 | 28.8 | | 10.8 | 9.8 | 3.9 | | 1.7 | 1.5 | 0.6 | | 0.1 | 0.1 | 0.1 | |
| 7A | 50 | Ballina HS, Ballina | control | 30.4 | 30.0 | 29.2 | | 39.5 | 39.5 | 37.8 | | 8.4 | 8.5 | 8.1 | | 13.9 | 13.3 | 10.5 | | 2.2 | 2.7 | 2.4 | | 0.4 | 0.4 | 0.3 | | 0.0 | 0.0 | 0.0 | |
| 8A | 50 | Sandon PS, Armidale | 1 | 38.3 | 36.8 | 36.4 | | 47.0 | 44.5 | 44.0 | | 8.6 | 7.9 | 7.5 | | 39.3 | 31.2 | 29.3 | | 7.9 | 4.1 | 3.0 | | 0.8 | 0.3 | 0.2 | | 0.0 | 0.0 | 0.0 | |
| 8A | 50 | Pottsville PS, Pottsville | control | 44.0 | 48.0 | 47.3 | | 51.0 | 54.5 | 53.5 | | 7.3 | 6.4 | 6.2 | | 70.9 | 87.8 | 85.9 | | 16.7 | 34.5 | 29.8 | | 1.8 | 3.6 | 2.4 | | 0.1 | 0.1 | 0.1 | |
| 9A | 80 | Westdale PS, Tamworth | 2 | 44.4 | 42.9 | 40.0 | | 54.5 | 50.0 | 45.5 | | 11.9 | 11.3 | 7.3 | | 56.4 | 50.6 | 43.1 | | 19.5 | 14.7 | 6.3 | | 11.5 | 8.6 | 2.0 | | 6.0 | 5.0 | 0.5 | |
| 9A | 80 | St Mary's School, Grafton | control | 43.3 | 42.0 | 41.6 | | 51.0 | 50.5 | 49.5 | | 7.5 | 8.2 | 8.3 | | 63.0 | 54.7 | 53.4 | | 17.5 | 16.8 | 14.6 | | 1.7 | 1.5 | 1.7 | | 0.1 | 0.0 | 0.1 | |
| 10A | 60 | Westport PS, Pt Macquarie | 3 | 49.0 | 44.8 | 45.4 | | 59.0 | 51.0 | 52.0 | | 8.5 | 6.2 | 6.7 | | 46.6 | 61.0 | 77.1 | | 27.9 | 13.0 | 19.8 | | 10.3 | 2.3 | 2.8 | | 0.7 | 0.2 | 0.2 | |
| 10A | 60 | St Carthage's & Trinity College, Lismore | control | 42.8 | 63.3 | 45.7 | | 49.0 | 87.0 | 53.0 | | 6.2 | 19.2 | 7.2 | | 68.5 | 91.5 | 78.8 | | 8.5 | 68.1 | 25.9 | | 0.2 | 46.8 | 1.3 | | 0.0 | 34.1 | 0.0 | |
| 11A | 100/80/60 | Oxley Vale PS, Tamworth | 2 | 43.8 | 42.7 | 41.2 | | 52.0 | 49.0 | 47.0 | | 7.8 | 7.2 | 6.3 | | 65.3 | 61.3 | 55.3 | | 17.2 | 12.3 | 6.2 | | 3.3 | 1.9 | 0.5 | | 0.2 | 0.1 | 0.0 | |
| 11A | 100/80/60 | St Mary's, Casino | control | 39.2 | 39.4 | 39.3 | | 46.0 | 46.5 | 46.0 | | 6.9 | 7.0 | 6.9 | | 42.3 | 43.7 | 43.1 | | 4.9 | 5.1 | 5.0 | | 0.1 | 0.1 | 0.2 | | 0.0 | 0.0 | 0.0 | |
| 12A | 50 | Gralee School & St Francis De Sales, Leeton | 1 | 46.5 | 45.4 | 45.4 | | 55.0 | 55.5 | 55.0 | | 8.3 | 9.0 | 8.6 | | 79.5 | 69.9 | 71.1 | | 27.8 | 27.8 | 25.5 | | 7.4 | 7.5 | 7.1 | | 0.5 | 0.4 | 0.6 | |
| 12A | 50 | Griffith Catholic HS & Griffith East PS, Griffith | control | 41.8 | 45.5 | 43.8 | | 49.0 | 55.0 | 53.0 | | 7.5 | 8.8 | 8.4 | | 57.3 | 71.3 | 63.2 | | 11.9 | 27.9 | 21.4 | | 1.8 | 6.1 | 3.3 | | 0.1 | 0.3 | 0.2 | |
| 13A | 60 | Scots School, Albury | 2 | 44.1 | 46.6 | 45.7 | | 54.7 | 59.0 | 58.5 | | 8.7 | 9.9 | 10.3 | | 59.2 | 67.1 | 61.3 | | 23.7 | 34.1 | 31.2 | | 4.5 | 10.6 | 10.6 | | 0.3 | 0.7 | 1.1 | |
| 13A | 60 | Mount Austin PS, Wagga Wagga | control | 43.3 | 44.0 | 44.5 | | 52.0 | 53.0 | 55.0 | | 8.3 | 8.8 | 9.4 | | 60.8 | 63.8 | 64.3 | | 17.4 | 21.3 | 22.7 | | 4.5 | 5.7 | 7.4 | | 0.4 | 0.5 | 0.9 | |
| 14A | 60 | South Wagga PS, Wagga Wagga | 1 | 43.3 | 44.0 | 43.0 | | 52.0 | 53.0 | 52.0 | | 8.3 | 8.8 | 8.3 | | 60.8 | 63.8 | 59.3 | | 17.4 | 21.3 | 18.7 | | 4.5 | 5.7 | 2.2 | | 0.4 | 0.5 | 0.1 | |
| 14A | 60 | North Albury School, Albury | control | 46.4 | 44.2 | 47.7 | | 57.0 | 54.0 | 59.0 | | 8.8 | 8.4 | 9.6 | | 71.4 | 61.2 | 73.0 | | 31.2 | 23.5 | 38.0 | | 7.5 | 3.7 | 10.8 | | 0.5 | 0.2 | 0.7 | |
| 15A | 60 | Illaroo PS, Nowra | 3 | 42.8 | 41.4 | 38.3 | | 54.0 | 52.5 | 45.5 | | 10.4 | 10.5 | 8.4 | | 57.9 | 51.2 | 41.3 | | 23.3 | 19.2 | 6.4 | | 5.2 | 4.8 | 0.8 | | 0.4 | 0.3 | 0.0 | |
| 15A | 60 | Corrimal East PS, Corrimal East | control | 48.5 | 46.6 | 45.8 | | 59.0 | 57.0 | 56.0 | | 9.9 | 9.8 | 9.7 | | 82.0 | 74.7 | 72.1 | | 41.4 | 34.0 | 30.7 | | 11.0 | 8.4 | 6.7 | | 1.4 | 0.9 | 0.6 | |
| 16A | 50 | Jamberoo PS, Jamberoo | 1 | 42.6 | 40.5 | 39.8 | | 53.5 | 49.5 | 48.0 | | 10.4 | 8.9 | 8.8 | | 54.7 | 47.2 | 44.7 | | 21.6 | 13.2 | 10.2 | | 6.6 | 3.0 | 2.5 | | 0.9 | 0.3 | 0.4 | |
| 16A | 50 | St Paul's PS, Albion Park | control | 43.7 | 41.1 | 39.9 | | 54.6 | 51.0 | 48.5 | | 10.3 | 10.2 | 9.8 | | 59.3 | 48.6 | 47.6 | | 22.7 | 16.0 | 11.7 | | 7.0 | 5.1 | 3.3 | | 1.4 | 0.9 | 0.6 | |
| 17A | 50/80 | St Joseph's PS, Goulburn | 3 | 50.0 | 44.2 | 39.4 | | 58.0 | 55.5 | 45.0 | | 6.8 | 9.5 | 6.3 | | 93.3 | 57.6 | 37.6 | | 46.1 | 29.1 | 5.4 | | 7.3 | 5.9 | 0.9 | | 0.7 | 0.2 | 0.1 | |
| 17A | 50/80 | Corrimal East PS, Corrimal East | control | 48.5 | 46.6 | 45.8 | | 59.0 | 57.0 | 56.0 | | 9.9 | 9.8 | 9.7 | | 82.0 | 74.7 | 72.1 | | 41.4 | 34.0 | 30.7 | | 11.0 | 8.4 | 6.7 | | 1.4 | 0.9 | 0.6 | |
| 18A | 50 | Towradgi PS, Towradgi | 1 | 41.4 | 41.2 | 41.5 | | 50.0 | 48.0 | 48.5 | | 8.3 | 7.7 | 7.2 | | 50.3 | 50.1 | 53.2 | | 13.1 | 10.4 | 11.1 | | 2.9 | 2.3 | 2.7 | | 0.4 | 0.3 | 0.2 | |
| 18A | 50 | Tarrawanna PS, Tarrawanna | control | 38.3 | 36.7 | 36.0 | | 45.5 | 43.5 | 42.5 | | 7.0 | 6.8 | 6.6 | | 35.3 | 26.9 | 22.2 | | 4.4 | 2.7 | 1.7 | | 0.2 | 0.1 | 0.1 | | 0.0 | 0.0 | 0.0 | |
| 19A | 50 | Cringila PS, Cringila | 1 | 49.5 | 44.0 | 46.0 | | 59.0 | 52.0 | 54.5 | | 9.0 | 8.1 | 8.4 | | 84.7 | 66.0 | 75.5 | | 45.9 | 19.7 | 26.7 | | 12.8 | 3.9 | 6.5 | | 1.3 | 0.4 | 0.6 | |
| 19A | 50 | Farmborough Road PS, Unanderra | control | 41.9 | 40.0 | 40.1 | | 52.0 | 50.0 | 49.5 | | 9.7 | 9.5 | 9.5 | | 56.2 | 46.4 | 46.9 | | 18.8 | 13.5 | 13.8 | | 4.0 | 2.8 | 3.0 | | 0.3 | 0.2 | 0.2 | |
| 20A | 70 | Avoca PS, Avoca | 1 | 55.0 | 60.1 | 56.6 | | 70.5 | 76.1 | 70.0 | | 15.6 | 14.0 | 12.6 | | 83.2 | 94.7 | 93.3 | | 62.6 | 70.2 | 64.5 | | 38.6 | 45.9 | 34.6 | | 14.7 | 25.8 | 14.4 | |
| 20A | 70 | Penrose PS, Penrose | control | 55.6 | 56.0 | 54.5 | | 73.9 | 74.5 | 71.5 | | 15.2 | 15.3 | 14.6 | | 85.4 | 86.3 | 86.8 | | 53.7 | 53.4 | 49.0 | | 34.9 | 36.9 | 30.5 | | 19.1 | 20.5 | 16.1 | |
| 21A | 60 | Lake Heights PS, Lake Heights | 2 | 47.0 | 42.9 | 41.9 | | 56.5 | 49.0 | 47.0 | | 8.0 | 6.7 | 5.7 | | 78.1 | 60.1 | 55.4 | | 32.6 | 12.9 | 7.9 | | 5.8 | 1.7 | 0.8 | | 0.5 | 0.2 | 0.1 | |
| 21A | 60 | Picton PS, Picton | control | 45.9 | 44.6 | 44.7 | | 56.5 | 54.0 | 52.5 | | 9.5 | 8.9 | 7.9 | | 70.1 | 63.6 | 70.6 | | 26.4 | 21.0 | 18.8 | | 9.4 | 7.5 | 5.3 | | 1.6 | 1.0 | 0.8 | |
| 22A | 50 | St Mary's PS, Dubbo | 2 | 40.4 | 41.7 | 40.7 | | 49.0 | 51.0 | 49.5 | | 8.3 | 8.8 | 8.4 | | 47.8 | 53.3 | 47.2 | | 12.0 | 16.8 | 12.6 | | 1.4 | 2.3 | 2.2 | | 0.1 | 0.1 | 0.2 | |
| 22A | 50 | North Bathurst PS, Bathurst | control | 42.9 | 46.5 | 44.6 | | 52.0 | 56.0 | 54.0 | | 9.1 | 9.6 | 9.3 | | 62.8 | 75.4 | 70.1 | | 19.6 | 34.4 | 24.5 | | 3.0 | 8.4 | 5.5 | | 0.3 | 0.6 | 0.3 | |
| 23A | 50 | Orange PS, Orange | 1 | 36.6 | 39.5 | 37.0 | | 43.5 | 46.5 | 44.5 | | 6.7 | 7.2 | 7.5 | | 26.6 | 43.9 | 30.9 | | 1.7 | 5.8 | 3.3 | | 0.1 | 0.4 | 0.4 | | 0.0 | 0.0 | 0.0 | |
| 23A | 50 | Orange Infants, Orange | control | 36.9 | 39.0 | 37.4 | | 44.5 | 48.0 | 45.0 | | 7.8 | 8.6 | 7.7 | | 30.8 | 41.5 | 32.8 | | 4.2 | 9.6 | 4.7 | | 0.3 | 0.9 | 0.3 | | 0.0 | 0.1 | 0.0 | |
| 24A | 60 | Sherwood Hills Christian School & Bradbury PS, Campbell Town | 2 | 32.4 | 30.6 | 33.3 | | 41.0 | 38.5 | 42.0</ | | | | | | | | | | | | | | | | | | | | | |

| Site No. | Non-school time speed limit | School | Sign type, or control site | Mean speed (km/h) | | | | 85 th percentile speed (km/h) | | | | Standard deviation (km/h) | | | | % travelling above speed limit | | | | % ≥10 km/h above speed limit | | | | % ≥20 km/h above speed limit | | | | % ≥30 km/h above speed limit | | | |
|----------|-----------------------------|---|----------------------------|-------------------|------|------|---|--|------|------|---|---------------------------|------|------|---|--------------------------------|------|------|---|------------------------------|------|------|---|------------------------------|------|------|---|------------------------------|-----|------|---|
| | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | |
| | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| 28A | 60 | Macarthur Girls HS, Parramatta | 2 | 45.2 | 44.9 | 43.2 | | 53.0 | 53.0 | 51.0 | | 8.2 | 7.9 | 7.8 | | 74.6 | 74.0 | 65.7 | | 26.2 | 23.6 | 16.2 | | 2.3 | 2.1 | 1.2 | | 0.1 | 0.1 | 0.1 | |
| 28A | 60 | St George's HS, Kogarah | control | 46.6 | 41.5 | 38.7 | | 54.5 | 50.0 | 47.0 | | 7.9 | 8.6 | 8.3 | | 79.2 | 57.8 | 43.4 | | 30.7 | 13.3 | 6.4 | | 3.7 | 0.9 | 0.4 | | 0.3 | 0.1 | 0.0 | |
| 29A | 50 | Merrylands PS & Fowlers Road Special School, Merrylands | 3 | 44.4 | 44.8 | 37.9 | | 52.0 | 53.0 | 44.5 | | 7.3 | 7.7 | 7.4 | | 71.2 | 69.4 | 32.1 | | 19.7 | 24.3 | 4.8 | | 2.5 | 2.9 | 0.7 | | 0.1 | 0.1 | 0.1 | |
| 29A | 50 | St Johns Park PS, St Johns Park | control | 43.1 | 45.1 | 43.0 | | 51.0 | 53.0 | 50.0 | | 8.0 | 8.0 | 6.8 | | 65.8 | 73.5 | 67.6 | | 16.9 | 25.5 | 12.2 | | 1.4 | 2.6 | 0.6 | | 0.0 | 0.1 | 0.0 | |
| 30A | 70/60 | Carlingford HS, Carlingford | 2 | 49.2 | 43.9 | 46.5 | | 65.0 | 58.5 | 60.5 | | 14.6 | 13.1 | 13.1 | | 71.8 | 61.0 | 67.0 | | 49.4 | 29.3 | 38.9 | | 26.5 | 12.2 | 16.8 | | 7.0 | 2.9 | 3.2 | |
| 30A | 70/60 | Ravenswood Girls High, Gordon | control | 51.8 | 51.2 | 52.7 | | 64.5 | 64.0 | 64.5 | | 12.3 | 12.4 | 11.0 | | 82.4 | 82.0 | 86.6 | | 56.0 | 51.8 | 56.6 | | 26.4 | 25.0 | 27.2 | | 5.3 | 5.9 | 5.0 | |
| 31A | 100 | Bellimbopinni School, Kempsey | 2 | 49.7 | 48.0 | 46.9 | | 61.5 | 55.5 | 53.5 | | 13.1 | 10.7 | 9.5 | | 80.4 | 83.0 | 0.0 | | 31.1 | 25.6 | 0.0 | | 0.0 | 9.8 | 7.2 | | 0.0 | 4.9 | 3.1 | |
| 31A | 100 | Rukenvale PS, Rukenvale | control | | | 61.9 | | | | 84.0 | | | | 17.7 | | | | 0.0 | | | | | | | | 54.8 | | | | 28.0 | |
| 32A | 50 | Middle Harbour School, Mosman | 1 | 38.9 | 37.8 | 40.7 | | 43.5 | 42.0 | 46.0 | | 5.2 | 5.0 | 5.5 | | 29.8 | 23.4 | 47.1 | | 3.6 | 2.0 | 5.4 | | 0.2 | 0.2 | 0.1 | | 0.0 | 0.0 | 0.0 | |
| 32A | | | no control | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 5: Recorded speed survey results for sites in groups B, C and D and their controls, during school speed limit hours (all vehicles)

| Site No. | Non-school time speed limit | School | Sign type, or control site | Mean speed (km/h) | | | | 85 th percentile speed (km/h) | | | | Standard deviation (km/h) | | | | % travelling above speed limit | | | | % ≥10 km/h above speed limit | | | | % ≥20 km/h above speed limit | | | | % ≥30 km/h above speed limit | | | | | | |
|---|-----------------------------|--|----------------------------|-------------------|------|------|------|--|------|------|------|---------------------------|------|------|------|--------------------------------|------|------|------|------------------------------|------|------|------|------------------------------|------|------|------|------------------------------|------|------|------|------|------|------|
| | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | | | |
| | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 |
| <i>Sites with static 'Slow Down' only signs and no flashing lights: Period 1 (Before) = Mar/Jun-04, Period 2 (1st after - 3 months) = Oct/Dec-04, Period 3 (2nd after - 9 months) = Feb/Mar-05</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1B | 60 | Brigadine College, St Ives | Slow Down | 49.2 | 47.6 | 52.1 | | 61.5 | 59.5 | 65.0 | | 11.7 | 11.1 | 12.2 | | 79.8 | 76.5 | 83.7 | | 45.0 | 36.8 | 53.4 | | 17.3 | 13.2 | 27.0 | | 4.0 | 2.9 | 7.1 | | | | |
| 1B | 60 | Narrabeen Lakes Primary School, Narrabeen | control | 49.8 | 49.2 | 50.3 | | 61.0 | 60.0 | 61.5 | | 9.6 | 9.6 | 9.9 | | 82.7 | 81.3 | 82.3 | | 44.9 | 41.2 | 47.5 | | 15.3 | 14.2 | 17.8 | | 1.8 | 2.0 | 2.2 | | | | |
| 2B | 50 | Chatswood PS, Chatswood | Slow Down | 31.5 | 35.5 | 33.4 | | 40.5 | 48.0 | 44.0 | | 7.9 | 10.3 | 8.9 | | 14.3 | 29.6 | 21.7 | | 2.3 | 10.9 | 5.1 | | 0.2 | 1.8 | 0.6 | | 0.0 | 0.1 | 0.0 | | | | |
| 2B | 50 | Christ the King, North Rocks | control | 49.4 | 51.7 | 52.5 | | 58.5 | 60.5 | 62.0 | | 8.6 | 9.0 | 9.4 | | 86.2 | 89.1 | 90.4 | | 44.0 | 58.5 | 58.2 | | 12.6 | 18.1 | 23.3 | | 0.8 | 1.7 | 3.0 | | | | |
| 3B | 60 | Annandale North PS, Annandale | Slow Down | 33.1 | 34.1 | 32.6 | | 42.0 | 43.5 | 40.5 | | 9.5 | 8.7 | 7.9 | | 19.2 | 24.9 | 16.5 | | 3.0 | 2.6 | 2.4 | | 0.3 | 0.1 | 0.3 | | 0.1 | 0.0 | 0.1 | | | | |
| 3B | 60 | Orange Grove Primary, Lilyfield | control | 47.5 | 45.8 | 45.0 | | 55.5 | 55.0 | 54.5 | | 8.1 | 9.3 | 9.5 | | 81.6 | 73.0 | 68.3 | | 34.4 | 32.7 | 27.4 | | 6.4 | 5.1 | 5.6 | | 0.5 | 0.4 | 0.9 | | | | |
| 4B | 100 | Uranquinty PS, Uranquinty | Slow Down | 41.7 | 44.4 | 43.9 | | 49.0 | 52.5 | 52.0 | | 7.6 | 8.6 | 8.1 | | 52.1 | 65.7 | 64.4 | | 12.3 | 20.9 | 19.9 | | 1.6 | 4.8 | 3.3 | | 0.2 | 0.9 | 0.4 | | | | |
| 4B | 0 | Yerong Creek PS, Yerong Creek | control | 50.4 | 50.3 | 49.6 | | 60.5 | 61.5 | 59.0 | | 10.5 | 10.8 | 10.0 | | 85.9 | 84.2 | 84.1 | | 45.1 | 44.0 | 40.8 | | 16.9 | 17.9 | 14.1 | | 4.7 | 5.5 | 3.8 | | | | |
| 5B | 60 | Muswellbrook South PS, Muswellbrook | Slow Down | 45.6 | 46.2 | 44.3 | | 55.0 | 56.0 | 53.0 | | 8.5 | 8.5 | 7.9 | | 72.8 | 74.2 | 68.3 | | 26.9 | 31.0 | 21.2 | | 5.0 | 5.8 | 2.7 | | 0.3 | 0.3 | 0.2 | | | | |
| 5B | 0 | Scone PS, Scone | (control) | 38.4 | 40.7 | 37.5 | | 47.5 | 50.0 | 46.0 | | 9.0 | 9.2 | 8.8 | | 40.8 | 51.5 | 36.8 | | 8.9 | 14.2 | 6.9 | | 0.8 | 1.3 | 0.5 | | 0.0 | 0.1 | 0.0 | | | | |
| <i>Flashing light sites that commenced operation earlier: Period 1 (Before) = Nov/Dec-02, Period 2 (1st after - 3 months) = Mar/Jun-03, Period 3 (2nd after - 12 months) = Nov/Dec-03, Period 4 (3rd after - 18 months) = Mar/Jun-04</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1C | 70 | Chatham PS, Taree | 3 | 46.9 | 43.3 | 43.1 | 43.0 | 58.4 | 55.0 | 48.8 | 48.5 | 10.2 | 7.9 | 7.9 | 8.0 | 73.2 | 72.3 | 62.7 | 60.8 | 27.4 | 33.8 | 12.0 | 11.5 | 12.5 | 11.0 | 5.1 | 5.0 | 2.9 | 1.2 | 0.7 | 1.0 | | | |
| 1C | 70 | St Benedict's PS, Edgeworth | control | 56.4 | 53.7 | 52.2 | 55.7 | 68.8 | 66.5 | 65.3 | 70.5 | 11.5 | 11.2 | 11.3 | 13.1 | 93.2 | 90.3 | 87.4 | 88.7 | 64.1 | 55.7 | 48.9 | 59.0 | 45.3 | 29.3 | 26.0 | 40.9 | 10.5 | 7.2 | 6.5 | 16.7 | | | |
| 2C | 60 | Tomaree PS, Salamander | 3 | 52.0 | 48.4 | 45.2 | 45.9 | 60.3 | 56.3 | 51.8 | 52.5 | 7.9 | 7.5 | 6.5 | 6.7 | 91.8 | 85.2 | 77.1 | 80.0 | 54.1 | 35.4 | 18.9 | 22.2 | 15.9 | 7.4 | 2.4 | 2.7 | 3.0 | 0.9 | 0.3 | 0.3 | | | |
| 2C | 60 | Elernmore Vale PS, Elernmore | control | 44.3 | 43.2 | 42.9 | 42.4 | 53.3 | 51.8 | 51.5 | 53.5 | 8.5 | 8.1 | 8.0 | 10.2 | 61.6 | 56.8 | 57.2 | 55.2 | 23.7 | 21.4 | 20.4 | 19.8 | 7.4 | 6.1 | 4.9 | 5.6 | 0.9 | 0.5 | 0.4 | 0.6 | | | |
| 3C | 70 | Mount Terry PS, Albion Park | 2 | 70.9 | 50.6 | 48.2 | 49.3 | 78.8 | 61.5 | 59.6 | 61.5 | 8.1 | 10.4 | 10.7 | 11.1 | 99.8 | 81.1 | 73.4 | 75.7 | 99.0 | 47.9 | 40.2 | 44.5 | 91.1 | 17.5 | 14.8 | 17.0 | 53.8 | 3.8 | 2.7 | 2.6 | | | |
| 3C | 70 | | control | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4C | 60 | Edmund Rice College, Wollongong | 3 | 47.9 | 43.8 | 43.9 | 45.4 | 58.0 | 52.3 | 50.8 | 52.0 | 9.4 | 8.2 | 7.0 | 7.2 | 78.0 | 59.3 | 67.1 | 76.1 | 35.2 | 19.5 | 15.0 | 19.0 | 10.5 | 4.7 | 2.9 | 3.6 | 2.0 | 2.3 | 0.3 | 0.7 | | | |
| 4C | 60 | St Paul's PS, Albion Park | control | 44.5 | 42.9 | 40.8 | 43.7 | 55.8 | 53.8 | 50.8 | 54.6 | 10.3 | 10.3 | 9.6 | 10.3 | 61.8 | 55.7 | 45.6 | 59.3 | 25.5 | 20.8 | 15.3 | 22.7 | 7.5 | 5.9 | 4.2 | 7.0 | 1.4 | 1.2 | 0.8 | 1.4 | | | |
| 5C | 80 | Blaxland PS, Blaxland | 1 | 56.0 | 57.5 | 50.7 | 52.1 | 67.8 | 69.5 | 62.5 | 64.5 | 11.1 | 11.4 | 11.0 | 11.9 | 91.6 | 92.7 | 82.9 | 85.2 | 68.3 | 72.2 | 50.3 | 56.1 | 34.4 | 41.4 | 20.2 | 25.0 | 9.3 | 12.5 | 4.3 | 6.5 | | | |
| 5C | 80 | | no control | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6C | 70 | Dundas PS, Oatlands | 1 | 52.2 | 58.7 | 47.0 | 44.9 | 64.5 | 69.5 | 55.3 | 52.5 | 10.8 | 11.5 | 8.9 | 8.9 | 89.0 | 90.2 | 83.1 | 74.6 | 46.0 | 68.6 | 25.4 | 19.0 | 24.4 | 52.5 | 9.6 | 6.2 | 7.5 | 19.8 | 2.1 | 1.1 | | | |
| 6C | 70 | Gordon West PS, Pymble | control | 53.1 | 49.3 | 48.3 | 46.9 | 66.8 | 63.8 | 62.4 | 59.5 | 13.0 | 12.8 | 12.4 | 12.4 | 83.0 | 75.9 | 75.8 | 72.2 | 57.7 | 45.0 | 38.4 | 35.2 | 32.3 | 21.6 | 18.8 | 16.7 | 7.8 | 4.7 | 4.2 | 4.2 | | | |
| <i>Flashing light sites that commenced operation earlier: Period 1 (Before - no data), Period 2 (1st after - 18 months) = Mar/Jun-04, Period 3 (2nd after - 21 months) = Oct/Dec-05, Period 4 (3rd after - 27 months) = Feb/Mar-05</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7D | 50 | Holbrook PS & St Patrick's PS, Holbrook | 2 | | 41.1 | 42.1 | 41.0 | | 47.0 | 50.0 | 48.0 | | | 6.2 | 7.3 | 7.0 | | | 53.4 | 56.6 | 51.9 | | | 6.3 | 12.5 | 8.2 | | 0.7 | 1.3 | 0.8 | | 0.1 | 0.1 | 0.1 |
| 7D | 50 | Griffith East & Griffith Catholic School, Griffith | control | | 42.4 | 45.5 | 43.8 | | 50.5 | 55.0 | 53.0 | | | 8.0 | 8.8 | 8.4 | | | 58.6 | 71.3 | 63.2 | | | 15.4 | 27.9 | 21.4 | | 2.3 | 6.1 | 3.3 | | 0.2 | 0.3 | 0.2 |
| 8D | 100 | Holmwood PS, Cowra | 2 | | 44.8 | 59.8 | 44.8 | | 52.0 | 89.5 | 53.0 | | | 9.4 | 21.8 | 9.3 | | | 65.1 | 79.5 | 0.0 | | | 18.1 | 48.8 | 0.0 | | 2.4 | 38.4 | 5.6 | | 0.0 | 32.6 | 2.0 |
| 8D | 100 | Bullarah PS, Moree | control | | 70.5 | 69.7 | 76.6 | | 95.9 | 95.9 | 99.5 | | | 22.7 | 22.6 | 21.9 | | | 93.3 | 92.7 | 0.0 | | | 79.9 | 75.0 | 0.0 | | 0.0 | 58.5 | 74.5 | | 0.0 | 46.0 | 58.3 |
| 9D | 60 | Bredbo PS, Bredbo | 1 | | 40.3 | 43.0 | 41.2 | | 46.5 | 51.0 | 47.0 | | | 7.6 | 9.0 | 7.7 | | | 42.4 | 61.1 | 49.7 | | | 8.6 | 15.3 | 9.4 | | 2.4 | 6.5 | 3.5 | | 0.3 | 0.9 | 0.4 |
| 9D | 60 | Ando PS, Ando | control | | 60.9 | 60.7 | 55.6 | | 85.5 | 85.5 | 76.0 | | | 19.6 | 19.8 | 18.3 | | | 89.0 | 91.4 | 85.8 | | | 61.9 | 59.1 | 44.9 | | 43.4 | 38.9 | 28.9 | | 28.5 | 27.3 | 20.4 |
| 10D | 50 | Helensburgh PS, Helensburgh | 1 | | 44.6 | 43.8 | 44.0 | | 53.0 | 52.5 | 52.0 | | | 7.7 | 8.0 | 7.6 | | | 70.4 | 65.6 | 67.4 | | | 21.6 | 19.9 | 18.6 | | 0.0 | 2.1 | 2.2 | | 0.1 | 0.1 | 0.2 |
| 10D | 50 | Oxford PS, Oxford | control | | 28.0 | 27.7 | 28.9 | | 35.0 | 35.0 | 37.0 | | | 6.5 | 6.6 | 7.1 | | | 4.9 | 4.6 | 7.7 | | | 0.3 | 0.4 | 0.6 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| 11D | 60 | Waitara PS, Waitara | 3 | | 45.4 | 44.6 | 43.0 | | 53.0 | 51.5 | 51.5 | | | 7.3 | 7.0 | 8.0 | | | 75.8 | 72.9 | 58.2 | | | 23.0 | 18.2 | 16.6 | | 2.5 | 2.0 | 3.3 | | 0.3 | 0.2 | 0.3 |
| 11D | 60 | Punchbowl PS, Sydney | control | | 43.4 | 43.2 | 44.3 | | 55.0 | 54.5 | 56.0 | | | 10.8 | 11.0 | 10.7 | | | 60.4 | 58.9 | 63.7 | | | 26.4 | 26.2 | 29.1 | | 5.5 | 5.7 | 6.3 | | 0.6 | 0.8 | 0.7 |

3.1.4 Summary tables of key speed parameters – all vehicles

Changes in mean speed, 85th percentile speed and the proportion of vehicles exceeding the speed limit by various amounts are shown in Tables 6 to 9, averaged according to site groups (Groups A, B, C, D). The changes shown are accompanied by control ratios (described in Section 2.3.2.1), and the effects of changes at the control sites have been used to adjust the changes in speed parameters for the treatment sites.

Overall, these figures show that the three types of flashing lights, as a group, perform better than the static 'Slow Down' only signs. Also evident is that speeds and speeding rates continue to decrease at flashing light sites after extended periods of operation.

After adjusting treatment site data with control site data, the following conclusions can be drawn:

Mean speeds

- After nine months, mean speeds reduced by 1.6 km/h (3.6%) to 42 km/h for Group A sites, while at the Group B sites they increased by 1.2 km/h (3%) to 41.3 km/h.
- After 18 months, mean speeds for Group C sites fell by 5 km/h (9.7%) to 46.8 km/h.
- Mean speeds for Group D sites fell by 1.7 km/h (3.8%) to 42.3 km/h between 18 months and 27 months after commencement of the operation of the flashing lights.

85th percentile speeds

- After nine months, 85th percentile speeds reduced by 3.1 km/h (5.8%) to 50 km/h for Group A sites, while for Group B sites they increased by 1.4 km/h (2.8%) to 50.9 km/h.
- After 18 months, 85th percentile speeds for Group C sites fell by 7.8 km/h (12.3%) to 55.3 km/h.
- 85th percentile speeds for Group D remained relatively unchanged at 50.4 km/h between 18 months and 27 months after commencement of the operation of the flashing lights.

Motorists exceeding 40 km/h

- After nine months, the proportion of motorists exceeding 40 km/h for Group A sites had fallen by 7.2% (i.e. from 57.7% to 50.5%), while for Group B sites the proportion increased by 5.5% (i.e. from 45.4% to 50.9%).
- After 18 months, the proportion of motorists exceeding 40 km/h for Group C sites fell by 4.8% (i.e. from 80.2% to 75.4%).
- The proportion of motorists exceeding 40 km/h for Group D sites remained relatively unchanged at about 57% between 18 months and 27 months 'after' commencement of operation of the flashing lights.

Motorists exceeding 40 km/h by more than 10 km/h

- After nine months, the proportion of motorists exceeding 40 km/h by more than 10 km/h for Group A sites had fallen by 9.9% (i.e. from 24.7% to 14.9%), while for Group B sites the proportion increased by 3% (i.e. from 17.4% to 20.4%).
- After 18 months, the proportion of motorists exceeding 40 km/h by more than 10 km/h for Group C sites fell by 16.1% (i.e. from 44.6% to 28.7%).
- The proportion of motorists exceeding 40 km/h by more than 10 km/h for Group D sites fell by 3.7% (i.e. from 16.9% to 13.2%) between 18 months and 27 months 'after' commencement of operation of the flashing lights.

Motorists exceeding 40 km/h by more than 20 km/h

- After nine months, the proportion of motorists exceeding 40 km/h by more than 20 km/h for Group A sites had fallen by 4.4% (i.e. from 9.2% to 4.9%), while for Group B sites the proportion increased by 1.6% (i.e. from 5.2% to 6.8%).
- After 18 months, the proportion of motorists exceeding 40 km/h by more than 20 km/h for Group C sites fell by 14.6% (i.e. from 24.5% to 9.9%).
- The proportion of motorists exceeding 40 km/h by more than 20 km/h for Group D sites increased by 1.3% (i.e. from 1.8% to 3.1%) between 18 months and 27 months 'after' commencement of operation of the flashing lights.

Motorists exceeding 40 km/h by more than 30 km/h

- After nine months, the proportion of motorists exceeding 40 km/h by more than 30 km/h for Group A sites remained relatively unchanged at 0.2%, while for Group B sites the proportion remained unchanged at 1.6%.
- After 18 months, the proportion of motorists exceeding 40 km/h by more than 30 km/h for Group C sites fell by 10.4% (i.e. from 12.4% to 2.0%).
- The proportion of motorists exceeding 40 km/h by more than 30 km/h for Group D sites remained relatively unchanged at 0.4% between 18 months and 27 months 'after' commencement of operation of the flashing lights.

The descriptive analysis, which uses control data provides an indication of changes in speeds as a result of treatment should be treated with caution. The inferential analysis, provided in Section 3.2, gives a more robust determination of the impact of the measures used at school speed zones.

It should also be noted that there were no baseline speed survey data available for the sites in Group D. To provide some indication of the changes that occurred across the survey periods, the first 'after' survey data for Group D sites have been used as 'baseline' figures, and the second and third 'after' periods have become first and second 'after' periods in the summary table. The changes shown, therefore, are changes between first and later follow-up surveys, and are not a true before-after comparison.

Note also that the results from Site 10A (Westport PS), when adjusted by control ratios, showed very large reductions in proportions of vehicles exceeding the speed limit. These reductions have been used in averages but are not included in the charts of parameters in Appendix A. The reductions were so large that if they were displayed alongside other sites' figures, the other sites' data would be compressed and difficult to read. The reason for the large reductions is not actual reductions at Site 10A, but large increases in speeding rates at the control site. This indicates that there may have been a drastic change in traffic conditions at the control site during the evaluation period.

Table 6: Speed characteristics for all Group A sites (32 sites, 31 controls) – all vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|--|--|---------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 44.3 | 1.01 | 44.6 | 43.0 | -1.6 | -3.6 | 0.98 | 43.5 | 42.0 | -1.6 | -3.6 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 54.0 | 1.02 | 55.1 | 51.8 | -3.3 | -5.9 | 0.98 | 53.1 | 50.0 | -3.1 | -5.8 |
| Percentage above 40 km/h | 60.5 | 0.99 | 60.1 | 56.3 | -3.8 | -6.4 | 0.95 | 57.7 | 50.5 | -7.2 | -12.5 |
| Percentage above 50 km/h | 24.5 | 1.30 | 32.0 | 19.2 | -12.8 | -40.0 | 1.01 | 24.7 | 14.9 | -9.9 | -39.9 |
| Percentage above 60 km/h | 7.6 | 1.20 | 9.1 | 6.1 | -3.0 | -33.1 | 1.22 | 9.2 | 4.9 | -4.4 | -47.2 |
| Percentage above 70 km/h | 1.7 | 1.07 | 1.8 | 1.8 | 0.0 | -1.6 | 0.88 | 1.5 | 1.3 | -0.2 | -12.3 |

Table 7: Speed characteristics for all Group B sites (5 sites, 5 controls) – all vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|--|--|---------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 40.2 | 1.01 | 40.7 | 41.6 | 0.9 | 2.1 | 1.00 | 40.1 | 41.3 | 1.2 | 3.0 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 49.6 | 1.02 | 50.4 | 51.9 | 1.5 | 3.0 | 1.00 | 49.5 | 50.9 | 1.4 | 2.8 |
| Percentage above 40 km/h | 47.7 | 1.03 | 49.1 | 54.2 | 5.1 | 10.3 | 0.95 | 45.4 | 50.9 | 5.5 | 12.2 |
| Percentage above 50 km/h | 17.9 | 1.15 | 20.6 | 20.4 | -0.2 | -0.9 | 0.97 | 17.4 | 20.4 | 3.0 | 17.4 |
| Percentage above 60 km/h | 4.9 | 1.19 | 5.8 | 5.1 | -0.7 | -11.3 | 1.07 | 5.2 | 6.8 | 1.6 | 30.3 |
| Percentage above 70 km/h | 0.9 | 1.72 | 1.6 | 0.8 | -0.8 | -47.0 | 1.72 | 1.6 | 1.6 | 0.0 | -2.9 |

Table 8: Speed characteristics for all Group C sites (6 sites, 4 controls) – all vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | | 3 rd 'after' | | | | |
|---|-------------------------------|---------------|--------|-------|-------|---------------|-------------------------|--------|-------|-------|---------------|-------------------------|--------|-------|-------|---------|
| | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % | |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 54.3 | 0.96 | 51.9 | 50.4 | -1.5 | -3.0 | 0.93 | 50.5 | 46.4 | -4.2 | -8.3 | 0.95 | 51.8 | 46.8 | -5.0 | -9.7 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 64.6 | 0.96 | 62.3 | 60.7 | -1.6 | -2.6 | 0.94 | 60.7 | 54.8 | -6.0 | -9.8 | 0.98 | 63.0 | 55.3 | -7.8 | -12.3 |
| Percentage above 40 km/h | 87.2 | 0.93 | 80.9 | 80.1 | -0.8 | -0.9 | 0.88 | 76.7 | 74.4 | -2.4 | -3.1 | 0.92 | 80.2 | 75.4 | -4.8 | -6.0 |
| Percentage above 50 km/h | 55.0 | 0.84 | 46.3 | 46.2 | -0.1 | -0.2 | 0.72 | 39.7 | 27.0 | -12.7 | -32.1 | 0.8 | 44.8 | 28.7 | -16.1 | -35.9 |
| Percentage above 60 km/h | 31.5 | 0.73 | 22.9 | 22.4 | -0.5 | -2.3 | 0.60 | 18.7 | 9.1 | -9.6 | -51.2 | 0.8 | 24.5 | 9.9 | -14.6 | -59.5 |
| Percentage above 70 km/h | 13.1 | 0.67 | 8.8 | 6.8 | -2.0 | -22.8 | 0.55 | 7.2 | 1.8 | -5.4 | -75.5 | 1.0 | 12.4 | 2.0 | -10.4 | -83.7 |

Table 9: Speed characteristics for all Group D sites (5 sites, 5 controls) – all vehicles, in the school zones

| Speed characteristics | 1 st after 'before' (km/h or %) | 2 nd 'after' | | | | | 3 rd 'after' | | | | |
|--|---|-------------------------|--------|-------|-------|------------------|-------------------------|--------|-------|-------|---------|
| | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % | |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 43.2 | 1.01 | 43.6 | 43.4 | -0.2 | -0.5 | 1.02 | 44.0 | 42.3 | -1.7 | -3.8 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 50.3 | 1.02 | 51.1 | 51.3 | 0.1 | 0.3 | 1.01 | 50.8 | 50.4 | -0.4 | -0.8 |
| Percentage above 40 km/h | 61.4 | 1.03 | 63.4 | 64.1 | 0.7 | 1.1 | 0.93 | 57.4 | 56.8 | -0.6 | -1.0 |
| Percentage above 50 km/h | 15.5 | 1.23 | 19.1 | 16.5 | -2.6 | -13.7 | 1.09 | 16.9 | 13.2 | -3.7 | -21.9 |
| Percentage above 60 km/h | 1.6 | 1.53 | 2.5 | 3.0 | 0.5 | 20.5 | 1.09 | 1.8 | 3.1 | 1.3 | 77.0 |
| Percentage above 70 km/h | 0.2 | 1.28 | 0.2 | 0.3 | 0.1 | 72.4 | 1.02 | 0.2 | 0.6 | 0.4 | 276.2 |

Note that the data from Holmwood and Holbrook (sites 7D and 8D) have been excluded from the second and third 'after' surveys due to unexplained inconsistencies in their data. These inconsistencies did not necessarily indicate survey problems, but may be a sign of unusual traffic conditions at those sites. Further investigation of speed conditions at these sites may be investigated to validate this assessment.

3.1.5 Impact of flashing lights and static 'Slow Down' only signs at school zones on heavy vehicle speeds

Tables 10 to 13 summarise the analysis of heavy vehicle mean speeds, 85th percentile speeds and percentages of this class of vehicle exceeding the speed limit by various amounts, averaged according to site groups (Group A, B, C, D). The changes shown in the tables are accompanied by control ratios (described in Section 2.3.2.1), and the effects of changes at the control sites have been used to adjust the changes in speed parameters for the treatment sites.

These results show similar differences between groups to what were found in the 'all vehicles' analysis, but the reductions in speed are more substantial for heavy vehicles.

The following changes are apparent, with site figures adjusted by control site data:

Mean speeds

- After 9 months, mean speeds reduced by 2.1 km/h (5%) to 39.8 km/h for Group A sites, while at the Group B sites they decreased by 1.9 km/h (4.6%) to 38.5 km/h.
- After 18 months, mean speeds for Group C sites fell by 8.2 km/h (15.7%) to 43.7 km/h.
- Mean speeds for Group D sites increased by 1.7 km/h (4.3%) to 40.2 km/h between 18 months and 27 months 'after' commencement of the operation of the flashing lights.

85th percentile speeds

- After 9 months, 85th percentile speeds reduced by 5.4 km/h (10.3%) to 47 km/h for Group A sites, while for Group B sites they decreased by 2.5 km/h (5%) to 46.7 km/h.
- After 18 months, 85th percentile speeds for Group C sites fell by 10.4 km/h (16.7%) to 51.9 km/h.
- 85th percentile speeds for Group D increased by 4.3 km/h (9.8%) to 48.5 km/h between 18 months and 27 months 'after' commencement of the operation of the flashing lights.

Heavy vehicles exceeding 40 km/h

- After 9 months, the proportion of heavy vehicles exceeding 40 km/h for Group A sites had fallen by 12% (i.e. from 52.5% to 40.5%), while for Group B sites the proportion remained relatively unchanged at 41.9%.
- After 18 months, the proportion of heavy vehicles exceeding 40 km/h for Group C sites fell by 20% (i.e. from 80.9% to 60.9%).
- The proportion of heavy vehicles exceeding 40 km/h for Group D sites increased by 6.6% (i.e. from 35.2% to 41.8%) between 18 months and 27 months 'after' commencement of operation of the flashing lights.

Heavy vehicles exceeding 40 km/h by more than 10 km/h

- After 9 months, the proportion of heavy vehicles exceeding 40 km/h by more than 10 km/h for Group A sites had fallen by 33.6% (i.e. from 44.1% to 10.5%), while for Group B sites the proportion decreased by 1.9% (i.e. from 17.9% to 16.0%).
- After 18 months, the proportion of heavy vehicles exceeding 40 km/h by more than 10 km/h for Group C sites fell by 25.5% (i.e. from 46.3% to 20.9%).
- The proportion of heavy vehicles exceeding 40 km/h by more than 10 km/h for Group D sites increased by 4.2% (i.e. from 6.1% to 10.3%) between 18 months and 27 months 'after' commencement of operation of the flashing lights.

Heavy vehicles exceeding 40 km/h by more than 20 km/h

- After 9 months, the proportion of heavy vehicles exceeding 40 km/h for Group A sites had fallen by 6.3% (i.e. from 9.5% to 3.1%), while for Group B sites the proportion decreased by 4.3% (i.e. from 8.7% to 4.4%).
- After 18 months, the proportion of heavy vehicles exceeding 40 km/h by more than 20 km/h for Group C sites fell by 15.4% (i.e. from 21.0% to 5.6%).
- The proportion of heavy vehicles exceeding 40 km/h by more than 20 km/h for Group D sites increased by 0.9% (i.e. from 0.5% to 1.4%) between 18 months and 27 months 'after' commencement of operation of the flashing lights.

Heavy vehicles exceeding 40 km/h by more than 30 km/h

- After 9 months, the proportion of heavy vehicles exceeding 40 km/h by more than 30 km/h for Group A sites remained relatively unchanged at 0.5%, while for Group B sites the proportion remained relatively unchanged at 0.4%.
- After 18 months, the proportion of heavy vehicles exceeding 40 km/h by more than 30 km/h for Group C sites fell by 5.9% (i.e. from 7.1% to 1.2%).
- The proportion of heavy vehicles exceeding 40 km/h by more than 30 km/h for Group D sites remained relatively unchanged at 0.2% between 18 months and 27 months 'after' commencement of operation of the flashing lights.

Note that there were no baseline figures for the sites in Group D. To provide some indication of the changes that occurred across the survey periods, the first 'after' survey data for Group D sites have been used as 'baseline' figures, and the second and third 'after' periods have become first and second 'after' periods in the summary table. The changes shown, therefore, are changes between first and later follow-up surveys, and are not a true before-after comparison.

Table 10: Speed characteristics for all Group A sites (32 sites, 31 controls) – heavy vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|---|-------------------------------|---------------|--------|-------|--------|---------------|-------------------------|--------|-------|-------|---------|
| | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % | |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 42.3 | 1.02 | 43.1 | 40.7 | -2.4 | -5.5 | 0.99 | 41.9 | 39.8 | -2.1 | -5.0 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 52.5 | 1.04 | 54.8 | 48.8 | -6.0 | -11.0 | 1.00 | 52.3 | 47.0 | -5.4 | -10.3 |
| Percentage above 40 km/h | 50.5 | 1.12 | 56.6 | 46.3 | -10.2 | -18.1 | 1.04 | 52.5 | 40.5 | -12.0 | -22.9 |
| Percentage above 50 km/h | 17.9 | 11.53 | 205.8 | 13.7 | -192.1 | -93.3 | 2.47 | 44.1 | 10.5 | -33.6 | -76.2 |
| Percentage above 60 km/h | 5.1 | 1.82 | 9.2 | 3.7 | -5.5 | -59.7 | 1.87 | 9.5 | 3.1 | -6.3 | -67.0 |
| Percentage above 70 km/h | 1.5 | 1.03 | 1.6 | 1.0 | -0.6 | -36.6 | 0.76 | 1.2 | 0.7 | -0.5 | -42.9 |

Table 11: Speed characteristics for all Group B sites (5 sites, 5 controls) – heavy vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|---|--|------------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 38.8 | 1.01 | 39.2 | 40.3 | 1.2 | 2.9 | 1.04 | 40.4 | 38.5 | -1.9 | -4.6 |
| 85 th percentile speed, p_{85} (km/h) | 46.4 | 1.03 | 47.8 | 49.9 | 2.0 | 4.3 | 1.06 | 49.1 | 46.7 | -2.5 | -5.0 |
| Percentage above 40 km/h | 42.3 | 1.06 | 44.7 | 49.6 | 4.9 | 11.0 | 1.01 | 42.6 | 41.9 | -0.6 | -1.4 |
| Percentage above 50 km/h | 12.8 | 1.30 | 16.7 | 17.9 | 1.2 | 7.1 | 1.40 | 17.9 | 16.0 | -1.9 | -10.7 |
| Percentage above 60 km/h | 3.3 | 1.02 | 3.4 | 3.7 | 0.3 | 9.5 | 2.63 | 8.7 | 4.4 | -4.3 | -49.7 |
| Percentage above 70 km/h | 0.3 | 0.71 | 0.2 | 0.9 | 0.7 | 380.2 | 3.65 | 0.9 | 0.5 | -0.4 | -45.2 |

Table 12: Speed characteristics for all Group C sites (6 sites, 4 controls) – heavy vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | | 3 rd 'after' | | | | |
|--|--|------------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 54.3 | 0.96 | 51.9 | 49.2 | -2.7 | -5.1 | 0.93 | 50.5 | 46.4 | -4.2 | -8.3 | 0.96 | 51.9 | 43.7 | -8.2 | -15.7 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 64.6 | 0.96 | 62.3 | 59.1 | -3.2 | -5.1 | 0.94 | 60.7 | 54.8 | -6.0 | -9.8 | 0.96 | 62.3 | 51.9 | -10.4 | -16.7 |
| Percentage above 40 km/h | 87.2 | 0.93 | 80.9 | 77.9 | -2.9 | -3.6 | 0.88 | 76.7 | 74.4 | -2.4 | -3.1 | 0.93 | 80.9 | 60.9 | -20.0 | -24.7 |
| Percentage above 50 km/h | 55.0 | 0.84 | 46.3 | 38.6 | -7.7 | -16.6 | 0.72 | 39.7 | 27.0 | -12.7 | -32.1 | 0.84 | 46.3 | 20.9 | -25.5 | -54.9 |
| Percentage above 60 km/h | 27.6 | 0.76 | 21.0 | 16.9 | -4.1 | -19.6 | 0.62 | 17.2 | 9.1 | -8.0 | -46.8 | 0.76 | 21.0 | 5.6 | -15.4 | -73.4 |
| Percentage above 70 km/h | 10.6 | 0.67 | 7.1 | 4.4 | -2.7 | -38.3 | 0.55 | 5.9 | 1.8 | -4.1 | -70.0 | 0.67 | 7.1 | 1.2 | -5.9 | -83.3 |

Table 13: Speed characteristics for all Group D sites (5 sites, 5 controls) – heavy vehicles, in the school zones

| Speed characteristics | 1 st after 'before' (km/h or %) | 2 nd 'after' | | | | | 3 rd 'after' | | | | |
|--|--|-------------------------|--------|-------|-------|---------------|-------------------------|--------|-------|-------|---------|
| | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % | |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑤/③×100 |
| Mean speed, \bar{x} (km/h) | 41.7 | 0.97 | 40.3 | 42.1 | 1.8 | 4.4 | 0.92 | 38.5 | 40.2 | 1.7 | 4.3 |
| 85 th percentile speed, p^{85} (km/h) | 47.7 | 0.99 | 47.3 | 49.4 | 2.1 | 4.4 | 0.93 | 44.2 | 48.5 | 4.3 | 9.8 |
| Percentage above 40 km/h | 51.3 | 1.02 | 52.4 | 53.8 | 1.4 | 2.6 | 0.69 | 35.2 | 41.8 | 6.6 | 18.8 |
| Percentage above 50 km/h | 9.5 | 1.03 | 9.8 | 12.9 | 3.1 | 31.5 | 0.64 | 6.1 | 10.3 | 4.2 | 67.8 |
| Percentage above 60 km/h | 0.5 | 1.21 | 0.7 | 3.4 | 2.8 | 415.3 | 0.97 | 0.5 | 1.4 | 0.9 | 170.5 |
| Percentage above 70 km/h | 0.1 | 1.08 | 0.1 | 0.7 | 0.5 | 372.0 | 2.35 | 0.3 | 0.2 | -0.1 | -37.8 |

Note that the data from Holmwood and Holbrook (sites 7D and 8D) have been excluded from the second and third 'after' surveys due to unexplained inconsistencies in their data. These inconsistencies did not necessarily indicate survey problems, but may be a sign of unusual traffic conditions at those sites. Further investigation of speed conditions at these sites may be useful.

3.1.6 Summary tables of key speed parameters by approach speed limit – all vehicles

The analysis undertaken also considered the impact of the flashing lights and static 'Slow Down' only signs at school zones with roads speed zoned 50 km/h, 60 km/h, 70 km/h and 80 km/h.

Tables 14 to 21 summarise the analysis of speeds at flashing lights and static 'Slow Down' only sign sites according to differing approach speeds (i.e. the non-school hours speed limit). The analysis shows the changes in mean and 85th percentile speeds and in the proportions of vehicles exceeding the speed limit by various amounts. These tables show data averaged for all school zones of the same approach speed limit in each group (Groups A, B, C). Similar to the charts in Sections 3.1.3 and 3.1.4, control site figures have been used to adjust the changes at the treatment sites. The conclusions drawn from this analysis should be treated with caution as the number of sites considered within each category is small.

- In Group A, the group of sites with 50 km/h approaches performed better than the sites with 60 and 70 km/h approaches, although the reductions in proportions of vehicles exceeding the speed limit by at least 20 km/h were greater at the sites with 60 km/h approaches. The 50 and 60 km/h (approach) Group B sites showed smaller reductions than those in Group A. Speed at the Group C 60 km/h (approach) sites after 18 months were similar to those achieved by the 60 km/h (approach) sites in Group A, but the proportions of vehicles speeding showed greater reductions.
- The Group C sites with 70 km/h approaches performed better than that group's sites with 60 km/h approaches in all survey periods. This is the opposite of the Group A results, but it must be noted that Group C had only one site with a 60 km/h approach and a control, and two sites with 70 km/h approaches and controls. Accordingly, these results must be used with caution.

Note that there were no baseline figures for the sites in Group D. There were also two sites (Holbrook and Holmwood) with unexplained inconsistencies in their follow-up data, especially in the proportions of vehicles exceeding the speed limit. These problems reduced the data set to the extent that further separation by approach speed limit would not be helpful. Accordingly, Group D is not dealt with in this analysis by approach speed limit.

Table 14: Speed characteristics for the Group A sites with 50 km/h approach speed limits (12 sites, 12 controls) – all vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|--|--|------------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑤/③×100 |
| Mean speed, \bar{x} (km/h) | 42.2 | 1.01 | 40.7 | 40.7 | 0.1 | 0.2 | 0.99 | 41.9 | 39.6 | -2.3 | -5.4 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 50.8 | 1.01 | 47.1 | 49.3 | 2.2 | 4.6 | 0.98 | 50.0 | 47.3 | -2.7 | -5.5 |
| Percentage above 40 km/h | 56.0 | 1.03 | 47.2 | 49.5 | 2.3 | 4.9 | 0.96 | 53.6 | 43.7 | -9.9 | -18.4 |
| Percentage above 50 km/h | 19.8 | 1.32 | 14.4 | 14.5 | 0.1 | 1.0 | 1.02 | 20.1 | 10.0 | -10.0 | -50.0 |
| Percentage above 60 km/h | 4.0 | 1.62 | 2.7 | 2.6 | -0.1 | -2.4 | 1.03 | 4.1 | 2.1 | -2.0 | -48.8 |
| Percentage above 70 km/h | 0.4 | 1.43 | 0.0 | 0.2 | 0.2 | 0 | 0.90 | 0.3 | 0.2 | -0.1 | -38.3 |

Table 15: Speed characteristics for the Group A sites with 60 km/h approach speed limits (13 sites, 12 controls) – all vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|--|--|------------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 44.5 | 1.01 | 45.1 | 42.6 | -2.5 | -5.6 | 0.97 | 43.1 | 41.8 | -1.3 | -3.0 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 54.7 | 1.04 | 55.4 | 51.5 | -3.9 | -7.1 | 0.97 | 53.0 | 49.6 | -3.5 | -6.5 |
| Percentage above 40 km/h | 59.7 | 0.96 | 61.8 | 55.0 | -6.7 | -10.9 | 0.94 | 56.1 | 54.3 | -1.9 | -3.4 |
| Percentage above 50 km/h | 24.6 | 1.43 | 32.6 | 17.1 | -15.4 | -47.4 | 1.00 | 24.7 | 14.0 | -10.7 | -43.3 |
| Percentage above 60 km/h | 8.2 | 0.85 | 13.3 | 5.0 | -8.3 | -62.7 | 1.47 | 12.1 | 3.5 | -8.6 | -71.0 |
| Percentage above 70 km/h | 1.5 | 0.90 | 2.1 | 1.0 | -1.2 | -55.0 | 0.76 | 1.1 | 0.6 | -0.5 | -48.2 |

Table 16: Speed characteristics for the Group A sites with 70 km/h approach speed limits (2 sites, 2 controls) – all vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|---|-------------------------------|---------------|--------|-------|-------|---------------|-------------------------|--------|-------|-------|---------|
| | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % | |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 55.2 | 0.98 | 54.0 | 56.6 | 2.6 | 4.9 | 1.00 | 55.2 | 56.2 | 1.0 | 1.7 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 68.8 | 0.99 | 68.3 | 69.8 | 1.5 | 2.1 | 0.99 | 68.4 | 69.3 | 0.9 | 1.3 |
| Percentage above 40 km/h | 89.8 | 0.96 | 86.4 | 94.6 | 8.2 | 9.5 | 1.00 | 89.7 | 94.5 | 4.8 | 5.3 |
| Percentage above 50 km/h | 62.9 | 0.90 | 56.4 | 62.4 | 6.0 | 10.6 | 0.97 | 61.1 | 62.7 | 1.6 | 2.6 |
| Percentage above 60 km/h | 33.5 | 0.93 | 31.1 | 33.3 | 2.2 | 7.1 | 1.01 | 33.9 | 32.3 | -1.7 | -4.9 |
| Percentage above 70 km/h | 12.1 | 0.97 | 11.7 | 16.1 | 4.3 | 36.9 | 1.10 | 13.3 | 13.6 | 0.4 | 2.8 |

Table 17: Speed characteristics for the Group A sites with 80 km/h approach speed limits (3 sites, 3 controls) – all vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|--|--|------------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 42.8 | 1.00 | 42.7 | 41.5 | -1.2 | -2.7 | 0.98 | 42.0 | 39.9 | -2.1 | -4.9 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 51.5 | 1.01 | 51.8 | 48.3 | -3.5 | -6.8 | 0.99 | 50.8 | 45.7 | -5.2 | -10.2 |
| Percentage above 40 km/h | 56.2 | 0.98 | 55.2 | 50.5 | -4.6 | -8.4 | 0.93 | 52.4 | 45.0 | -7.4 | -14.1 |
| Percentage above 50 km/h | 15.5 | 1.05 | 16.3 | 10.9 | -5.4 | -33.3 | 0.93 | 14.4 | 5.5 | -8.9 | -61.5 |
| Percentage above 60 km/h | 5.2 | 0.93 | 4.8 | 3.6 | -1.2 | -25.3 | 0.99 | 5.1 | 0.9 | -4.2 | -82.3 |
| Percentage above 70 km/h | 2.1 | 0.55 | 1.1 | 1.7 | 0.6 | 51.6 | 0.64 | 1.3 | 0.2 | -1.1 | -86.0 |

Table 18: Speed characteristics for the Group B sites with 50 km/h approach speed limits (3 sites, 3 controls) – all vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|---|-------------------------------|---------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 35.4 | 1.00 | 35.9 | 38.0 | 2.1 | 5.8 | 1.00 | 35.4 | 36.7 | 1.3 | 3.7 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 43.8 | 1.01 | 44.4 | 48.0 | 3.6 | 8.1 | 1.01 | 44.1 | 45.5 | 1.4 | 3.2 |
| Percentage above 40 km/h | 28.6 | 0.97 | 29.5 | 40.1 | 10.6 | 35.8 | 0.96 | 27.3 | 34.2 | 6.9 | 25.4 |
| Percentage above 50 km/h | 5.9 | 1.09 | 7.7 | 11.5 | 3.7 | 48.3 | 1.01 | 5.9 | 9.2 | 3.3 | 55.3 |
| Percentage above 60 km/h | 0.7 | 1.10 | 1.1 | 2.2 | 1.1 | 101.0 | 1.19 | 0.8 | 1.4 | 0.6 | 74.3 |
| Percentage above 70 km/h | 0.1 | 1.37 | 0.1 | 0.3 | 0.2 | | 2.12 | 0.2 | 0.2 | 0.0 | -19.9 |

Table 19: Speed characteristics for the Group B sites with 60 km/h approach speed limits (2 sites, 2 controls) – all vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|---|-------------------------------|---------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 47.4 | 1.02 | 47.6 | 46.9 | -0.7 | -1.4 | 0.99 | 47.1 | 48.2 | 1.1 | 2.3 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 58.3 | 1.02 | 59.1 | 57.8 | -1.3 | -2.2 | 0.99 | 57.6 | 59.0 | 1.4 | 2.5 |
| Percentage above 40 km/h | 76.3 | 1.12 | 74.0 | 75.4 | 1.3 | 1.8 | 0.95 | 72.4 | 76.0 | 3.6 | 5.0 |
| Percentage above 50 km/h | 35.9 | 1.26 | 39.0 | 33.9 | -5.1 | -13.0 | 0.92 | 33.0 | 37.3 | 4.3 | 13.0 |
| Percentage above 60 km/h | 11.1 | 1.33 | 12.2 | 9.5 | -2.7 | -22.2 | 0.90 | 10.1 | 14.9 | 4.8 | 47.7 |
| Percentage above 70 km/h | 2.2 | 2.25 | 3.0 | 1.6 | -1.4 | -45.6 | 1.12 | 2.4 | 3.6 | 1.2 | 48.4 |

Table 20: Speed characteristics for the Group C sites with 60 km/h approach speed limits (2 sites, 1 control) – all vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | | 3 rd 'after' | | | | |
|---|-------------------------------|---------------|--------|-------|-------|---------------|-------------------------|--------|-------|-------|---------------|-------------------------|--------|-------|-------|---------|
| | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % | |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑤/③×100 |
| Mean speed, \bar{x} (km/h) | 51.9 | 0.97 | 52.2 | 49.9 | -2.4 | -4.5 | 0.94 | 49.0 | 46.6 | -2.4 | -4.8 | 0.97 | 50.4 | 47.8 | -2.6 | -5.2 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 62.0 | 0.97 | 64.2 | 59.4 | -4.9 | -7.6 | 0.94 | 58.2 | 55.0 | -3.2 | -5.5 | 0.99 | 61.5 | 56.3 | -5.2 | -8.4 |
| Percentage above 40 km/h | 87.1 | 0.91 | 83.2 | 79.0 | -4.2 | -5.0 | 0.83 | 72.6 | 75.7 | 3.1 | 4.2 | 0.93 | 80.9 | 80.4 | -0.4 | -0.5 |
| Percentage above 50 km/h | 52.5 | 0.86 | 74.8 | 42.4 | -32.5 | -43.4 | 0.73 | 38.3 | 28.1 | -10.2 | -26.7 | 0.86 | 45.4 | 32.5 | -12.9 | -28.5 |
| Percentage above 60 km/h | 20.3 | 0.80 | 17.3 | 17.8 | 0.5 | 2.9 | 0.61 | 12.4 | 8.5 | -3.9 | -31.8 | 0.85 | 17.2 | 10.4 | -6.7 | -39.2 |
| Percentage above 70 km/h | 4.7 | 0.70 | 4.3 | 5.3 | 1.0 | 23.5 | 0.52 | 2.5 | 1.7 | -0.8 | -32.8 | 0.84 | 4.0 | 2.5 | -1.5 | -37.9 |

Table 21: Speed characteristics for the Group C sites with 70 km/h approach speed limits (3 sites, 2 controls) – all vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | | 3 rd 'after' | | | | |
|---|-------------------------------|---------------|--------|-------|-------|---------------|-------------------------|--------|-------|-------|---------------|-------------------------|--------|-------|-------|---------|
| | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % | |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑤/③×100 |
| Mean speed, \bar{x} (km/h) | 56.7 | 0.94 | 53.3 | 50.8 | -2.5 | -4.6 | 0.92 | 52.0 | 46.1 | -6.0 | -11.4 | 0.94 | 53.1 | 45.7 | -7.4 | -13.9 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 67.2 | 0.96 | 64.6 | 62.0 | -2.6 | -4.0 | 0.94 | 63.3 | 54.5 | -8.8 | -13.8 | 0.96 | 64.4 | 54.2 | -10.3 | -15.9 |
| Percentage above 40 km/h | 87.3 | 0.94 | 82.3 | 81.2 | -1.1 | -1.3 | 0.93 | 80.9 | 73.0 | -7.8 | -9.7 | 0.91 | 79.5 | 70.4 | -9.2 | -11.5 |
| Percentage above 50 km/h | 57.5 | 0.82 | 47.4 | 50.1 | 2.7 | 5.7 | 0.71 | 41.0 | 25.9 | -15.2 | -37.0 | 0.77 | 44.0 | 25.0 | -19.0 | -43.1 |
| Percentage above 60 km/h | 42.7 | 0.66 | 28.1 | 27.0 | -1.1 | -3.8 | 0.58 | 24.7 | 9.8 | -14.8 | -60.2 | 0.71 | 30.3 | 9.4 | -20.9 | -69.0 |
| Percentage above 70 km/h | 21.4 | 0.64 | 13.7 | 8.3 | -5.5 | -39.8 | 0.58 | 12.4 | 1.9 | -10.5 | -85.0 | 1.06 | 22.7 | 1.6 | -21.1 | -93.0 |

3.1.7 Comparison of sites according to approach speed limit – heavy vehicles

Tables 22 to 29 show data averaged for all school zones of the same approach speed limit in each group (Groups A, B, C). Again, the control site figures have been used to adjust the changes at the treatment sites.

- The changes at Group A sites with 50 and 60 km/h approaches show better heavy vehicle speed reductions at sites with 60 km/h approaches than at sites with 50 km/h approaches. The proportions of vehicles speeding still reduced more at sites with 60 km/h approaches than sites with 50 km/h approaches; this is a similar result to what was found for all vehicles.
- Substantial reductions were found across the Group C sites with 70 km/h approaches. This contrasts with increases found at Group A sites with the same approach speed limit. Note that only a small number of sites had 70 km/h approaches, so these averages are susceptible to disturbance by large changes at a single site.

This descriptive analyses, this control ratio analysis gives some indication of reductions that can be attributed to the presence of the flashing lights and the static signs, but the inferential analysis, in Section 3.2 provides a more robust estimate.

Table 22: Speed characteristics for the Group A sites with 50 km/h approach speed limits (12 sites, 12 controls) – heavy vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|--|--|------------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 39.8 | 1.02 | 38.4 | 39.0 | 0.6 | 1.6 | 1.00 | 39.7 | 38.1 | -1.6 | -4.0 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 47.5 | 1.03 | 44.0 | 46.8 | 2.8 | 6.3 | 1.00 | 47.3 | 45.3 | -2.0 | -4.3 |
| Percentage above 40 km/h | 43.8 | 1.22 | 36.9 | 40.9 | 4.1 | 11.1 | 1.08 | 47.2 | 36.1 | -11.1 | -23.6 |
| Percentage above 50 km/h | 13.6 | 1.64 | 10.3 | 10.0 | -0.3 | -3.0 | 1.14 | 15.5 | 8.0 | -7.5 | -48.3 |
| Percentage above 60 km/h | 2.0 | 2.65 | 1.3 | 1.3 | 0.0 | 0.3 | 2.28 | 4.5 | 1.7 | -2.9 | -63.4 |
| Percentage above 70 km/h | 0.2 | 0.77 | 0.0 | 0.1 | 0.1 | | 0.43 | 0.1 | 0.2 | 0.1 | 138.5 |

Table 23: Speed characteristics for the Group A sites with 60 km/h approach speed limits (13 sites, 12 controls) – heavy vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|--|--|------------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 43.4 | 0.97 | 44.3 | 40.1 | -4.2 | -9.4 | 0.96 | 41.8 | 39.0 | -2.8 | -6.6 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 56.6 | 0.98 | 58.1 | 47.9 | -10.2 | -17.5 | 0.97 | 54.9 | 45.9 | -9.0 | -16.4 |
| Percentage above 40 km/h | 50.8 | 0.88 | 62.2 | 42.7 | -19.5 | -31.3 | 0.88 | 44.8 | 38.8 | -6.0 | -13.4 |
| Percentage above 50 km/h | 19.1 | 0.89 | 31.3 | 11.4 | -19.8 | -63.4 | 0.86 | 16.4 | 7.3 | -9.0 | -55.2 |
| Percentage above 60 km/h | 7.1 | 1.46 | 18.7 | 2.9 | -15.8 | -84.6 | 1.76 | 12.5 | 1.4 | -11.1 | -89.0 |
| Percentage above 70 km/h | 2.7 | 1.44 | 2.1 | 0.4 | -1.7 | -80.1 | 0.85 | 2.3 | 0.2 | -2.1 | -91.1 |

Table 24: Speed characteristics for the Group A sites with 70 km/h approach speed limits (2 sites, 2 controls) – heavy vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|--|--|------------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 48.7 | 1.02 | 49.5 | 51.5 | 2.0 | 4.0 | 1.02 | 49.7 | 52.9 | 3.2 | 6.4 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 60.3 | 1.02 | 61.6 | 63.1 | 1.5 | 2.5 | 1.03 | 62.0 | 63.4 | 1.4 | 2.3 |
| Percentage above 40 km/h | 79.0 | 1.02 | 80.9 | 86.2 | 5.2 | 6.5 | 1.08 | 85.1 | 89.5 | 4.5 | 5.2 |
| Percentage above 50 km/h | 42.0 | 0.90 | 37.8 | 45.5 | 7.7 | 20.3 | 0.96 | 40.5 | 53.0 | 12.5 | 31.0 |
| Percentage above 60 km/h | 17.4 | 1.12 | 19.5 | 22.0 | 2.5 | 12.6 | 1.15 | 20.1 | 24.8 | 4.8 | 23.8 |
| Percentage above 70 km/h | 4.7 | 1.36 | 6.3 | 9.0 | 2.7 | 41.9 | 1.39 | 6.5 | 6.2 | -0.3 | -4.3 |

Table 25: Speed characteristics for the Group A sites with 80 km/h approach speed limits (3 sites, 3 controls) – heavy vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|--|--|------------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 40.7 | 1.01 | 41.1 | 39.7 | -1.4 | -3.5 | 0.99 | 40.2 | 37.9 | -2.3 | -5.7 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 48.4 | 1.04 | 50.1 | 46.4 | -3.7 | -7.4 | 1.00 | 48.3 | 43.2 | -5.1 | -10.6 |
| Percentage above 40 km/h | 46.1 | 1.05 | 48.6 | 41.1 | -7.5 | -15.3 | 0.97 | 44.7 | 30.5 | -14.3 | -31.9 |
| Percentage above 50 km/h | 10.7 | 1.45 | 15.6 | 7.8 | -7.8 | -49.8 | 1.07 | 11.4 | 2.5 | -8.9 | -78.0 |
| Percentage above 60 km/h | 3.2 | 1.50 | 4.8 | 2.2 | -2.6 | -54.6 | 1.80 | 5.8 | 0.4 | -5.4 | -92.8 |
| Percentage above 70 km/h | 0.9 | 0.00 | 0.0 | 0.9 | 0.9 | | 0.43 | 0.4 | 0.1 | -0.3 | -75.0 |

Table 26: Speed characteristics for the Group B sites with 50 km/h approach speed limits (3 sites, 3 controls) – heavy vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|---|-------------------------------------|---------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑤/③×100 |
| Mean speed, \bar{x} (km/h) | 35.6 | 1.00 | 35.6 | 38.4 | 2.8 | 7.9 | 1.07 | 38.0 | 34.7 | -3.4 | -8.8 |
| 85 th percentile speed, P^{85} (km/h) | 42.0 | 1.03 | 43.3 | 48.3 | 5.0 | 11.7 | 1.09 | 45.9 | 41.3 | -4.6 | -10.1 |
| Percentage above 40 km/h | 28.0 | 0.99 | 27.6 | 40.6 | 12.9 | 46.7 | 1.06 | 29.6 | 27.3 | -2.3 | -7.9 |
| Percentage above 50 km/h | 7.0 | 1.26 | 8.8 | 16.5 | 7.7 | 87.0 | 1.67 | 11.7 | 10.8 | -0.9 | -7.5 |
| Percentage above 60 km/h | 2.6 | 1.13 | 2.9 | 3.3 | 0.4 | 12.5 | 3.80 | 9.7 | 2.7 | -7.0 | -72.1 |
| Percentage above 70 km/h | 0.1 | 0.97 | 0.1 | 1.1 | 1.0 | | 5.68 | 0.7 | 0.1 | -0.7 | -90.6 |

Table 27: Speed characteristics for the Group B sites with 60 km/h approach speed limits (2 sites, 2 controls) – heavy vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | |
|--|--|------------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑥/③×100 |
| Mean speed, \bar{x} (km/h) | 43.6 | 1.03 | 44.7 | 43.3 | -1.5 | -3.3 | 1.00 | 43.5 | 44.2 | 0.7 | 1.6 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 53.0 | 1.03 | 54.7 | 52.3 | -2.5 | -4.5 | 1.01 | 53.4 | 54.8 | 1.4 | 2.6 |
| Percentage above 40 km/h | 63.8 | 1.16 | 73.8 | 63.1 | -10.7 | -14.5 | 0.92 | 59.0 | 63.9 | 4.9 | 8.3 |
| Percentage above 50 km/h | 21.6 | 1.36 | 29.4 | 20.0 | -9.4 | -32.0 | 0.98 | 21.2 | 23.8 | 2.6 | 12.3 |
| Percentage above 60 km/h | 4.4 | 0.85 | 3.7 | 4.3 | 0.6 | 15.1 | 0.89 | 3.9 | 6.8 | 2.9 | 75.2 |
| Percentage above 70 km/h | 0.4 | 0.31 | 0.1 | 0.4 | 0.3 | 213.4 | 0.61 | 0.3 | 1.2 | 0.9 | 332.8 |

Table 28: Speed characteristics for the Group C sites with 60 km/h approach speed limits (2 sites, 1 control) – heavy vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | | 3 rd 'after' | | | | |
|---|-------------------------------|---------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑤/③×100 |
| Mean speed, \bar{x} (km/h) | 51.9 | 0.97 | 50.4 | 49.9 | -0.5 | -1.1 | 0.94 | 49.0 | 46.6 | -2.4 | -4.8 | 0.97 | 50.4 | 44.7 | -5.7 | -11.4 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 62.0 | 0.97 | 60.0 | 59.4 | -0.7 | -1.1 | 0.94 | 58.2 | 55.0 | -3.2 | -5.5 | 0.97 | 60.0 | 53.4 | -6.6 | -11.0 |
| Percentage above 40 km/h | 87.1 | 0.91 | 79.5 | 79.0 | -0.4 | -0.5 | 0.83 | 72.6 | 75.7 | 3.1 | 4.2 | 0.91 | 79.5 | 69.1 | -10.4 | -13.1 |
| Percentage above 50 km/h | 52.5 | 0.86 | 45.2 | 42.4 | -2.8 | -6.2 | 0.73 | 38.3 | 28.1 | -10.2 | -26.7 | 0.86 | 45.2 | 22.2 | -23.0 | -50.9 |
| Percentage above 60 km/h | 16.8 | 0.80 | 13.4 | 17.8 | 4.4 | 32.9 | 0.61 | 10.3 | 8.5 | -1.8 | -17.5 | 0.80 | 13.4 | 5.4 | -8.1 | -60.0 |
| Percentage above 70 km/h | 3.4 | 0.70 | 2.3 | 4.8 | 2.4 | 103.4 | 0.52 | 1.7 | 1.7 | -0.1 | -5.1 | 0.70 | 2.3 | 1.3 | -1.1 | -45.1 |

Table 29: Speed characteristics for the Group C sites with 70 km/h approach speed limits (3 sites, 2 controls) – heavy vehicles, in the school zones

| Speed characteristics | Baseline 'before' (km/h or %) | First 'after' | | | | | 2 nd 'after' | | | | | 3 rd 'after' | | | | |
|---|-------------------------------|---------------|----------|--------|-------|-----------|-------------------------|----------|--------|-------|---------|-------------------------|----------|--------|-------|---------|
| | | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % | Control ratio | Expected | Actual | Diff. | % |
| | ① | ② | ③=①×② | ④ | ⑤=④-③ | ⑥=⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑤/③×100 | ② | ③=①×② | ④ | ⑤=④-③ | ⑤/③×100 |
| Mean speed, \bar{x} (km/h) | 56.7 | 0.94 | 53.3 | 48.6 | -4.7 | -8.9 | 0.92 | 52.0 | 46.1 | -6.0 | -11.4 | 0.94 | 53.3 | 42.8 | -10.5 | -19.8 |
| 85 th percentile speed, P ⁸⁵ (km/h) | 67.2 | 0.96 | 64.6 | 58.9 | -5.7 | -8.8 | 0.94 | 63.3 | 54.5 | -8.8 | -13.8 | 0.96 | 64.6 | 50.5 | -14.1 | -21.9 |
| Percentage above 40 km/h | 87.3 | 0.94 | 82.3 | 76.8 | -5.4 | -6.6 | 0.93 | 80.9 | 73.0 | -7.8 | -9.7 | 0.94 | 82.3 | 52.7 | -29.5 | -35.9 |
| Percentage above 50 km/h | 57.5 | 0.82 | 47.4 | 34.9 | -12.5 | -26.4 | 0.71 | 41.0 | 25.9 | -15.2 | -37.0 | 0.82 | 47.4 | 19.6 | -27.8 | -58.7 |
| Percentage above 60 km/h | 38.5 | 0.72 | 27.6 | 15.9 | -11.8 | -42.5 | 0.63 | 24.3 | 9.8 | -14.5 | -59.6 | 0.72 | 27.6 | 5.8 | -21.8 | -79.0 |
| Percentage above 70 km/h | 17.9 | 0.64 | 11.5 | 4.0 | -7.5 | -64.9 | 0.58 | 10.4 | 1.9 | -8.5 | -82.1 | 0.64 | 11.5 | 1.1 | -10.4 | -90.5 |

3.2 Inferential analysis

Analytic outcomes in this section are reported in terms of three measures, statistical significance of the overall model and its component parameters, a Speed Difference factor relating to the key variable being assessed, namely signage (flashing light/control), and Goodness of Fit of the model associated with ANOVA/ANCOVA analysis. Numbers of observations associated with each analysis are also reported.

The Speed Difference factor measures:

- whether speeds changed differentially between control and treatment sites, when measurements in after treatment speeds are compared with before periods, and
- whether speed reductions were greater for treatment sites than for control sites.

The speed difference estimates are measured using the following equation:

$$\text{Speed Difference due to flashing light speed sign} = \frac{\text{Flashing light site change in speed}}{\text{in speed}} - \frac{\text{Control site change in speed}}{\text{in speed}} \quad (1)$$

Speed Difference estimates have been calculated for both the Before-3 Month After, and the Before-9 Month After intervals. The form of equation used to calculate these differences is shown below in (2).

$$\text{Speed Difference} = (T_a - T_b) - (C_a - C_b) \quad (2)$$

Where

T_a = Treatment Site speed measurement in an After period

T_b = Treatment Site speed measurement in the Before period

C_a = Control Site speed measurement in an After period

C_b = Control Site speed measurement in the Before period.

Separate terms are required for the Before state for control and treatment sites, because before speeds vary across the two site types. Adjustments are also made for the impacts of differences in speed limits.

A negative value indicates that the Treatment site or group of sites displays a greater speed reduction than the Control site or sites. For the analysis to indicate that observed variations in mean and 85th percentile speeds are statistically significant, both the overall ANOVA/ANCOVA models and the levels of significance associated with analytic variables which measure the impact of signage, are required to be significant.

While both ANOVA and ANCOVA models are used, in most cases ANCOVA model outputs are preferred as they seek to partial out the impacts of variations in vehicle approach speeds on the slow down effects of flashing and static signs. Outcomes of statistical testing are also presented in two formats, unweighted and weighted. Where unweighted analysis is used, each

hourly observation is treated as equal. Where weighted analysis is used, numbers of individual observations associated with each hourly grouping are associated with that observation in subsequent analysis. In an unweighted analysis all survey sites are treated equally, while for weighted analysis survey sites with larger numbers of individual vehicle observations have greater impacts on estimates than sites with lower counts. Association of traffic count weights with observations also has the impact of improving statistical significance of both overall fit, and model parameter values.

3.2.1 Group A – analysis of speeds at school zones with flashing lights

Data collection periods

Speed data were collected for:

1. before – Term 2, March-June 2004
2. three months after – Term 4, October-December 2004
3. nine months after – Term 1-2, February-May 2005.

Results

Results are reported in Table 30 for analyses carried out where input data is not weighted by traffic count, while in Table 31 results are reported where traffic counts have been used to statistically weight the analysis to take account of traffic volumes associated with hourly groupings used to compute mean and 85th percentile speed observations.

In Table 30 changes in mean travel speeds associated with flashing light speed signs at the school zones are reported in total and by sign type. Results have not been weighted by hourly traffic. Speed changes are reported in terms of speed change differences between sites with flashing lights and corresponding control sites.

For individual sign types, Type 1 and Type 3 flashing lights yield reductions greater than the overall result for all flashing light signs, being estimated at over 4 km/h for ANCOVA analysis. For Type 2 flashing lights, while small positive results are observed for ANOVA analysis, a negative result is indicated for ANCOVA analysis, with speed reductions post installation being less than speed reductions associated with Control sites. The fact that Type 2 flashing lights observations account for over 40 percent of the observations underlying All Flashing Light estimates tends to drag down mean estimates for flashing lights considered as a group.

Table 30: Group A: School zone flashing light speed signs mean Speeds (Unweighted)

| ANOVA/ANCOVA model & sign tested | Statistical significance ($p < 0.05$) | Speed difference (treatment v control) adjusted for before period $((T_a - T_b) - (C_a - C_b))$ | | Number of observations (n) | Goodness of fit R^2 |
|----------------------------------|---|---|----------------|----------------------------|-----------------------|
| | | 3 months after | 9 months after | | |
| ANOVA | | | | | |
| Type 1 | ✓ | -2.98 | -3.98 | 1808 | 0.366 |
| Type 2 | ✓ | -0.11 | -0.71 | 2026 | 0.192 |
| Type 3 | ✓ | -5.05 | -2.03 | 992 | 0.150 |
| All flashing signs | ✓ | -1.96 | -1.97 | 4826 | 0.199 |
| ANCOVA | | | | | |
| Type 1 | ✓ | -3.79 | -4.25 | 1807 | 0.428 |
| Type 2 | ✓ | 1.82 | 0.82 | 1845 | 0.603 |
| Type 3 | ✓ | -2.91 | -4.16 | 955 | 0.453 |
| All flashing signs | ✓ | -1.47 | -2.18 | 4607 | 0.454 |

Using the ANOVA Results presented in Table 30, the fitting of flashing lights of all types to school zone sites was associated with a reduction in mean travel speeds from 45.0 km/h to 42.6 km/h over a nine month period. This constitutes a reduction of 2.4 km/h in mean speeds, of which 2.0 km/h was attributable to flashing lights independent of other factors. When differences in approach speeds were factored in, flashing light signs reduced travel speeds by 2.2 km/h. For some individual sign types the mean speed reductions due to signage were higher being in the order of 4.3 km/h.

A similar result is presented in Table 31, where mean speed difference estimates have been generated from ANOVA and ANCOVA analysis where single hourly observations are weighted by associated hourly traffic counts.

Table 31: Group A: School zone flashing light speed signs mean speeds (weighted)

| ANOVA/ANCOVA model & sign tested | Statistical significance ($p < 0.05$) | Speed difference (treatment v control) adjusted for before period $((T_a - T_b) - (C_a - C_b))$ | | Number of observations (n) | Goodness of fit R^2 |
|----------------------------------|---|---|----------------|----------------------------|-----------------------|
| | | 3 Months After | 9 Months After | | |
| ANOVA | | | | | |
| Type 1 | ✓ | -2.33 | -2.87 | 635892 | 0.257 |
| Type 2 | ✓ | -0.39 | -1.00 | 915503 | 0.280 |
| Type 3 | ✓ | -1.51 | -1.44 | 516470 | 0.149 |
| All flashing signs | ✓ | -1.06 | -1.51 | 2067865 | 0.222 |
| ANCOVA | | | | | |
| Type 1 | ✓ | -2.83 | -3.49 | 635831 | 0.340 |
| Type 2 | ✓ | 1.76 | 1.37 | 834687 | 0.630 |
| Type 3 | ✓ | -1.55 | -2.20 | 506602 | 0.229 |
| All flashing signs | ✓ | -0.75 | -1.32 | 1977120 | 0.455 |

Smaller overall reductions for mean speeds are reported for all flashing signs, and Type 1 and Type 3 flashing lights compared with unweighted estimates. Reductions for Type 1 and Type 3 flashing lights over a 9 month before and after period of 3.5 km/h and 2.2 km/h respectively are indicated.

Overall, fitting of flashing lights to Group A sites was associated with a reduction in weighted mean travel speeds from 45 km/h to 42.5 km/h over a nine month period, a reduction of 2.5 km/h. While flashing lights accounted for 1.5 km/h of this reduction, when variations in speeds of vehicles approaching school zones is factored in, flashing lights considered separately can be shown to have slowed vehicles down by 1.3 km/h. Appreciable differences in the performances of different sign types were encountered, with one sign type being associated with a reduction in weighted mean travel speeds of 2.9 km/h, which adjusts upward to 3.5 km/h when approach speeds prior to school zones were factored in.

In Table 32 and Table 33, 85th percentile speed changes are reported weighted and unweighted by hourly traffic data. Results are similar to those observed for mean speeds though the magnitude of speed reduction associated with Type 1 and Type 3 flashing lights, tended to be greater than for mean speeds. This tends to indicate that flashing light school zone speed signs had more impact on faster vehicles compared with slower vehicles.

**Table 32: Group A: School zone flashing light speed signs
85th percentile speeds (unweighted)**

| ANOVA/ANCOVA model & sign tested | Statistical significance ($p < 0.05$) | Speed Difference (Treatment v Control) Adjusted for Before Period $((T_a - T_b) - (C_a - C_b))$ | | Number of observations (n) | Goodness of fit R^2 |
|----------------------------------|---|---|----------------|----------------------------|-----------------------|
| | | 3 months after | 9 months after | | |
| ANOVA | | | | | |
| Type 1 | ✓ | -6.44 | -7.75 | 1808 | 0.324 |
| Type 2 | ✓ | -0.71 | -1.98 | 2026 | 0.201 |
| Type 3 | ✓ | -8.33 | -3.05 | 992 | 0.232 |
| All flashing signs | ✓ | -4.21 | -4.11 | 4826 | 0.218 |
| ANCOVA | | | | | |
| Type 1 | ✓ | -7.10 | -7.80 | 1807 | 0.344 |
| Type 2 | ✓ | 1.52 | 0.61 | 1845 | 0.622 |
| Type 3 | ✓ | -5.10 | -6.04 | 955 | 0.589 |
| All flashing signs | ✓ | -3.55 | -4.15 | 4607 | 0.411 |

It is of interest to note that ANOVA analysis indicates that Type 2 flashing lights sites were associated with a net reduction in travel speeds over both 3 and 9 month before/after periods where 85th percentile speed estimates were computed. As was the case for mean speed estimates, this however did not recur in ANCOVA sourced estimates.

At an overall level, fitting of flashing lights to Group A sites was associated with a reduction in 85th percentile travel speeds from 54.7 km/h to 49.9 km/h over a nine month period, a reduction of 4.8 km/h. Flashing lights accounted for 4.1 km/h of this reduction. When variations in speeds of vehicles approaching school zones are factored in, flashing lights can be shown to have slowed vehicles down by 4.2 km/h. Appreciable differences in the performances of different sign types were again encountered, with one sign type being associated with a reduction in 85th percentile travel speeds of 7.7 km/h, which adjusts marginally upward to 7.8 km/h when approach speeds prior to school zones were factored into the analysis.

**Table 33: Group A: School zone flashing light speed signs
85th percentile speeds (weighted)**

| ANOVA/ANCOVA model & sign tested | Statistical significance ($p < 0.05$) | Speed difference (treatment v control) adjusted for before period $((T_a - T_b) - (C_a - C_b))$ | | Number of observations (n) | Goodness of fit R^2 |
|----------------------------------|---|---|----------------|----------------------------|-----------------------|
| | | 3 months after | 9 months after | | |
| Anova | | | | | |
| Type 1 | ✓ | -5.06 | -5.81 | 635892 | 0.237 |
| Type 2 | ✓ | -2.01 | -2.90 | 915503 | 0.313 |
| Type 3 | ✓ | -3.10 | -3.32 | 516470 | 0.300 |
| All flashing signs | ✓ | -2.97 | -3.70 | 2067865 | 0.257 |
| Ancova | | | | | |
| Type 1 | ✓ | -5.43 | -6.26 | 635831 | 0.280 |
| Type 2 | ✓ | 1.38 | 0.84 | 834687 | 0.678 |
| Type 3 | ✓ | -3.10 | -4.27 | 506602 | 0.392 |
| All flashing signs | ✓ | -2.28 | -3.20 | 1977120 | 0.461 |

Fitting of flashing lights to Group A sites was associated with a reduction in 85th percentile weighted travel speeds over a nine month period from 54.6 km/h to 49.6 km/h, a reduction of 5.0 km/h. Flashing lights accounted for 3.7 km/h of this reduction, and when variations in speeds of vehicles approaching school zones are factored in, flashing lights can be shown to have slowed vehicles down by 3.2 km/h. Appreciable differences in the performances of different sign types were encountered, with one sign type being associated with a reduction in 85th percentile travel speeds of 4.8 km/h, which adjusts upward to 6.1 km/h when approach speeds prior to school zones are factored into the analysis.

Speed reduction estimates reported in the above for all flashing signs for Group A are heavily affected by results reported for Type 2 flashing lights, which are less positive than for the other two sign types. Where ANOVA analysis was undertaken speed reductions associated with this type of flashing sign were small, while when ANCOVA analysis was undertaken, statistical modelling indicated that this sign type did not outperform control sites. To determine whether these results reflected factors other than the intrinsic effectiveness of the sign type and its characteristics of installation and operation a brief analysis of individual Type 2 flashing lights sites and their associated control sites was carried out. This investigation indicated that the results for Type 2 flashing lights signs appeared to be heavily affected by a small number of outlying pairs of test and control sites, whose variance from the norm was sufficiently large to affect overall results for this sign type. In this regard it needs to be noted that 9 out of the 12 treatment/control site pairs of Type 2 flashing lights sites, recorded net reductions in travel speeds associated with flashing light effects.

The analysis revealed an unexpected reduction in approach zone speeds for a number of test sites. This would tend to understate ANCOVA based estimates of speed reductions associated with flashing light signs, as this analysis employs approach speeds as an explanatory variable. Further analysis may be required to determine whether a valid statistical case exists to drop the statistical outliers referred to, and/or adjust the ANCOVA analysis.

3.2.2 Group B - analysis of speeds at school zones with static 'Slow Down' only signs sites

Data collection periods

Speed data was collected for:

1. before – Term 2, May-June 2004
2. three months after – Term 4, October-December 2004
3. nine months after – Term 1-2, March-May 2005.

Results

Results are reported in Table 34 (unweighted) and in Table 35 (weighted).

Sites with static 'Slow Down' only signs performed less well than control sites in terms of changes in mean and 85th percentile speed changes associated with the two post installation periods. This is shown by the positive speed difference estimates.

Sites where static 'Slow Down' only signs were fitted and their control sites are of interest because traffic speeds increased over time at both treatment and control sites. These sites, however, were associated with a greater increase in speed over time than their control sites, even though speeds were below their control site equivalents for each observation period.

Table 34: Group B: School zone static 'Slow Down' only sign sites (unweighted)

| ANOVA/ANCOVA model | Statistical significance ($p < 0.05$) | Speed difference (treatment v control) adjusted for before period $((T_a - T_b) - (C_a - C_b))$ | | Number of observations (n) | Goodness of fit R^2 |
|------------------------------|--|--|----------------|----------------------------|--------------------------|
| | | 3 months after | 9 months after | | |
| Mean speed | | | | | |
| ANOVA | ✓ | 1.43 | 1.06 | 696 | 0.329 |
| ANCOVA | ✓ | 3.06 | 2.08 | 694 | 0.812 |
| 85th percentile speed | | | | | |
| ANOVA | ✓ | 1.77 | 0.39 | 696 | 0.283 |
| ANCOVA | ✓ | 4.12 | 2.60 | 694 | 0.782 |

In summary when static 'Slow Down' only signs sites are treated as a group, mean unweighted travel speeds were observed to increase from 39.3 km/h to 41.9 km/h over a nine month period, an increase of 2.6 km/h. After adjusting for unweighted mean speed increases observed at control sites, analysis indicated that static 'Slow Down' sign effects contributed 1.1 km/h to this increase, rather than working in the reverse direction. When variations in approach speeds at test and control sites was factored in, the sign effect was adjusted up to 2.1 km/h.

Similarly, unweighted 85th percentile speeds were observed to increase from 48.2 km/h to 50.5 km/h over a nine month period following installation. The speed sign effect counted for an estimated 0.4 km/h of the observed 2.3 km/h increase. When approach speeds were factored

into the analysis, static 'Slow Down' only signs were associated with a 2.6 km/h increase in 85th percentile speeds.

Table 35: Group B: School zone static 'Slow Down' only speed sign sites (weighted)

| ANOVA/ANCOVA model & sign tested | Statistical significance ($p < 0.05$) | Speed difference (treatment v control) adjusted for before period $((T_a - T_b) - (C_a - C_b))$ | | Number of observations (n) | Goodness of fit R^2 |
|----------------------------------|--|---|----------------|----------------------------|--------------------------|
| | | 3 months after | 9 months after | | |
| Mean speed | | | | | |
| ANOVA | ✓ | 0.52 | 1.08 | 258518 | 0.221 |
| ANCOVA | ✓ | 3.16 | 2.49 | 258252 | 0.706 |
| 85th percentile speed | | | | | |
| ANOVA | ✓ | 1.14 | 0.32 | 285518 | 0.234 |
| ANCOVA | ✓ | 3.22 | 2.90 | 258252 | 0.712 |

Similarly, when static 'Slow Down' only signs sites were treated as a group, mean weighted travel speeds were observed to increase from 43.8 km/h to 45.4 km/h over a nine month period, an increase of 1.6 km/h. After adjusting for unweighted mean speed increases observed at control sites, analysis indicated that static 'Slow Down' sign effects contributed 1.1 km/h to this increase, rather than working in the reverse direction. When variations in approach speeds at test and control sites were factored in, the sign effect was adjusted up to 2.5 km/h.

Similarly, weighted 85th percentile speeds at sites fitted with "Slow Down" signs were observed to increase from 53.6 km/h to 54.3 km/h over a nine month period following installation. Further analysis adjusting for speed changes at control sites, indicated that the speed sign effect counted for an estimated 0.3 km/h of the observed 0.7 km/h increase. When variations in approach speeds between treatment and control sites were factored into the analysis, static 'Slow Down' only signs were associated with an effective 2.9 km/h increase in 85th percentile speeds.

3.2.3 Group C - analysis of speeds at school zones with previous flashing light sites

Data collection periods

Speed data was collected for:

1. before – Term 4, November-December 2002
2. three months after – Term 1, March-June 2003
3. 12 months after – Term 4, November-December 2003
4. 18 months after – Term 2, April-June 2004.

Results

In contrast with sites evaluated for Groups A and B, information on sign performance was available for three as opposed to two post sign installation periods, with the additional period covering an 18 month interval. As was the case for Groups A and B, investigations of changes in mean and 85th percentile speeds were carried out with observations both weighted and unweighted by hourly traffic counts.

In Table 36 (unweighted) and

Table 37 (weighted) effects of flashing light school zone speed signs are evaluated in total and for individual sign types for mean travel speeds. It should be noted that while nominally speed data was collected for all three flashing light sign types, lack of speed data for control sites effectively excluded Type 2 signs from the analysis. Similarly, lack of matched control sites limited analysis of Type 1 signs to information obtained from one matched treatment/control site pair. These limitations need to be borne in mind when generalising results observed.

Examination of speed differences calculated for unweighted data, indicate considerable volatility in results obtained by sign type. Type 3 signs display more consistent results, with travel speed reduction occurring for all but one case. Magnitudes associated with reductions in mean speeds vary appreciably. Consistent mean speed reductions are observed over the longest, that is the 18 month period. In contrast Type 1 signs are associated with increases in mean speeds, for all cases except ANCOVA analysis of mean speed changes occurring between the before and 18 months after survey period.

Table 36: Group C: School zone flashing light speed signs mean speeds (unweighted)

| ANOVA/ANCOVA model & sign tested | Statistical significance ($p < 0.05$) | Speed Difference (treatment v control) adjusted for before period ($(T_a - T_b) - (C_a - C_b)$) | | | Number of observations (n) | Goodness of fit R ² |
|----------------------------------|--|--|-----------------|-----------------|-------------------------------|---------------------------------------|
| | | 3 months after | 12 months after | 18 months after | | |
| ANOVA | | | | | | |
| Type 1 | ✓ | 5.92 | 0.10 | 0.17 | 217 | 0.36 |
| Type 3 | ✓ | -1.73 | -0.41 | -1.94 | 575 | 0.38 |
| All flashing signs | ✓ | 0.70 | -0.24 | -1.22 | 792 | 0.37 |
| ANCOVA | | | | | | |
| Type 1 | ✓ | 1.08 | 0.05 | -5.00 | 199 | 0.66 |
| Type 3 | ✓ | -1.21 | 0.52 | -0.36 | 545 | 0.57 |
| All flashing signs | ✓ | 0.14 | 0.37 | -1.56 | 744 | 0.54 |

Overall the installation of flashing lights at Group C sites was associated with a reduction in unweighted mean travel speeds from 50.0 km/h to 45.1 km/h over an eighteen month period, a reduction of 4.9 km/h. Flashing lights accounted for 1.2 km/h of this reduction. When speeds of vehicles approaching school zones were factored in, flashing lights were shown to have slowed vehicles down by 1.6 km/h compared with control sites.

When input data was weighted by hourly traffic counts, as shown in Table 37 a slight variation on the pattern of results observed for unweighted speed counts emerges. At an individual sign type level the Type 3 flashing lights performed consistently better than their controls. The performance of Type 1 signs improved compared with unweighted results, with speed reductions being associated with all time periods, except the 3 month post installation time period.

Table 37: Group C: School zone flashing light speed signs mean speeds (weighted)

| ANOVA/ANCOVA model & sign tested | Statistical significance ($p < 0.05$) | Speed difference (treatment v control) adjusted for before period ($(T_a - T_b) - (C_a - C_b)$) | | | Number of observations (n) | Goodness of fit R^2 |
|----------------------------------|--|--|-----------------|-----------------|-------------------------------|------------------------------|
| | | 3 months after | 12 months after | 18 months after | | |
| ANOVA | | | | | | |
| Type 1 | ✓ | 3.06 | -0.21 | -1.20 | 188377 | 0.35 |
| Type 3 | ✓ | -3.91 | -3.09 | -5.19 | 220765 | 0.38 |
| All flashing signs | ✓ | -0.62 | -1.79 | -3.34 | 409142 | 0.32 |
| ANCOVA | | | | | | |
| Type 1 | ✓ | 0.35 | -0.01 | -5.35 | 185017 | 0.69 |
| Type 3 | ✓ | -1.54 | 0.09 | -1.45 | 214318 | 0.67 |
| All flashing signs | ✓ | -0.89 | -0.50 | -3.82 | 399335 | 0.56 |

Overall fitting of flashing lights of all types to Group C sites was associated with a reduction in weighted mean travel speeds from 50.4 km/h to 44.8 km/h over an eighteen month period, a reduction of 5.6 km/h. Flashing lights accounted for 3.3 km/h of this reduction. When variations in speeds of vehicles approaching school zones are taken account of it is seen that flashing signs reduced speeds by 3.8 km/h.

Table 38 and Table 39 provide analytic results for unweighted and weighted 85th percentile speeds respectively for Group C flashing light sites and their control groups. Relative results reported for unweighted 85th percentile speeds for Type 1 and Type 3 flashing light signs as shown in Table 38 are more consistent than those reported for unweighted average speeds. Type 3 signs are associated with reductions in travel speeds over all three measurement periods. In contrast while Type 1 flashing lights are associated with reductions in travel speeds over 12 and 18 month periods, the reverse appears true over the shortest, that is the 3 month time period. Reductions in 85th percentile speeds, where they occur also tend to be greater than those shown for mean speeds.

Table 38: Group C: School zone flashing light speed signs 85th percentile speeds (unweighted)

| ANOVA/ANCOVA model & sign tested | Statistical significance ($p < 0.05$) | Speed difference (treatment v control) adjusted for before period ($(T_a - T_b) - (C_a - C_b)$) | | | Number of observations (n) | Goodness of fit R^2 |
|----------------------------------|--|--|-----------------|-----------------|-------------------------------|------------------------------|
| | | 3 months after | 12 months after | 18 months after | | |

| | | | | | | |
|--------------------|---|-------|-------|-------|-----|------|
| ANOVA | | | | | | |
| Type 1 | ✓ | 3.22 | -3.70 | -4.02 | 217 | 0.45 |
| Type 3 | ✓ | -3.41 | -3.58 | -5.46 | 575 | 0.48 |
| All flashing signs | ✓ | -1.12 | -2.86 | -4.89 | 792 | 0.49 |
| ANCOVA | | | | | | |
| Type 1 | ✓ | 0.48 | -2.22 | -7.62 | 199 | 0.69 |
| Type 3 | ✓ | -2.53 | -0.80 | -2.64 | 545 | 0.63 |
| All flashing signs | ✓ | -1.31 | -1.46 | -3.99 | 744 | 0.61 |

Overall, fitting of flashing lights to Group C sites was associated with a reduction in unweighted 85th percentile travel speeds from 60.5 km/h to 52.2 km/h over an eighteen month period, a reduction of 8.3 km/h. Flashing lights accounted for 4.9 km/h of this reduction. When speeds of vehicles approaching school zones were considered the magnitude of the reduction in 85th percentile speeds was reduced to 4.0 km/h.

When 85th percentile observations were weighted by hourly traffic counts, a similar picture to that observed for unweighted 85th percentile speeds emerges. Type 2 school zone flashing lights continue to be associated with consistent reductions in 85th percentile travel speeds across all measurement time intervals, but with slightly larger magnitudes than their unweighted equivalents. The same pattern as observed for unweighted 85th percentile speed for Type 1 sites is also observed, but with slightly higher positive magnitudes. For both sign types, reductions in 85th percentile speeds consistently persist into the 18 month measurement time interval.

**Table 39: Group C: School zone flashing light speed signs
85th percentile speeds (weighted)**

| ANOVA/ANCOVA model & sign tested | Statistical significance ($p < 0.05$) | Speed difference (treatment v control) adjusted for before period $((T_a - T_b) - (C_a - C_b))$ | | | Number of Observations (n) | Goodness of fit R ² |
|----------------------------------|--|--|-----------------|-----------------|-------------------------------|---------------------------------------|
| | | 3 months after | 12 months after | 18 months after | | |
| ANOVA | | | | | | |
| Type 1 | ✓ | 0.77 | -4.01 | -5.10 | 188377 | 0.48 |
| Type 3 | ✓ | -6.17 | -5.78 | -9.46 | 220765 | 0.51 |
| All flashing signs | ✓ | -2.56 | -4.86 | -7.21 | 409142 | 0.48 |
| ANCOVA | | | | | | |
| Type 1 | ✓ | 0.27 | -1.93 | -7.81 | 185017 | 0.74 |
| Type 3 | ✓ | -3.39 | -1.00 | -3.90 | 214318 | 0.72 |
| All flashing signs | ✓ | -2.05 | -2.41 | -6.33 | 399335 | 0.64 |

When results are combined across all flashing light sign types the fitting of flashing lights to Group C sites was associated with a reduction in weighted 85th percentile travel speeds from 61.2 km/h to 51.9 km/h over a eighteen month period, a reduction of 9.3 km/h. Flashing lights accounted for 7.2 km/h of this reduction. When variations in speeds of vehicles approaching school zones was allowed for flashing lights this impact was reduced to 6.3 km/h.

3.2.4 Summary of the effectiveness of different types of flashing lights

Analysis of Group A, which comprised the largest sub-sample analysed, and which contains groups of all of the different types of flashing units, revealed that:

- After 9 months of operation reductions in mean and 85th percentile speeds were achieved by Type 1 and Type 3 flashing lights, while for Type 2 flashing lights mean and 85th percentile speeds increased.
- For Type 1 and Type 3 flashing lights, mean speeds fell by 3.5 km/h and 2.2 km/h respectively, while for Type 2 flashing lights they increased by 1.4 km/h. In all cases the changes were statistically significant ($p < 0.05$).
- For Type 1 and Type 3 flashing lights, 85th percentile speeds reduced markedly by 6.3 km/h and 4.3 km/h respectively, while for Type 2 flashing lights they increased slightly by 0.8 km/h. In all cases the changes were statistically significant ($p < 0.05$).
- When considering the effectiveness of flashing light signs as a whole, the impact of Type 2 flashing lights detracted from the speed reductions achieved by Types 1 and 3 flashing lights.
- A feature of Types 1 and 3 flashing lights, both of which achieved speed reductions, is that the flashing lights were located on regulatory 40 km/h school zone speed limit signs. For Type 2 flashing lights, however, which experienced an increase in speed, the flashing lights were located on advisory 'SLOW DOWN SCHOOL ZONE' signs.

Statistical analysis of Group B sites, which comprised test sites equipped with passive SLOW DOWN Signs, in addition to normal school zone speed signs, plus matched control sites, indicated no evidence of sign associated speed reduction. Statistical analysis of Group C sites,

which comprised a small number of Type 1, 2 and 3 sites and associated control sites yielded slightly different results to those shown by Group A. This Group varied from other Groups, in that it featured an 18 month survey period, though it should be noted that the fragmentary nature of Type 2 survey site data ruled it out of the analysis. More consistent speed reduction effects were displayed by Type 3 equipped sites both in terms of mean and 85th percentile speeds. For Type 1 sites, speed reduction associated with flashing light signage was less consistent, which may be associated with the smaller number of observations associated with the one available treatment/control site pair. For both sign types, speed reduction effects were observed to persist over the longest, that is the 18 month measurement interval. Smaller numbers of sites, and resulting sample sizes observed for Group C limits the interpretation which can be placed on results reported.

4 Summary of descriptive analysis

This summary of the results uses changes in control site figures as a mechanism of excluding any effects on traffic that might not be related to the presence of the treatments (flashing lights or additional signs).

4.1 Comparison between Groups A, B, C and D – all vehicles

4.1.1 Mean speeds

Mean speeds changed as follows:

- Group A – decreased by 1.6 km/h (3.6%) after nine months of operation
- Group B – increased by 1.2 km/h (3%) after nine months operation
- Group C – decreased by 5 km/h (9.7%) after 18 months of operation
- Group D – decreased by 1.7 km/h (3.8%) between 18 months and 27 months after commencement of operation.

4.1.2 85th percentile speeds

85th percentile speeds changed as follows:

- Group A – decreased by 3.1 km/h (5.8%) after nine months of operation
- Group B – increased by 1.4 km/h (2.8%) after nine months of operation
- Group C – decreased by 7.8 km/h (12.3%) after 18 months of operation
- Group D – remained relatively unchanged between 18 months and 27 months after commencement of operation.

4.1.3 Proportion of vehicles exceeding the 40 km/h speed limit

The proportion of vehicles exceeding the 40 km/h speed limit changed as follows:

- Group A – decreased by 7.2% (i.e. from 57.7% to 50.5%) after nine months of operation
- Group B – increased by 5.5% (i.e. from 45.4% to 50.9%) after nine months of operation
- Group C – decreased by 4.8% (i.e. from 80.2% to 75.4%) after 18 months of operation
- Group D – remained relatively unchanged at about 57% between 18 months and 27 months after commencement of operation.

4.1.4 Proportion of vehicles exceeding the 40 km/h speed limit by more than 10 km/h

The proportion of vehicles exceeding the 40 km/h speed limit by more than 10 km/h changed as follows:

- Group A – decreased by 9.9% (i.e. from 24.7% to 14.9%) after nine months of operation
- Group B – increased by 3% (i.e. from 17.4% to 20.4%) after nine months of operation
- Group C – decreased by 15.9 % (i.e. from 44.6% to 28.7%) after 18 months of operation
- Group D – decreased by 3.7% (i.e. from 16.9% to 13.2%) between 18 months and 27 months after commencement of operation.

4.1.5 Proportion of vehicles exceeding the 40 km/h speed limit by more than 20 km/h

The proportion of vehicles exceeding the 40 km/h speed limit by more than 20 km/h changed as follows:

- Group A – decreased by 4.4% (i.e. from 9.2% to 4.9%) after nine months of operation
- Group B – increased by 1.6% (i.e. from 5.2% to 6.8%) after nine months of operation
- Group C – decreased by 14.6% (i.e. from 24.5% to 9.9%) after 18 months of operation
- Group D – decreased by 1.3% (i.e. from 3.1% to 1.8%) to between 18 months and 27 months after commencement of operation.

4.1.6 Proportion of vehicles exceeding the 40 km/h speed limit by more than 30 km/h

The proportion of vehicles exceeding the 40 km/h speed limit by more than 30 km/h changed as follows:

- Group A – remained relatively unchanged at 0.2% after nine months of operation
- Group B – remained relatively unchanged at 1.6% after nine months of operation
- Group C – decreased by 10.4% (i.e. from 12.4% to 2%) after 18 months of operation
- Group D – remained relatively unchanged at 0.4% between 18 months and 27 months after commencement of operation.

4.2 Comparison between Groups A, B, C and D – heavy vehicles

These results show similar differences between groups to what were found in the ‘all vehicles’ analysis, but the reductions in speed were more substantial for heavy vehicles.

4.2.1 Mean speeds

Means speeds changed as follows:

- Group A – decreased by 2.1 km/h (5%) after nine months of operation
- Group B – decreased by 1.9 km/h (4.6%) after nine months operation
- Group C – decreased by 8.2 km/h (15.7%) after 18 months of operation
- Group D – decreased by 1.7 km/h (4.3%) between 18 months and 27 months after commencement of operation.

4.2.2 85th percentile speeds

85th percentile speeds for each of the study groups changed as follows:

- Group A – decreased by 5.4 km/h (10.3%) after nine months of operation
- Group B – decreased by 2.5 km/h (5%) after nine months of operation
- Group C – decreased by 10.4 km/h (16.7%) after 18 months of operation
- Group D – increased by 4.3 km/h (9.8%) between 18 months and 27 months after commencement of operation.

4.2.3 Proportion of vehicles exceeding the 40 km/h speed limit

The proportion of vehicles exceeding the 40 km/h speed limit changed as follows:

- Group A – decreased by 12% (i.e. from 52.5% to 40.5%) after nine months of operation
- Group B – remained relatively unchanged at 41.9% after nine months of operation
- Group C – decreased by 20% (i.e. from 80.9% to 60.9%) after 18 months of operation
- Group D – increased by 6.6% (i.e. from 35.2% to 41.8%) between 18 months and 27 months after commencement of operation.

4.2.4 Proportion of vehicles exceeding the 40 km/h speed limit by more than 10 km/h

The proportion of vehicles exceeding the 40 km/h speed limit by more than 10 km/h changed as follows:

- Group A – decreased by 33.6% (i.e. from 44.1% to 10.5%) after nine months of operation
- Group B – decreased by 1.9% (i.e. from 17.9% to 16%) after nine months of operation
- Group C – decreased by 25.5% (i.e. from 46.3% to 20.9%) after 18 months of operation

- Group D – increased by 4.2% (i.e. from 6.1% to 10.3%) between 18 months and 27 months after commencement of operation.

4.2.5 Proportion of vehicles exceeding the 40 km/h speed limit by more than 20 km/h

The proportion of vehicles exceeding the 40 km/h speed limit by more than 20 km/h changed as follows:

- Group A – decreased by 6.3% (i.e. from 9.5% to 3.1%) after nine months of operation
- Group B – increased by 4.3% (i.e. from 4.4% to 8.7%) after nine months of operation
- Group C – decreased by 15.4% (i.e. from 21% to 5.6%) after 18 months of operation
- Group D – remained relatively unchanged at 1.4 between 18 months and 27 months after commencement of operation.

4.2.6 Proportion of vehicles exceeding the 40 km/h speed limit by more than 30 km/h

The proportion of vehicles exceeding the 40 km/h speed limit by more than 30 km/h changed as follows:

- Group A – remained relatively unchanged at 0.7% after nine months of operation
- Group B – remained relatively unchanged at 0.5% after nine months of operation
- Group C – decreased by 5.9% (i.e. from 7.1% to 1.2%) after 18 months of operation
- Group D – remained relatively unchanged at 0.2% between 18 months and 27 months after commencement of operation.

4.3 Comparison between Groups A, B, C and D according to approach speed limits – all vehicles

This section of the analysis was performed to gauge whether the approach speed limit at a site had an effect on the likelihood of drivers slowing down in response to the treatments.

- In Group A, the group of sites with 50 km/h approaches performed better than the sites with 60 and 70 km/h approaches, although the reductions in proportions of vehicles exceeding the speed limit by at least 20 km/h reduced by more at the sites with 60 km/h approaches. The 50 and 60 km/h (approach) Group B sites showed smaller reductions than those in Group A. Speeds at the Group C 60 km/h (approach) sites after 18 months were similar to those achieved by the 60 km/h (approach) sites in Group A, but the proportions of vehicles speeding showed greater reductions.
- The Group C sites with 70 km/h approaches performed better than that group's sites with 60 km/h approaches in all survey periods. This is the opposite of the Group A results, but it must be noted that Group C had only one site with a 60 km/h approach and a control, and two sites with 70 km/h approaches and controls. Accordingly, these results must be used with caution.

4.4 Comparison between Groups A, B, C and D according to approach speed limits – heavy vehicles

Heavy vehicle data were also analysed according to approach speed limit.

- The changes at Group A sites with 50 and 60 km/h approaches show better heavy vehicle speed reductions at sites with 60 km/h approaches than at sites with 50 km/h approaches. The proportions of vehicles speeding still reduced more at sites with 60 km/h approaches than sites with 50 km/h approaches; this is a similar result to what was found for all vehicles.
- Substantial reductions were found across the Group C sites with 70 km/h approaches. This contrasts with increases found at Group A sites with the same approach speed limit. Note that only a small number of sites had 70 km/h approaches, so these averages are susceptible to disturbance by large changes at a single site.

5 Summary of inferential analysis

5.1 Changes in mean speeds for Groups A, B and C

Table 40 summarises and compares changes in weighted mean speeds for Groups A, B and C. The summary below provides differences in weighted mean speed between the before period and a 9 month after period for Groups A and B, and a 18 month after period for Group C.

Table 40: Changes in mean speeds at treatment sites in Groups A, B and C

| Group | Before (km/h) | After (km/h) | Change (km/h) | Change due to flashing lights / static 'Slow Down' only signs (km/h) | Statistically significant (p<0.05) |
|----------|---------------|--------------|---------------|--|------------------------------------|
| A | 45.0 | 42.5 | -2.5 | -1.3 | ✓ |
| B | 43.8 | 45.4 | +1.6 | +2.5 | ✓ |
| C | 50.4 | 44.8 | -5.6 | -3.8 | ✓ |

The above table reveals that:

- Treatment sites in Group A, which contained the larger sample of flashing lights sites, exhibited a reduction of 2.5 km/h in mean speeds over a 9 month after period. Excluding other factors, flashing lights accounted for 52% (1.3 km/h) of this reduction.
- At the Group B static 'Slow Down' only sign sites analysis indicated signs were associated with an increase in travel speeds of 2.5 km/h. Other factors reduced this impact to 1.6 km/h.
- Treatment sites in Group C exhibited a reduction of 5.6 km/h over an 18 month after period. Excluding other factors, flashing lights accounted for 68% (3.8 km/h) of this reduction.
- All changes were statistically significant (p<0.05).

5.2 Changes in 85th percentile speeds for Groups A, B and C

Table 41 summarises and compares changes in 85th percentile speeds for Groups A, B and C.

Table 41: Changes in 85th percentile speeds in Groups A, B and C

| Group | Before (km/h) | After (km/h) | Change (km/h) | Change due to Signage (km/h) | Statistically significant (p<0.05) |
|----------|---------------|--------------|---------------|------------------------------|------------------------------------|
| A | 54.6 | 49.6 | -5.0 | -3.2 | ✓ |
| B | 53.6 | 54.3 | +0.7 | +2.9 | ✓ |
| C | 61.2 | 51.9 | -9.3 | -6.3 | ✓ |

The above table reveals that:

- Treatment sites in Group A, which contained the larger sample of flashing lights sites, exhibited a reduction of 3.8 km/h in 85th percentile speeds over a 9 month after period. Excluding other factors, flashing lights accounted for 64% (3.2 km/h) of this reduction.
- At the Group B static 'Slow Down' only sign sites analysis indicated signs were associated with an increase in 85th percentile travel speeds of 2.9 km/h. Other factors reduced this impact to 0.7 km/h.
- Treatment sites in Group C exhibited a reduction of 9.3 km/h over an 18 month after period. Excluding other factors, flashing lights accounted for 68% (6.3 km/h) of this reduction.
- All changes were statistically significant ($p < 0.05$).

5.3 Effectiveness of different types of flashing lights

The analysis revealed that:

- Analysis of Group A information indicated that when control site and other factors are excluded, Type 1 and Type 3 flashing lights reduced mean speeds by 3.5 km/h and 2.2 km/h respectively. In contrast Type 2 flashing lights were associated with an increase of 1.3 km/h. In all cases the changes were statistically significant ($p < 0.05$).
- for Group A, Type 1 and Type 3 flashing light caused 85th percentile speeds to reduce markedly by 6.3 km/h and 4.3k km/h respectively. For Type 2 flashing lights speeds increased slightly by 0.8 km/h. In all cases the changes were statistically significant ($p < 0.05$).
- Despite a small sample size, Group C results indicate that reductions associated with weighted mean and 85th percentile speeds persisted for a longer (18 month) time period.

6 Operational performance of the flashing lights signs

The RTA reported 80 faults with the flashing light signs (Types 1, 2 and 3) from 27 January 2004 to 8 June 2005 inclusive (an approximate 18 month time frame). This number represents about 2 faults per site during the 18-month study period. This rate of failure is considered to be high, particularly as it may have adverse safety implications for school children during 'fault' periods.

It should also be noted that these were reported faults; that is, occasions when RTA staff or the public had noticed faults with the signs and reported them. It is possible that the signs failed at other times but were not reported.

Common faults included:

- the lights (one or both) did not function as required for a day or more
- the lights continually flashed
- the lights flashed at the wrong times (including flashing during holiday times).

Table 42 tabulates the number of reported faults and the approximate number of failures per flashing lights site.

Table 42: Electronic sign faults

| Sign type | Number of faults reported | Number of flashing lights installed | Average number of faults per installation |
|---------------------------|---------------------------|-------------------------------------|---|
| All flashing lights types | 80 | 43 | Approx. 2 |

7 Discussion and conclusions

Key findings

Descriptive statistical analysis – Proportion of vehicles exceeding the 40 km/h speed limit

The descriptive analysis provided the following key findings for vehicles exceeding the speed limit overall, and exceeding the speed limit by 10 km/h, 20 km/h and 30 km/h.

- Group A – Flashing lights sites

The proportion of vehicles exceeding the speed limit fell by 7.2%, from 57.7% to 50.5%, while speeds of vehicles exceeding the speed limit by more than 10 km/h and 20 km/h fell by 9.9% (24.7% to 14.9%) and 4.4% (9.2% to 4.9%) respectively after nine months of operation. The proportion exceeding the speed limit by more than 30 km/h remained relatively unchanged at 0.2%.

- Group B - Static 'Slow Down' only signs sites

Unlike the Group A sites the proportions of vehicles exceeding the speed limit increased at the static 'Slow Down' only sign sites. The proportion of vehicles exceeding the speed limit increased by 5.5%, from 45.4% to 50.9%. Vehicles exceeding the speed limit by more than 10 km/h and 20 km/h increased by 3.5% (17.4% to 20.9%) and 1.6% (5.2% to 6.8%) respectively after nine months of operation. The proportion exceeding the speed limit by more than 30 km/h remained relatively unchanged at 1.6%. These results should be treated cautiously as sample numbers are small.

- Group C - Previously installed flashing lights sites with 'before' speed data

The proportion of vehicles exceeding the speed limit fell by 5.5%, from 50.9% to 45.4%. Vehicles exceeding the speed limit by more than 10 km/h, 20 km/h and 30 km/h fell by 16.1% (44.6% to 28.7%), 14.6% (24.5% to 9.9%) and 10.4% (12.4% to 2%) respectively after 18 months of operation.

Inferential analysis – Mean and 85th percentile speeds

The more statistically robust inferential analysis provided the following major findings associated with mean and 85th percentile speeds.

- Group A - Flashing lights sites

Mean speeds and 85th percentile speeds were reduced by 1.3 km/h and 3.2 km/h respectively after a 3 to 9-month period of operation by impacts associated with flashing light signage. Each of the reductions was statistically significant ($p < 0.05$). While these reductions may appear moderate, research has shown (Nilsson cited in Fildes and Lee 1993) that relatively small changes in mean speeds result in substantial reductions in crash risk. Based on the reductions achieved for this group it is expected there would be a:

- reduction in fatal crashes of close to 11%

- reduction in fatal or severe crashes of nearly 8.5%
- reduction in injury crashes of about 6%.
- Group B – Static ‘Slow Down’ only sign sites
 - The analysis revealed that the static signs were associated with increased vehicle speeds. The analysis found increases in mean and 85th percentile speeds of 2.5 km/h and 2.9 km/h respectively after a 3 to 9-month period of installation. All changes were statistically significant ($p < 0.05$).

As this group of sites is relatively small (i.e. 5 sites), and possibly not representative of the performance of the use of the static signs, and with mean speeds close to the 40 km/h school speed limit, great caution should be exercised with these findings.

- Group C – Previously installed flashing lights sites

Group C comprised a small group of flashing lights which had been installed at an earlier date compared with Groups A and C. This allowed evaluation of flashing light impacts over a longer period (18 months) compared with Groups A and C (9 months).

Over the longer 18 month period analysis indicated that flashing lights were associated with reductions of 3.8 km/h and 6.3 km/h in weighted mean and 85th percentile speeds respectively, after the impacts of other factors on speeds had been removed.

As this group of sites was relatively small (4 sites) it may be less representative of ‘flashing light sites’ in general, and caution should be exercised when drawing conclusions about longer term effects of flashing lights in school zones.

Performance of different types of flashing lights

The study revealed that:

- Type 1 and Type 3 flashing lights achieved significant reductions in mean and 85th percentile speeds. For Type 2 flashing lights results were inconclusive. For Group A sites Type 2 signage was associated with increased mean and 85th percentile speeds. For Group C sites, lack of control site data prevented analysis of Type 2 Sign data. Survey sampling issues associated with Type 2 Group A sites appear to have detracted from results observed.
- a feature of Type 1 and Type 3 flashing lights, which achieved the reductions, is that the flashing lights were located on the regulatory 40 km/h school speed zone signs, while the Type 2 flashing lights had the flashing lights located on advisory ‘SLOW DOWN SCHOOL ZONE’ signs
- when considering the effectiveness of flashing lights as a whole, the impact of results associated with Group A Type 2 flashing lights detracted from results observed for Types 1 and 3 flashing lights.

Heavy vehicles

Heavy vehicle speeds and speeding rates reduced in a similar manner to the parameters for all vehicles, but the reductions in speed were more substantial for heavy vehicles.

In-service performance of different types of flashings lights units

RTA records reveal that in general the performance of the flashing light units was poor. Eighty faults were reported during an approximate 18 month time frame. This number represents about 2 faults per site for this study period. This rate of failure is considered to be high, particularly as it may have adverse safety implications for school children during 'fault' periods.

While the analysis reveals that flashing lights significantly reduce vehicle speeds within school speed zones, thus providing substantial reductions in crash risk, the units need to be investigated to ensure that their operational performance is vastly improved.

Summary

The major findings of the evaluation were that:

- Flashing lights were effective in reducing vehicle speed outside schools during the operation of the 40 km/h school speed zone.
- Type 1 and Type 3 flashing lights achieved significant reductions in speeds, results observed for Type 2 flashing lights were problematic. For one group of signs surveyed, Type 2 signs appeared to be associated with increased speeds, though survey issues were detected which may account for this.
- The use of static 'Slow Down' only signs was associated with increases in speeds.
- Flashing lights placed on regulatory 40 km/h school speed zone signs were most effective in reducing vehicle speeds, while the use of flashing lights on advisory signs proved ineffective in reducing vehicle speeds.

8 References

Fildes, BN & Lee, SJ 1993, *The speed review: Road environment, behaviour, speed limits, enforcement and crashes*, report, no. CRI 27, Federal Office of Road Safety (FORS), Canberra, ACT, Australia.

Roads and Traffic Authority of New South Wales 2001. *Road Safety 2010 Speed Management Action Plan 2002-2004*.

Appendix A – Full speed survey tables and charts

Table A I: Recorded speed survey results for sites in Group A, and their controls, during school speed limit hours (heavy vehicles only)

| Site No. | Non-school time speed limit | School | Flashing lights (FL) and controls | Mean speed (km/h) | | | | 85 th percentile speed (km/h) | | | | Standard deviation (km/h) | | | | % travelling above speed limit | | | | % ≥10 km/h above speed limit | | | | % ≥20 km/h above speed limit | | | | % ≥30 km/h above speed limit | | | |
|---|-----------------------------|--|-----------------------------------|-------------------|------|------|---|--|------|------|---|---------------------------|------|------|---|--------------------------------|------|------|---|------------------------------|------|------|---|------------------------------|------|------|---|------------------------------|------|------|---|
| | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | |
| | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Sites with one of three types of flashing lights: Period 1 (Before) = Mar/Jun-04, Period 2 (1st after - 3 months) = Oct/Dec-04, Period 3 (2nd after - 9 months) = Feb/Mar-05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1A | 60 | Great Lakes College, Tuncurry | 1 | 44.1 | 48.9 | 44.3 | | 53.5 | 60.1 | 51.5 | | 8.9 | 9.6 | 7.5 | | 61.9 | 82.5 | 69.4 | | 19.9 | 36.4 | 16.2 | | 5.2 | 15.1 | 4.0 | | 1.1 | 2.4 | 0.4 | |
| 1A | 60 | Forster HS, Forster | control | 49.1 | 43.2 | 50.5 | | 59.0 | 50.0 | 63.5 | | 10.0 | 7.2 | 10.8 | | 82.5 | 64.8 | 83.5 | | 39.4 | 13.8 | 44.2 | | 14.1 | 1.7 | 19.3 | | 4.5 | 0.3 | 6.2 | |
| 2A | 50 | St Mary's, Noraville | 2 | 43.4 | 40.5 | 40.1 | | 52.0 | 48.3 | 46.2 | | 8.4 | 7.2 | 6.7 | | 62.4 | 49.7 | 46.7 | | 19.9 | 9.2 | 5.6 | | 2.8 | 0.0 | 0.9 | | 0.3 | 0.0 | 0.1 | |
| 2A | 50 | Our Lady of the Rosary PS, Shelley Beach | control | 35.8 | 38.3 | 37.5 | | 44.5 | 47.0 | 47.0 | | 8.6 | 9.0 | 9.1 | | 30.5 | 39.0 | 34.1 | | 4.8 | 10.0 | 9.5 | | 0.4 | 1.4 | 1.1 | | 0.0 | 0.0 | 0.0 | |
| 3A | 60 | Tuggerah PS, Tuggerah | 1 | 43.3 | 39.0 | 38.9 | | 55.5 | 45.1 | 45.3 | | 10.9 | 7.4 | 7.0 | | 58.1 | 39.1 | 40.5 | | 21.1 | 5.9 | 3.4 | | 9.1 | 1.6 | 0.7 | | 1.4 | 0.0 | 0.0 | |
| 3A | 60 | Ettalong PS, Ettalong | control | 40.8 | 44.3 | 44.5 | | 50.2 | 54.0 | 55.5 | | 8.4 | 9.1 | 9.6 | | 50.7 | 63.4 | 63.2 | | 14.9 | 27.7 | 26.8 | | 0.5 | 4.1 | 5.2 | | 0.0 | 0.0 | 0.7 | |
| 4A | 60 | St Joseph's PS, Maitland | 2 | 43.4 | 40.5 | 39.5 | | 52.0 | 48.5 | 45.0 | | 8.9 | 9.0 | 7.2 | | 60.8 | 41.8 | 42.7 | | 17.6 | 13.0 | 5.5 | | 4.8 | 4.1 | 1.3 | | 0.8 | 0.4 | 0.3 | |
| 4A | 60 | St Benedict's PS, Edgeworth | control | 52.8 | 47.1 | 45.2 | | 67.0 | 60.2 | 57.0 | | 13.0 | 11.3 | 11.0 | | 82.9 | 71.6 | 66.1 | | 54.1 | 33.3 | 25.0 | | 33.2 | 14.5 | 10.7 | | 10.2 | 3.8 | 2.8 | |
| 5A | 60 | School of Performing Arts, Broadmeadow | 3 | 40.7 | 40.2 | 37.0 | | 52.0 | 50.0 | 44.0 | | 11.0 | 10.2 | 8.5 | | 49.4 | 46.2 | 32.6 | | 18.8 | 14.1 | 5.4 | | 4.7 | 3.8 | 1.1 | | 0.4 | 0.5 | 0.2 | |
| 5A | 60 | Lambton PS, Lambton | control | 40.7 | 40.4 | 39.0 | | 50.5 | 51.0 | 48.0 | | 9.3 | 10.1 | 9.3 | | 46.5 | 44.0 | 40.7 | | 15.5 | 16.6 | 9.8 | | 2.6 | 3.1 | 2.4 | | 0.4 | 0.6 | 0.4 | |
| 6A | 80/60 | Glen Innes PS & St Joseph's PS, Glen Innes | 1 | 38.4 | 36.9 | 36.4 | | 46.0 | 43.6 | 42.0 | | 7.5 | 6.9 | 6.3 | | 38.6 | 28.3 | 23.4 | | 5.5 | 2.0 | 1.0 | | 0.1 | 0.1 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 6A | 80/60 | Coffs Primary and Christ Community, Coffs Harbour | control | 38.6 | 39.7 | 37.8 | | 46.7 | 49.6 | 46.5 | | 8.9 | 9.7 | 9.2 | | 41.6 | 44.8 | 38.5 | | 7.7 | 14.0 | 7.9 | | 1.4 | 1.8 | 1.0 | | 0.2 | 0.0 | 0.0 | |
| 7A | 50 | Hillvue PS, Tamworth | 2 | 35.9 | 36.5 | 34.2 | | 41.5 | 44.0 | 41.5 | | 6.4 | 7.9 | 7.2 | | 19.3 | 27.0 | 19.4 | | 2.4 | 4.2 | 1.3 | | 0.2 | 0.8 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 7A | 50 | Ballina HS, Ballina | control | 26.3 | 26.7 | 26.3 | | 31.3 | 31.3 | 31.0 | | 4.8 | 5.1 | 5.2 | | 1.0 | 3.0 | 2.0 | | 0.0 | 0.0 | 0.6 | | 0.0 | 0.0 | 0.3 | | 0.0 | 0.0 | 0.0 | |
| 8A | 50 | Sandon PS, Armidale | 1 | 34.4 | 32.7 | 31.6 | | 42.1 | 38.6 | 38.0 | | 7.3 | 6.5 | 6.4 | | 18.1 | 9.7 | 7.1 | | 3.2 | 0.8 | 0.3 | | 0.2 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 8A | 50 | Pottsville PS, Pottsville | control | 41.1 | 43.7 | 43.1 | | 47.6 | 49.0 | 47.5 | | 7.3 | 5.3 | 5.0 | | 57.2 | 72.4 | 67.6 | | 7.8 | 7.4 | 6.8 | | 1.5 | 0.9 | 0.2 | | 0.3 | 0.0 | 0.0 | |
| 9A | 80 | Westdale PS, Tamworth | 2 | 42.1 | 41.3 | 38.2 | | 50.1 | 48.2 | 43.5 | | 10.6 | 9.8 | 6.6 | | 45.9 | 44.9 | 29.5 | | 14.9 | 12.0 | 3.5 | | 6.9 | 5.3 | 0.9 | | 2.7 | 2.6 | 0.3 | |
| 9A | 80 | St Mary's School, Grafton | control | 41.1 | 41.2 | 40.8 | | 49.0 | 50.0 | 49.5 | | 7.8 | 8.5 | 8.9 | | 51.4 | 51.5 | 49.8 | | 11.8 | 14.3 | 13.4 | | 0.6 | 1.5 | 1.3 | | 0.1 | 0.0 | 0.1 | |
| 10A | 60 | Westport PS, Pt Macquarie | 3 | 45.6 | 41.3 | 39.7 | | 56.0 | 46.0 | 46.0 | | 9.3 | 5.6 | 7.2 | | 45.7 | 46.0 | 33.2 | | 18.4 | 4.9 | 6.0 | | 6.0 | 0.5 | 1.0 | | 0.4 | 0.0 | 0.2 | |
| 10A | 60 | St Carthage's & Trinity College, Lismore | control | 37.8 | 61.4 | 42.5 | | 43.0 | 86.0 | 48.5 | | 5.1 | 20.1 | 6.3 | | 29.0 | 84.3 | 66.2 | | 0.2 | 60.5 | 8.7 | | 0.0 | 42.2 | 0.3 | | 0.0 | 33.6 | 0.0 | |
| 11A | 100/80/60 | Oxley Vale PS, Tamworth | 2 | 41.6 | 40.9 | 39.1 | | 49.0 | 47.5 | 44.0 | | 7.9 | 7.4 | 6.0 | | 53.9 | 50.1 | 38.5 | | 11.8 | 9.5 | 3.1 | | 2.6 | 1.1 | 0.4 | | 0.0 | 0.1 | 0.0 | |
| 11A | 100/80/60 | St Mary's, Casino | control | 36.7 | 36.7 | 36.5 | | 43.0 | 44.0 | 42.5 | | 6.6 | 6.8 | 6.5 | | 24.9 | 26.8 | 25.3 | | 1.9 | 2.6 | 2.0 | | 0.1 | 0.1 | 0.2 | | 0.1 | 0.0 | 0.0 | |
| 12A | 50 | Gralee School & St Francis De Sales, Leeton | 1 | 44.0 | 40.2 | 40.1 | | 52.0 | 50.1 | 50.0 | | 8.6 | 10.0 | 9.6 | | 70.8 | 47.5 | 48.5 | | 19.3 | 15.1 | 14.0 | | 3.7 | 3.7 | 2.8 | | 0.5 | 0.5 | 0.0 | |
| 12A | 50 | Griffith Catholic HS & Griffith East PS, Griffith | control | 38.7 | 42.1 | 39.5 | | 46.0 | 51.8 | 47.5 | | 7.7 | 9.4 | 7.8 | | 38.2 | 55.3 | 42.9 | | 6.9 | 17.6 | 7.6 | | 0.9 | 3.3 | 1.0 | | 0.0 | 0.5 | 0.1 | |
| 13A | 60 | Scots School, Albury | 2 | 43.0 | 44.4 | 42.4 | | 51.5 | 55.0 | 53.0 | | 7.9 | 8.9 | 8.5 | | 56.7 | 58.8 | 48.7 | | 17.6 | 27.1 | 19.2 | | 1.9 | 4.6 | 3.6 | | 0.1 | 0.2 | 0.3 | |
| 13A | 60 | Mount Austin PS, Wagga Wagga | control | 40.6 | 41.2 | 42.3 | | 46.5 | 49.0 | 51.5 | | 8.0 | 8.1 | 8.7 | | 44.1 | 47.3 | 53.7 | | 9.9 | 13.1 | 16.1 | | 3.9 | 2.2 | 4.0 | | 0.0 | 0.2 | 0.6 | |
| 14A | 60 | South Wagga PS, Wagga Wagga | 1 | 61.5 | 38.4 | 38.4 | | 118.7 | 45.5 | 45.0 | | 37.6 | 7.2 | 7.2 | | 57.0 | 33.9 | 33.9 | | 37.2 | 6.2 | 6.3 | | 31.5 | 0.3 | 0.6 | | 26.4 | 0.1 | 0.0 | |
| 14A | 60 | North Albury School, Albury | control | 43.2 | 41.4 | 44.5 | | 51.5 | 49.5 | 54.0 | | 7.5 | 7.3 | 8.5 | | 59.2 | 47.4 | 63.2 | | 17.5 | 12.5 | 23.8 | | 1.9 | 1.0 | 4.2 | | 0.0 | 0.1 | 0.2 | |
| 15A | 60 | Illaroo PS, Nowra | 3 | 39.6 | 39.8 | 36.0 | | 48.8 | 50.0 | 43.3 | | 8.9 | 9.7 | 7.6 | | 42.6 | 41.8 | 27.5 | | 11.7 | 15.5 | 3.2 | | 1.5 | 2.8 | 0.0 | | 0.2 | 0.3 | 0.0 | |
| 15A | 60 | Corrimal East PS, Corrimal East | control | 47.5 | 46.9 | 44.9 | | 56.6 | 56.0 | 54.0 | | 8.5 | 9.7 | 9.5 | | 81.2 | 76.8 | 66.0 | | 35.4 | 30.3 | 23.7 | | 6.6 | 7.0 | 3.7 | | 1.1 | 1.8 | 1.0 | |
| 16A | 50 | Jamberoo PS, Jamberoo | 1 | 42.7 | 38.9 | 39.4 | | 52.0 | 46.5 | 49.2 | | 9.5 | 7.8 | 9.8 | | 54.5 | 38.6 | 43.6 | | 18.8 | 7.1 | 13.0 | | 4.2 | 0.5 | 3.0 | | 1.0 | 0.3 | 0.9 | |
| 16A | 50 | St Paul's PS, Albion Park | control | 42.3 | 39.7 | 39.5 | | 52.0 | 49.0 | 47.5 | | 9.4 | 10.2 | 8.9 | | 51.0 | 39.4 | 43.6 | | 17.6 | 14.2 | 8.5 | | 5.2 | 3.9 | 2.3 | | 1.3 | 0.9 | 0.5 | |
| 17A | 50/80 | St Joseph's PS, Goulburn | 3 | 47.8 | 42.1 | 37.8 | | 56.7 | 52.8 | 42.3 | | 6.8 | 8.9 | 5.5 | | 84.2 | 47.9 | 25.6 | | 38.2 | 19.3 | 2.0 | | 4.9 | 4.2 | 0.3 | | 0.6 | 0.1 | 0.0 | |
| 17A | 50/80 | Corrimal East PS, Corrimal East | control | 47.5 | 46.9 | 44.9 | | 56.6 | 56.0 | 54.0 | | 8.5 | 9.7 | 9.5 | | 81.2 | 76.8 | 66.0 | | 35.4 | 30.3 | 23.7 | | 6.6 | 7.0 | 3.7 | | 1.1 | 1.8 | 1.0 | |
| 18A | 50 | Towradgi PS, Towradgi | 1 | 39.6 | 40.6 | 40.7 | | 47.9 | 46.5 | 46.0 | | 7.7 | 6.3 | 7.6 | | 36.8 | 50.3 | 50.6 | | 11.4 | 7.0 | 7.4 | | 1.0 | 1.1 | 3.1 | | 0.0 | 0.0 | 0.4 | |
| 18A | 50 | Tarrawanna PS, Tarrawanna | control | 35.1 | 33.5 | 32.7 | | 41.3 | 40.0 | 39.0 | | 6.3 | 6.0 | 6.4 | | 20.3 | 12.9 | 10.8 | | 0.8 | 0.8 | 1.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 19A | 50 | Cringila PS, Cringila | 1 | 45.7 | 41.3 | 42.0 | | 54.4 | 48.0 | 49.2 | | 8.8 | 7.1 | 6.9 | | 69.0 | 53.2 | 54.2 | | 30.6 | 10.9 | 12.6 | | 5.6 | 1.1 | 1.2 | | 0.0 | 0.0 | 0.0 | |
| 19A | 50 | Farmborough Road PS, Unanderra | control | 39.9 | 35.9 | 37.5 | | 48.7 | 45.0 | 45.5 | | 8.8 | 8.3 | 8.4 | | 45.0 | 26.0 | 35.2 | | 12.5 | 5.5 | 6.6 | | 1.9 | 0.4 | 0.5 | | 0.0 | 0.0 | 0.0 | |
| 20A | 70 | Avoca PS, Avoca | 1 | 49.0 | 56.2 | 56.8 | | 63.6 | 71.0 | 68.3 | | 15.2 | 12.4 | 10.5 | | 73.2 | 91.1 | 95.3 | | 47.0 | 61.6 | 69.2 | | 24.4 | 37.7 | 36.7 | | 7.1 | 16.4 | 8.3 | |
| 20A | 70 | Penrose PS, Penrose | control | 54.5 | 59.6 | 57.0 | | 69.0 | 74.7 | 71.9 | | 12.9 | 14.7 | 13.9 | | 80.3 | 93.4 | 94.4 | | 59.1 | 63.5 | 57.9 | | 31.8 | 48.2 | 38.1 | | 12.1 | 22.6 | 16.7 | |
| 21A | 60 | Lake Heights PS, Lake Heights | 2 | 44.5 | 41.1 | 39.5 | | 53.5 | 47.0 | 44.0 | | 7.8 | 6.6 | 5.6 | | 67.1 | 49.2 | 36.0 | | 23.5 | 9.2 | 5.1 | | 3.5 | 0.9 | 0.2 | | 0.3 | 0.1 | 0.0 | |
| 21A | 60 | Picton PS, Picton | control | 43.5 | 42.6 | 42.5 | | 52.3 | 51.5 | 50.1 | | 8.2 | 8.3 | 7.6 | | 61.5 | 53.5 | 58.0 | | 18.2 | 16.8 | 13.5 | | 3.6 | 3.5 | 2.2 | | 0.3 | 0.3 | 0.4 | |
| 22A | 50 | St Mary's PS, Dubbo | 2 | 38.0 | 40.8 | 40.6 | | 45.0 | 50.0 | 49.5 | | 7.3 | 8.7 | 8.8 | | 34.2 | 49.2 | 48.4 | | 5.1 | 14.0 | 12.8 | | 0.7 | 2.0 | 2.1 | | 0.0 | 0.0 | 0.4 | |
| 22A | 50 | North Bathurst PS, Bathurst | control | 41.3 | 46.6 | 44.2 | | 49.5 | 57.3 | 53.5 | | 7.9 | 9.0 | 9.5 | | 50.7 | 76.7 | 67.2 | | 12.7 | 30.2 | 23.7 | | 0.7 | 8.0 | 7.4 | | 0.0 | 1.1 | 0.6 | |
| 23A | 50 | Orange PS, Orange | 1 | 32.4 | 41.8 | 42.0 | | 39.0 | 51.0 | 50.0 | | 6.2 | 8.6 | 9.0 | | 10.4 | 56.4 | 52.2 | | 0.0 | 16.2 | 22.7 | | 0.0 | 1.8 | 4.8 | | 0.0 | 0.1 | 0.0 | |
| 23A | 50 | Orange Infants, Orange | control | 33.7 | 34.4 | 33.6 | | 40.5 | 41.0 | 39.5 | | 6.7 | 7.2 | 6.3 | | 15.1 | 17.9 | 14.2 | | 0.7 | 2.7 | 0.9 | | 0.0 | 0.0 | 0.2 | | 0.0 | 0.0 | 0.0 | |
| 24A | 60 | Sherwood Hills Christian School & Bradbury PS, Campbell Town | 2 | 31.5 | 30.2 | 32.3 | | 37.4 | 35.1 | 39.2 | | | | | | | | | | | | | | | | | | | | | |

| Site No. | Non-school time speed limit | School | Flashing lights (FL) & controls | Mean speed (km/h) | | | | 85 th percentile speed (km/h) | | | | Standard deviation (km/h) | | | | % travelling above speed limit | | | | % ≥10 km/h above speed limit | | | | % ≥20 km/h above speed limit | | | | % ≥30 km/h above speed limit | | | | |
|---|-----------------------------|---|---------------------------------|-------------------|------|------|---|--|------|------|---|---------------------------|------|------|---|--------------------------------|------|------|---|------------------------------|------|------|---|------------------------------|------|------|------|------------------------------|------|-----|------|--|
| | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | | | | | |
| | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | |
| Sites with one of three types of flashing lights: Period 1 (Before) = Mar/Jun-04, Period 2 (1st after - 3 months) = Oct/Dec-04, Period 3 (2nd after - 9 months) = Feb/Mar-05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25A | 60 | Turrumurra North PS, Turrumurra | 3 | 34.0 | 35.8 | 35.1 | | 40.0 | 42.0 | 41.9 | | 6.6 | 6.6 | 7.3 | | 15.0 | 22.2 | 20.6 | | 1.0 | 2.0 | 2.6 | | 0.0 | 0.1 | 0.4 | | 0.0 | 0.0 | 0.4 | | |
| 25A | 60 | Hornsby North PS, Hornsby | control | 46.6 | 45.0 | 42.2 | | 55.0 | 57.0 | 51.5 | | 7.8 | 10.0 | 8.3 | | 81.2 | 60.6 | 49.5 | | 28.5 | 29.8 | 17.1 | | 6.3 | 6.0 | 2.8 | | 0.5 | 1.1 | 0.4 | | |
| 26A | 60 | Rossmore PS, Bringelly | 2 | 43.4 | 37.7 | 37.8 | | 54.0 | 45.5 | 44.5 | | 10.0 | 8.2 | 7.9 | | 62.5 | 31.5 | 30.9 | | 21.5 | 7.4 | 6.4 | | 5.4 | 1.2 | 1.2 | | 0.7 | 0.1 | 0.1 | | |
| 26A | 60 | Luddenham PS, Luddenham | control | 52.8 | 55.5 | 51.4 | | 63.0 | 67.5 | 62.0 | | 9.2 | 10.7 | 9.3 | | 92.3 | 96.5 | 90.8 | | 55.9 | 60.3 | 47.3 | | 22.8 | 33.4 | 20.2 | | 3.3 | 11.3 | 2.5 | | |
| 27A | 80 | Epping Boys HS, Marsfield | 2 | 48.3 | 46.8 | 49.0 | | 57.0 | 55.3 | 58.5 | | 9.7 | 8.8 | 10.6 | | 84.7 | 81.2 | 83.8 | | 36.9 | 29.3 | 36.8 | | 10.3 | 6.3 | 13.0 | | 2.2 | 1.5 | 4.1 | | |
| 27A | 80 | Colyton HS, Colyton | control | 52.4 | 49.3 | 52.2 | | 63.0 | 60.5 | 64.0 | | 10.4 | 10.4 | 11.1 | | 88.7 | 78.6 | 86.8 | | 52.6 | 38.2 | 49.9 | | 20.9 | 15.4 | 23.3 | | 4.7 | 4.0 | 6.6 | | |
| 28A | 60 | Macarthur Girls HS, Parramatta | 2 | 41.2 | 41.1 | 40.0 | | 48.5 | 48.5 | 47.0 | | 7.3 | 7.2 | 7.2 | | 54.3 | 53.5 | 46.2 | | 9.5 | 8.9 | 7.3 | | 1.0 | 0.2 | 0.3 | | 0.0 | 0.0 | 0.0 | | |
| 28A | 60 | St George's HS, Kogarah | control | 42.4 | 36.7 | 34.5 | | 49.5 | 44.0 | 40.5 | | 6.9 | 7.2 | 7.0 | | 59.2 | 26.9 | 17.4 | | 11.1 | 3.0 | 2.7 | | 0.4 | 0.0 | 0.3 | | 0.0 | 0.0 | 0.0 | | |
| 29A | 50 | Merrylands PS & Fowlers Road Special School, Merrylands | 3 | 41.6 | 42.1 | 36.6 | | 49.9 | 50.5 | 42.3 | | 7.5 | 7.9 | 7.5 | | 57.4 | 56.0 | 22.2 | | 13.9 | 15.5 | 3.0 | | 0.7 | 0.9 | 1.2 | | 0.0 | 0.0 | 0.7 | | |
| 29A | 50 | St Johns Park PS, St Johns Park | control | 38.7 | 40.9 | 37.6 | | 45.7 | 48.5 | 43.5 | | 7.4 | 7.5 | 6.7 | | 35.3 | 50.0 | 35.2 | | 6.2 | 11.0 | 2.3 | | 1.0 | 0.5 | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| 30A | 70/60 | Carlingford HS, Carlingford | 2 | 47.0 | 41.8 | 42.6 | | 62.0 | 54.5 | 55.0 | | 13.6 | 11.7 | 11.5 | | 67.9 | 54.4 | 57.2 | | 45.0 | 23.2 | 24.9 | | 18.3 | 6.5 | 6.9 | | 2.9 | 1.0 | 1.2 | | |
| 30A | 70/60 | Ravenswood Girls High, Gordon | control | 49.7 | 50.3 | 49.9 | | 61.5 | 62.5 | 60.8 | | 11.4 | 12.2 | 10.2 | | 77.4 | 79.9 | 82.2 | | 49.9 | 50.3 | 48.5 | | 17.7 | 19.6 | 15.1 | | 2.9 | 5.2 | 1.9 | | |
| 31A | 100 | Bellimbopinni School, Kempsey | 2 | 48.1 | 48.4 | 46.7 | | 58.0 | 56.0 | 54.0 | | 12.0 | 11.0 | 9.7 | | 76.9 | 81.8 | 0.0 | | 26.2 | 28.8 | 0.0 | | 0.0 | 9.9 | 7.6 | | 0.0 | 5.1 | 3.4 | | |
| 31A | 100 | Rukenvale PS, Rukenvale | control | | | 59.7 | | | | 82.5 | | | | 18.2 | | | | | | | | | | | | | 42.3 | | | | 26.6 | |
| 32A | 50 | Middle Harbour School, Mosman | 1 | 36.3 | 35.5 | 38.7 | | 41.0 | 40.0 | 44.4 | | 6.0 | 6.4 | 5.6 | | 18.2 | 13.3 | 33.4 | | 3.0 | 1.9 | 3.1 | | 0.8 | 0.5 | 0.0 | | 0.4 | 0.5 | 0.0 | | |
| 32A | | | no control | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table A 2: Recorded speed survey results for sites in groups B, C and D, and their controls, during school speed limit hours (heavy vehicles only)

| Site No. | Non-school time speed limit | School | Flashing lights (FL) & 'Slow Down' signs | Mean speed (km/h) | | | | 85 th percentile speed (km/h) | | | | Standard deviation (km/h) | | | | % travelling above speed limit | | | | % ≥10 km/h above speed limit | | | | % ≥20 km/h above speed limit | | | | % ≥30 km/h above speed limit | | | | | |
|---|-----------------------------|--|--|-------------------|------|------|------|--|------|------|------|---------------------------|------|------|------|--------------------------------|------|------|------|------------------------------|------|------|------|------------------------------|------|------|------|------------------------------|------|------|------|---|---|
| | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | | |
| | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 |
| <i>Sites with static 'Slow Down' only signs and no flashing lights: Period 1 (Before) = Mar/Jun-04, Period 2 (1st after - 3 months) = Oct/Dec-04, Period 3 (2nd after - 9 months) = Feb/Mar-05</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1B | 60 | Brigadine College, St Ives | Slow Down | 44.4 | 42.8 | 46.7 | | 54.5 | 51.5 | 59.5 | | 10.1 | 9.6 | 11.1 | | 66.8 | 60.1 | 71.0 | | 25.6 | 17.1 | 33.7 | | 6.6 | 5.0 | 13.0 | | 0.9 | 0.9 | 2.3 | | | |
| 1B | 60 | Narrabeen Lakes Primary School, Narrabeen | control | 45.0 | 44.8 | 45.6 | | 55.0 | 55.0 | 56.5 | | 9.4 | 8.9 | 9.6 | | 66.7 | 66.7 | 68.3 | | 27.6 | 26.1 | 29.1 | | 5.1 | 4.8 | 7.3 | | 0.9 | 0.6 | 0.7 | | | |
| 2B | 50 | Chatswood PS, Chatswood | Slow Down | 30.7 | 32.4 | 29.5 | | 38.9 | 44.9 | 36.8 | | 7.9 | 9.8 | 6.9 | | 16.5 | 25.5 | 8.2 | | 2.5 | 3.4 | 1.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | | |
| 2B | 50 | Christ the King, North Rocks | control | 46.5 | 47.3 | 53.3 | | 53.7 | 57.5 | 61.5 | | 7.5 | 9.8 | 9.5 | | 77.9 | 80.0 | 89.9 | | 29.3 | 42.6 | 63.1 | | 5.0 | 7.2 | 30.4 | | 0.7 | 1.0 | 3.6 | | | |
| 3B | 60 | Annandale North PS, Annandale | Slow Down | 33.6 | 35.9 | 29.9 | | 37.7 | 44.1 | 33.6 | | 9.5 | 7.2 | 9.2 | | 10.0 | 23.1 | 7.7 | | 5.0 | 15.4 | 7.7 | | 5.0 | 0.0 | 3.8 | | 0.0 | 0.0 | 0.0 | | | |
| 3B | 60 | Orange Grove Primary, Lilyfield | control | 42.6 | 42.7 | 46.3 | | 50.0 | 52.0 | 58.5 | | 8.2 | 9.2 | 12.2 | | 59.6 | 57.0 | 64.0 | | 14.6 | 19.9 | 29.0 | | 3.2 | 3.5 | 14.3 | | 0.5 | 0.4 | 5.4 | | | |
| 4B | 100 | Uranquinty PS, Uranquinty | Slow Down | 42.5 | 46.8 | 44.7 | | 49.5 | 56.0 | 53.5 | | 7.8 | 10.1 | 8.1 | | 57.5 | 73.1 | 66.0 | | 13.5 | 30.6 | 23.8 | | 2.7 | 9.8 | 4.3 | | 0.4 | 3.4 | 0.2 | | | |
| 4B | 100 | Yerong Creek PS, Yerong Creek | control | 51.9 | 50.8 | 50.6 | | 63.5 | 62.0 | 61.0 | | 11.5 | 10.8 | 11.1 | | 87.5 | 85.6 | 83.2 | | 50.0 | 47.6 | 44.1 | | 22.5 | 19.4 | 18.1 | | 8.1 | 4.9 | 5.8 | | | |
| 5B | 60 | Muswellbrook South PS, Muswellbrook | Slow Down | 42.7 | 43.8 | 41.7 | | 51.5 | 53.0 | 50.0 | | 8.4 | 9.0 | 7.9 | | 60.9 | 66.1 | 56.8 | | 17.6 | 22.8 | 13.9 | | 2.2 | 3.6 | 0.6 | | 0.0 | 0.0 | 0.0 | | | |
| 5B | 60 | Scone PS, Scone | control | 35.9 | 37.9 | 35.3 | | 44.6 | 47.5 | 44.0 | | 9.0 | 9.1 | 8.5 | | 30.8 | 40.4 | 25.4 | | 5.0 | 8.9 | 4.5 | | 0.8 | 0.6 | 0.3 | | 0.3 | 0.0 | 0.1 | | | |
| <i>Flashing light sites that commenced operation earlier: Period 1 (Before) = Nov/Dec-02, Period 2 (1st after - 3 months) = Mar/Jun-03, Period 3 (2nd after - 12 months) = Nov/Dec-03, Period 4 (3rd after - 18 months) = Mar/Jun-04</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1C | 70 | Chatham PS, Taree | 3 | 46.9 | 43.3 | 43.1 | 40.7 | 58.4 | 49.0 | 48.8 | 45.9 | 10.2 | 7.9 | 7.9 | 8.3 | 73.2 | 61.9 | 62.7 | 39.8 | 27.4 | 12.5 | 12.0 | 10.1 | | 4.7 | 5.1 | 4.1 | | 0.8 | 0.7 | 0.5 | | |
| 1C | 70 | St Benedict's PS, Edgeworth | control | 56.4 | 53.7 | 52.2 | 52.8 | 68.8 | 66.5 | 65.3 | 67.0 | 11.5 | 11.2 | 11.3 | 13.0 | 93.2 | 90.3 | 87.4 | 82.9 | 64.1 | 55.7 | 48.9 | 54.1 | 38.2 | 29.3 | 26.0 | 33.2 | 10.5 | 7.2 | 6.5 | 10.2 | | |
| 2C | 60 | Tomaree PS, Salamander | 3 | 52.0 | 48.4 | 45.2 | 44.1 | 60.3 | 56.3 | 51.8 | 50.7 | 7.9 | 7.5 | 6.5 | 6.1 | 91.8 | 85.2 | 77.1 | 73.0 | 54.1 | 35.4 | 18.9 | 15.7 | 15.9 | 7.4 | 2.4 | 0.6 | | 0.9 | 0.3 | 0.0 | | |
| 2C | 60 | Elernmore Vale PS, Elernmore | control | 44.3 | 43.2 | 42.9 | 40.7 | 53.3 | 51.8 | 51.5 | 52.0 | 8.5 | 8.1 | 8.0 | 9.9 | 61.6 | 56.8 | 57.2 | 44.9 | 23.7 | 21.4 | 20.4 | 19.1 | 7.4 | 6.1 | 4.9 | 3.4 | 0.9 | 0.5 | 0.4 | 0.4 | | |
| 3C | 70 | Mount Terry PS, Albion Park | 2 | 70.9 | 50.6 | 48.2 | 47.1 | 78.8 | 61.5 | 59.6 | 58.1 | 8.1 | 10.4 | 10.7 | 10.6 | 99.8 | 81.1 | 73.4 | 69.4 | 99.0 | 47.9 | 40.2 | 38.4 | 91.1 | 17.5 | 14.8 | 10.5 | 53.8 | 3.8 | 2.7 | 2.3 | | |
| 3C | | | control | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4C | 60 | Edmund Rice College, Wollongong | 3 | 47.9 | 43.8 | 43.9 | 43.2 | 58.0 | 52.3 | 50.8 | 50.5 | 9.4 | 8.2 | 7.0 | 8.4 | 78.0 | 59.3 | 67.1 | 61.0 | 35.2 | 19.5 | 15.0 | 15.6 | | 4.7 | 2.9 | 3.0 | | 0.9 | 0.3 | 1.3 | | |
| 4C | 60 | St Paul's PS, Albion Park | control | 44.5 | 42.9 | 40.8 | 42.3 | 55.8 | 53.8 | 50.8 | 52.0 | 10.3 | 10.3 | 9.6 | 9.4 | 61.8 | 55.7 | 45.6 | 51.0 | 25.5 | 20.8 | 15.3 | 17.6 | 7.5 | 5.9 | 4.2 | 5.2 | 1.4 | 1.2 | 0.8 | 1.3 | | |
| 5C | 80 | Blaxland PS, Blaxland | 1 | 56.0 | 57.5 | 50.7 | 46.7 | 67.8 | 69.5 | 62.5 | 59.0 | 11.1 | 11.4 | 11.0 | 11.6 | 91.6 | 92.7 | 82.9 | 73.1 | 68.3 | 72.2 | 50.3 | 35.3 | 34.4 | 41.4 | 20.2 | 12.5 | 10.1 | 12.5 | 4.3 | 2.6 | | |
| 5C | | | no control | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6C | 70 | Dundas PS, Oatlands | 1 | 52.2 | 51.9 | 47.0 | 40.5 | 64.5 | 66.3 | 55.3 | 47.5 | 10.8 | 11.5 | 8.9 | 8.7 | 89.0 | 87.6 | 83.1 | 48.9 | 46.0 | 44.2 | 25.4 | 10.2 | 24.4 | 25.5 | 9.6 | 2.8 | | 7.6 | 2.1 | 0.5 | | |
| 6C | 70 | Gordon West PS, Pymble | control | 53.1 | 49.3 | 48.3 | 43.2 | 66.8 | 63.8 | 62.4 | 54.0 | 13.0 | 12.8 | 12.4 | 11.0 | 83.0 | 75.9 | 75.8 | 60.3 | 57.7 | 45.0 | 38.4 | 24.3 | 32.3 | 21.6 | 18.8 | 9.1 | 7.8 | 4.7 | 4.2 | 1.7 | | |
| <i>Flashing light sites that commenced operation earlier: Period 1 (Before - no data), Period 2 (1st after - 18 months) = Mar/Jun-04, Period 3 (2nd after - 21 months) = Oct/Dec-05, Period 4 (3rd after - 27 months) = Feb/Mar-05</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7D | 50 | Holbrook PS & St Patrick's PS, Holbrook | 2 | | 40.5 | | | | 45.0 | | | | | | | 46.3 | | | | | | | | 4.2 | | | | | 0.0 | | | | |
| 7D | 50 | Griffith East & Griffith Catholic School, Griffith | control | | 38.3 | | | | 45.6 | | | | | | | 35.5 | | | | | | | | 6.9 | | | | | 0.0 | | | | |
| 8D | 100 | Holmwood PS, Cowra | 2 | 44.2 | 58.8 | 43.5 | | 50.0 | 88.6 | 51.0 | | 10.1 | 22.0 | 8.5 | | 60.8 | 76.2 | 0.0 | | 15.0 | 47.3 | 0.0 | | 0.0 | 0.0 | 36.3 | 3.9 | 0.0 | 31.5 | 1.2 | | | |
| 8D | 100 | Bullarah PS, Moree | control | 75.5 | 76.0 | 77.4 | | 94.0 | 95.2 | 95.6 | | 18.0 | 18.6 | 17.5 | | 95.6 | 97.0 | 0.0 | | 91.9 | 86.9 | 0.0 | | 0.0 | 77.8 | 83.2 | 0.0 | 65.7 | 69.9 | | | | |
| 9D | 60 | Bredbo PS, Bredbo | 1 | 40.2 | 43.9 | 41.1 | | 45.3 | 51.5 | 46.0 | | 5.9 | 8.5 | 6.6 | | 40.9 | 65.2 | 49.1 | | 5.4 | 16.3 | 7.2 | | 1.1 | 6.6 | 2.7 | | 0.2 | 1.2 | 0.4 | | | |
| 9D | 60 | Ando PS, Ando | control | 66.0 | 64.5 | 58.1 | | 88.6 | 91.6 | 78.4 | | 19.8 | 20.2 | 18.1 | | 93.0 | 94.8 | 93.0 | | 74.2 | 67.9 | 52.4 | | 54.8 | 46.1 | 34.3 | | 38.7 | 35.8 | 24.5 | | | |
| 10D | 50 | Helensburgh PS, Helensburgh | 1 | 42.0 | 40.2 | 40.8 | | 49.8 | 47.8 | 48.4 | | 6.8 | 7.0 | 7.1 | | 55.4 | 43.4 | 40.6 | | 13.3 | 10.3 | 11.7 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | | |
| 10D | 50 | Oxford PS, Oxford | control | 30.7 | 26.7 | 23.5 | | 32.9 | 30.0 | 26.0 | | 5.1 | 4.9 | 3.9 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | | |
| 11D | 60 | Waitara PS, Waitara | 3 | 41.7 | 42.2 | 38.5 | | 48.5 | 49.0 | 48.4 | | 7.3 | 8.2 | 8.8 | | 53.3 | 52.7 | 35.8 | | 9.8 | 12.2 | 11.9 | | 1.4 | 3.7 | 1.6 | | 0.4 | 0.8 | 0.2 | | | |
| 11D | 60 | Punchbowl PS, Sydney | control | 38.3 | 38.6 | 38.9 | | 48.0 | 48.5 | 48.5 | | 9.2 | 9.6 | 9.2 | | 39.9 | 41.1 | 42.3 | | 9.7 | 12.0 | 11.9 | | 0.9 | 1.4 | 1.1 | | 0.0 | 0.0 | 0.2 | | | |

| Site No. | Speed limit | School | Flashing lights (FL) & controls | Mean speed (km/h) | | | | 85 th percentile speed (km/h) | | | | Standard deviation (km/h) | | | | % travelling above speed limit | | | | % ≥10 km/h above speed limit | | | | % ≥20 km/h above speed limit | | | | % ≥30 km/h above speed limit | | | |
|---|-------------|---|---------------------------------|-------------------|------|------|---|--|-------|-------|---|---------------------------|------|------|---|--------------------------------|------|------|---|------------------------------|------|------|---|------------------------------|-----|-----|---|------------------------------|-----|-----|---|
| | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | | | | |
| | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Sites with one of three types of flashing lights: Period 1 (Before) = Mar/Jun-04, Period 2 (1st after - 3 months) = Oct/Dec-04, Period 3 (2nd after - 9 months) = Feb/Mar-05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25A | 60 | Turrumurra North PS, Turrumurra | 3 | 53.7 | 53.8 | 51.7 | | 60.0 | 60.5 | 57.5 | | 6.5 | 6.8 | 6.3 | | 13.8 | 13.9 | 8.5 | | 0.9 | 1.2 | 0.4 | | 1.0 | 0.1 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 25A | 60 | Hornsby North PS, Hornsby | control | 55.4 | 58.0 | 57.7 | | 61.0 | 63.5 | 63.5 | | 6.6 | 6.2 | 6.5 | | 18.3 | 32.0 | 31.2 | | 0.8 | 2.4 | 2.1 | | 1.1 | 0.1 | 0.2 | | 0.0 | 0.0 | 0.0 | |
| 25A | 60 | Turrumurra North PS, Turrumurra | 3 | 48.9 | 50.1 | 48.6 | | 55.0 | 56.5 | 54.5 | | 6.4 | 6.6 | 6.6 | | 3.3 | 5.3 | 3.5 | | 0.1 | 0.4 | 0.2 | | 8.4 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 25A | 60 | Hornsby North PS, Hornsby | control | 55.7 | 56.9 | 56.1 | | 62.0 | 63.5 | 62.5 | | 7.1 | 7.6 | 7.1 | | 20.2 | 32.1 | 25.1 | | 0.6 | 2.5 | 1.3 | | 1.9 | 0.1 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 26A | 60 | Rossmore PS, Bringelly | 2 | 60.0 | 55.7 | 54.9 | | 67.5 | 64.0 | 63.0 | | 7.5 | 7.9 | 8.7 | | 45.0 | 24.6 | 24.6 | | 9.9 | 3.9 | 4.5 | | 5.8 | 0.4 | 0.6 | | 0.1 | 0.1 | 0.0 | |
| 26A | 60 | Luddenham PS, Luddenham | control | 58.5 | 59.0 | 59.1 | | 65.0 | 65.5 | 66.5 | | 7.4 | 7.6 | 8.1 | | 36.4 | 39.2 | 40.3 | | 5.2 | 7.0 | 8.5 | | 0.0 | 0.6 | 0.7 | | 0.1 | 0.0 | 0.0 | |
| 26A | 60 | Rossmore PS, Bringelly | 2 | 68.2 | 61.3 | 65.1 | | 76.5 | 70.0 | 73.5 | | 8.2 | 9.0 | 8.3 | | 83.0 | 51.9 | 70.6 | | 42.5 | 17.0 | 29.2 | | 1.3 | 2.7 | 4.0 | | 0.7 | 0.2 | 0.3 | |
| 26A | 60 | Luddenham PS, Luddenham | control | 57.1 | 55.3 | 55.2 | | 63.5 | 61.5 | 61.5 | | 8.4 | 7.5 | 7.7 | | 29.9 | 19.9 | 18.5 | | 4.3 | 1.5 | 1.3 | | 0.0 | 0.1 | 0.1 | | 0.0 | 0.0 | 0.0 | |
| 27A | 70 | Epping Boys HS, Marsfield | 2 | 76.5 | 72.5 | 72.9 | | 84.5 | 82.0 | 81.0 | | 8.8 | 9.7 | 8.6 | | 77.9 | 61.0 | 62.5 | | 34.6 | 21.7 | 20.9 | | 0.1 | 3.1 | 2.4 | | 0.9 | 0.5 | 0.3 | |
| 27A | 70 | Colyton HS, Colyton | control | 62.4 | 62.1 | 63.4 | | 75.5 | 76.0 | 76.5 | | 12.4 | 12.6 | 12.2 | | 28.6 | 27.9 | 31.6 | | 7.8 | 8.3 | 8.6 | | 4.0 | 1.1 | 1.1 | | 0.2 | 0.2 | 0.2 | |
| 27A | 70 | Epping Boys HS, Marsfield | 2 | 66.3 | 64.5 | 72.4 | | 77.5 | 77.5 | 81.0 | | 11.1 | 12.3 | 8.5 | | 37.1 | 33.6 | 58.2 | | 10.1 | 10.1 | 19.7 | | 0.4 | 1.3 | 2.5 | | 0.2 | 0.2 | 0.3 | |
| 27A | 70 | Colyton HS, Colyton | control | 65.1 | 65.3 | 65.4 | | 77.5 | 77.5 | 77.0 | | 12.2 | 12.2 | 11.5 | | 34.3 | 34.2 | 34.5 | | 10.9 | 11.2 | 10.0 | | 0.0 | 1.7 | 1.3 | | 0.3 | 0.3 | 0.2 | |
| 28A | 60 | Macarthur Girls HS, Parramatta | 2 | 47.5 | 45.4 | 44.6 | | 57.0 | 53.5 | 53.0 | | 9.8 | 8.5 | 8.6 | | 8.0 | 2.8 | 2.4 | | 1.0 | 0.3 | 0.2 | | 0.5 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 28A | 60 | St George's HS, Kogarah | control | 33.2 | 33.7 | 33.3 | | 38.0 | 38.0 | 38.0 | | 4.8 | 4.8 | 4.7 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.4 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 28A | 60 | Macarthur Girls HS, Parramatta | 2 | 49.6 | 46.9 | 47.0 | | 60.0 | 57.5 | 58.0 | | 11.9 | 10.8 | 10.9 | | 15.5 | 9.2 | 9.0 | | 2.3 | 1.1 | 1.1 | | 1.8 | 0.2 | 0.2 | | 0.0 | 0.1 | 0.0 | |
| 28A | 60 | St George's HS, Kogarah | control | 38.3 | 48.2 | 48.6 | | 44.0 | 58.5 | 59.0 | | 6.3 | 11.0 | 11.0 | | 0.1 | 9.6 | 11.2 | | 0.0 | 0.7 | 0.8 | | 0.0 | 0.1 | 0.0 | | 0.0 | 0.1 | 0.0 | |
| 29A | 50 | Merrylands PS & Fowlers Road Special School, Merrylands | 3 | 51.3 | 51.3 | 47.9 | | 59.0 | 59.5 | 55.0 | | 7.8 | 8.3 | 7.2 | | 57.4 | 55.2 | 36.1 | | 13.0 | 15.7 | 5.1 | | 2.8 | 0.9 | 0.2 | | 0.0 | 0.1 | 0.0 | |
| 29A | 50 | St Johns Park PS, St Johns Park | control | 58.0 | 52.3 | 52.3 | | 64.5 | 60.5 | 60.0 | | 7.0 | 7.7 | 7.5 | | 89.6 | 54.7 | 55.7 | | 39.8 | 17.2 | 17.6 | | 0.3 | 2.1 | 1.8 | | 0.3 | 0.2 | 0.2 | |
| 29A | 50 | Merrylands PS & Fowlers Road Special School, Merrylands | 3 | 53.6 | 53.5 | 50.6 | | 61.0 | 62.5 | 58.0 | | 8.3 | 8.7 | 7.9 | | 70.2 | 66.6 | 52.4 | | 22.2 | 24.1 | 11.1 | | 2.5 | 2.5 | 0.9 | | 0.1 | 0.2 | 0.1 | |
| 29A | 50 | St Johns Park PS, St Johns Park | control | 45.9 | 46.8 | 46.4 | | 52.5 | 52.5 | 52.5 | | 6.6 | 6.4 | 6.2 | | 22.1 | 26.5 | 23.1 | | 1.4 | 2.0 | 1.7 | | 0.4 | 0.2 | 0.1 | | 0.0 | 0.0 | 0.0 | |
| 30A | 60 | Carlingford HS, Carlingford | 2 | 63.0 | 63.3 | 63.4 | | 72.0 | 70.5 | 70.5 | | 10.1 | 7.1 | 8.2 | | 67.1 | 65.9 | 70.1 | | 22.9 | 17.7 | 18.8 | | 0.0 | 1.9 | 1.8 | | 0.3 | 0.2 | 0.2 | |
| 30A | 60 | Ravenswood Girls High, Gordon | control | 54.7 | 55.0 | 56.1 | | 64.0 | 66.0 | 64.0 | | 11.8 | 13.3 | 9.5 | | 31.8 | 38.4 | 31.5 | | 4.8 | 7.0 | 3.7 | | 1.9 | 0.9 | 0.3 | | 0.1 | 0.1 | 0.0 | |
| 30A | 60 | Carlingford HS, Carlingford | 2 | 54.8 | 49.6 | 57.3 | | 65.0 | 60.0 | 72.0 | | 13.0 | 14.1 | 16.6 | | 52.6 | 35.8 | 54.9 | | 20.5 | 13.4 | 25.0 | | 0.1 | 2.3 | 5.0 | | 0.3 | 0.3 | 0.7 | |
| 30A | 60 | Ravenswood Girls High, Gordon | control | 54.1 | 56.8 | 56.3 | | 61.0 | 63.0 | 62.5 | | 6.9 | 6.7 | 6.6 | | 16.4 | 27.1 | 24.3 | | 1.3 | 3.1 | 2.1 | | 0.1 | 0.3 | 0.2 | | 0.0 | 0.0 | 0.0 | |
| 31A | 60 | Bellimbopinni School, Kempsey | 2 | 86.3 | 91.3 | 95.7 | | 96.0 | 99.5 | 104.0 | | 9.9 | 8.8 | 8.7 | | 4.2 | 10.9 | 29.4 | | 0.3 | 0.8 | 3.1 | | 0.0 | 0.1 | 0.2 | | 0.0 | 0.0 | 0.0 | |
| 31A | 100 | Rukenvale PS, Rukenvale | control | 0.0 | | 94.3 | | 0.0 | | 105.5 | | 0.0 | | 11.2 | | 0.0 | | 26.7 | | 0.0 | | 6.9 | | 0.0 | | 1.5 | | 0.0 | | 0.0 | |
| 31A | 60 | Bellimbopinni School, Kempsey | 2 | 93.5 | 93.1 | 95.9 | | 102.0 | 102.0 | 104.5 | | 8.9 | 9.0 | 9.1 | | 22.0 | 19.6 | 32.2 | | 1.7 | 2.0 | 4.5 | | 1.0 | 0.2 | 0.4 | | 0.0 | 0.0 | 0.0 | |
| 31A | 100 | Rukenvale PS, Rukenvale | control | 0.0 ² | | 98.0 | | 0.0 | | 109.5 | | 0.0 | | 13.1 | | 0.0 | | 44.3 | | 0.0 | | 15.1 | | 0.0 | | 3.5 | | 0.0 | | 0.4 | |
| 32A | 60 | Middle Harbour School, Mosman | 1 | 44.0 | 40.5 | 43.5 | | 49.0 | 47.5 | 48.5 | | 5.4 | 7.2 | 5.2 | | 0.6 | 0.3 | 0.3 | | 0.0 | 0.0 | 0.1 | | 0.7 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 32A | | (single direction site) | no control | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

² 'Before' and first 'after' data was unavailable.

Table A 4: Recorded speed survey results for approaches to sites in groups B, C and D, and their controls, during school speed limit hours (all vehicles)

| Site No. | Speed limit | School | Flashing lights (FL) & 'Slow Down' signs | Mean speed (km/h) | | | | 85 th percentile speed (km/h) | | | | Standard deviation (km/h) | | | | % travelling above speed limit | | | | % ≥10 km/h above speed limit | | | | % ≥20 km/h above speed limit | | | | % ≥30 km/h above speed limit | | | |
|---|-------------|--|--|-------------------|------|------|------|--|------|-------|------|---------------------------|------|------|------|--------------------------------|------|------|------|------------------------------|------|------|------|------------------------------|------|------|------|------------------------------|------|-----|-----|
| | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | | | | |
| | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| <i>Sites with static 'Slow Down' only signs and no flashing lights: Period 1 (Before) = Mar/Jun-04, Period 2 (1st after - 3 months) = Oct/Dec-04, Period 3 (2nd after - 9 months) = Feb/Mar-05</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1B | 60 | Brigadine College, St Ives | Slow Down | 60.6 | 60.1 | 57.6 | | 69.0 | 69.5 | 65.0 | | 10.1 | 10.8 | 8.7 | | 58.1 | 56.6 | 37.4 | | 14.0 | 14.3 | 5.2 | | 0.1 | 1.3 | 0.3 | | 0.0 | 0.1 | 0.0 | |
| 1B | 60 | Narrabeen Lakes Primary School, Narrabeen | control | 55.3 | 55.6 | 56.5 | | 63.5 | 64.5 | 64.5 | | 9.1 | 9.6 | 9.1 | | 28.2 | 30.8 | 34.0 | | 3.5 | 4.4 | 5.2 | | 37.4 | 0.4 | 0.4 | | 0.0 | 0.0 | 0.0 | |
| 1B | 60 | Brigadine College, St Ives | Slow Down | 53.0 | 48.2 | 50.4 | | 66.0 | 62.5 | 65.0 | | 13.7 | 13.5 | 14.0 | | 33.3 | 19.0 | 27.2 | | 7.2 | 4.6 | 5.9 | | 0.0 | 0.5 | 0.7 | | 0.1 | 0.1 | 0.1 | |
| 1B | 60 | Narrabeen Lakes Primary School, Narrabeen | control | 58.5 | 58.5 | 59.9 | | 65.5 | 65.5 | 67.0 | | 8.0 | 7.3 | 7.8 | | 41.2 | 39.1 | 49.3 | | 6.3 | 5.7 | 8.1 | | 35.6 | 0.3 | 0.6 | | 0.0 | 0.0 | 0.0 | |
| 2B | 50 | Chatswood PS, Chatswood ³ | Slow Down | 40.7 | 41.8 | 40.7 | | 50.0 | 48.5 | 47.5 | | 8.9 | 6.9 | 6.9 | | 13.8 | 9.5 | 6.6 | | 1.7 | 0.9 | 0.4 | | 16.4 | 0.1 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 2B | 50 | Christ the King, North Rocks | control | 55.6 | 55.0 | 55.5 | | 62.5 | 62.0 | 62.0 | | 6.9 | 7.5 | 6.7 | | 80.5 | 76.7 | 79.6 | | 26.9 | 25.3 | 26.0 | | 0.4 | 2.1 | 1.9 | | 0.1 | 0.2 | 0.1 | |
| 3B | 50 | Annandale North PS, Annandale ⁴ | Slow Down | 40.1 | 36.7 | 36.7 | | 47.0 | 43.0 | 42.5 | | 8.2 | 7.0 | 6.4 | | 7.5 | 2.2 | 2.5 | | 0.6 | 0.1 | 0.1 | | 12.7 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 3B | 50 | Orange Grove Primary, Lilyfield | control | 50.1 | 50.7 | 51.1 | | 56.0 | 57.5 | 58.5 | | 6.0 | 8.0 | 8.7 | | 47.4 | 56.6 | 60.6 | | 4.9 | 9.4 | 11.2 | | 0.0 | 0.5 | 0.8 | | 0.0 | 0.0 | 0.0 | |
| 4B | 50 | Uranquinty PS, Uranquinty | Slow Down | 60.6 | 60.1 | 57.6 | | 69.0 | 69.5 | 65.0 | | 10.1 | 10.8 | 8.7 | | 58.1 | 56.6 | 37.4 | | 14.0 | 14.3 | 5.2 | | 0.1 | 1.3 | 0.3 | | 0.0 | 0.1 | 0.0 | |
| 4B | 50 | Yerong Creek PS, Yerong Creek | control | 55.3 | 55.6 | 56.5 | | 63.5 | 64.5 | 64.5 | | 9.1 | 9.6 | 9.1 | | 28.2 | 30.8 | 34.0 | | 3.5 | 4.4 | 5.2 | | 37.4 | 0.4 | 0.4 | | 0.0 | 0.0 | 0.0 | |
| 4B | 50 | Uranquinty PS, Uranquinty | Slow Down | 53.0 | 48.2 | 50.4 | | 66.0 | 62.5 | 65.0 | | 13.7 | 13.5 | 14.0 | | 33.3 | 19.0 | 27.2 | | 7.2 | 4.6 | 5.9 | | 0.0 | 0.5 | 0.7 | | 0.1 | 0.1 | 0.1 | |
| 4B | 50 | Yerong Creek PS, Yerong Creek | control | 58.5 | 58.5 | 59.9 | | 65.5 | 65.5 | 67.0 | | 8.0 | 7.3 | 7.8 | | 41.2 | 39.1 | 49.3 | | 6.3 | 5.7 | 8.1 | | 35.6 | 0.3 | 0.6 | | 0.0 | 0.0 | 0.0 | |
| 5B | 60 | Muswellbrook South PS, Muswellbrook | Slow Down | 63.3 | 54.8 | 59.0 | | 69.0 | 64.0 | 64.0 | | 6.7 | 8.8 | 5.9 | | 71.2 | 30.7 | 37.5 | | 13.6 | 3.3 | 4.0 | | 0.0 | 0.2 | 0.3 | | 0.1 | 0.1 | 0.0 | |
| 5B | 60 | Scone PS, Scone | control | 59.3 | 55.3 | 54.6 | | 65.5 | 61.9 | 60.7 | | 6.3 | 6.6 | 6.4 | | 38.7 | 19.5 | 15.8 | | 5.8 | 2.2 | 1.9 | | 0.7 | 0.2 | 0.2 | | 0.0 | 0.0 | 0.0 | |
| 5B | 60 | Muswellbrook South PS, Muswellbrook | Slow Down | 51.9 | 53.7 | 53.3 | | 60.0 | 62.5 | 62.0 | | 9.3 | 9.9 | 9.6 | | 13.5 | 23.4 | 20.5 | | 1.1 | 2.6 | 2.3 | | 0.0 | 0.2 | 0.2 | | 0.0 | 0.1 | 0.1 | |
| 5B | 60 | Scone PS, Scone | control | 34.3 | 34.1 | 34.2 | | 41.0 | 40.5 | 40.5 | | 6.5 | 6.3 | 6.1 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| <i>Flashing light sites that commenced operation earlier: Period 1 (Before) = Nov/Dec-02, Period 2 (1st after - 3 months) = Mar/Jun-03, Period 3 (2nd after - 12 months) = Nov/Dec-03, Period 4 (3rd after - 18 months) = Mar/Jun-04</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1C | 70 | Chatham PS, Taree | 3 | 46.7 | 42.1 | 42.3 | 53.4 | 59.5 | 48.5 | 48.5 | 64.0 | 11.3 | 8.2 | 8.6 | 10.4 | 70.2 | 53.7 | 56.9 | 2.9 | 28.4 | 11.3 | 12.0 | 0.1 | 13.5 | 4.1 | 5.4 | 0.1 | 3.6 | 0.5 | 0.7 | 0.0 |
| 1C | 60 | St Benedict's PS, Edgeworth | control | 57.2 | 54.5 | 53.6 | 62.0 | 68.5 | 66.0 | 65.5 | 73.0 | 10.4 | 10.2 | 10.5 | 11.3 | 95.7 | 93.8 | 91.8 | 60.9 | 68.0 | 59.2 | 54.1 | 27.3 | 39.1 | 29.2 | 27.6 | 0.2 | 10.2 | 6.8 | 6.7 | 0.3 |
| 1C | 70 | Chatham PS, Taree | 3 | 47.2 | 44.5 | 43.9 | 52.6 | 57.3 | 49.5 | 49.0 | 62.0 | 9.2 | 7.6 | 7.2 | 8.9 | 76.3 | 70.1 | 68.5 | 2.1 | 26.4 | 13.8 | 12.0 | 0.2 | 11.5 | 5.2 | 4.8 | 0.0 | 2.1 | 1.1 | 0.8 | 0.0 |
| 1C | 60 | St Benedict's PS, Edgeworth | control | 55.6 | 52.9 | 50.9 | 58.8 | 69.0 | 67.0 | 65.0 | 69.5 | 12.6 | 12.1 | 12.0 | 11.8 | 90.7 | 86.8 | 83.0 | 50.7 | 60.2 | 52.2 | 43.7 | 16.2 | 37.3 | 29.4 | 24.4 | 0.2 | 10.8 | 7.5 | 6.3 | 0.2 |
| 2C | 60 | Tomaree PS, Salamander | 3 | 48.8 | 46.4 | 44.4 | 53.3 | 55.0 | 53.0 | 50.5 | 60.0 | 6.6 | 6.8 | 6.1 | 6.5 | 88.7 | 80.2 | 73.7 | 13.5 | 40.9 | 26.7 | 15.6 | 1.2 | 2.8 | 2.1 | 0.7 | 0.3 | 0.2 | 0.1 | 0.1 | 0.0 |
| 2C | 60 | Elmore Vale PS, Elmore | control | 39.0 | 37.7 | 37.7 | 59.0 | 46.5 | 44.5 | 45.0 | 67.0 | 7.3 | 7.0 | 7.2 | 8.1 | 42.4 | 34.4 | 36.3 | 45.3 | 4.2 | 2.3 | 2.9 | 7.9 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| 2C | 60 | Tomaree PS, Salamander | 3 | 55.2 | 50.4 | 46.1 | 52.9 | 65.5 | 59.5 | 53.0 | 60.0 | 9.3 | 8.3 | 7.0 | 6.9 | 94.8 | 90.2 | 80.4 | 14.2 | 67.2 | 44.1 | 22.2 | 1.2 | 29.0 | 12.7 | 4.0 | 0.5 | 5.8 | 1.6 | 0.6 | 0.0 |
| 2C | 60 | Elmore Vale PS, Elmore | control | 49.5 | 48.8 | 48.1 | 56.9 | 60.0 | 59.0 | 58.0 | 62.5 | 9.7 | 9.3 | 8.9 | 6.4 | 80.8 | 79.2 | 78.2 | 25.0 | 43.2 | 40.5 | 37.8 | 2.5 | 14.7 | 12.0 | 9.8 | 0.1 | 1.7 | 0.9 | 0.9 | 0.0 |
| 3C | 70 | Mount Terry PS, Albion Park | 2 | 69.5 | 49.2 | 45.5 | 61.2 | 76.5 | 61.0 | 58.3 | 73.5 | 7.3 | 11.1 | 11.7 | 11.7 | 99.9 | 77.1 | 63.1 | 22.7 | 99.1 | 38.3 | 28.0 | 5.2 | 90.0 | 15.4 | 12.6 | 0.1 | 44.9 | 5.3 | 3.6 | 0.1 |
| 3C | | | no control | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3C | 70 | Mount Terry PS, Albion Park | 2 | 72.4 | 51.9 | 50.9 | 64.8 | 81.0 | 62.0 | 61.0 | 74.0 | 8.9 | 9.8 | 9.7 | 9.5 | 99.7 | 85.0 | 83.7 | 27.9 | 98.9 | 57.5 | 52.5 | 4.7 | 92.1 | 19.6 | 17.0 | 0.2 | 62.7 | 2.2 | 1.8 | 0.0 |
| 3C | | | no control | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4C | 60 | Edmund Rice College, Wollongong | 3 | 46.2 | 41.6 | 42.9 | 52.0 | 56.5 | 49.5 | 49.0 | 60.0 | 9.3 | 7.6 | 6.6 | 8.2 | 72.3 | 48.1 | 61.3 | 15.0 | 27.8 | 12.6 | 11.2 | 1.5 | 7.6 | 2.4 | 1.8 | 2.6 | 1.4 | 0.2 | 0.3 | 0.0 |
| 4C | 60 | St Paul's PS, Albion Park | control | 44.5 | 42.3 | 40.2 | 50.7 | 55.0 | 52.5 | 49.5 | 60.5 | 9.4 | 9.8 | 8.8 | 9.1 | 61.9 | 53.2 | 42.5 | 14.2 | 24.7 | 19.1 | 13.3 | 1.6 | 5.7 | 4.2 | 2.6 | 1.2 | 0.7 | 0.6 | 0.4 | 0.0 |
| 4C | 60 | Edmund Rice College, Wollongong | 3 | 49.6 | 46.0 | 45.0 | 55.1 | 59.5 | 55.2 | 52.5 | 62.0 | 9.6 | 8.8 | 7.5 | 7.3 | 83.7 | 70.5 | 72.9 | 20.4 | 42.5 | 26.3 | 18.9 | 2.5 | 13.4 | 7.0 | 3.9 | 1.2 | 2.6 | 1.5 | 0.4 | 0.1 |
| 4C | 60 | St Paul's PS, Albion Park | control | 44.5 | 43.6 | 41.4 | 53.6 | 56.5 | 55.0 | 52.0 | 61.5 | 11.2 | 10.8 | 10.4 | 8.6 | 61.6 | 58.2 | 48.7 | 18.9 | 26.3 | 22.5 | 17.3 | 3.0 | 9.3 | 7.5 | 5.7 | 2.0 | 2.0 | 1.8 | 1.1 | 0.0 |
| 5C | 60 | Blaxland PS, Blaxland | 1 | 58.1 | 59.2 | 54.1 | 64.1 | 68.5 | 70.0 | 63.5 | 71.0 | 10.0 | 10.0 | 8.9 | 8.0 | 97.4 | 97.9 | 95.7 | 72.4 | 75.4 | 79.0 | 62.6 | 20.9 | 38.2 | 43.9 | 22.6 | 0.3 | 9.3 | 13.2 | 4.4 | 0.2 |
| 5C | | | no control | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5C | 60 | Blaxland PS, Blaxland | 1 | 53.9 | 55.8 | 47.4 | 71.2 | 67.0 | 69.0 | 61.5 | 79.5 | 12.2 | 12.8 | 13.2 | 8.3 | 85.9 | 87.4 | 70.2 | 92.5 | 61.1 | 65.4 | 38.0 | 59.5 | 30.6 | 38.9 | 17.7 | 0.0 | 10.8 | 11.9 | 4.3 | 1.1 |
| 5C | | | no control | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6C | 70 | Dundas PS, Oatlands | 1 | 55.3 | 54.0 | 49.4 | 66.4 | 68.0 | 68.5 | 58.0 | 74.0 | 10.7 | 11.1 | 8.5 | 8.7 | 95.5 | 93.8 | 92.3 | 30.1 | 56.7 | 49.3 | 31.7 | 3.6 | 32.8 | 30.0 | 12.5 | 0.1 | 10.5 | 9.4 | 3.2 | 0.0 |
| 6C | 70 | Gordon West PS, Pymble | control | 53.5 | 50.9 | 48.8 | 55.2 | 66.5 | 64.5 | 61.8 | 68.5 | 12.2 | 11.9 | 11.2 | 13.3 | 85.2 | 80.6 | 78.5 | 10.8 | 57.1 | 46.0 | 36.6 | 1.2 | 31.5 | 23.7 | 17.7 | 13.1 | 7.7 | 5.6 | 4.1 | 0.0 |
| 6C | 70 | Dundas PS, Oatlands | 1 | 49.1 | 49.9 | 44.6 | 54.2 | 61.0 | 64.0 | 52.5 | 63.5 | 10.8 | 11.9 | 9.3 | 8.6 | 82.5 | 81.3 | 73.8 | 2.9 | 35.4 | 39.2 | 19.0 | 0.3 | 16.0 | 20.9 | 6.6 | 0.3 | 4.5 | 5.7 | 1.0 | 0.0 |
| 6C | 70 | Gordon West PS, Pymble | control | 52.8 | 47.7 | 47.9 | 59.0 | 67.0 | 63.0 | 63.0 | 68.0 | 13.9 | 13.8 | 13.6 | 11.4 | 80.7 | 71.1 | 73.1 | 9.9 | 58.4 | 44.0 | 40.2 | 1.2 | 33.2 | 19.6 | 20.0 | 6.8 | 7.9 | 3.8 | 4.4 | 0.1 |
| <i>Flashing light sites that commenced operation earlier: Period 1 (Before - no data), Period 2 (1st after - 18 months) = Mar/Jun-04, Period 3 (2nd after - 21 months) = Oct/Dec-05, Period 4 (3rd after - 27 months) = Feb/Mar-05</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7D | 50 | Holbrook PS & St Patrick's PS, Holbrook | 2 | 42.5 | 46.1 | 45.0 | | 48.5 | 51.5 | 50.5 | | 6.1 | 6.6 | 6.6 | | 0.0 | 22.4 | 16.6 | | 0.0 | 1.3 | 1.0 | | 2.0 | 0.1 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 7D | 50 | Griffith East & Griffith Catholic School, Griffith | control | 53.8 | 55.1 | 53.5 | | 60.0 | 61.5 | 60.0 | | 6.7 | 6.5 | 6.8 | | 70.0 | 78.3 | 69.2 | | 18.5 | 21.5 | 16.5 | | 86.5 | 2.2 | 1.5 | | 0.1 | 0.1 | 0.1 | |
| 7D | 50 | Holbrook PS & St Patrick's PS, Holbrook | 2 | 46.2 | 57.0 | 48.1 | | 53.5 | 66.0 | 55.0 | | 7.3 | 8.8 | 7.5 | | 0.0 | 77.8 | 36.0 | | 0.0 | 32.4 | 6.0 | | 53.2 | 8.8 | 0.5 | | 0.0 | 0.0 | 0.0 | |
| 7D | 50 | Griffith East & Griffith Catholic School, Griffith | control | 53.2 | 51.5 | 52.3 | | 59.5 | 58.5 | 59.0 | | 7.1 | 7.7 | 7.4 | | 66.1 | 59.8 | 62.7 | | 15.8 | 11.3 | 13.5 | | 0.0 | 1.0 | 1.3 | | 0.2 | 0.1 | 0.1 | |
| 8D | 100 | Holmwood PS, Cowra | 2 | 88.8 | 89.7 | 93.5 | | 98.5 | 98.0 | 104.0 | | 10.2 | 9.6 | 11.0 | | 8.7 | 8.8 | 28.3 | | | | | | | | | | | | | |

| Site No. | Speed limit | School | Flashing lights (FL) & 'Slow Down' signs | Mean speed (km/h) | | | | 85 th percentile speed (km/h) | | | | Standard deviation (km/h) | | | | % travelling above speed limit | | | | % ≥10 km/h above speed limit | | | | % ≥20 km/h above speed limit | | | | % ≥30 km/h above speed limit | | | |
|----------|-------------|-----------------------------|--|-------------------|------|------|------|--|-------|-------|-------|---------------------------|------|------|-----|--------------------------------|------|------|-------|------------------------------|------|------|-------|------------------------------|------|------|-------|------------------------------|------|------|-------|
| | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | |
| | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| 9D | 50 | Ando PS, Ando | control | | 84.6 | 89.2 | 98.0 | | 98.0 | 103.5 | 91.6 | | 13.8 | 14.7 | | | 98.6 | 99.4 | 100.0 | | 95.1 | 97.7 | 100.0 | | 0.0 | 90.5 | 100.0 | | 67.2 | 75.2 | 100.0 |
| 9D | 50 | Bredbo PS, Bredbo | l | | 71.7 | 69.5 | 71.9 | | 82.5 | 79.0 | 82.5 | | 10.4 | 9.0 | 9.8 | | 99.6 | 99.6 | 99.5 | | 90.4 | 88.1 | 91.6 | | 0.6 | 45.6 | 56.5 | | 21.8 | 14.1 | 22.2 |
| 9D | 50 | Ando PS, Ando | control | | 88.8 | 88.4 | 88.0 | | 102.5 | 102.0 | 102.7 | | 13.2 | 14.8 | | | 98.8 | 98.3 | 97.9 | | 97.8 | 97.1 | 96.2 | | 0.0 | 90.4 | 90.0 | | 77.7 | 75.3 | 74.2 |
| 10D | 60 | Helensburgh PS, Helensburgh | l | | 52.0 | 50.8 | 52.8 | | 57.5 | 57.0 | 58.5 | | 5.9 | 5.8 | 6.1 | | 6.7 | 4.0 | 9.9 | | 0.2 | 0.0 | 0.3 | | 26.5 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| 10D | 60 | Oxford PS, Oxford | control | | 42.3 | 30.9 | 31.8 | | 48.3 | 35.0 | 36.4 | | 6.4 | 3.9 | | | 0.2 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 1.2 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| 10D | 60 | Helensburgh PS, Helensburgh | l | | 57.4 | 57.2 | 56.4 | | 64.0 | 63.5 | 62.5 | | 6.5 | 6.6 | 6.3 | | 30.5 | 29.7 | 24.2 | | 3.1 | 2.9 | 1.7 | | 0.5 | 0.1 | 0.1 | | 0.0 | 0.0 | 0.0 |
| 10D | 60 | Oxford PS, Oxford | control | | 29.5 | 29.2 | 28.4 | | 35.1 | 35.0 | 34.0 | | 5.2 | 6.5 | | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.2 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| 11D | 60 | Waitara PS, Waitara | 3 | | 57.0 | 57.0 | 56.7 | | 63.5 | 63.0 | 63.0 | | 7.2 | 6.7 | 6.4 | | 28.0 | 27.9 | 25.0 | | 3.5 | 3.2 | 2.5 | | 0.0 | 0.2 | 0.3 | | 0.1 | 0.0 | 0.1 |
| 11D | 60 | Punchbowl PS, Sydney | control | | 58.6 | 58.8 | 58.1 | | 67.0 | 67.5 | 66.5 | | 9.1 | 9.1 | | | 43.0 | 44.2 | 41.1 | | 9.9 | 10.5 | 8.2 | | 0.0 | 1.2 | 1.0 | | 0.1 | 0.0 | 0.2 |
| 11D | 60 | Waitara PS, Waitara | 3 | | 59.1 | 58.7 | 62.8 | | 65.0 | 64.0 | 68.5 | | 6.5 | 6.2 | 6.0 | | 38.3 | 35.6 | 65.5 | | 5.6 | 4.2 | 11.8 | | 0.3 | 0.4 | 0.8 | | 0.0 | 0.0 | 0.1 |
| 11D | 60 | Punchbowl PS, Sydney | control | | 51.7 | 51.7 | 53.4 | | 60.5 | 62.0 | 62.5 | | 8.9 | 10.9 | | | 15.2 | 19.9 | 21.1 | | 1.9 | 3.1 | 3.0 | | 0.0 | 0.2 | 0.3 | | 0.0 | 0.0 | 0.0 |

Table A 5: Recorded speed survey results for approaches to sites in Group A, and their controls, during school speed limit hours (heavy vehicles only)

| Site No. | Speed limit | School | Flashing lights (FL) & controls | Mean speed (km/h) | | | | 85 th percentile speed (km/h) | | | | Standard deviation (km/h) | | | | % travelling above speed limit | | | | % ≥10 km/h above speed limit | | | | % ≥20 km/h above speed limit | | | | % ≥30 km/h above speed limit | | | | |
|---|-------------|---|---------------------------------|-------------------|------|------|------|--|------|------|------|---------------------------|------|------|------|--------------------------------|------|------|------|------------------------------|-----|-----|------|------------------------------|---|---|---|------------------------------|---|---|---|---|
| | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | |
| | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 |
| <i>Sites with one of three types of flashing lights: Period 1 (Before) = Mar/Jun-04, Period 2 (1st after - 3 months) = Oct/Dec-04, Period 3 (2nd after - 9 months) = Feb/Mar-05</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1A | 60 | Great Lakes College, Tuncurry | 1 | 49.1 | 73.0 | 51.2 | 58.5 | 80.7 | 59.7 | 10.6 | 8.8 | 9.5 | 9.6 | 93.5 | 12.7 | 1.1 | 69.2 | 1.0 | 0.2 | 17.8 | 0.0 | 0.0 | 1.6 | 0.0 | | | | | | | | |
| 1A | 60 | Forster HS, Forster | control | 71.4 | 48.2 | 67.7 | 78.8 | 57.0 | 75.0 | 7.3 | 10.3 | 7.5 | 94.1 | 6.4 | 83.5 | 58.1 | 0.4 | 41.8 | 14.7 | 0.0 | 4.8 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 1A | 60 | Great Lakes College, Tuncurry | 1 | 63.4 | 61.9 | 65.1 | 71.5 | 67.5 | 72.2 | 7.8 | 6.2 | 7.3 | 64.0 | 60.1 | 77.0 | 21.3 | 11.1 | 24.1 | 2.8 | 0.3 | 2.5 | 0.3 | 0.3 | 0.6 | | | | | | | | |
| 1A | 60 | Forster HS, Forster | control | 62.3 | 63.9 | 64.1 | 68.0 | 71.3 | 70.5 | 5.8 | 7.2 | 6.2 | 62.1 | 70.0 | 73.7 | 10.0 | 18.9 | 17.5 | 0.0 | 3.0 | 0.3 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 2A | 50 | St Mary's, Noraville | 2 | 50.0 | 46.4 | 46.9 | 55.5 | 51.7 | 52.5 | 5.8 | 6.0 | 6.4 | 42.4 | 23.8 | 26.5 | 6.3 | 1.2 | 2.6 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 2A | 50 | Our Lady of the Rosary PS, Shelley Beach | control | 33.1 | 34.5 | 34.5 | 37.6 | 38.0 | 38.5 | 4.4 | 4.5 | 4.5 | 0.0 | 0.7 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 2A | 50 | St Mary's, Noraville | 2 | 36.9 | 36.1 | 35.9 | 41.3 | 40.5 | 40.5 | 4.2 | 4.1 | 4.1 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 2A | 50 | Our Lady of the Rosary PS, Shelley Beach | control | 46.0 | 47.4 | 45.5 | 52.5 | 54.1 | 51.0 | 6.8 | 7.6 | 7.1 | 29.7 | 40.9 | 20.9 | 0.0 | 1.5 | 3.6 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 3A | 60 | Tuggerah PS, Tuggerah | 1 | 64.4 | 64.4 | 65.9 | 70.0 | 70.1 | 72.4 | 6.1 | 6.4 | 6.5 | 79.2 | 76.6 | 78.3 | 17.3 | 18.0 | 31.4 | 1.2 | 1.8 | 2.9 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 3A | 60 | Ettalong PS, Ettalong | control | 52.1 | 52.2 | 52.8 | 61.0 | 61.6 | 61.2 | 8.4 | 10.8 | 8.6 | 10.1 | 23.0 | 17.4 | 0.0 | 1.6 | 1.4 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 3A | 60 | Tuggerah PS, Tuggerah | 1 | 49.8 | 51.1 | 47.6 | 57.9 | 59.1 | 55.4 | 8.4 | 7.9 | 7.7 | 7.6 | 12.7 | 4.9 | 1.4 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 3A | 60 | Ettalong PS, Ettalong | control | 40.7 | 40.8 | 40.6 | 46.2 | 45.1 | 45.0 | 5.5 | 4.7 | 5.2 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 4A | 60 | St Joseph's PS, Maitland | 2 | 48.3 | 45.7 | 44.6 | 62.5 | 58.5 | 57.0 | 14.6 | 12.7 | 12.6 | 21.3 | 8.8 | 7.4 | 1.4 | 1.1 | 0.3 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 4A | 60 | St Benedict's PS, Edgeworth | control | 53.5 | 64.6 | 64.8 | 65.5 | 71.0 | 71.5 | 11.5 | 6.3 | 7.1 | 26.5 | 74.2 | 73.2 | 10.0 | 20.9 | 24.9 | 2.5 | 1.0 | 1.8 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 4A | 60 | St Joseph's PS, Maitland | 2 | 44.8 | 44.0 | 43.3 | 53.0 | 51.5 | 50.0 | 7.9 | 7.6 | 7.5 | 3.7 | 3.4 | 2.0 | 0.2 | 0.2 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 4A | 60 | St Benedict's PS, Edgeworth | control | 54.3 | 51.6 | 47.8 | 67.0 | 63.5 | 61.0 | 13.0 | 12.3 | 11.7 | 36.5 | 27.0 | 15.3 | 8.9 | 5.3 | 1.6 | 1.2 | 0.2 | 0.0 | 0.2 | 0.0 | 0.0 | | | | | | | | |
| 5A | 60 | School of Performing Arts, Broadmeadow | 3 | 45.8 | 45.5 | 43.6 | 54.0 | 54.9 | 51.5 | 9.1 | 9.0 | 8.1 | 2.4 | 4.2 | 2.1 | 1.0 | 0.4 | 0.1 | 0.4 | 0.0 | 0.1 | 0.4 | 0.0 | 0.0 | | | | | | | | |
| 5A | 60 | Lambton PS, Lambton | control | 64.4 | 64.3 | 65.0 | 71.5 | 71.5 | 73.0 | 8.3 | 7.8 | 7.7 | 73.3 | 74.2 | 74.3 | 20.7 | 20.8 | 26.2 | 1.7 | 1.7 | 1.9 | 0.4 | 0.2 | 0.4 | | | | | | | | |
| 5A | 60 | School of Performing Arts, Broadmeadow | 3 | 49.5 | 49.5 | 51.4 | 55.5 | 56.0 | 58.6 | 6.2 | 6.7 | 7.4 | 3.8 | 4.8 | 10.3 | 0.3 | 0.3 | 1.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 5A | 60 | Lambton PS, Lambton | control | 36.2 | 45.0 | 36.6 | 41.7 | 56.1 | 42.0 | 5.8 | 18.0 | 5.7 | 0.0 | 11.6 | 0.0 | 0.0 | 9.0 | 0.0 | 0.0 | 8.0 | 0.0 | 0.0 | 8.0 | 0.0 | | | | | | | | |
| 6A | 80 | Glen Innes PS & St Joseph's PS, Glen Innes | 1 | 34.3 | 34.7 | 34.3 | 40.0 | 40.5 | 39.5 | 5.6 | 5.3 | 5.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 6A | 80 | Coffs Primary and Christ Community, Coffs Harbour | control | 42.5 | 40.4 | 40.1 | 48.0 | 45.5 | 44.9 | 5.7 | 5.0 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 6A | 80 | Glen Innes PS & St Joseph's PS, Glen Innes | 1 | 41.0 | 38.1 | 37.0 | 51.0 | 46.0 | 43.0 | 8.7 | 8.1 | 7.2 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 6A | 80 | Coffs Primary and Christ Community, Coffs Harbour | control | 45.7 | 51.0 | 56.0 | 53.5 | 58.0 | 61.0 | 7.6 | 7.1 | 5.6 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 7A | 50 | Hillvue PS, Tamworth | 2 | 37.4 | 40.1 | 39.0 | 43.0 | 45.0 | 43.9 | 6.7 | 6.9 | 6.1 | 2.9 | 4.0 | 5.4 | 1.0 | 1.3 | 1.2 | 0.0 | 0.4 | 0.0 | 0.0 | 0.4 | 0.0 | | | | | | | | |
| 7A | 50 | Ballina HS, Ballina | control | 23.0 | 29.7 | 26.6 | 25.5 | 35.0 | 30.5 | 2.6 | 16.5 | 3.8 | 0.0 | 7.5 | 0.0 | 0.0 | 5.4 | 0.0 | 0.0 | 3.2 | 0.0 | 0.0 | 3.2 | 0.0 | | | | | | | | |
| 7A | 50 | Hillvue PS, Tamworth | 2 | 39.6 | 39.7 | 38.0 | 45.0 | 46.0 | 43.3 | 5.9 | 6.9 | 6.0 | 3.5 | 6.1 | 3.0 | 0.4 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 7A | 50 | Ballina HS, Ballina | control | 23.7 | 24.0 | 24.9 | 25.8 | 25.6 | 26.9 | 2.6 | 2.7 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 8A | 50 | Sandon PS, Armidale | 1 | 29.0 | 27.6 | 27.7 | 35.0 | 32.0 | 32.5 | 5.0 | 4.5 | 4.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 8A | 50 | Pottsville PS, Pottsville | control | 42.5 | 43.5 | 44.3 | 51.9 | 52.0 | 51.0 | 9.4 | 7.5 | 6.7 | 17.0 | 19.4 | 15.0 | 2.4 | 0.0 | 1.6 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.4 | | | | | | | | |
| 8A | 50 | Sandon PS, Armidale | 1 | 39.0 | 37.1 | 36.7 | 48.9 | 45.0 | 44.5 | 8.9 | 7.2 | 7.4 | 12.1 | 3.8 | 4.4 | 4.1 | 0.5 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 8A | 50 | Pottsville PS, Pottsville | control | 44.6 | 57.4 | 58.9 | 55.5 | 63.0 | 65.5 | 12.3 | 5.6 | 6.7 | 35.9 | 89.1 | 92.0 | 9.8 | 34.2 | 44.4 | 2.2 | 1.1 | 5.3 | 0.0 | 0.0 | 0.5 | | | | | | | | |
| 9A | 80 | Westdale PS, Tamworth | 2 | 53.4 | 47.9 | 47.1 | 65.3 | 58.0 | 55.5 | 10.9 | 10.1 | 8.7 | 1.2 | 1.0 | 0.2 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 9A | 80 | St Mary's School, Grafton | control | 38.6 | 48.4 | 47.8 | 49.5 | 54.5 | 53.5 | 9.8 | 6.5 | 6.4 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 9A | 80 | Westdale PS, Tamworth | 2 | 49.2 | 44.4 | 42.9 | 60.0 | 52.5 | 49.4 | 11.6 | 9.8 | 7.6 | 2.9 | 0.4 | 0.0 | 0.3 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | | | | | | | | |
| 9A | 80 | St Mary's School, Grafton | control | 42.6 | 45.0 | 45.1 | 51.5 | 54.0 | 54.5 | 8.6 | 10.0 | 10.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 10A | 60 | Westport PS, Pt Macquarie | 3 | 34.7 | 49.8 | 50.8 | 41.0 | 55.5 | 57.0 | 6.0 | 5.9 | 6.6 | 0.0 | 4.5 | 6.6 | 0.0 | 0.3 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 10A | 60 | St Carthage's & Trinity College, Lismore | control | 46.4 | 91.0 | 46.3 | 54.5 | 100.8 | 53.0 | 8.3 | 10.0 | 7.0 | 3.3 | 99.0 | 1.8 | 0.0 | 98.0 | 0.1 | 0.0 | 90.0 | 0.1 | 0.0 | 55.0 | 0.0 | | | | | | | | |
| 10A | 60 | Westport PS, Pt Macquarie | 3 | 49.5 | 48.3 | 50.5 | 60.8 | 55.0 | 57.5 | 9.8 | 6.7 | 7.6 | 14.8 | 4.0 | 7.3 | 2.2 | 0.0 | 1.3 | 0.4 | 0.0 | 0.2 | 0.4 | 0.0 | 0.2 | | | | | | | | |
| 10A | 60 | St Carthage's & Trinity College, Lismore | control | 49.0 | 88.6 | 52.2 | 54.5 | 102.9 | 58.0 | 6.4 | 16.9 | 6.6 | 2.4 | 93.8 | 8.1 | 0.0 | 91.4 | 0.2 | 0.0 | 78.9 | 0.0 | 0.0 | 58.6 | 0.0 | | | | | | | | |
| 11A | 80 | Oxley Vale PS, Tamworth | 2 | 45.0 | 42.0 | 40.6 | 54.0 | 47.7 | 46.5 | 8.4 | 7.2 | 6.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 11A | 80 | St Mary's, Casino | control | 38.3 | 39.2 | 39.7 | 44.0 | 47.0 | 44.5 | 5.5 | 7.6 | 4.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 11A | 80 | Oxley Vale PS, Tamworth | 2 | 45.1 | 41.7 | 40.3 | 53.3 | 48.2 | 46.5 | 7.8 | 6.5 | 6.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 11A | 80 | St Mary's, Casino | control | 38.6 | 36.8 | 38.9 | 46.5 | 44.5 | 45.5 | 7.6 | 7.9 | 7.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 12A | 50 | Gralee School & St Francis De Sales, Leeton | 1 | 56.3 | 54.7 | 56.7 | 64.8 | 62.5 | 63.1 | 8.0 | 8.7 | 7.7 | 81.9 | 73.6 | 82.0 | 33.3 | 25.9 | 32.7 | 2.2 | 4.0 | 5.7 | 0.0 | 1.0 | 0.5 | | | | | | | | |
| 12A | 50 | Griffith Catholic HS & Griffith East PS, Griffith | control | 48.7 | 51.3 | 49.3 | 53.5 | 57.0 | 55.0 | 5.0 | 6.0 | 5.6 | 35.5 | 55.1 | 40.3 | 1.6 | 6.8 | 2.7 | 0.0 | 0.9 | 0.2 | 0.0 | 0.0 | 0.0 | | | | | | | | |
| 12A | 50 | Gralee School & St Francis De Sales, Leeton | 1 | 51.9 | 52.2 | 50.5 | 57.0 | 57.5 | 54.5 | 5.7 | 5.7 | 5.0 | 56.1 | 60.1 | | | | | | | | | | | | | | | | | | |

| Site No. | Speed limit | School | Flashing lights (FL) & controls | Mean speed (km/h) | | | | 85 th percentile speed (km/h) | | | | Standard deviation (km/h) | | | | % travelling above speed limit | | | | % ≥10 km/h above speed limit | | | | % ≥20 km/h above speed limit | | | | % ≥30 km/h above speed limit | | | |
|---|-------------|---|---------------------------------|-------------------|------|------|---|--|------|-------|---|---------------------------|------|------|---|--------------------------------|------|------|---|------------------------------|------|------|---|------------------------------|-----|-----|---|------------------------------|-----|-----|---|
| | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | | | | |
| | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Sites with one of three types of flashing lights: Period 1 (Before) = Mar/Jun-04, Period 2 (1st after - 3 months) = Oct/Dec-04, Period 3 (2nd after - 9 months) = Feb/Mar-05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26A | 60 | Rossmore PS, Bringelly | 2 | 56.7 | 52.0 | 51.8 | | 65.5 | 60.9 | 59.3 | | 8.5 | 8.4 | 9.0 | | 32.8 | 18.0 | 13.0 | | 6.6 | 1.3 | 3.4 | | 0.4 | 0.3 | 0.8 | | 0.0 | 0.0 | 0.0 | |
| 26A | 60 | Luddenham PS, Luddenham | control | 57.4 | 58.2 | 57.4 | | 63.5 | 65.0 | 64.6 | | 6.6 | 7.1 | 8.0 | | 30.8 | 33.5 | 31.7 | | 2.4 | 4.2 | 4.5 | | 0.0 | 0.5 | 0.2 | | 0.0 | 0.0 | 0.0 | |
| 26A | 60 | Rossmore PS, Bringelly | 2 | 66.5 | 60.1 | 63.1 | | 74.5 | 68.5 | 71.0 | | 7.5 | 8.6 | 8.0 | | 78.6 | 48.7 | 62.7 | | 33.4 | 13.0 | 19.9 | | 2.8 | 1.2 | 2.5 | | 0.2 | 0.0 | 0.4 | |
| 26A | 60 | Luddenham PS, Luddenham | control | 56.6 | 54.8 | 54.4 | | 63.5 | 60.5 | 59.5 | | 7.6 | 6.6 | 5.9 | | 26.9 | 17.3 | 11.2 | | 4.1 | 0.9 | 0.5 | | 0.4 | 0.0 | 0.3 | | 0.0 | 0.0 | 0.2 | |
| 27A | 70 | Epping Boys HS, Marsfield | 2 | 70.8 | 66.9 | 67.8 | | 79.9 | 77.0 | 76.0 | | 9.7 | 10.2 | 8.4 | | 52.2 | 36.6 | 37.3 | | 15.7 | 9.7 | 7.2 | | 2.9 | 1.9 | 1.0 | | 0.5 | 0.1 | 0.0 | |
| 27A | 70 | Colyton HS, Colyton | control | 56.1 | 55.2 | 57.1 | | 69.8 | 69.0 | 70.0 | | 12.7 | 13.1 | 12.9 | | 12.3 | 11.7 | 14.3 | | 1.6 | 2.3 | 2.1 | | 0.4 | 0.4 | 0.4 | | 0.1 | 0.1 | 0.2 | |
| 27A | 70 | Epping Boys HS, Marsfield | 2 | 57.2 | 59.1 | 65.6 | | 67.5 | 70.5 | 73.5 | | 11.6 | 11.9 | 7.9 | | 9.3 | 15.2 | 26.9 | | 1.9 | 2.7 | 4.7 | | 0.0 | 0.1 | 0.4 | | 0.0 | 0.1 | 0.1 | |
| 27A | 70 | Colyton HS, Colyton | control | 58.0 | 59.5 | 59.8 | | 71.0 | 72.0 | 72.5 | | 11.7 | 11.9 | 11.9 | | 15.9 | 17.9 | 18.7 | | 2.1 | 4.2 | 4.4 | | 0.1 | 0.7 | 0.4 | | 0.0 | 0.1 | 0.1 | |
| 28A | 60 | Macarthur Girls HS, Parramatta | 2 | 42.3 | 39.7 | 39.4 | | 54.0 | 48.8 | 48.3 | | 10.3 | 8.3 | 8.0 | | 3.8 | 1.0 | 0.0 | | 0.4 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 28A | 60 | St George's HS, Kogarah | control | 27.7 | 27.8 | 27.3 | | 32.0 | 32.8 | 32.5 | | 4.1 | 5.1 | 4.8 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 28A | 60 | Macarthur Girls HS, Parramatta | 2 | 45.3 | 43.2 | 43.8 | | 54.0 | 51.3 | 53.2 | | 9.5 | 8.4 | 9.7 | | 2.6 | 1.7 | 3.1 | | 0.0 | 0.0 | 0.4 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 28A | 60 | St George's HS, Kogarah | control | 34.2 | 45.5 | 45.7 | | 39.3 | 51.4 | 53.0 | | 5.1 | 7.0 | 8.7 | | 0.0 | 1.2 | 0.8 | | 0.0 | 0.0 | 0.4 | | 0.0 | 0.0 | 0.4 | | 0.0 | 0.0 | 0.0 | |
| 29A | 50 | Merrylands PS & Fowlers Road Special School, Merrylands | 3 | 46.4 | 48.1 | 43.9 | | 54.5 | 58.4 | 52.0 | | 8.8 | 9.3 | 8.1 | | 36.0 | 42.1 | 19.7 | | 3.8 | 11.0 | 2.1 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 29A | 50 | St Johns Park PS, St Johns Park | control | 54.1 | 48.1 | 47.6 | | 61.5 | 57.5 | 56.8 | | 6.8 | 8.5 | 8.3 | | 71.7 | 34.8 | 33.7 | | 19.3 | 11.1 | 9.0 | | 0.9 | 0.0 | 0.7 | | 0.0 | 0.0 | 0.3 | |
| 29A | 50 | Merrylands PS & Fowlers Road Special School, Merrylands | 3 | 51.3 | 51.8 | 48.4 | | 59.3 | 59.5 | 55.0 | | 8.6 | 7.7 | 6.9 | | 56.4 | 57.7 | 36.7 | | 14.0 | 14.9 | 2.3 | | 1.7 | 1.8 | 0.5 | | 0.0 | 0.0 | 0.5 | |
| 29A | 50 | St Johns Park PS, St Johns Park | control | 38.2 | 38.2 | 37.5 | | 43.5 | 45.1 | 43.4 | | 6.2 | 6.4 | 6.0 | | 3.9 | 3.2 | 1.7 | | 0.5 | 0.0 | 0.6 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 30A | 60 | Carlingford HS, Carlingford | 2 | 58.9 | 60.0 | 60.7 | | 67.5 | 67.0 | 67.5 | | 9.6 | 6.8 | 7.8 | | 44.4 | 47.0 | 52.6 | | 10.3 | 8.9 | 10.3 | | 0.8 | 0.4 | 0.6 | | 0.0 | 0.0 | 0.0 | |
| 30A | 60 | Ravenswood Girls High, Gordon | control | 52.8 | 53.6 | 53.0 | | 60.5 | 64.5 | 60.9 | | 9.6 | 12.2 | 8.7 | | 15.9 | 29.9 | 16.2 | | 1.2 | 5.0 | 1.0 | | 0.0 | 0.5 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 30A | 60 | Carlingford HS, Carlingford | 2 | 49.6 | 43.9 | 51.7 | | 61.3 | 53.8 | 66.0 | | 12.5 | 12.0 | 15.5 | | 31.6 | 16.6 | 35.8 | | 7.6 | 3.5 | 13.1 | | 1.0 | 0.3 | 2.3 | | 0.0 | 0.1 | 0.3 | |
| 30A | 60 | Ravenswood Girls High, Gordon | control | 48.8 | 52.4 | 51.4 | | 56.0 | 59.0 | 57.5 | | 7.0 | 6.4 | 6.2 | | 5.3 | 10.6 | 7.2 | | 0.0 | 1.2 | 0.7 | | 0.0 | 0.0 | 0.2 | | 0.0 | 0.0 | 0.0 | |
| 31A | 60 | Bellimbopinni School, Kempsey | 2 | 0.0 | 89.9 | 93.5 | | 95.1 | 98.5 | 103.5 | | 9.5 | 9.6 | 10.0 | | 2.9 | 6.6 | 25.8 | | 0.3 | 0.0 | 1.4 | | 0.0 | 0.0 | 0.1 | | 0.0 | 0.0 | 0.0 | |
| 31A | 100 | Rukenvale PS, Rukenvale | control | 0.0 | | 90.5 | | 0.0 | | 100.4 | | 0.0 | | 10.3 | | 0.0 | | 15.5 | | 0.0 | | 0.7 | | 0.0 | | 0.7 | | 0.0 | | 0.0 | |
| 31A | 60 | Bellimbopinni School, Kempsey | 2 | 0.0 | 89.0 | 92.1 | | 99.0 | 99.5 | 102.0 | | 9.4 | 9.8 | 10.4 | | 10.9 | 9.1 | 21.7 | | 1.0 | 0.3 | 2.0 | | 0.0 | 0.2 | 0.3 | | 0.0 | 0.0 | 0.0 | |
| 31A | 100 | Rukenvale PS, Rukenvale | control | 0.0 | | 93.1 | | 0.0 | | 104.0 | | 0.0 | | 13.2 | | 0.0 | | 35.1 | | 0.0 | | 1.8 | | 0.0 | | 0.6 | | 0.0 | | 0.0 | |
| 32A | 60 | Middle Harbour School, Mosman | 1 | 39.3 | 38.7 | 39.1 | | 44.7 | 44.5 | 43.5 | | 8.1 | 6.4 | 5.2 | | 2.4 | 0.5 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |
| 32A | | (single direction site) | no control | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table A 6: Recorded speed survey results for approaches to sites in groups B, C and D, and their controls, during school speed limit hours (heavy vehicles only)

| Site No. | Speed limit | School | Flashing lights (FL) & 'Slow Down' only signs | Mean speed (km/h) | | | | 85 th percentile speed (km/h) | | | | Standard deviation (km/h) | | | | % travelling above speed limit | | | | % ≥10 km/h above speed limit | | | | % ≥20 km/h above speed limit | | | | % ≥30 km/h above speed limit | | | | |
|---|-------------|--|---|-------------------|------|------|---|--|-------|-------|---|---------------------------|------|------|-----|--------------------------------|------|------|------|------------------------------|------|------|-----|------------------------------|------|------|-----|------------------------------|------|------|-----|---|
| | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | |
| | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 |
| <i>Sites with static 'Slow Down' only signs and no flashing lights: Period 1 (Before) = Mar/Jun-04, Period 2 (1st after - 3 months) = Oct/Dec-04, Period 3 (2nd after - 9 months) = Feb/Mar-05</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1B | 60 | Brigadine College, St Ives | Slow Down | 57.2 | 56.8 | 53.7 | | 65.3 | 66.5 | 60.5 | | 9.0 | 9.9 | 8.1 | | 36.5 | 37.9 | 16.0 | | 5.5 | 7.3 | 1.9 | | 0.4 | 0.7 | 0.2 | | 0.1 | 0.0 | 0.0 | | |
| 1B | 60 | Narrabeen Lakes Primary School, Narrabeen | control | 51.9 | 53.4 | 53.2 | | 60.0 | 62.0 | 62.5 | | 8.8 | 9.4 | 9.4 | | 14.8 | 20.7 | 22.9 | | 1.7 | 3.7 | 3.2 | | 0.0 | 0.5 | 0.1 | | 0.0 | 0.0 | 0.0 | | |
| 1B | 60 | Brigadine College, St Ives | Slow Down | 50.9 | 45.4 | 46.6 | | 63.0 | 57.5 | 61.0 | | 12.3 | 11.6 | 13.2 | | 22.2 | 10.6 | 16.1 | | 3.3 | 2.1 | 3.7 | | 0.3 | 0.2 | 0.5 | | 0.0 | 0.0 | 0.0 | | |
| 1B | 60 | Narrabeen Lakes Primary School, Narrabeen | control | 52.6 | 53.7 | 55.8 | | 60.5 | 60.9 | 63.5 | | 8.9 | 7.6 | 8.3 | | 15.3 | 16.5 | 26.8 | | 3.0 | 2.9 | 3.3 | | 0.0 | 0.0 | 0.1 | | 0.0 | 0.0 | 0.0 | | |
| 2B | 50 | Chatswood PS, Chatswood | Slow Down | 39.6 | 33.2 | 30.5 | | 45.2 | 37.6 | 34.4 | | 6.6 | 5.1 | 5.4 | | 2.0 | 0.0 | 1.7 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| 2B | 50 | Christ the King, North Rocks | control | 47.2 | 46.0 | 47.9 | | 56.5 | 56.3 | 55.5 | | 8.6 | 9.1 | 7.7 | | 36.4 | 30.0 | 40.8 | | 6.5 | 9.2 | 5.3 | | 0.0 | 0.8 | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| 3B | 50 | Annandale North PS, Annandale | Slow Down | 29.6 | 27.0 | 30.5 | | 37.6 | 31.3 | 36.9 | | 7.0 | 5.6 | 8.1 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| 3B | 50 | Orange Grove Primary, Lilyfield | control | 46.0 | 46.3 | 47.5 | | 52.0 | 54.0 | 55.5 | | 5.8 | 8.4 | 9.2 | | 20.1 | 33.2 | 37.9 | | 1.2 | 3.5 | 5.6 | | 0.0 | 0.3 | 1.0 | | 0.0 | 0.1 | 0.3 | | |
| 4B | 50 | Uranquinty PS, Uranquinty | Slow Down | 61.4 | 60.0 | 60.5 | | 72.3 | 69.1 | 70.8 | | 10.5 | 9.4 | 9.9 | | 88.5 | 90.6 | 86.0 | | 51.1 | 42.5 | 49.6 | | 19.4 | 15.3 | 17.5 | | 6.1 | 3.2 | 4.2 | | |
| 4B | 50 | Yerong Creek PS, Yerong Creek | control | 65.9 | 68.0 | 66.7 | | 80.7 | 80.2 | 78.1 | | 12.1 | 12.3 | 11.6 | | 92.6 | 92.6 | 94.5 | | 66.3 | 71.1 | 69.8 | | 32.6 | 45.5 | 38.0 | | 15.9 | 17.4 | 12.8 | | |
| 4B | 50 | Uranquinty PS, Uranquinty | Slow Down | 60.4 | 63.2 | 61.2 | | 70.8 | 74.5 | 71.5 | | 11.2 | 10.3 | 9.5 | | 87.8 | 91.5 | 89.8 | | 43.7 | 61.3 | 51.9 | | 17.3 | 23.1 | 19.1 | | 3.9 | 6.9 | 3.6 | | |
| 4B | 50 | Yerong Creek PS, Yerong Creek | control | 65.6 | 68.9 | 68.6 | | 80.2 | 83.0 | 81.5 | | 14.2 | 12.8 | 12.3 | | 88.5 | 94.1 | 96.1 | | 61.2 | 76.0 | 72.0 | | 40.0 | 45.3 | 44.6 | | 17.0 | 21.3 | 19.6 | | |
| 5B | 60 | Muswellbrook South PS, Muswellbrook | Slow Down | 62.5 | 52.9 | 58.5 | | 68.5 | 62.0 | 64.0 | | 6.2 | 9.1 | 5.9 | | 65.6 | 23.8 | 36.8 | | 10.9 | 2.6 | 2.3 | | 0.8 | 0.7 | 0.3 | | 0.0 | 0.4 | 0.0 | | |
| 5B | 60 | Scone PS, Scone | control | 56.3 | 53.0 | 52.4 | | 62.3 | 59.5 | 58.0 | | 6.7 | 6.9 | 6.2 | | 23.2 | 13.6 | 9.1 | | 3.8 | 0.6 | 0.7 | | 0.3 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| 5B | 60 | Muswellbrook South PS, Muswellbrook | Slow Down | 49.9 | 51.8 | 52.0 | | 57.0 | 59.0 | 59.2 | | 7.4 | 8.0 | 8.0 | | 4.7 | 11.3 | 12.5 | | 0.3 | 1.1 | 1.1 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| 5B | 60 | Scone PS, Scone | control | 28.7 | 28.3 | 29.6 | | 33.4 | 32.5 | 34.5 | | 5.1 | 4.2 | 4.6 | | 0.2 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| <i>Flashing light sites that commenced operation earlier: Period 1 (Before) = Nov/Dec-02, Period 2 (1st after - 3 months) = Mar/Jun-03, Period 3 (2nd after - 12 months) = Nov/Dec-03, Period 4 (3rd after - 18 months) = Mar/Jun-04</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1C | 70 | Chatham PS, Taree | 3 | 50.2 | 46.0 | 45.9 | | 47.5 | 61.3 | 55.6 | | 11.2 | 10.3 | 9.4 | | 9.8 | 2.5 | 0.4 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| 1C | 60 | St Benedict's PS, Edgeworth | control | 64.4 | 62.7 | 64.9 | | 62.5 | 70.5 | 69.5 | | 7.1 | 7.1 | 6.5 | | 6.5 | 9.8 | 16.7 | | 10.2 | 18.5 | 64.9 | | 1.6 | 0.4 | 0.9 | | 22.3 | 0.1 | 0.1 | 2.0 | |
| 1C | 70 | Chatham PS, Taree | 3 | 51.1 | 48.0 | 48.9 | | 48.6 | 62.3 | 55.8 | | 57.5 | 58.6 | 10.2 | | 9.0 | 8.9 | 9.4 | | 2.2 | 1.5 | 1.1 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| 1C | 60 | St Benedict's PS, Edgeworth | control | 53.2 | 51.9 | 49.3 | | 54.4 | 66.4 | 66.0 | | 62.4 | 67.5 | 13.2 | | 13.5 | 12.8 | 12.9 | | 6.0 | 4.6 | 1.6 | | 36.6 | 1.2 | 0.4 | | 0.0 | 9.8 | 0.2 | 0.2 | |
| 2C | 60 | Tomaree PS, Salamander | 3 | 56.2 | 57.1 | 51.9 | | 53.2 | 64.4 | 64.5 | | 59.6 | 61.5 | 7.9 | | 7.5 | 7.4 | 7.3 | | 31.1 | 31.4 | 11.5 | | 17.0 | 2.5 | 2.2 | | 0.9 | 1.3 | 0.0 | | |
| 2C | 60 | Elernmore Vale PS, Elernmore | control | 52.8 | 52.7 | 51.9 | | 54.1 | 61.5 | 59.1 | | 61.1 | 62.9 | 8.7 | | 6.8 | 8.4 | 7.9 | | 17.1 | 12.9 | 15.5 | | 21.0 | 2.7 | 1.4 | | 2.8 | 2.4 | 0.5 | | |
| 2C | 60 | Tomaree PS, Salamander | 3 | 60.5 | 55.4 | 52.0 | | 50.6 | 66.6 | 63.1 | | 59.5 | 57.0 | 6.3 | | 7.2 | 7.4 | 5.9 | | 50.8 | 22.4 | 13.2 | | 3.9 | 6.5 | 1.9 | | 0.8 | 0.4 | 0.0 | | |
| 2C | 60 | Elernmore Vale PS, Elernmore | control | 56.0 | 53.4 | 68.6 | | 54.4 | 66.8 | 59.6 | | 77.0 | 59.6 | 11.0 | | 7.1 | 9.6 | 5.9 | | 20.7 | 11.8 | 80.5 | | 12.0 | 9.9 | 0.7 | | 53.9 | 1.6 | 3.6 | | |
| 3C | 70 | Mount Terry PS, Albion Park | 2 | 66.5 | 61.7 | 55.1 | | 57.8 | 76.2 | 70.7 | | 68.2 | 69.0 | 10.8 | | 11.5 | 10.4 | 10.0 | | 37.8 | 16.8 | 10.9 | | 9.2 | 10.8 | 6.3 | | 1.0 | 0.0 | 0.0 | | |
| 3C | | | no control | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3C | 70 | Mount Terry PS, Albion Park | 2 | 62.4 | 61.2 | 60.2 | | 61.2 | 71.8 | 69.9 | | 69.1 | 70.5 | 9.1 | | 9.7 | 9.2 | 8.9 | | 18.0 | 14.9 | 11.1 | | 15.3 | 4.1 | 3.1 | | 1.5 | 0.8 | 0.0 | | |
| 3C | | | no control | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4C | 60 | Edmund Rice College, Wollongong | 3 | 51.3 | 48.7 | 47.3 | | 47.1 | 58.2 | 56.4 | | 54.0 | 8.8 | | 8.4 | 8.6 | 7.9 | | 14.3 | 6.0 | 5.6 | | 3.6 | 1.6 | 0.0 | | 0.0 | 0.0 | 0.0 | | | |
| 4C | 60 | St Paul's PS, Albion Park | control | 48.5 | 47.3 | 46.5 | | 48.3 | 57.6 | 57.7 | | 54.7 | 59.3 | 10.6 | | 9.8 | 8.2 | 9.8 | | 11.5 | 9.8 | 5.4 | | 13.2 | 4.0 | 1.2 | | 0.0 | 2.1 | 0.0 | | |
| 4C | 60 | Edmund Rice College, Wollongong | 3 | 56.3 | 50.8 | 48.9 | | 52.0 | 64.0 | 57.8 | | 56.1 | 58.0 | 7.5 | | 7.8 | 7.2 | 6.8 | | 27.4 | 7.2 | 6.6 | | 9.8 | 1.8 | 0.0 | | 0.0 | 2.4 | 0.0 | | |
| 4C | 60 | St Paul's PS, Albion Park | control | | | | | 51.0 | | | | | 58.4 | | | | | | | | | | | | 10.7 | | | | | 0.6 | | |
| 5C | 60 | Blaxland PS, Blaxland | 1 | 69.6 | 65.2 | 62.5 | | 62.6 | 76.6 | 72.2 | | 68.6 | 69.0 | 7.3 | | 7.8 | 6.7 | 7.0 | | 3.9 | 2.9 | 0.6 | | 65.4 | 0.2 | 0.2 | | 0.0 | 13.3 | 0.0 | | |
| 5C | | | no control | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5C | 60 | Blaxland PS, Blaxland | 1 | 71.4 | 72.8 | 65.8 | | 67.9 | 78.5 | 79.6 | | 75.0 | 74.5 | 7.5 | | 6.5 | 9.4 | 8.1 | | 9.8 | 10.3 | 3.9 | | 87.2 | 0.8 | 0.6 | | 0.4 | 42.4 | 0.1 | | |
| 5C | | | no control | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6C | 70 | Dundas PS, Oatlands | 1 | 64.9 | 61.4 | 61.6 | | 60.2 | 74.0 | 69.0 | | 70.8 | 68.0 | 10.2 | | 8.7 | 10.1 | 9.2 | | 26.0 | 11.9 | 15.6 | | 7.9 | 6.4 | 1.8 | | 3.6 | 1.2 | 1.3 | | |
| 6C | 70 | Gordon West PS, Pymble | control | 51.8 | 49.2 | 53.6 | | 49.1 | 66.4 | 62.9 | | 66.4 | 63.5 | 13.7 | | 13.1 | 12.7 | 13.3 | | 5.9 | 4.2 | 6.7 | | 4.0 | 0.4 | 0.3 | | 0.2 | 0.6 | 0.0 | | |
| 6C | 70 | Dundas PS, Oatlands | 1 | 50.7 | 52.2 | 46.6 | | 48.0 | 60.2 | 64.7 | | 56.1 | 57.5 | 9.0 | | 11.8 | 8.6 | 8.6 | | 1.5 | 5.9 | 0.6 | | 0.3 | 0.2 | 2.3 | | 0.0 | 0.0 | 0.0 | | |
| 6C | 70 | Gordon West PS, Pymble | control | 61.8 | 58.9 | 58.4 | | 55.7 | 70.6 | 67.9 | | 66.9 | 64.0 | 10.1 | | 9.4 | 8.6 | 10.4 | | 14.0 | 7.5 | 6.7 | | 3.7 | 2.7 | 0.6 | | 1.0 | 0.2 | 1.3 | | |
| <i>Flashing light sites that commenced operation earlier: Period 1 (Before - no data), Period 2 (1st after - 18 months) = Mar/Jun-04, Period 3 (2nd after - 21 months) = Oct/Dec-05, Period 4 (3rd after - 27 months) = Feb/Mar-05</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7D | 50 | Holbrook PS & St Patrick's PS, Holbrook | 2 | 41.3 | 45.1 | 43.3 | | 45.5 | 50.5 | 48.5 | | 48.5 | | | | 4.9 | 6.2 | 6.0 | | 3.5 | 14.4 | | | 6.1 | | | | 0.0 | 0.0 | 0.4 | | |
| 7D | 50 | Griffith East & Griffith Catholic School, Griffith | control | 48.6 | 51.3 | 49.3 | | 54.5 | 57.0 | 55.0 | | 55.0 | | | | 6.2 | 6.0 | 5.6 | | 34.0 | 55.1 | 40.3 | | 3.4 | 6.8 | 2.7 | | 0.0 | 0.9 | 0.2 | | |
| 7D | 50 | Holbrook PS & St Patrick's PS, Holbrook | 2 | 44.0 | 56.4 | 45.6 | | 51.3 | 65.5 | 52.5 | | 52.5 | | | | 6.9 | 8.5 | 7.0 | | 17.5 | 74.0 | 22.6 | | 1.5 | 31.3 | 2.4 | | 0.0 | 7.5 | 0.2 | | |
| 7D | 50 | Griffith East & Griffith Catholic School, Griffith | control | 49.5 | 47.1 | 47.8 | | 57.0 | 54.0 | 55.4 | | 55.4 | | | | 7.8 | 7.1 | 7.6 | | 51.3 | 32.2 | 35.6 | | 9.4 | 2.6 | 4.3 | | 0.6 | 0.0 | 0.0 | | |
| 8D | 100 | Holmwood PS, Cowra | 2 | 84.3 | 85.5 | 89.9 | | 95.0 | 96.0 | 101.5 | | 101.5 | | | | 12.6 | 11.5 | 12.7 | | 2.6 | 2.9 | 19.9 | | 0.4 | 0.0 | 0.4 | | 0.0 | 0.0 | 0.0 | | |
| 8D | 100 | Bullarah PS, Moree | control | 97.6 | 95.7 | 80.5 | | 110.8 | 104.7 | 100.2 | | 100.2 | | | | 18.9 | 11.9 | 17.8 | | 43.7 | 33.7 | 13.6 | | 12.7 | 7.2 | 3.1 | | 8.4 | 2.4 | 0.6 | | |
| 8D | 100 | Holmwood PS, Cowra | 2 | 88.8 | 88.2 | 91.8 | | 100.0 | 100.0 | 102.8 | | 102.8 | | | | 14.1 | 15.2 | 13.3 | | 14.2 | 15.5 | 26.1 | | 0.0 | 0.6 | 0.5 | | 0.0 | 0.0 | 0.0 | | |
| 8D | 100 | Bullarah PS, Moree | control | 86.7 | 94.0 | 94.1 | | 98.9 | 102.3 | 102.6 | | 102.6 | | | | 14.4 | 13.7 | 10.5 | | 14.3 | 26.1 | 26.4 | | 1.6 | 13.0 | 4.1 | | 1.6 | 6.5 | | | |

| Site No. | Speed limit | School | Flashing lights (FL) & 'Slow Down' only signs | Mean speed (km/h) | | | | 85 th percentile speed (km/h) | | | | Standard deviation (km/h) | | | | % travelling above speed limit | | | | % ≥10 km/h above speed limit | | | | % ≥20 km/h above speed limit | | | | % ≥30 km/h above speed limit | | | |
|----------|-------------|----------------------|---|-------------------|------|------|---|--|------|------|---|---------------------------|------|-----|---|--------------------------------|------|------|---|------------------------------|-----|------|---|------------------------------|-----|-----|---|------------------------------|-----|-----|---|
| | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | | Period | | | |
| | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| I1D | 60 | Waitara PS, Waitara | 3 | 53.2 | 52.6 | 52.2 | | 58.2 | 60.0 | 58.0 | | 9.0 | 7.0 | 6.9 | | 9.4 | 14.2 | 8.9 | | 3.6 | 1.3 | 1.6 | | 2.1 | 0.0 | 0.7 | | 1.2 | 0.0 | 0.0 | |
| I1D | 60 | Punchbowl PS, Sydney | control | 53.3 | 53.5 | 53.0 | | 63.0 | 63.5 | 63.1 | | 10.1 | 10.1 | 9.9 | | 25.3 | 27.3 | 24.2 | | 3.8 | 3.2 | 3.2 | | 0.3 | 0.1 | 0.1 | | 0.0 | 0.0 | 0.0 | |
| I1D | 60 | Waitara PS, Waitara | 3 | 59.8 | 56.7 | 61.9 | | 68.1 | 63.0 | 69.0 | | 8.9 | 8.1 | 7.4 | | 43.2 | 27.5 | 59.0 | | 12.4 | 6.1 | 14.9 | | 5.8 | 0.7 | 1.1 | | 0.3 | 0.0 | 0.0 | |
| I1D | 60 | Punchbowl PS, Sydney | control | 46.3 | 46.1 | 48.1 | | 55.0 | 56.0 | 57.5 | | 8.4 | 9.6 | 8.6 | | 4.5 | 6.6 | 6.8 | | 0.3 | 0.4 | 0.7 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | |

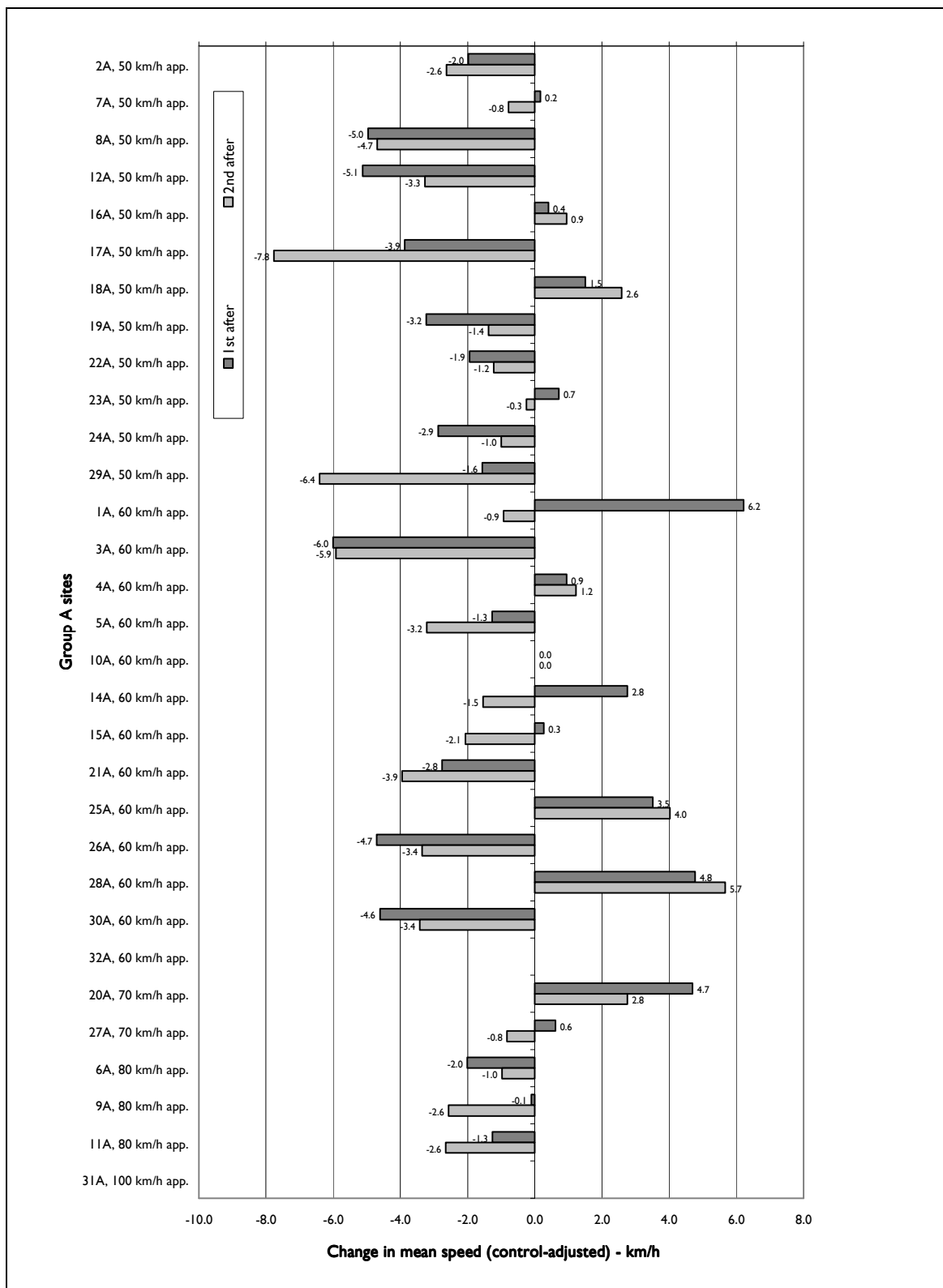


Figure A I: Changes in mean speeds (control-adjusted) at Group A sites, sorted by approach speed limit (all vehicles)

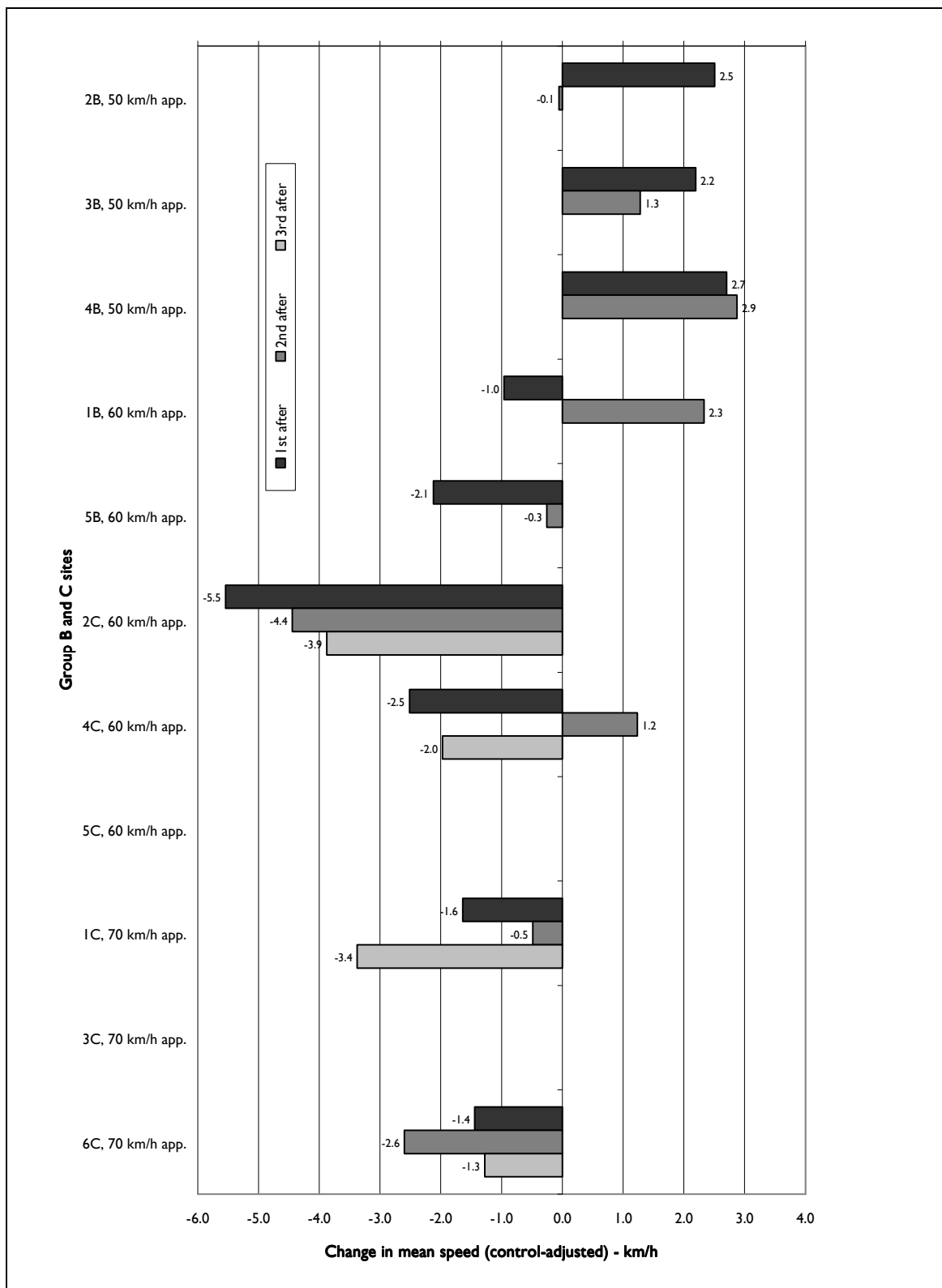


Figure A 2: Changes in mean speeds (control-adjusted) at Group B and C sites, sorted by approach speed limit (all vehicles)

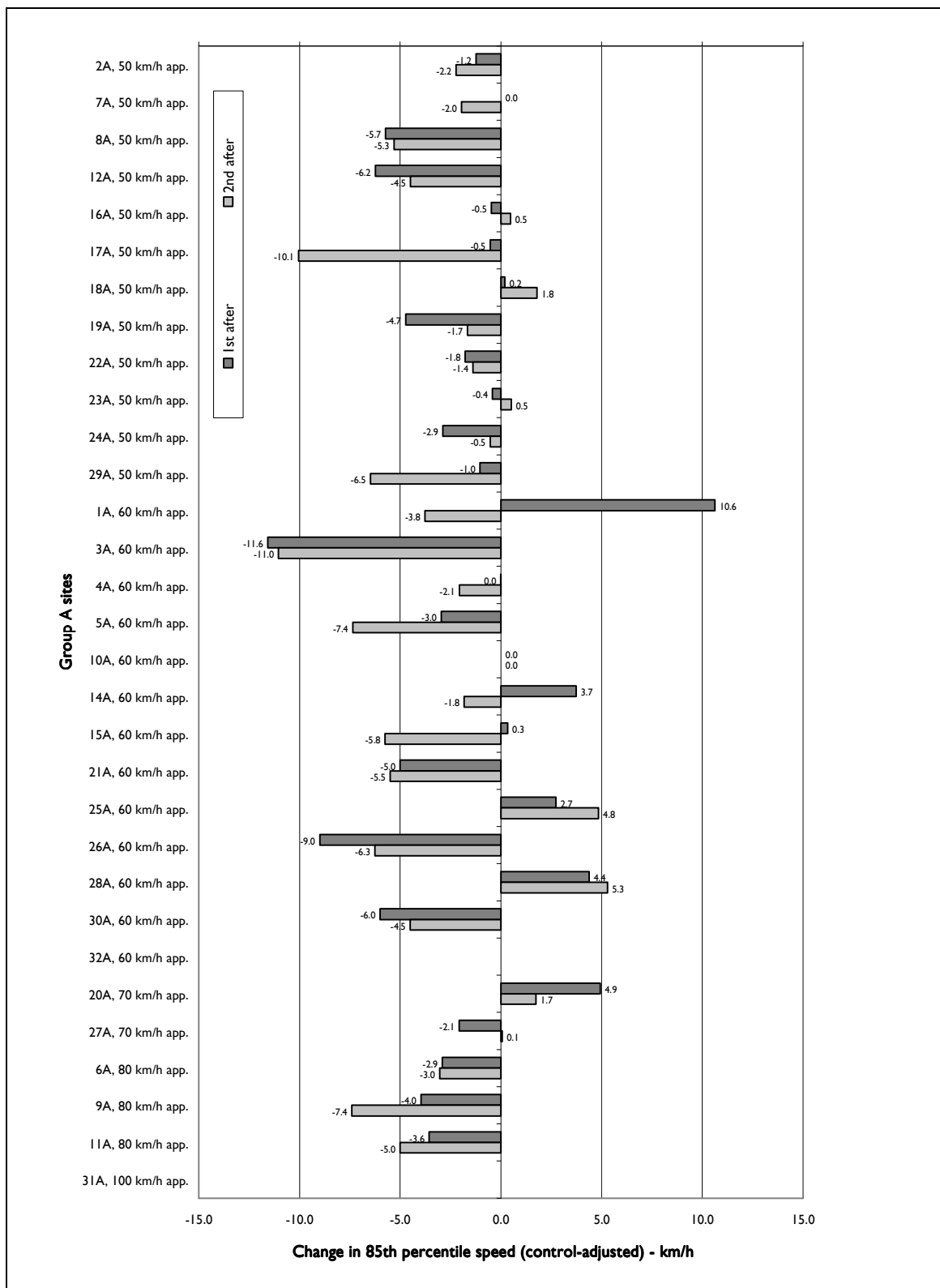


Figure A 3: Changes in 85th percentile speeds (control-adjusted) at Group A sites, sorted by approach speed limit (all vehicles)

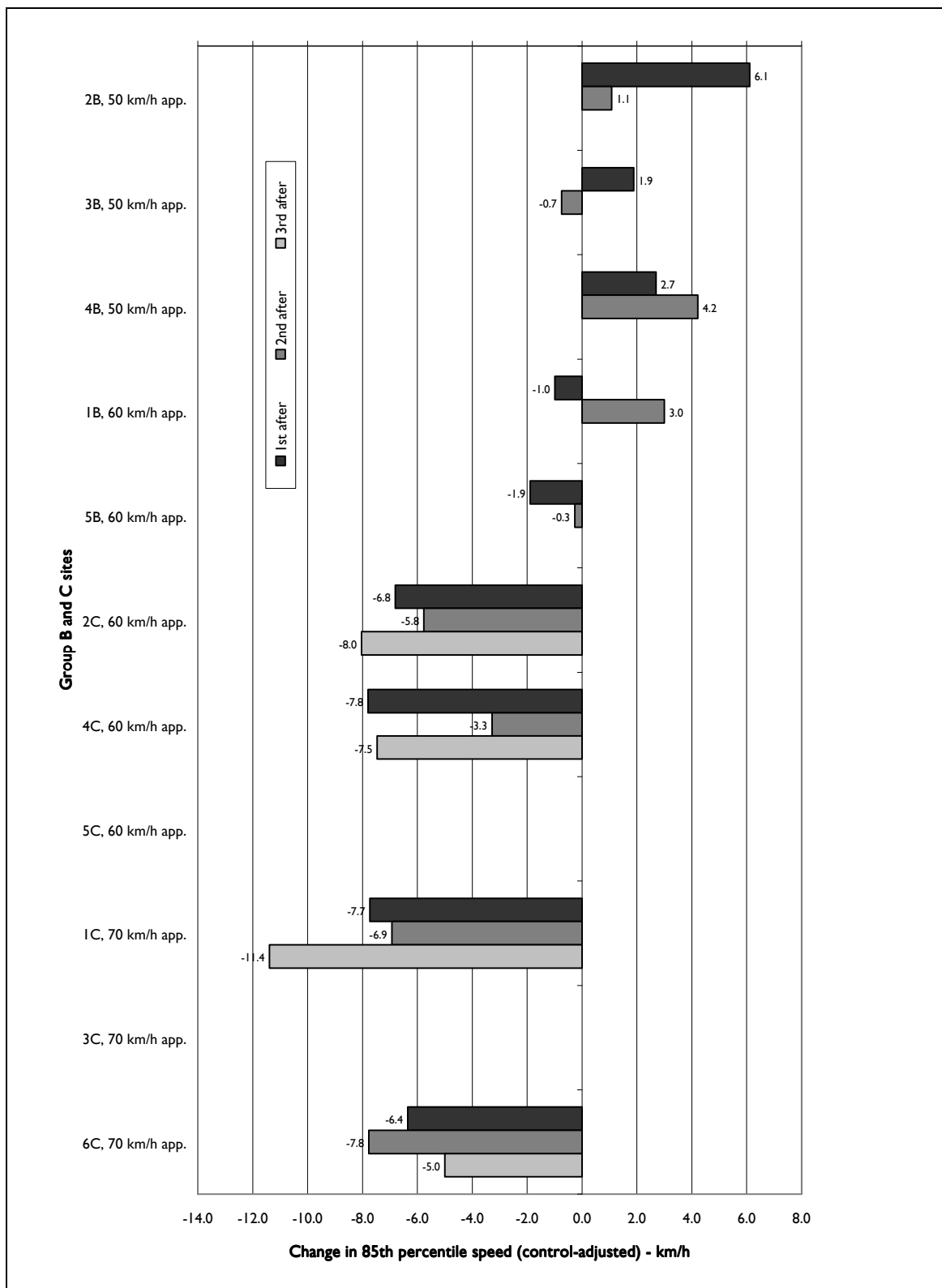


Figure A 4: Changes in 85th percentile speeds (control-adjusted) at Group B and C sites, sorted by approach speed limit (all vehicles)

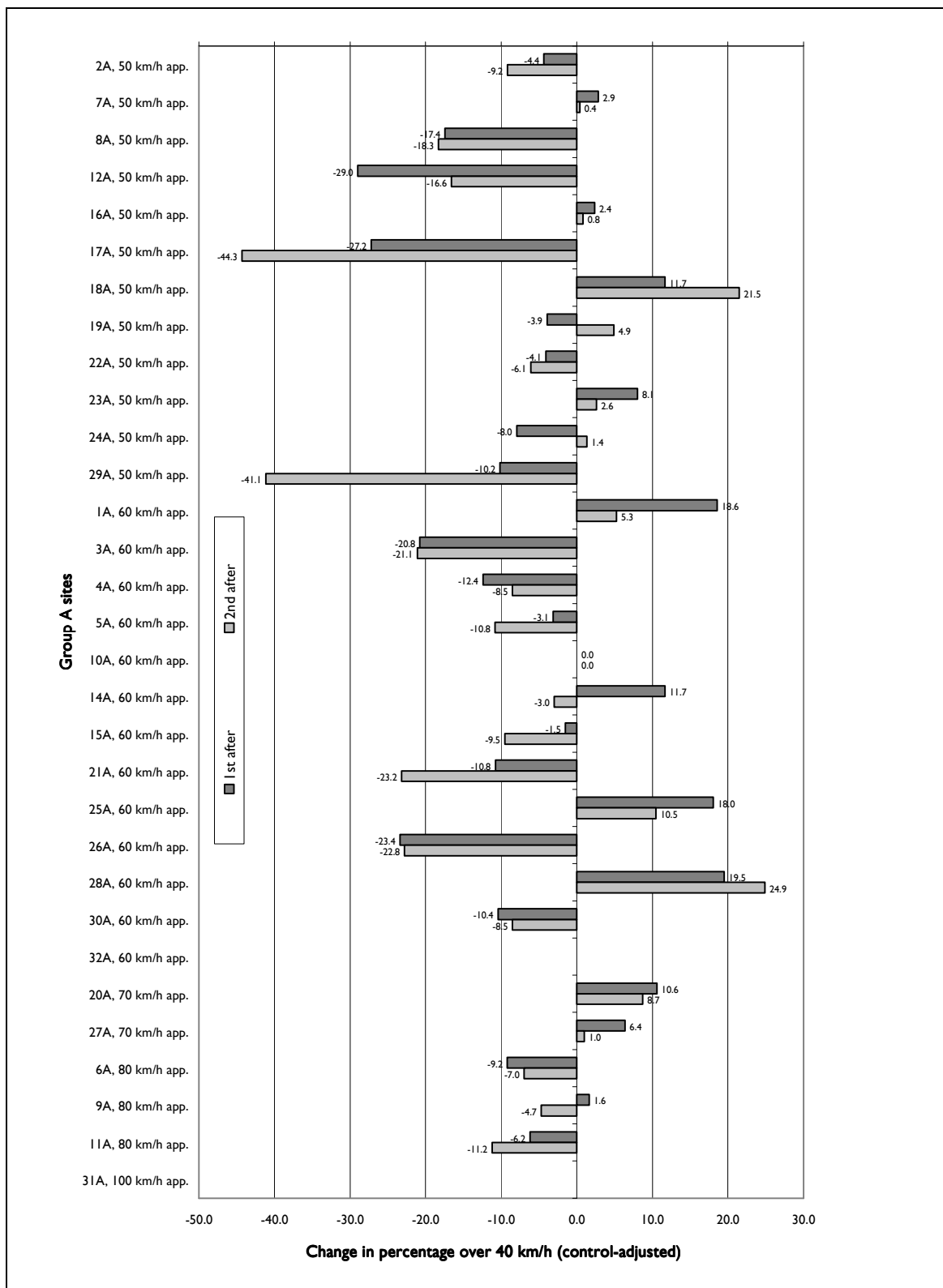


Figure A 5: Changes in proportion over 40 km/h (control-adjusted) at Group A sites, sorted by approach speed limit (all vehicles)

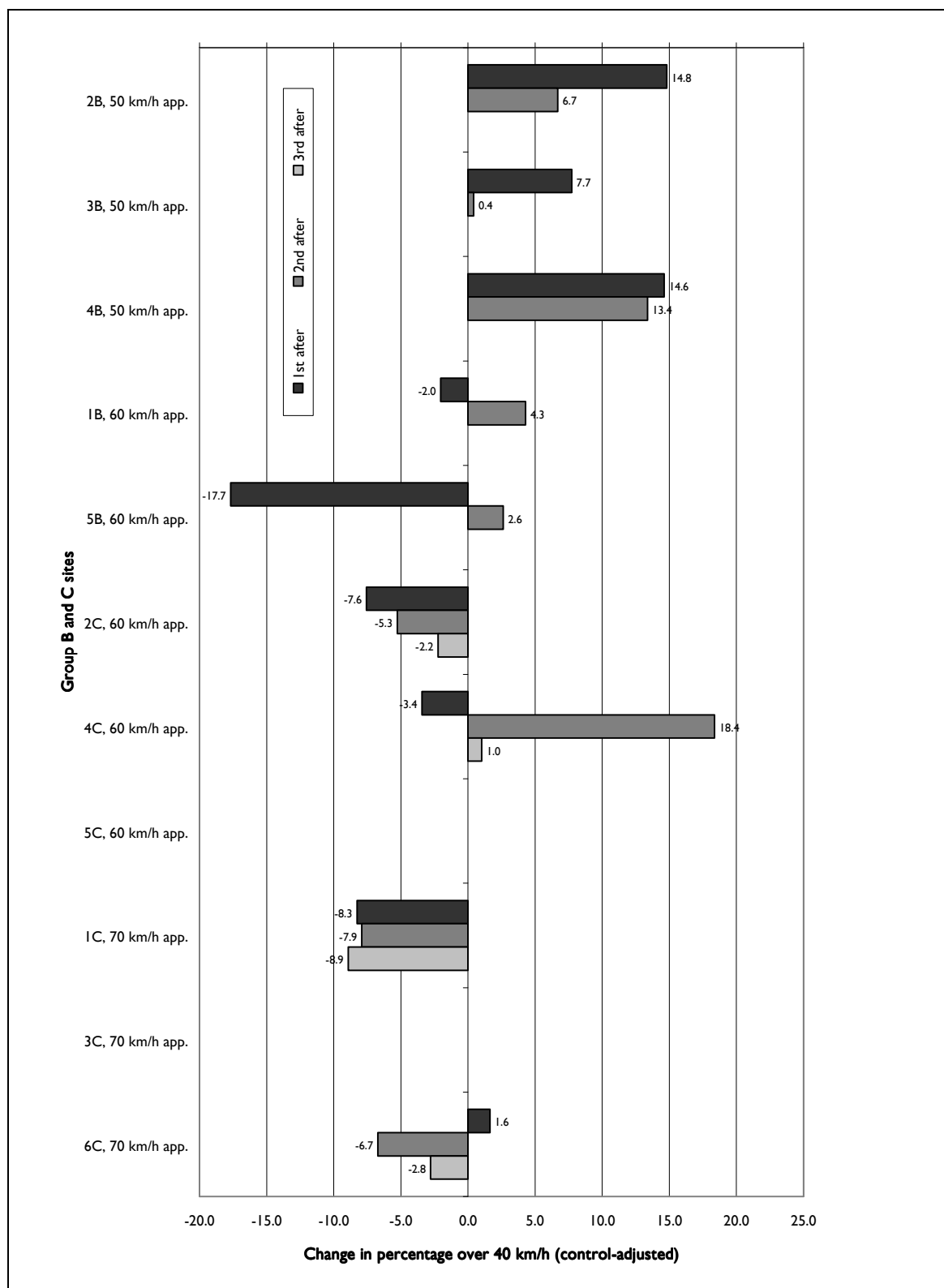


Figure A 6: Changes in proportion over 40 km/h (control-adjusted) at Group B and C sites, sorted by approach speed limit (all vehicles)

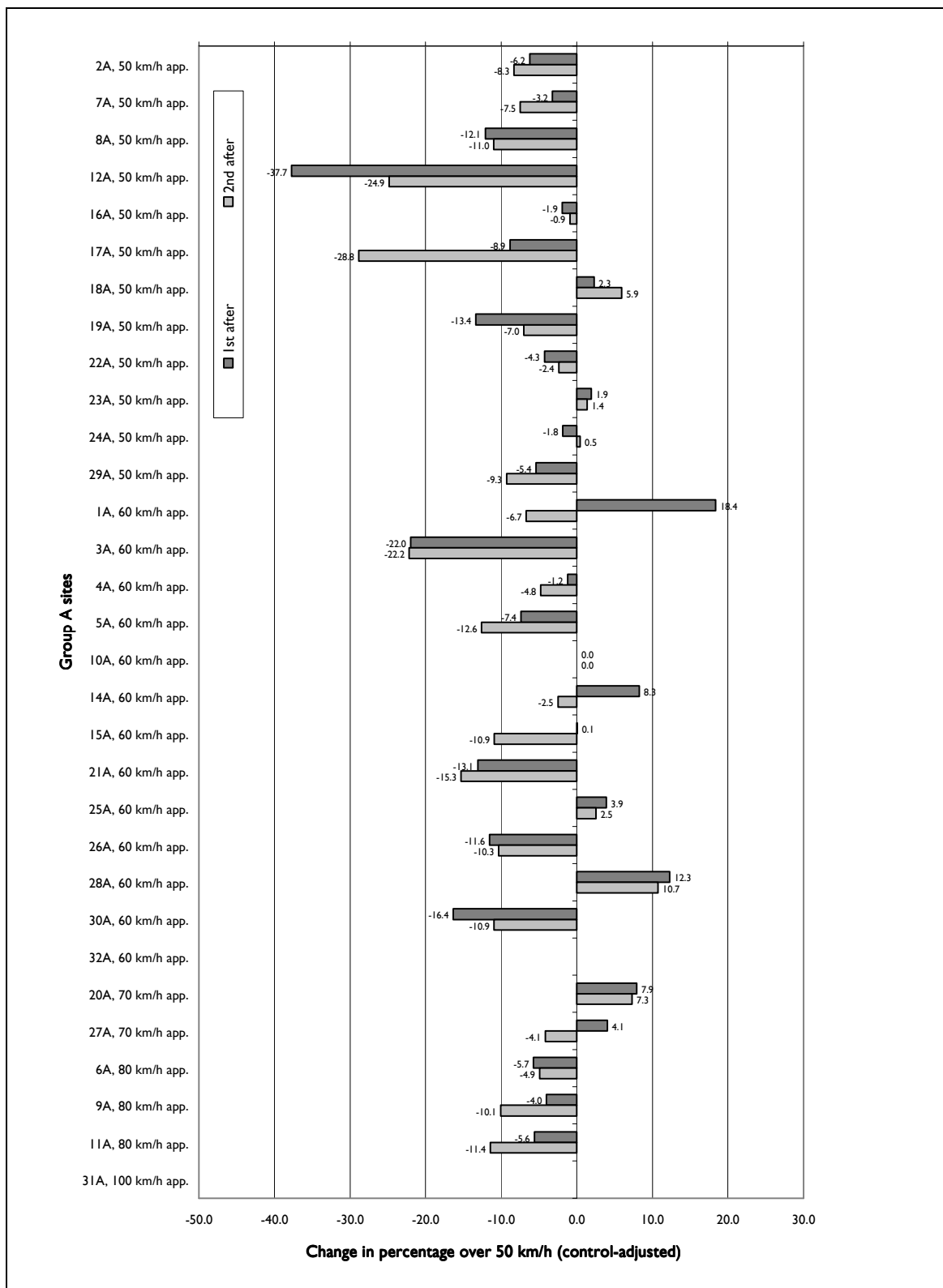


Figure A 7: Changes in proportion over 50 km/h (control-adjusted) at Group A sites, sorted by approach speed limit (all vehicles)

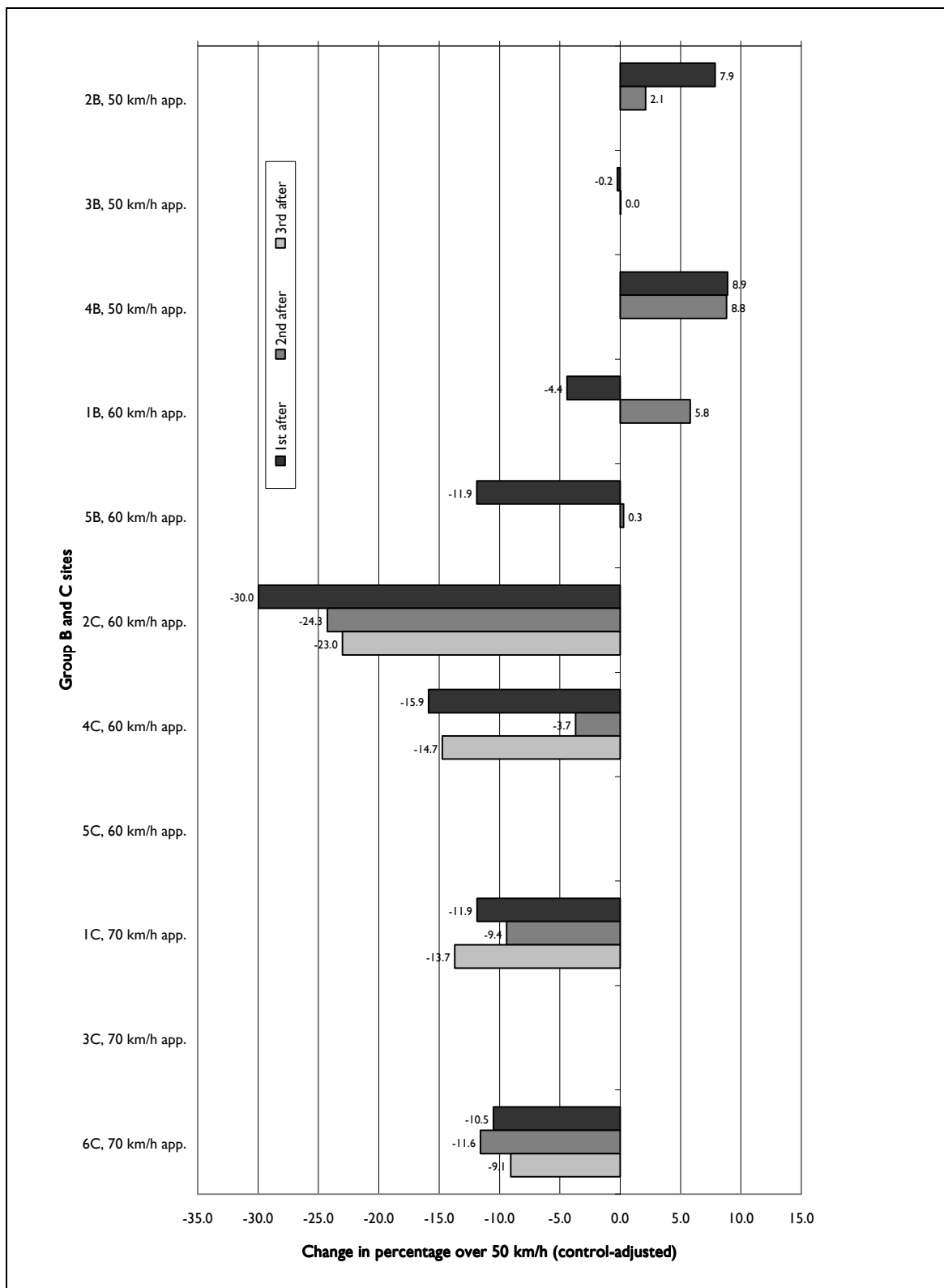


Figure A 8: Changes in proportion over 50 km/h (control-adjusted) at Group B and C sites, sorted by approach speed limit (all vehicles)

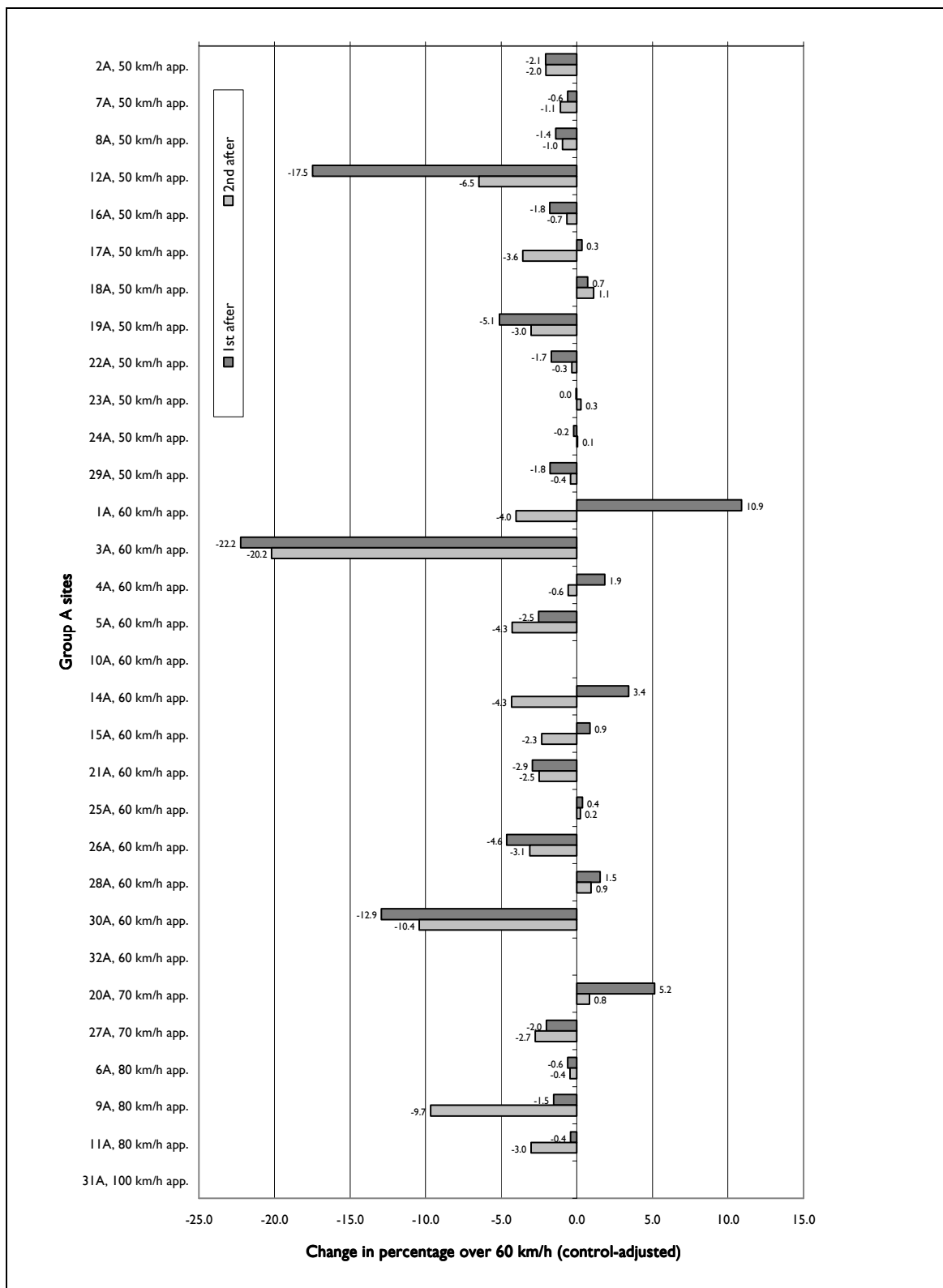


Figure A 9: Changes in proportion over 60 km/h (control-adjusted) at Group A sites, sorted by approach speed limit (all vehicles)

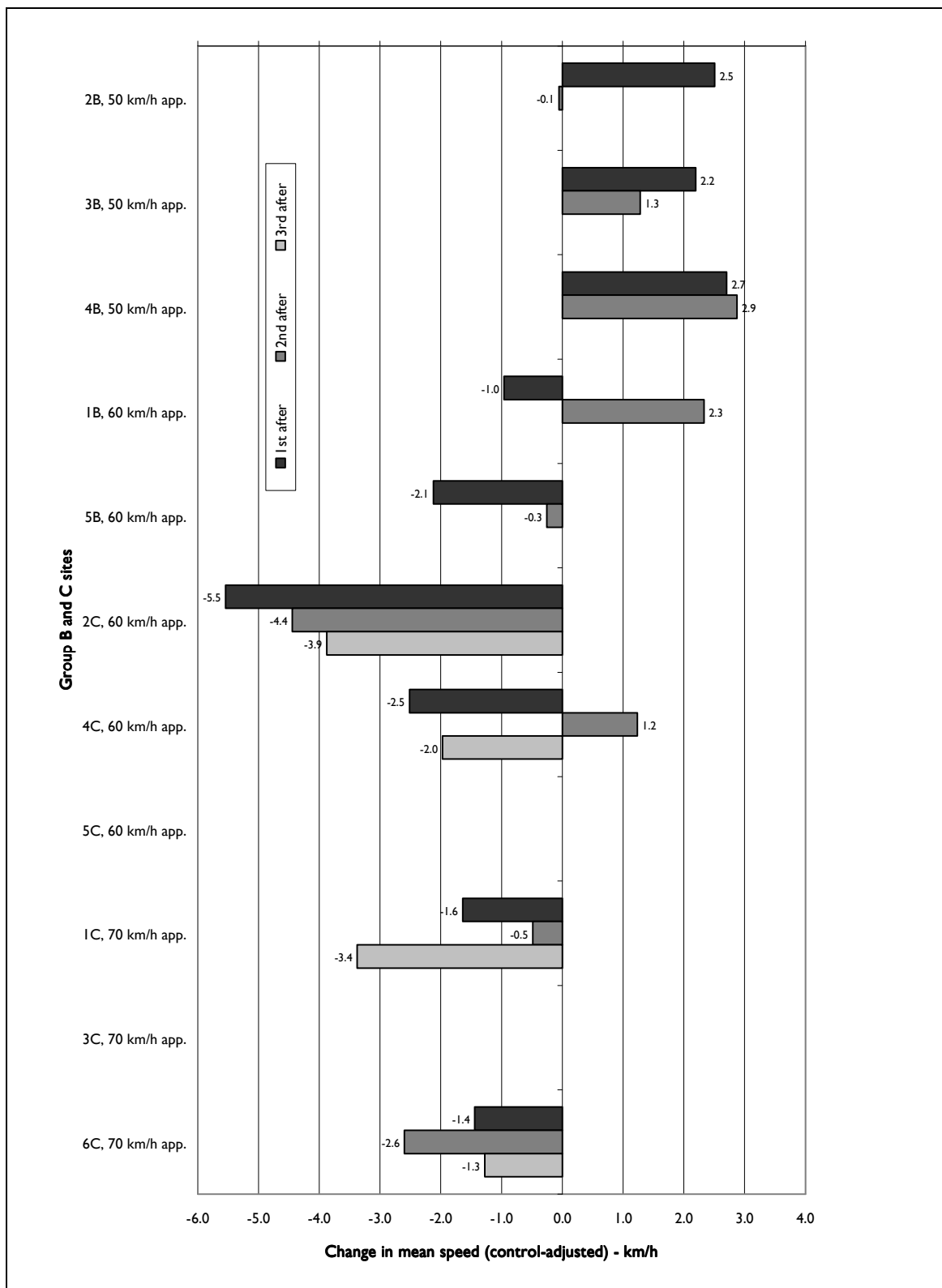


Figure A 10: Changes in proportion over 60 km/h (control-adjusted) at Group B and C sites, sorted by approach speed limit (all vehicles)

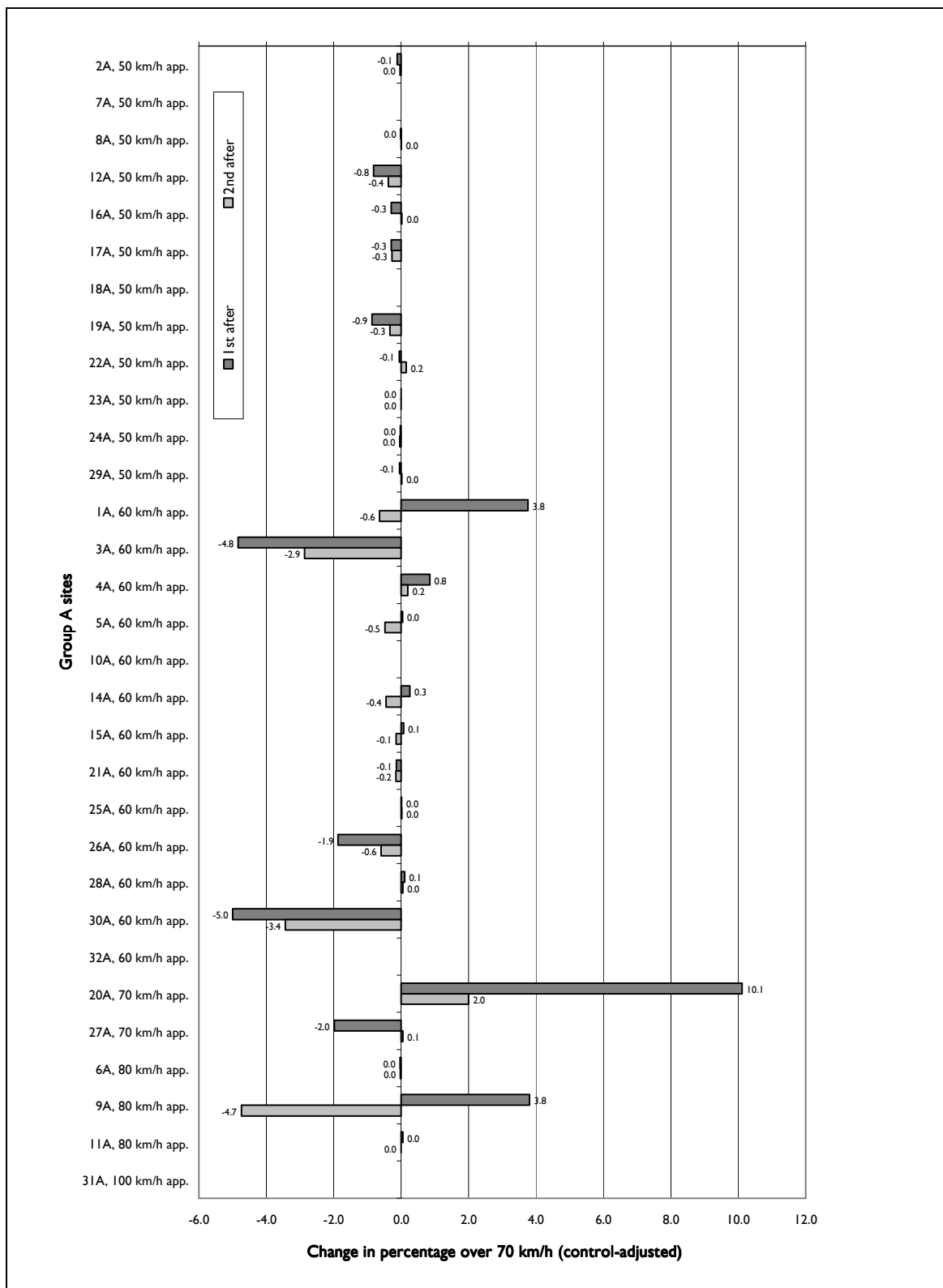


Figure A 11: Changes in proportion over 70 km/h (control-adjusted) at Group A sites, sorted by approach speed limit (all vehicles)

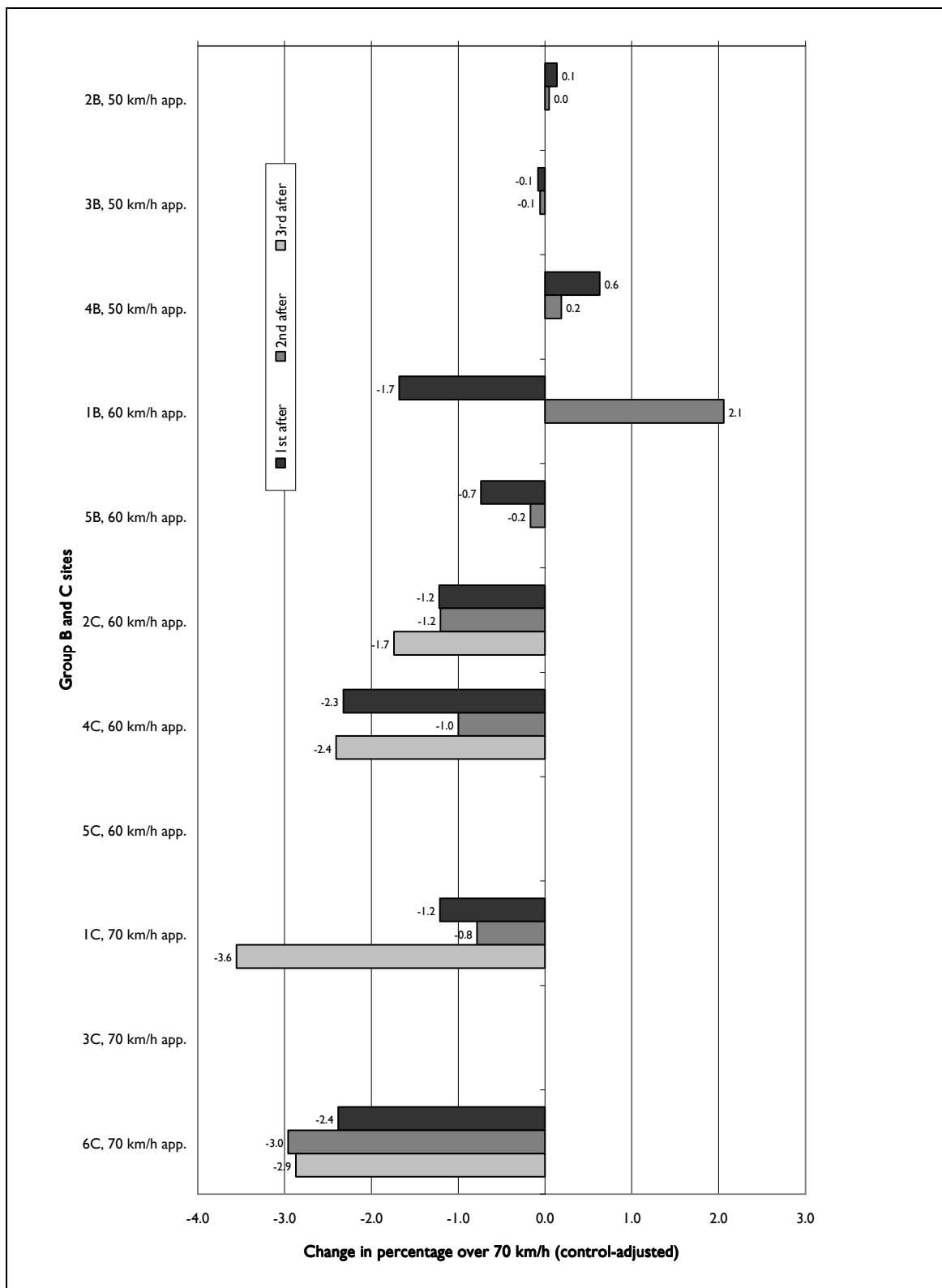


Figure A 12: Changes in proportion over 70 km/h (control-adjusted) at Group B and C sites, sorted by approach speed limit (all vehicles)