

## **Title**

**Christchurch's 40km/h Part Time School Speed Zone Trial: Community Perceptions and Attitudes**

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## **Abstract**

Christchurch's two year part time 40km/h school speed zone (SSZ) trial started in January 2000. An evaluation of the trial has been carried out by the city council in terms of attitudes and perceptions of its effectiveness. The five school communities involved and a section of the general driving public were surveyed. Results show a high level of support for SSZ, and for their extension. They were seen by respondents to slow vehicle speeds, raise driver awareness of children, and increase the safety of children. Within the high regard shown for SSZ, analysis also showed an effect of reduced impact of them for respondents who drove through a SSZ site frequently. The electronic lights activated during the before and after school period when the school speed zone operates were felt to be an important feature to driver behaviour modification.

**Keywords:** School speed zone, children, safety

## **Introduction**

There have been widespread community concerns regarding the safety of the school journey. In Christchurch, 'Safe Routes To School' surveys show road safety issues to be the main barrier for children to travel actively to school. To address some of these concerns, a part time 40km/h 'school speed zone' (SSZ) trial was started in Christchurch in January 2000, to run until December 2001. The SSZ trial sought to increase driver awareness when traveling within school zones and to modify their behaviour. Providing a safer environment for child pedestrians and cyclists was also a priority. Five trial schools were selected, covering a variety of roading environments. These included combinations of urban and rural areas, 50km/h, 60km/h, and 70km/h speed environments, and varying traffic volumes. The trial has seen for the first time in New Zealand the use of electronic variable speed limit signs to define the school zone. These 'activated lights' show the 40km/h part time speed limit, as well as producing alternately flashing lights in the corners of the signs, during the before and after school period.

The Land Transport Safety Authority has conducted speed surveys of the SSZ, which are the subject of a separate paper at this conference. Evaluation of the SSZ by the Christchurch City Council to date has been through observation and monitoring of the trial, and through counts of children walking or cycling at the five schools. Observation to date points to drivers checking their speeds when traveling through the SSZ. The counts of child travel before the SSZ and since its introduction show a static pattern of walking or cycling to school. A self administered survey was carried out with the school communities concerned and the general driving public to find out the attitudes towards, and perceptions of the effectiveness of, the SSZ both in its current form and its possible future use. Following the trial it is planned to develop criteria to determine where the most appropriate locations are for installing SSZ, which this paper seeks to contribute to.

## **Survey Method**

The survey consisted of three independent variables of the frequency of driving through the SSZ, the commonest location this took place at, and respondent status (by parentage and residence). Four dependent variables relating to the current operation of the SSZ were constructed on a range of three to five point

Likert type scales. These were any noticing of change in vehicle speeds, how often respondents drove through SSZ at or below 40km/h, how SSZ affected their awareness of children, and if the SSZ have affected the safety of child pedestrians and cyclists.

Eight further dependent variables were concerned with the future operation of SSZ. Of these, the three featuring yes or no responses were whether or not the SSZ were a good idea, if they should be more of them, and if they would lead to more children walking or cycling to school if located in the respondent's area. How SSZ would be obeyed if they were in activated lights or fluorescent sign only format were two variables with five point Likert type scale questions. Open-ended questions on what the SSZ speed limit should be in 50km/h, 60km/h, and 70km/h areas made up the remaining three variables. Space was also made for respondent comments for several questions.

The first phase of the survey took place during late 2000, when the survey was sent to all families at the five trial schools. Samples of 100 surveys each were distributed to residents on the immediate streets near the schools. The survey was also made available to the public of Christchurch through council libraries, service centres and through the internet via the council web site.

The second survey phase took place in early 2001 when members of the New Zealand Automobile Association were sampled using a Christchurch postal area that had a broad socioeconomic cross-section. Response rates were 23% for school families, 37% for SSZ residents (assisted by a response incentive) and 15% for the automobile association sample. Fifty-six returns were received from the general public. In all 549 returns were received, with 231 of these coming from school families in the SSZ.

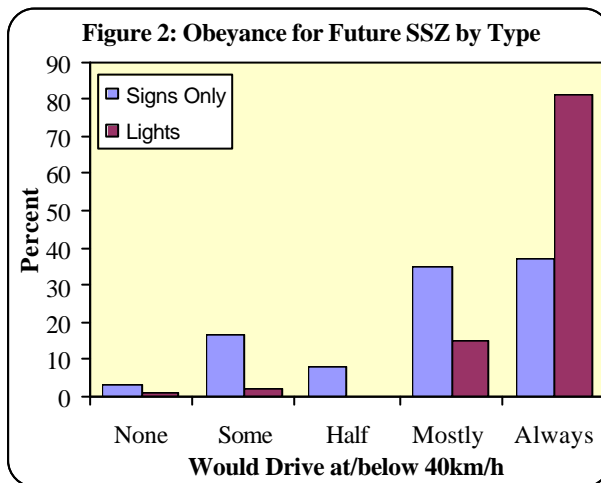
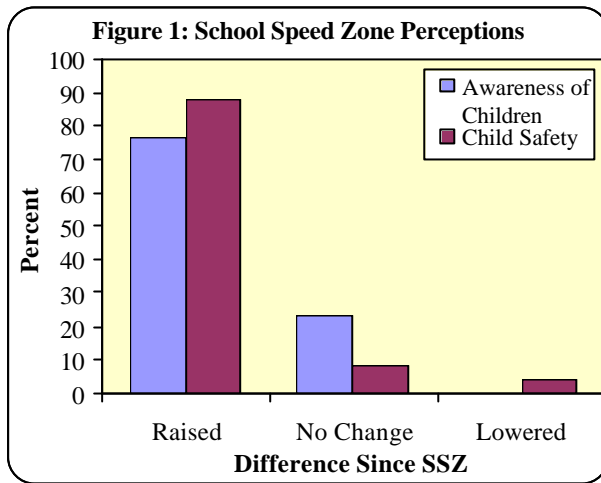
## **Results**

### **Quantitative Responses**

Respondents were reasonably distributed across the five SSZ locations in terms of the most frequently driven through SSZ, with a range of 18% to 24%. A good distribution was also obtained for the frequency of driving through a particular SSZ, with the five response options producing a range of 15% to 23%.

Overall responses to the dependent variable questions showed high levels of both perceived personal and public compliance for the SSZ, along with high ratings of both raised awareness of and improved safety for children. Very high support was obtained for SSZ being both a good idea and that they should be continued. Strong support was received for the future use of SSZ in its current activated light format, but not so much for the use of fluorescent signs only. Most respondents were content with a 40km/h limit applying in SSZ whether in a 50, 60 or 70km/h environment. Excluding the question relating to whether or not parents would allow more walking or cycling to school in a SSZ (since not all respondents could answer), there was an average valid response rate of 85% to these questions. Figure 1 and Figure 2 illustrate some of these findings. In summary, the responses showed that:

- ?? 96% noticed lower vehicle speeds in SSZ since their inception
- ?? 81% said that they drove at or below 40km/h when the SSZ was active
- ?? 77% stated a raised awareness of children due to the SSZ
- ?? 88% thought that SSZ have increased the safety of child pedestrians and cyclists
- ?? 96% said that the SSZ are a good idea
- ?? 92% answered that they would like to see more SSZ in Christchurch
- ?? 81% would drive at or below 40km/h all of the time in future SSZ using activated lights
- ?? 37% would drive at or below 40km/h all of the time in future SSZ using fluorescent signs only
- ?? A preferred SSZ speed limit of 40km/h in 50km/h, 60km/h and 70km/h areas by 62%, 62% and 56% of respondents respectively
- ?? 57% of parents who answered stating that future SSZ would encourage more walking or cycling to school by their children (valid n=319)



**Qualitative Comments**

Comments provided by respondents for several questions were post coded to identify common themes, with respondent comments sometimes containing several themes. For both how the SSZ affected the safety of children, and if they were a good idea, the main themes mentioned were of lower speeds (n = 201 and 230), improved child safety (n = 145 and 208), greater awareness of both children (n = 142 and 145) and schools (n = 59 and 67). A key reason for the high levels of support was that drivers were happy to comply with the lower speed limit as it was only a temporary restriction during the day whose merit was strongly recognised.

In terms of whether the SSZ should be extended, responses centred around improved child safety, greater child awareness, and lower vehicle speeds. Other factors identified included some respondents stating that SSZ should be at all schools, while others felt they should only be at selected schools. Table 1 and Table 2 show the categories mentioned for general comments on the safety of children and if the SSZ should be extended.

For those saying that future SSZ would lead to their children walking and cycling more, key reasons given were to do with the perceived safer roads (n = 88) and lower vehicle speeds (n = 28). For those saying that further SSZ would not lead to their children walking or cycling any more than they do now, comments focused on the roads still being unsafe (n = 39), and the distance to school (n = 26). A space for general

comments at the end of the survey was highlighted by a large number of comments stating that the SSZ were worthwhile and should stay (n = 176).

**Table 1: Comments on how the SSZ has affected the safety of children**

Category	No.
Lower Speeds Produced	201
Higher Child Safety	145
Greater Child Awareness	142
Greater School Awareness	59
No Difference	24
Need More Safety Measures	7
Other	37

**Table 2: Comments on if there should be more SSZ**

Category	No.
For Higher Child Safety	221
For Greater Child Awareness	107
Need at some Schools	67
For Lower Speeds Produced	65
Need at all Schools	62
Need More Safety Measures	18
Other	19

### Tests of Significance

Most variables were recoded in order to carry out significance testing between the initial three independent and twelve dependent variables. Most of the recoding either compressed categories which had few responses, or determined groups within the independent variables. To examine the location variable more closely, two variables of normal road speed limit (50km/h and over 50km/h) and traffic volume (nominal labels of high and low) were created to replace the location variable. To mitigate against possible bias from the school parent sample, the parental status variable was divided into two variables, parent and non-parent, each of which had the two levels of residing in a SSZ community or outside of it. A total of five independent variables were used, along with ten dependent variables (with over a 90% response in the affirmative, the variables asking if SSZ were a good idea and if there should be more of them were dropped). The recoding resulted in either two or three levels for all variables. Given that recoding occurred (including the SSZ speed preferences for various speed environments), and that some of the sampling was not strictly random, chi-square tests of significance were used.

**Table 3: Significant Chi-Square Tests**

Independent Variable	Dependent Variable	Result (p<0.05)	Relationship	Interpretation
<b>Frequency (F)</b>	Driving Speed	X <sup>2</sup> (4,459) = 16.99	Negative	If higher F, lower driving at/below 40km/h
	Child Safety	X <sup>2</sup> (4,393) = 11.21	Negative	If higher F, lower level of child safety perceived
	Signs Obedance	X <sup>2</sup> (4,427) = 15.93	Negative	If higher F, lower level of future sign obedance
	More Chn Walk	X <sup>2</sup> (2,250) = 7.03	Negative	If higher F, lower level of future child walk/cycle
<b>Traffic Volume (TV)</b>	Signs Obedance	X <sup>2</sup> (2,419) = 11.34	Positive	If higher TV, higher level of future sign obedance
	More Chn Walk	X <sup>2</sup> (1,247) = 5.39	Positive	If higher TV, higher level of future child walk/cycle
<b>Speed Limit (SL)</b>	Signs Obedance	X <sup>2</sup> (2,419) = 9.53	Negative	If lower SL, higher level of future sign obedance
<b>Parents (P)</b>	Lights Obedance	X <sup>2</sup> (2,321) = 9.85	Positive	If SSZ parents, higher level of future lights obedance
	Signs Obedance	X <sup>2</sup> (2,311) = 8.64	Negative	If SSZ parents, lower level of future sign obedance
<b>Non Parents (NP)</b>	Vehicle Speeds	X <sup>2</sup> (1,147) = 3.99	Positive	If SSZ residents, see lower vehicle speeds
	More Chn Walk	X <sup>2</sup> (1, 55) = 5.66	Positive	If SSZ residents, higher level of future chn walking
	60k Preference	X <sup>2</sup> (2,154) = 10.53	Negative	If SSZ residents, higher SSZ limit in 60km/h area

Those statistical test that were significant are listed in Table 3, using a 0.05 level of significance. A positive relationship indicates that the observed correlation had a direct relationship with the order of levels within variables (e.g. the higher the traffic volume on the SSZ most driven through, the more likely respondents would allow their children to walk or cycle in future SSZ). A negative relationship implies the opposite finding (e.g. the higher the frequency with which respondents drove through a SSZ, the less likely they were to drive at or below 40km/h).

## **Discussion**

The main theme to emerge from the significance testing related to the frequency with which respondents drove through the SSZ. This independent variable was borne out in four correlations, three of which produced the strongest chi-square values overall. All had a negative relationship, i.e. as the frequency of driving through a SSZ increases, then their impact declines. For the current SSZ situation, this was found for how fast respondents drove through SSZ, and their perceived safety of children. Exploratory questions relating to use of signs only and if more children would walk or cycle if more SSZ were installed were also related to the frequency variable in this sense. Of a minor nature, support for such a finding of diminishing impact comes from two further correlations involving exploratory variables. The first shows that parents in a SSZ area would be less inclined to travel at or below 40km/h in a SSZ using signs only compared to parents outside SSZ areas. The second exploratory variable shows that SSZ residents who were not parents had a higher ideal SSZ speed preference for 60km/h environments than those non-parents living outside SSZ areas do. In all, six of the twelve correlations found support the diminishing impact theme.

The dependent variable that stood out the most in testing was the question relating to signs, which had four correlations. Three were of a negative relationship. With the road volume (positive) and respondent frequency (negative) variables somewhat contradicting each other, a tenable explanation would be that any use of signs only in future SSZ would be appropriate in lower speed environments. In contrast, respondent compliance with activated lights was at a high and similar level across the variables of respondent frequency, speed environment and road volume.

## **Conclusions**

Strong overall support for the SSZ was found in the survey. Their concept was well liked, with a firm desire to see them installed in other school communities. The SSZ were perceived as working well in terms of driver obedience presently and in the future in their current form. For example, the same figure of 81% was found for those respondents stating that they currently drive at or below 40km/h in SSZ areas, and for those who stated that they would do likewise with future light activated SSZ. Awareness of children and an improvement in their safety as pedestrians and cyclists was widely perceived to have occurred. Consistent among respondent comments were that SSZ worked to improve child road safety through lowering vehicle speeds and raising driver awareness of children and the presence of schools. Key to their acceptance was that SSZ imposed little inconvenience to drivers since they were only a temporary day time restriction on their journey.

Although a cautionary note, it should be borne in mind that the respondent frequency findings of a diminishing impact of SSZ are a subtext within a framework of strong support for SSZ. It should also be noted that the self reported high awareness levels of children was the same regardless of respondent frequency through SSZ, thereby producing a tangible benefit of SSZ in its own right. Given the findings of this survey, prioritisation of the activated lights implementation would suggest that they be installed in higher – i.e. greater than 50km/h – speed environments. Wherever they are to be installed in future, they seem sure to enjoy a high level of public acceptance.

## **Acknowledgments**

The author would like to thank City Streets Unit colleagues from the Christchurch City Council for their assistance in developing the survey. Appreciation also goes to Kath Jamieson (CCC), Wayne Osmers (Land Transport Safety Authority) and Susan Cambridge (Christchurch Road Safety Coordinator) in this regard.