Effectiveness of a Speed Display Sign on reducing vehicles’ speeds at road works

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Purpose

This research paper investigates the impact of a Driver Feedback Speed Display (DFSD) sign on drivers’ speed through road works.
Background

One of the NZTA’s priorities:

Safe speeds to reduce deaths and serious injuries

Reported Injury Crashes due to speeding drivers within Temporary Speed Limit - State Highways

- minor injury
- serious injury
- Fatal injury

Year

2008
2009
2010
2011
2012

Reported crashes

0
5
10
15
20
25
30
35
40
45

0 10 20 30 40 50

NZ TRANSPORT AGENCY
WAKA KOTAHI
## Locations of the sites

<table>
<thead>
<tr>
<th>Site</th>
<th>Posted speed km/h</th>
<th>TSL km/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
<td>70</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>30</td>
</tr>
</tbody>
</table>

- **Site 1**: Te Horo, SH1
- **Site 2**: Ngauranga, SH2 NB on-ramp
- **Site 3**: Dowse Drive, SH2 NB
- **Site 4**: Willow Park Drive, SH2
Photos of the sites

**Trial 1**: Te Horo, SH1 Both Directions

**Trial 2**: Ngauranga, SH2 NB on-ramp

**Trial 3**: Dowse Drive, SH2 NB

**Trial 4**: Willow Park Drive, SH2 NB
Equipment used

A radar unit

Driver Feedback Speed Display Sign (DFSD Sign)

Product Name: Viacount II

Product Name: Vaisis

Supplier: ELWC Australia
Methodology

• Day 1

Point 1 – Day 1

Work Area
Methodology

• Day 2
Analysis Methods

- **Analysis Method 1**
  - Compares Day 1 and Day 2 speed data obtained from radar unit

- **Analysis Method 2**
  - Day 2 Only
  - Compares Point 1 (Radar Unit) and Point 2 (Driver Feedback Speed Display sign) speed data.

- **Analysis Method 3**
  - Lane 1 and Lane 2
  - Compares the speed data of two adjacent lanes on the same day
  - One lane with feedback sign and lane which did not have a Driver Feedback Speed Display sign.
Results

Site 1: Te Horo – Method 1
Temporary Speed Limit (TSL) = 50 km/h

85% of the speeding drivers slowed down to keep within the TSL

<table>
<thead>
<tr>
<th>Speeding vehicles</th>
<th>Before 11/04/2013</th>
<th>After 12/04/2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speeding vehicles</td>
<td>41%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Before - Day 1
After - Day 2
Site 2: Ngauranga on-ramp – Method 1
Temporary Speed Limit = 50 km/h

58% of the speeding drivers slowed down to keep within the TSL

Before
18/04/2013
After
22/04/2013
Speeding vehicles | 46% | 19%
Site 3: Dowse Drive – Method 1
Temporary Speed Limit = 70km/h

75% of the speeding drivers slowed down to keep within the TSL

Before 30/04/2013
After 1/05/2013

- Speeding vehicles
  - Before: 16%
  - After: 4%
Site 4: SH2 / Willow Park Drive - Method 1
Temporary Speed Limit = 30km/h

1% of the speeding drivers slowed down to keep within the TSL

<table>
<thead>
<tr>
<th>Speeding vehicles</th>
<th>Before 30/04/2013</th>
<th>After 1/05/2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speeding vehicles</td>
<td>99%</td>
<td>98%</td>
</tr>
</tbody>
</table>

Before - Day 1
After - Day 2

Number of vehicles
Speed (km/h)
Analysis Methods

- **Analysis Method 1**
  - Compares Day 1 and Day 2 speed data obtained from radar unit

- **Analysis Method 2**
  - Day 2 Only
  - Compares **Point 2** (Radar Unit) with **Point 1** (Driver Feedback Speed Display sign) speed data.
Site 1: Te Horo – Method 2
Temporary Speed Limit (TSL) = 50km/h

59% of the speeding drivers slowed down to keep within the TSL

- Point 1 - Before
- Point 2 - After

<table>
<thead>
<tr>
<th>Speeding vehicles</th>
<th>Sign Point 1</th>
<th>Radar Point 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>27%</td>
<td></td>
<td>11%</td>
</tr>
</tbody>
</table>
Site 2: Ngauranga on-ramp – Method 2
Temporary Speed Limit = 50km/h

76% of the speeding drivers slowed down to keep within the TSL.

<table>
<thead>
<tr>
<th>Speeding vehicles</th>
<th>Sign Point 1</th>
<th>Radar Point 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speeding vehicles</td>
<td>81%</td>
<td>19%</td>
</tr>
</tbody>
</table>
92% of the speeding drivers slowed down to keep within the TSL.
Analysis Methods

• Analysis Method 1
  – Compares Day 1 and Day 2 speed data obtained from radar unit

• Analysis Method 2
  – Day 2 Only
  – Compares Point 1 (Radar Unit) and Point 2 (Driver Feedback Speed Display sign) speed data.

• Analysis Method 3
  – Lane 1 and Lane 2
  – Compares the speed data of two adjacent lanes on the same day
  – One lane with feedback sign and a lane which did not have a Driver Feedback Speed Display sign.
Analysis method 3

Four scenarios are listed below:
1. Day 1, Lane 1 without feedback sign
2. Day 1, Lane 2 without feedback sign
3. Day 2, Lane 1 with feedback sign
4. Day 2, Lane 2 without feedback sign
Site 1: Te Horo – Method 3
Temporary Speed Limit (TSL) = 50km/h

<table>
<thead>
<tr>
<th>Lane</th>
<th>Speeding vehicles (%)</th>
<th>Day 1 11/04/2013</th>
<th>Day 2 12/04/2013</th>
<th>% drop on Day 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lane 1</td>
<td>41%</td>
<td>11%</td>
<td>-74%</td>
<td></td>
</tr>
<tr>
<td>Lane 2</td>
<td>71%</td>
<td>69%</td>
<td>-3%</td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

1. Compliance to temporary speed limit will improve with the use of speed display sign at road works site

2. The proportions of drivers exceeding the Temporary Speed Limit (TSL) were significantly reduced at three sites while the feedback sign was in operation.

3. The effectiveness of a driver feedback speed display sign varied across sites

4. Wet weather had little impact on the speed compared to the driver feedback speed sign
   • Only 3% of the drivers reduced their speed due to a wet weather
   • 74% of the drivers reduced their speed while the speed sign was in operation
Questions

Thank you for listening