Development and Evaluation of a Rural Intersection Active Warning System

Fergus Tate – NZ Transport Agency
Safer Speeds
Improving Safety at High Risk Intersections
Speed at Intersections
Impact on serious or fatal injuries

100km/hr
61% Risk
Serious or fatal mostly of the time

80 km/hr
25% Risk
Serious or fatal mostly avoided

60 km/hr
6% Risk
Serious or fatal few occasions
Intersection Warning Systems
What is RIAWS?

Rural Intersection Active Warning System

Reduce fatal and serious crashes

- Slow motorists
- Increase driver awareness
- Improve gap judgement
Himitangi Trial
Targeted Crashes
Himitangi 2003 to 2012
The RIAWS in Service

Himatangi Intersection SH1

- Remote B
  - NB Radar: 92kph
  - NB Sign: 70
  - NB Approach

- Remote F
  - NB TMU: 89kph
  - NB Approach

- Master
  - NB TMU: 89kph

- Stop Line 0
  - W Stop

- Stop Line 1
  - SB Stop

- Stop Line 2
  - E Stop

- Stop Line 3
  - NB Stop

- Remote C
  - W Approach

- Remote D
  - Remote E
  - SB Approach

- Remote A
  - E Approach

- SH 1

- SH 56

- Himatangi Beach Road

- Hourly Stats (Previous Hour)
  - E Approach Counts: 63
  - NB Radar Counts: 59
  - W Approach Counts: 17
  - SB Radar Counts: 46
  - SB Approach Counts: 1
  - NB Approach Counts: 44
  - NB Sign On %: 41
  - SB Sign On %: 46
The RIAWS in Service
Evaluation tools integrated into system
Risk Reduction
Trial Sites

Evaluation of data

Himitangi sign on %

Weekdays Sign on %  Weekends Sign on %

New Zealand Government
Driver perceptions survey

- The signs catch your attention
- The signs are easy to read
- The meaning of the signs are easy to understand
- The signs send the right message for a high risk intersection
- The signs are effective in causing safe driver behaviour

Proportion of respondents

Strongly Disagree | Disagree | Neither disagree or agree | Agree | Strongly Agree
Effectiveness of signage

Slow down or 70?

Modal speeds and Sign type

<table>
<thead>
<tr>
<th>Mode Speed (km/h)</th>
<th>Baseline</th>
<th>Nov 2013</th>
<th>April 2014</th>
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</thead>
<tbody>
<tr>
<td>Pakaraka EB</td>
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<tr>
<td>Pakaraka WB</td>
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<tr>
<td>Puketona NB</td>
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<tr>
<td>Puketona SB</td>
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NZ TRANSPORT AGENCY

New Zealand Government
Just to make sure…

South Island sites
Safety Impacts?
Post Encroachment Time
Safety Impacts?

Post Encroachment Times < 6 seconds

Before RIAWS

After RIAWS

Proportion of Post Encroachment Times < 6.0 seconds

Post Encroachment Time (seconds)
Safety Impacts?

Post Encroachment Time smallest 10%

Proportion of Post Encroachment Times

Post Encroachment Time (seconds)

Before RIAWS
After RIAWS
And the REALLY Good News!

Crash History 6 RIAWS Sites
Himitangi, Yaldhurst, Kennington, Newbury, Puketona, Pakaraka

- Fatal and Serious Crashes
- All Injury Crashes
- Non-injury Crashes
- All Crashes

Expected: [Graph]
Actual: [Graph]
In Conclusion

- RIAWS developed and trialled in NZ
- RIAWS has resulted in:
  - Tangible and enduring speed reductions
  - Improved safety at high risk intersections
- Variable speed limit most effective
- Costs < $200,000 NZ
- Effective without police enforcement
THANK YOU