

# Evaluation of the Speed Trailer as a Community Road Safety Resource in Christchurch

Susan Cambridge<sup>1</sup>; Wayne Osmer<sup>2</sup> (Presenter); Tony Francis<sup>3</sup>  
<sup>1</sup>Christchurch City Council; <sup>2</sup>Land Transport Safety Authority;  
<sup>3</sup>Francis and Cambridge Ltd

## Biography

Wayne Osmer is Regional Engineer in the Christchurch office of the New Zealand Land Transport Safety Authority. He has worked for LTSA, formerly part of the Ministry of Transport, in various positions for over 25 years. In his current position he heads the Engineering Section which is responsible for maintaining the LTSA crash database and providing processed crash information and policy advice on traffic safety matters to road controlling authorities and other road safety professionals throughout most of the South Island of New Zealand.

## Abstract

A speed trailer, a type of speed information device that tells vehicles how fast they are travelling, has been used in Christchurch for several years. The Christchurch City Council and the Land Transport Safety Authority evaluated the effectiveness of speed trailers using four separate surveys. Measurement of the speeds of free running vehicles before and after the speed trailer with a control survey when the trailer was not present found that the trailer had an effect on speeds for at least 200 metres downstream of the trailer. A survey of 27 schools found that most thought the trailer had an effect on vehicle speeds, raised awareness of vehicle speeds, and helped learning about speeds. Most would like to use the trailer again and were positive and supportive of the trailer. A survey of 544 drivers, interviewed after they had passed the trailer, found most had noticed it and knew what it was. The majority said it made them more aware of their speeds. Nearly half the drivers made positive comments about the trailer. People who regularly installed the trailer were surveyed. They had found no serious shortcomings but thought the trailer could be lighter and more damp proof. The researchers concluded that the trailer does slow traffic, it makes drivers more aware of their speeds and it provides an educational tool for schools and their communities.

## 1. INTRODUCTION

A speed trailer is a type of speed information device (SID). It is a trailer that can be parked at the side of the road, with an electronic sign at the top set to show passing vehicles how fast they are travelling. Most can be set to show how much the fine would be if the driver is exceeding the speed limit.

In Christchurch City and elsewhere speed trailers have been used by schools as a source of projects for students and to raise awareness in the community. Comments from those involved have been positive, but more information was needed on how they are used and what effects the trailer may have on drivers and speeding vehicles.

Speed trailers are used in areas where speed is a problem with the aim of slowing traffic. However, they are also used to give residents and schools a tool to record traffic speeds. They allow groups in the community to raise awareness among drivers of the issue of speeding.

When evaluating the effectiveness of speed trailers these aspects of their use should be taken into account as well as the issue of whether drivers slow down when they see them. Speed trailers can be used in a variety of situations. It is important to find out which situations are most effective so that they may be deployed for maximum effect.

## **2. OBJECTIVES**

The objectives of this study were:

- (a) To measure speeds of vehicles ahead of, and after they have passed the speed trailer in a variety of situations to quantify any difference in speeds.
- (b) To interview drivers after they have passed a speed trailer and ask whether they noticed the speed trailer, whether or not they slowed down and why, and what their attitude is to speed trailers.
- (c) To survey schools and those who have requested or used the speed trailer to find out whether it was useful and what impact they felt it had on speeding behaviour and attitudes.
- (d) To interview those deploying speed trailers to find out the various uses of speed trailers, the ease of data collection, the best locations for speed trailers and what improvements might be made to them.

## **3. METHOD**

Four separate surveys were used to gain an understanding of the effectiveness of speed trailers.

### **3.1 Measurement of traffic speeds**

A speed trailer was operated on arterial roads at three locations with different speed limits (50 km/h, 60 km/h and 80 km/h.) Speeds of free-running vehicles were noted before drivers saw the speed trailer and after they had passed the speed trailer. Control speed checks were carried out at the same sites at the same time and day of the week without the speed trailer.

The sites were chosen to ensure that the speed trailer was not visible from the site of the first speed check. Similarly, the site of the second speed survey was not visible as drivers passed the speed trailer.

The digits on the number plates were recorded with the vehicle speed at each site to try and match the speeds of individual vehicles with driver responses to an interview further downstream from the trailer.

Speeds were measured from a parked vehicle by a different method at each location – using a digitector with cable detection before the trailer site and a laser gun after the site.

### **3.2 Interviews with drivers who passed the speed trailer.**

These were done in association with the speed surveys. Police stopped drivers after they had passed the speed trailer. The Police checkpoint for the driver interviews was not visible from the second speed check. A team of six students recruited through Student Job Search interviewed

drivers. Where possible their responses to the questions were matched to their measured speeds prior to the checkpoint.

### **3.3 Survey of schools**

Survey forms were posted to schools where the speed trailer had been used. Principals or teachers were asked to complete the survey and return it by post.

### **3.4 Interviews with those who install speed trailers**

Road safety co-ordinators, Police and others who had set up speed trailers were interviewed by telephone to find out what problems they had with them, what the optimum circumstances are for their use, how they might be improved, and how well the data collection works.

## **4. RESULTS**

### **4.1 Speed measurements**

Results showed the speed trailer did have an effect on mean speeds for at least 200 metres downstream of the trailer, with reductions of around 3 km/h at each site. Eighty-five percentile speeds reduced by 4km/hr at all sites with the trailer present.

Looking at the matched speeds of vehicles passing the trailer site it was also clear that drivers travelling in the higher speed brackets reduced speed more when the speed trailer was present than when it was not. Table 1 on the next page shows the combined results for all three sites.

### **4.2 Interviews with drivers who passed the speed trailer.**

A total of 544 drivers were interviewed with 177, 178 and 189 drivers respectively at the three sites. The main findings from the driver interviews were:

- Nearly all respondents (96%) said they noticed the speed trailer as they drove past.
- 94% said they understood that the trailer told them how fast they were going or was a reminder to check their speeds.
- About 12% of respondents said they thought the speed trailer might be used to give tickets to speeding drivers.

Table 1. Speed Decrease of Vehicles Passing the Speed Trailer Sites

Upstream Site (km/hr above or below the speed limit)	Control Sites (Trailer Not Present)		Test Sites (Trailer Present)	
	Number in Sample	Mean Speed Decrease (km/hr)	Number in Sample	Mean Speed Decrease (km/hr)
> 20 km/h below	4	-17.7	1	-15.0
15 – 19 km/h below	9	-8.7	8	-4.0
10 – 14 km/h below	30	-5.4	23	-1.8
5 – 9 km/h below	72	-4.1	61	-1.3
0 – 4 km/h below	149	-3.1	142	0.5
1 – 5 km/h above	109	-1.6	125	2.5
6 – 10 km/h above	27	1.4	30	5.4
11 – 15 km/h above	5	4.0	8	13.9
16 – 20 km/h above	2	8.0	1	19.0
> 20 km/h above	2	10.0	-	-

- Over 80% of drivers at each site said they were travelling within 10 km/h of the speed limit before they saw the speed trailer.
- Nearly 13% of the drivers at the 50 km/h site, 21% of drivers at the 60 km/h site, and 5% of drivers at the 80 km/h site indicated that they did not know the correct speed limit on the road.
- At the 50 km/h site nearly half the drivers thought the speed limit should be 60 km/h.
- At the 60 km/h site about 16% of drivers thought the speed limit should be only 50 km/h. Another 4% thought it should be between 50 km/h and 60 km/h.
- About 15% of drivers at the 80 km/h site thought the speed limit should be 100 km/h, with a further 5% saying it should be higher than 80 km/h.
- At each of the three sites 73%, 77%, and 69% of drivers said the speed trailer made them more aware of their speeds.
- 36%, 34% and 28% of drivers at each site said they reduced speed as a result of seeing the speed trailer. It should be noted that many drivers said they were driving at or below the speed limit when they passed the speed trailer.

Drivers were asked if they wished to make comments about the speed trailer. About 55% of drivers made comments, most of them positive and supportive of the use of speed trailers. Some drivers felt there should be more speed limit signs. Several drivers at each site felt there should be more speed trailers.

Responses to questions in the interviews were compared with recorded speeds for drivers. There was no relationship between the speeds drivers said they were travelling and the speeds recorded for their vehicles.

Similarly comparing drivers who said they increased or decreased their speed as a result of seeing the speed trailer showed that many drivers were not aware that they had decreased their speed. Note: most of the drivers who increased their speed were travelling below the speed limit.

#### **4.3 Survey of schools**

Twenty-seven schools completed the speed trailer questionnaire. Most schools had someone from the school involved in setting up the speed trailer. Twenty five percent of the schools did not find the trailer easy to operate. The only problem mentioned in relation to the speed trailer was its weight.

Almost every respondent thought the speed trailer affected the awareness of vehicle speeds in their community. Twenty one schools (78%) said they noticed a reduction in vehicle speeds when the trailer was operating.

Respondents indicated that the trailer had promoted learning about speeds both among the students and among the drivers.

Nearly half the schools made comments about additional benefits from the speed trailer. Seven schools (26%) had used the trailer to teach maths or statistics skills. A further six schools (22%) said it made drivers more aware that the school is there and focussed their attention on their speed.

Most schools (85%) said they would like to use the trailer again. Nearly half them thought the trailer was readily available. About 22% thought it was not. Currently the trailer is in constant use and booked up for several months in advance. About 80% of schools considered once a term or once every six months an ideal frequency for its use.

Eighteen of the twenty-seven schools provided additional positive supportive comments about the trailer.

#### **4.4 Interviews with those who install speed trailers**

Interviews were carried out with five people who regularly set speed trailers up in their local areas. The aim of these interviews was to find out what problems there are with the trailers, and whether some types of sites are better than others when positioning them.

There are two types of speed trailers used in Christchurch. Most installers felt the trailers were fairly easy to operate. Comments indicate some modifications have improved ease of use. Three out of five installers thought the operating instructions were clear and adequate. One other installer thought they were clear but not adequate.

The main problems cited were the weight of the trailer and difficulties with collecting data. Suggested improvements to the trailer included making it easier to change the tyres and making the electric terminals secure. Damp proofing the trailer and finding a way of making them lighter were suggested. Three out of the five installers said they found it easy to get data from the trailer's data collection system. The other two had difficulties with downloading data.

Installers considered the best locations for a speed trailer to be outside schools, areas where residents perceive a problem with speed, and high crash risk areas. Some installers thought high speed areas were not suitable. Others thought they were most suitable.

The installers mentioned slowing traffic speeds, raising awareness of speed behaviour and empowerment of the community as benefits of using the speed trailer.

## **5. CONCLUSIONS**

The presence of the speed trailer did have an effect on the speed of traffic at the three locations surveyed. Drivers slowed down more when the speed trailer was present than when it was not.

The interviews showed that drivers felt they were made more aware of their speed by its presence. Most drivers were positive about speed trailers. Many drivers did not know what the speed limit was in the area where they were being interviewed. There was no relationship between the speeds drivers said they were travelling and their observed speeds. Similarly, many drivers were not aware they had decreased speed.

Most schools were positive about the speed trailer. Many of them had used the trailer for maths projects. Most schools felt the trailer had raised awareness of the issue of speed in their communities. There were also comments that the presence of the school was made more obvious and that the students had been made aware of the need to keep themselves safe. Most schools would like to use the speed trailer again, once a term or every six months. Nearly a quarter of schools felt the speed trailer was not easily available. It is usually booked up for several months in advance.

Installers had used both types of trailers available in Christchurch. They were positive about speed trailers and their role in slowing traffic and raising awareness of speed issues. However there were ways in which they felt trailers could be made easier to use, in particular being made lighter and more weatherproof. They also felt that recharging the batteries, changing tyres and collecting data from the trailers could be made easier.

Speed trailers are of benefit in the community both by slowing traffic speeds and by raising awareness of speed issues. Schools find them most useful in promoting the need to slow down near the school and in getting road safety into the maths curriculum.

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### **Keywords**

speed trailer, speed indicator device, school speeds, community