Use of a Driver Feedback Sign In Reducing drivers’ speed through roadworks

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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

- **Green**: minor injury
- **Yellow**: serious injury
- **Red**: Fatal injury

<table>
<thead>
<tr>
<th>Year</th>
<th>Reported crashes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>25</td>
</tr>
<tr>
<td>2009</td>
<td>40</td>
</tr>
<tr>
<td>2010</td>
<td>30</td>
</tr>
<tr>
<td>2011</td>
<td>25</td>
</tr>
<tr>
<td>2012</td>
<td>10</td>
</tr>
</tbody>
</table>
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>
Equipment used

A radar unit

Product Name: Viacount II

Driver Feedback Speed Display Sign (DFSD Sign)

Product Name: Vaisis
Methodology

• Day 1
Methodology

• Day 2

Point 2

Point 1

Work Area
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) = 50km/h

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

Before - Day 1
After - Day 2

Speeding vehicles
Before 11/04/2013
After 12/04/2013
41% 6%

Number of vehicles

Speed (km/h)

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

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>18/04/2013</td>
<td>22/04/2013</td>
</tr>
<tr>
<td>Speeding vehicles</td>
<td>46%</td>
</tr>
</tbody>
</table>

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

Site 3: Dowse Drive – Method 1
Temporary Speed Limit = 70km/h

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>30/04/2013</td>
<td>1/05/2013</td>
</tr>
<tr>
<td>Speeding vehicles</td>
<td>16%</td>
</tr>
</tbody>
</table>

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

- Before: 30% speeding, Average speed: 51
- After: 9% speeding, Average speed: 45
- Speeding vehicles: 99% Before, 98% After
- 85% speed reduction: 61% Before, 53% After
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.
## Analysis Method 2
### Point 1 vs Point 2

<table>
<thead>
<tr>
<th>Site</th>
<th>TSL</th>
<th>Speeding Vehicles</th>
<th>Sign Point 1</th>
<th>Sign Point 2</th>
<th>Radar Point 2</th>
<th>Radar Point 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site 1: Te Horo</strong></td>
<td><strong>50km/h</strong></td>
<td>Speeding vehicles</td>
<td><strong>27%</strong></td>
<td><strong>11%</strong></td>
<td><strong>59%</strong></td>
<td><strong>11%</strong></td>
</tr>
<tr>
<td><strong>Site 2: Ngauranga on-ramp</strong></td>
<td><strong>50km/h</strong></td>
<td>Speeding vehicles</td>
<td><strong>81%</strong></td>
<td><strong>19%</strong></td>
<td><strong>76%</strong></td>
<td><strong>19%</strong></td>
</tr>
<tr>
<td><strong>Site 3: Dowse Drive</strong></td>
<td><strong>70km/h</strong></td>
<td>Speeding vehicles</td>
<td><strong>49%</strong></td>
<td><strong>4%</strong></td>
<td><strong>92%</strong></td>
<td><strong>4%</strong></td>
</tr>
</tbody>
</table>

- 59% of the speeding drivers slowed down to keep within the TSL
- 76% of the speeding drivers slowed down to keep within the TSL
- 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, SB lane without feedback sign
2. Day 2, SB lane with feedback sign
3. Day 1, NB lane without feedback sign
4. Day 2, NB lane without feedback sign
Site 1: Te Horo – Method 3
Temporary Speed Limit (TSL) = 50km/h

<table>
<thead>
<tr>
<th></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>SB lane</td>
<td>41%</td>
<td>11%</td>
<td>-74%</td>
</tr>
<tr>
<td>NB lane</td>
<td>71%</td>
<td>69%</td>
<td>-3%</td>
</tr>
</tbody>
</table>

Scenario 1: Day 1 – SB direction
Scenario 2: Day 2 – SB with speed sign
Scenario 3: Day 1 – NB direction
Scenario 4: Day 2 – NB direction

Graph showing speed distribution with 50km/h speed limit.
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
Questions

Thank you for listening