Improving Road Safety With Rumble Strips
Audio Tactile Profile Markings ATP’s

There is truck loads of information around about the performance of ATP

• Steve James (NZTA) also presented at the 2011 and 2015 NZRF Conferences and advised we are achieving up to 25% of all injury crash savings and 40% death and serious injury crashes.

• Benefit Cost Ratio (BCR) of 18.

• ATP’s are simple to apply to existing roads with little inconvenience to the motoring public.

• KiwiRAP highlights ATP as a cost effective treatment to reduce serious injury and fatal road accidents.
## Potential Reductions (%) in Various Injury Crash Types

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>HEAD-ON CRASHES</th>
<th>RUN-OFF ROAD</th>
<th>INTERSECTION CRASHES</th>
<th>RELATIVE COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road signs and delineation</td>
<td>25-40</td>
<td>25-40</td>
<td>25-40</td>
<td>$</td>
</tr>
<tr>
<td>Rumble strips</td>
<td>10-25</td>
<td>10-25</td>
<td></td>
<td>$-$$</td>
</tr>
<tr>
<td>Central median hatching</td>
<td>10-25</td>
<td></td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>Speed reduction (per 10km/h)</td>
<td>15-40</td>
<td>15-40</td>
<td>15-40</td>
<td>$</td>
</tr>
<tr>
<td>Dedicated lanes for turning traffic</td>
<td></td>
<td></td>
<td>25-40</td>
<td>$-$$</td>
</tr>
<tr>
<td>Removal of roadside objects</td>
<td>25-40</td>
<td></td>
<td></td>
<td>$$</td>
</tr>
<tr>
<td>Roadside barriers</td>
<td>25-40</td>
<td></td>
<td></td>
<td>$$</td>
</tr>
</tbody>
</table>
History of ATP’s

• ATP’s have been around since the Mid 1990’s
• These were initially applied using Thermoplastic, long term some applications didn’t stand up to New Zealand conditions
• International experience with rumble strips indicated significant reductions in single vehicle run off road accidents
• Prior to trialling ATP, the NZ Transport Agency (NZTA) contacted Transport Engineering Research NZ (TERNZ) to undertake research
History of ATP’s

• 2004 review of lane delineation is a literature research report identifying 24 key research articles citing more than 500 documents.
• Average accident reductions of 27% were identified
• Following this research, Cold Applied Plastic (CAP) was introduced to New Zealand which has proven to be very successful and gives long term performance
• The first significant CAP ATP application in 2006 was on SH 2 Katikati to Bethlehem
• There was a new marking format for this installation to retain the 3.2 m carriage way
History of ATP’s

- 3400 between ribs
- 3250 between paint lines
- New markings
- 3500
- Existing 100mm wide edgeline

150 | 150
Rib | Paint

150 | 100 | 150
Rib & Paint

C.L
History of ATP’s

• A joint agency approach to reduce road trauma in the Central North Island, came up with SWATT (South Waikato and Taupo Target 2010)
• Hamish Mackey of TERNZ conducted a study on vehicle placement within ATP edge and centre lines. Proving that vehicle’s tracked within their lanes when ATP’s are applied to edge lines and when edge and centre line ATP’s are used.
History of ATP’s

• ATP layout design has developed so they are visible to both cyclists and motor cyclists
• The layout allows for clear area’s when approaching bridges, intersections, turn pockets and to allow adequate shoulder widths
• The NZRF website has a link to NZ Rumble Strip Resources
History of ATP’s

• The original modelling for this project gave us a BCR of around 6.2 based on a project life of 4 years
• We now have documented testing from this application after 6 years that shows it is still performing
• Vince Dravitzki’s paper Rumbling Through The Bay presented at the 2013 NZRF conference
History of ATP’s

• This then takes the BCR to 18
• There are some sections on SH2 that lasted for and were still performing after 10 years
• ATP’s don’t only offer the benefit of Audio and Tactile but also give excellent dry and wet night Retroreflectivity
Retroreflectivity

• We all know the Audio and Tactile effect and the benefits the ATP’s
• With our aging driving population, Dry and WET night visibility is also critical
Age visibility reduction

Compensation through more headlamps

20 year old driver  33 year old driver  46 year old driver  59 year old driver

72 year old driver
Age visibility reduction

100 year old driver?
Visibility of ATP’s

250 medlux² in the dry
Excellent night time visibility

250 medlux² in the dry
Excellent night time visibility

130 medlux² in the wet
Excellent wet night visibility
Excellent wet night visibility
Visibility of ATP’s

SH 1
CAP ATP

SH 30
Standard marking
ATP Installation

• To ensure the maximum performance is achieved from CAP ATP’s and the return on the investment for the road owner all Applicators are approved by the supplier
• All are NZTA pre qualified
• The application machinery is NZTA/NZRF T12 certified.
• These certifications are renewed every 12 months and a register of these is available on the NZRF website
NZRF Website: http://nzrf.co.nz/t12/

T12 Register

**T12 Initial Certificates**
Please contact the NZRF Executive Director to arrange for Initial certification.

**T12 Testing Officers**

<table>
<thead>
<tr>
<th>Testing Officer</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bruce Belton</td>
<td>Fulton Hogan Ltd T/A Coastline Markers</td>
</tr>
<tr>
<td>Lucas Orsborn</td>
<td>Orsborn Roadmarkers Ltd</td>
</tr>
<tr>
<td>Paul del Favero</td>
<td>Downer NZ Ltd</td>
</tr>
<tr>
<td>Ryan Gorman</td>
<td>Fulton Hogan Ltd</td>
</tr>
<tr>
<td>Tony McLellan</td>
<td>Fulton Hogan Ltd</td>
</tr>
<tr>
<td>Wayne Rouse</td>
<td>Roadmarkers New Zealand</td>
</tr>
</tbody>
</table>

[Scope of Testing Officer Status here](#)

**T12 Applicator Register**

The T12 register is updated on a continuous basis, and all currently registered applicators are listed. T12 Applicator Certificates must be read subject to the schedules which describe the markings & formats tested.

**T12 Inspection Checklist here | Testing Officer Observation Note**

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Address</th>
<th>City</th>
<th>Registration Number</th>
<th>Expiry Date</th>
<th>Certificate Number</th>
<th>Material</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downer NZ Ltd</td>
<td>645 Great South Road Penrose</td>
<td>Auckland</td>
<td>BQY303</td>
<td>15 Feb 2018</td>
<td>4452</td>
<td>Thermoplastic</td>
<td>Plain Flat Marking, Audio-Tactile, Agglomerate</td>
</tr>
<tr>
<td>Downer NZ Ltd</td>
<td>645 Great South Road Penrose</td>
<td>Auckland</td>
<td>UB5372</td>
<td>22 Jan 2018</td>
<td>4450</td>
<td>Thermoplastic</td>
<td>Plain Flat Marking</td>
</tr>
<tr>
<td>Fulton Hogan Ltd T/A Coastline Markers</td>
<td>PO Box 302-52B</td>
<td>North Harbour</td>
<td>DGW904</td>
<td>11 Sep 2017</td>
<td>4444</td>
<td>Cold Applied Plastic</td>
<td>Plain Flat Marking, Audio-Tactile, Agglomerate</td>
</tr>
</tbody>
</table>
Visibility of ATP’s
Industry Concerns on ATP Maintenance

• Reinstatement after reseals and other pavement treatments
• Replacement at the end of their effective life
• Research has been commissioned by NZTA and done by Opus to look at treatment options for ATP’s during reseal operations. These are:
  ➢ Sealing over the ATP
  ➢ Sealing up to the ATP’s
  ➢ Removal prior to reseal and then reinstating after sealing
• NZRF carried out a survey assessment of a sample of the network and found that 25% of the ATP treatments had not been reinstated
There is a further major area of concern for our industry, that is the lack of safety retrofits including ATP’s on local roads.
Our industry has the technology and capacity to apply these systems throughout NZTA’s & the Local Authority networks