

# Effectiveness of Transverse Road Markings on Reducing Vehicle Speeds

NZTA research report 423

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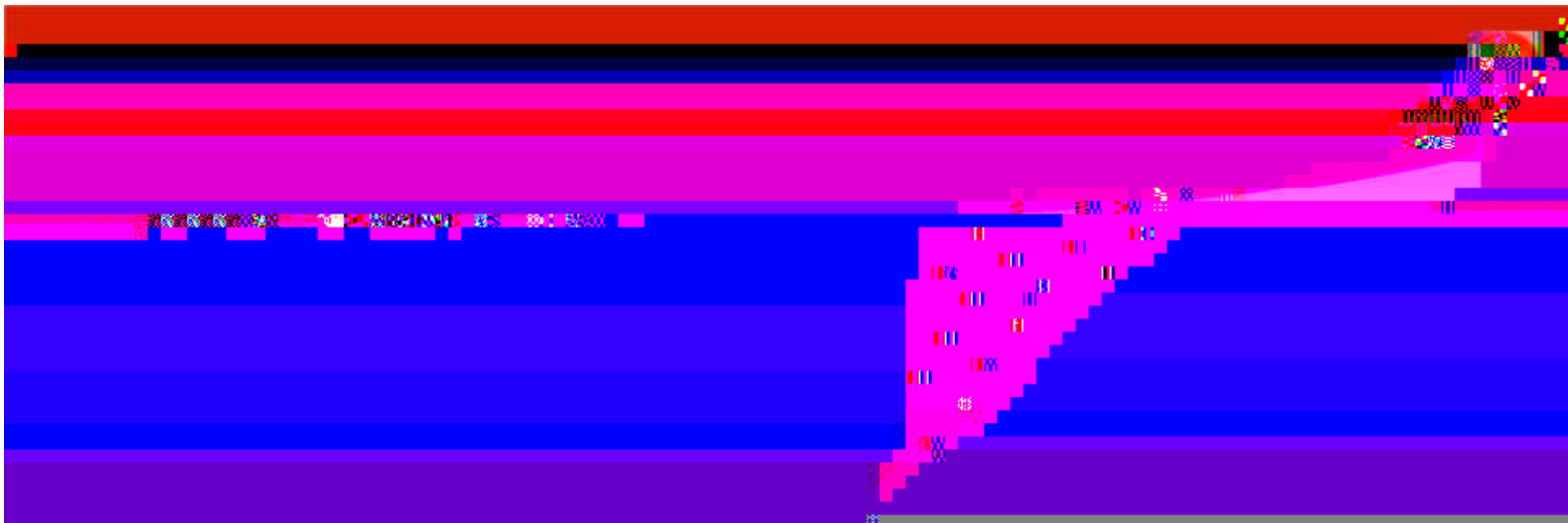
# NZ's Speed Problem





# Hazards







# Hazard Treatment

- Sign Clutter

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# Alternative Devices

- Alternative devices (such as perceptual countermeasures) or measures that can inform a



# Definitions: Transverse Road Markings

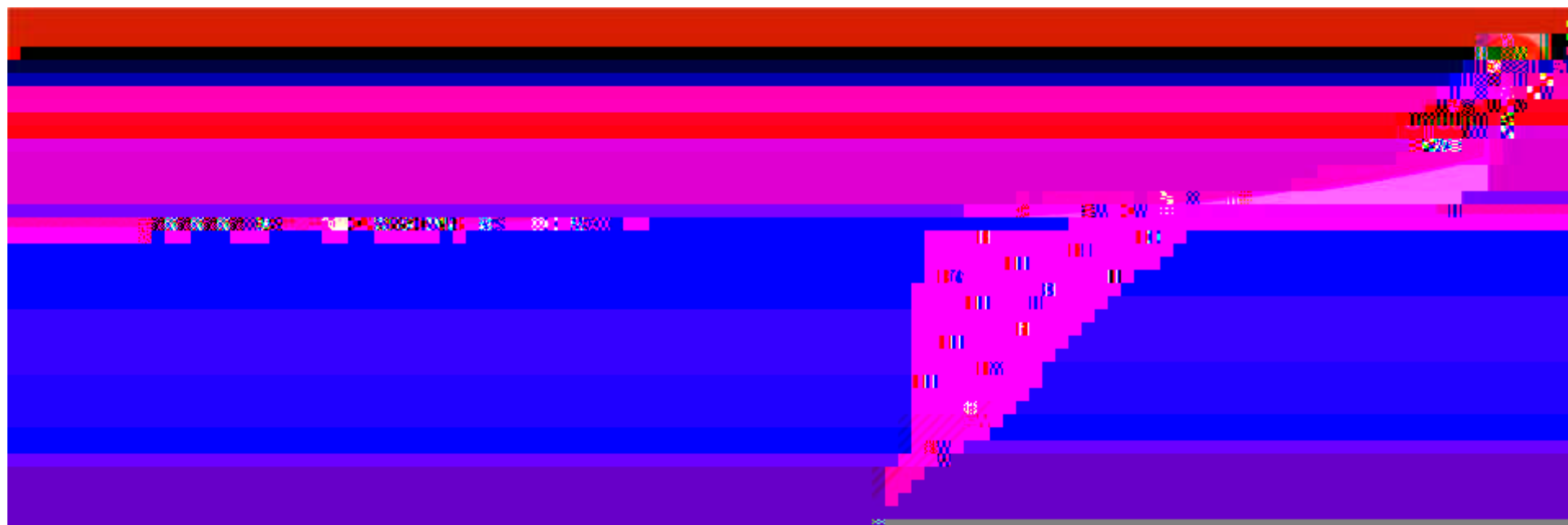
- Transverse road markings are a speed mitigation device. They can be generally defined as:



# Scope of Research





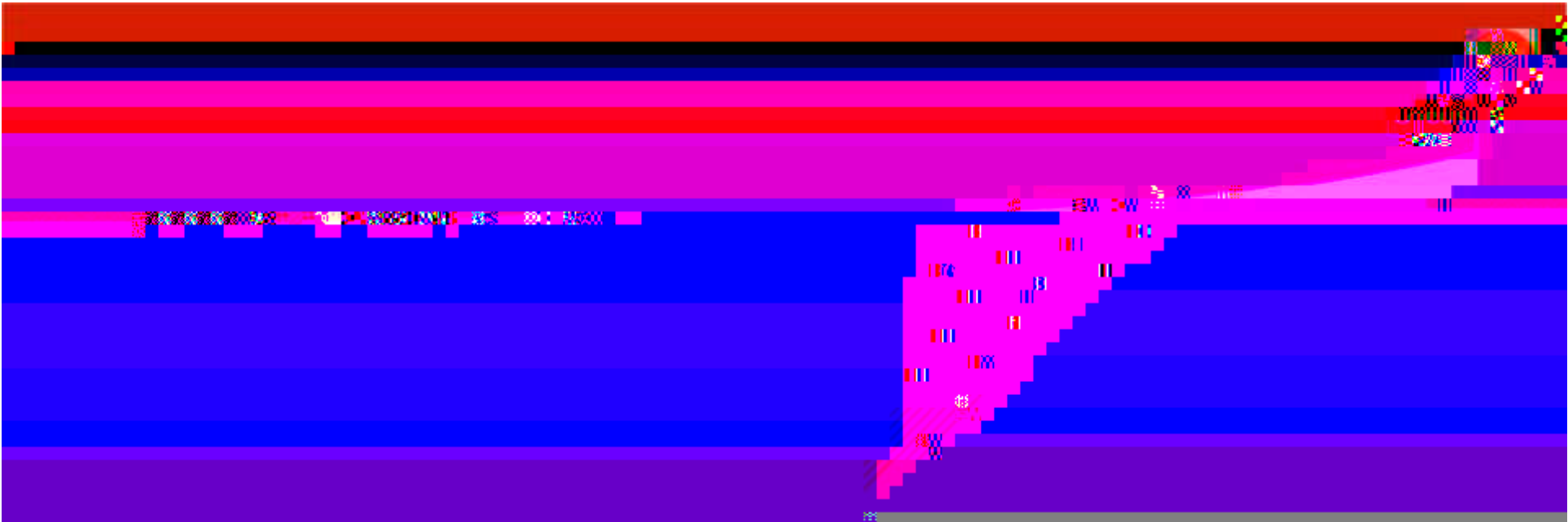




# NZ: Simulator trials

- NZ research using driving

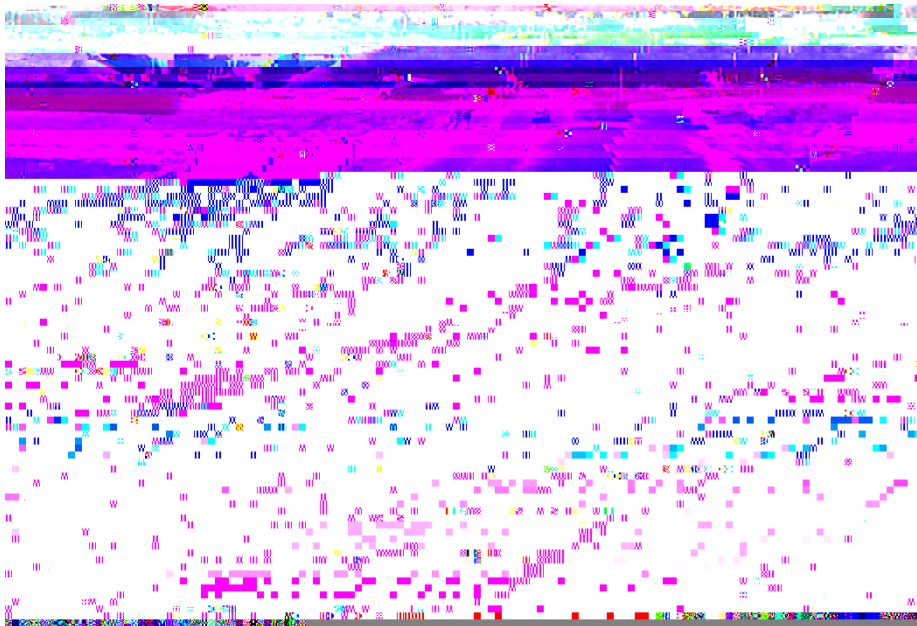






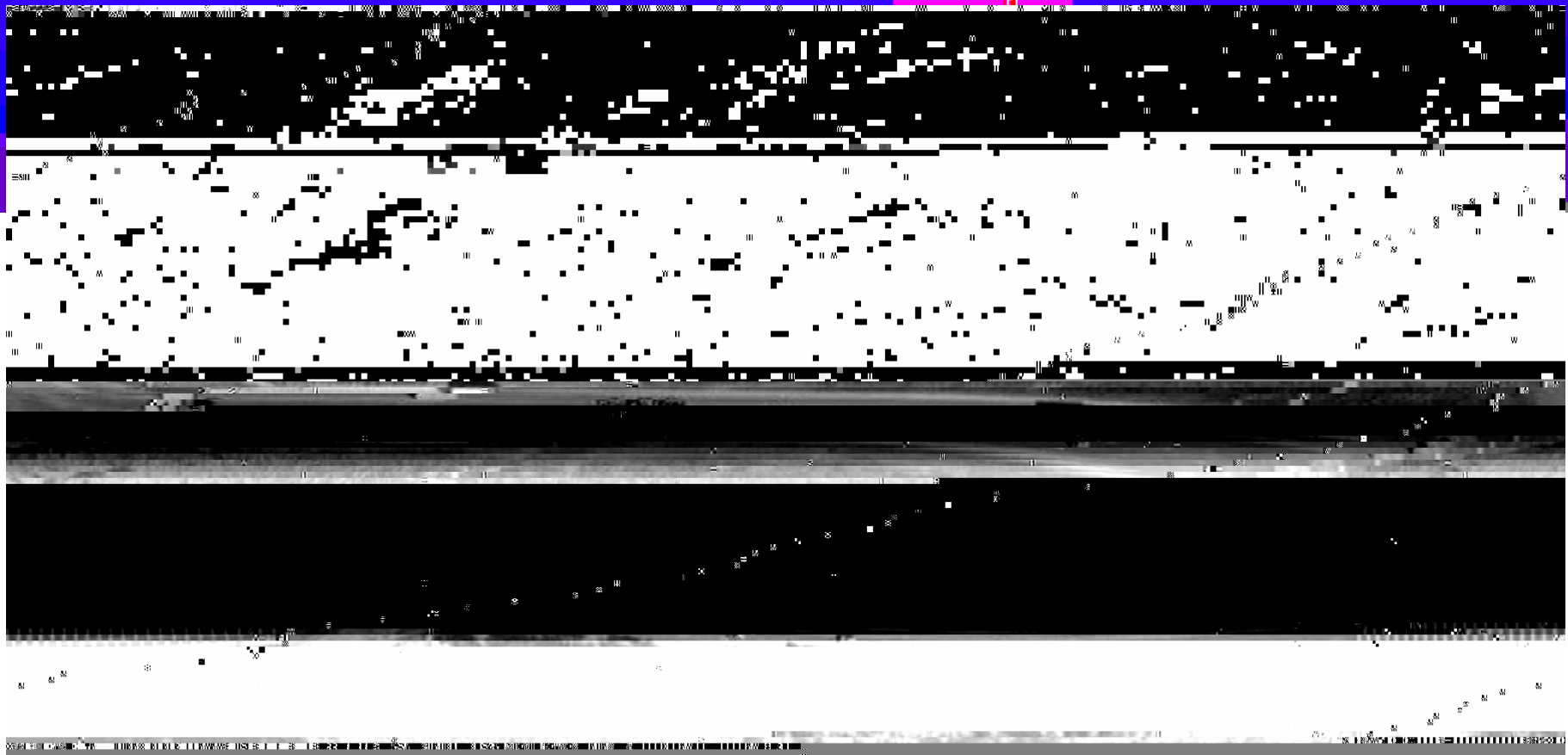
# International: Transverse Road Markings

- Research into understanding their effects and properties completed in Australia, UK & USA.
- Used extensively at motorway off-ramps and roundabouts in the UK.





# International : Transverse Road Markings

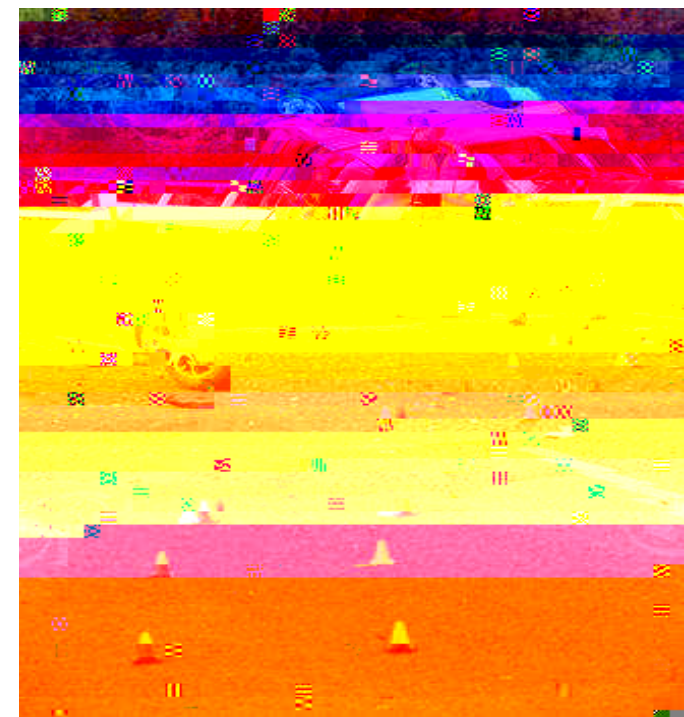


Pacific Highway in New South Wales, Australia (photo courtesy of Google Earth Pro License)



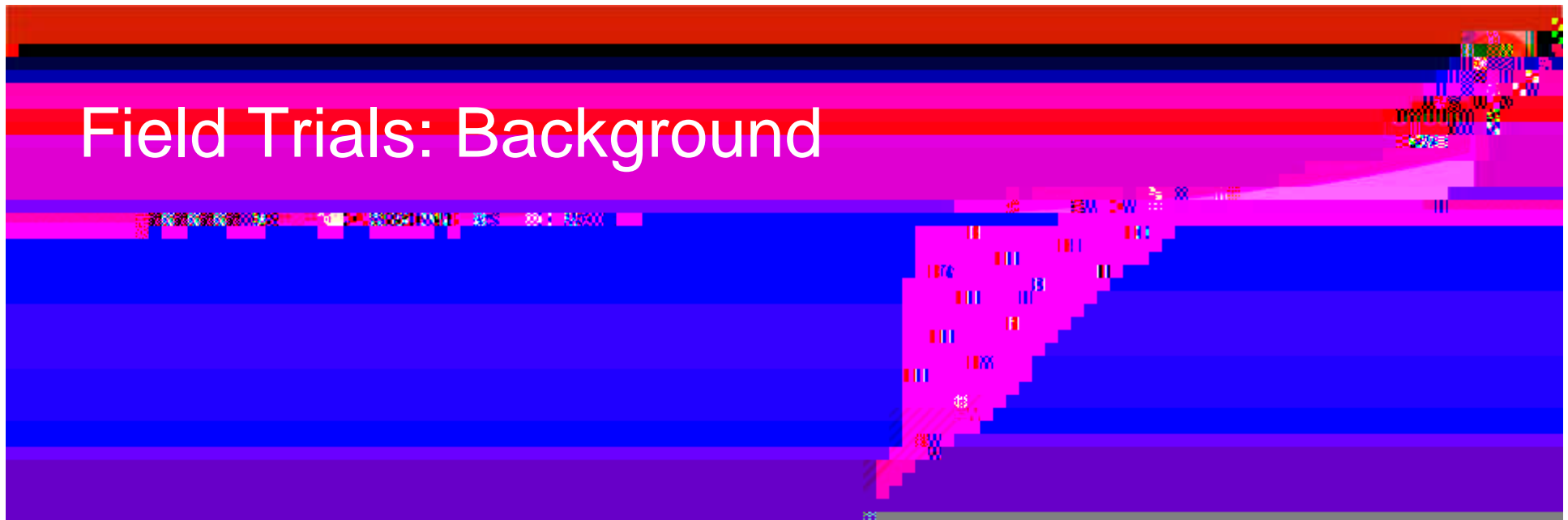
# Key Points from Research

- Various layouts (evenly spaced, logarithmically decreasing lines, colour of lines, length and width of lines, distance between the end of the treatment and the hazard etc) have been used and there have been contradictory findings.
- Regardless of the marking layout & site application, reductions in mean & 85<sup>th</sup> percentile speeds were typically found on hazard approaches if installed.
- In NZ, it provides an opportunity to reduce fatal and serious injury crashes caused by speeding on high speed rural hazard approaches





# Field Trials: Background

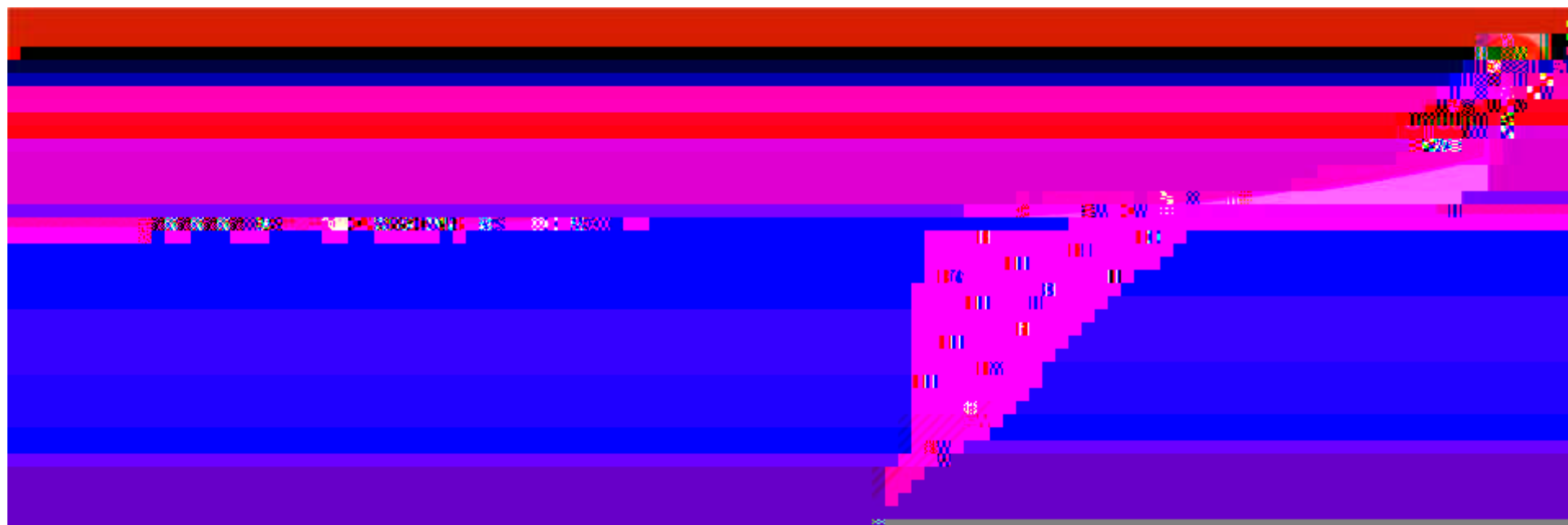




# Field Trials: Arrangement Details

Variable	Explanation
<b>Line Arrangement</b>	100mm transverse bars extending at a 60 degree angle over 1.0m from the edgeline and centreline respectively.
<b>Line Spacing</b>	





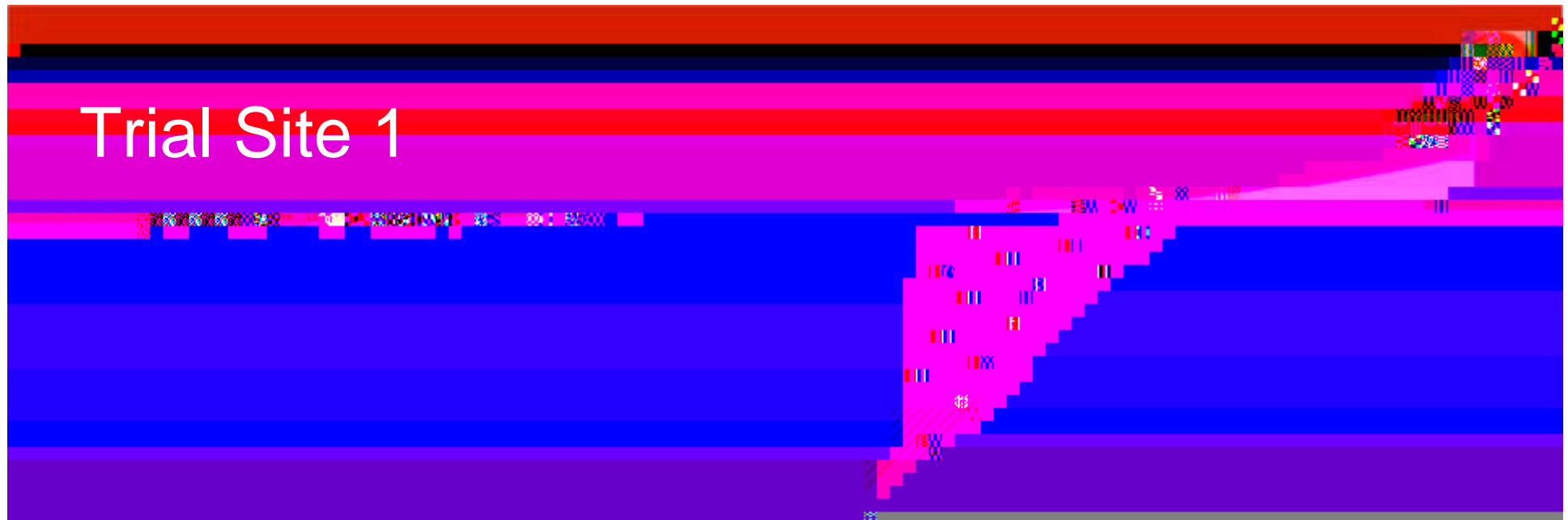


# Field Trials: Site Selection

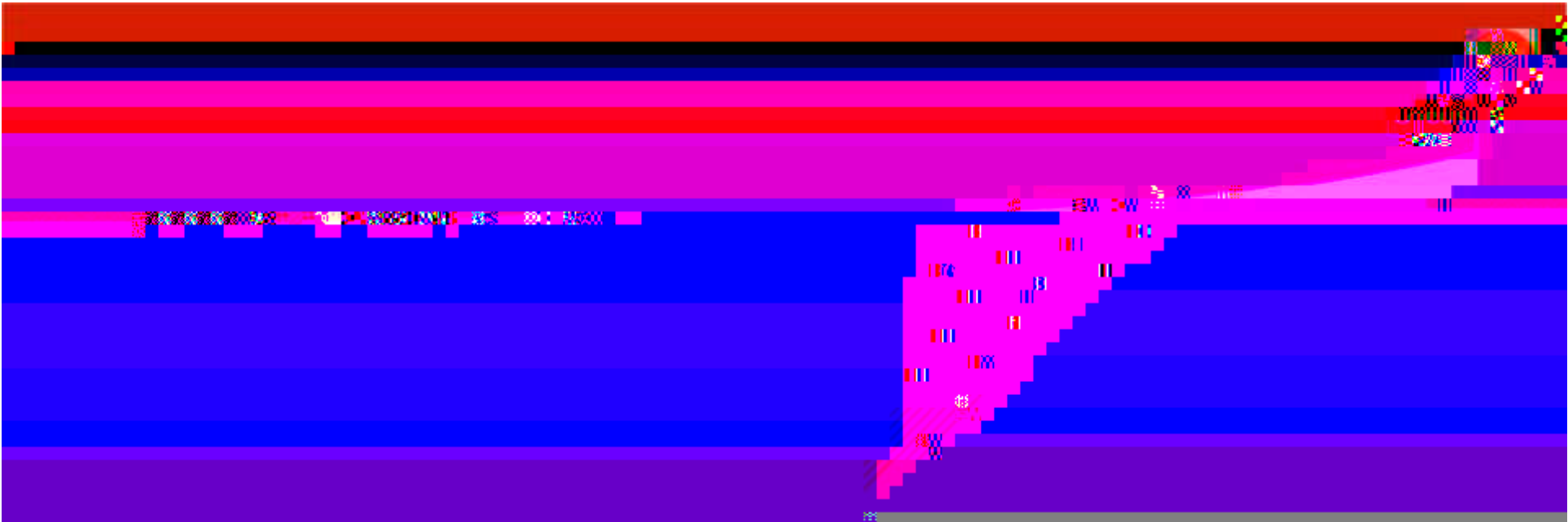




# Trial Site 1





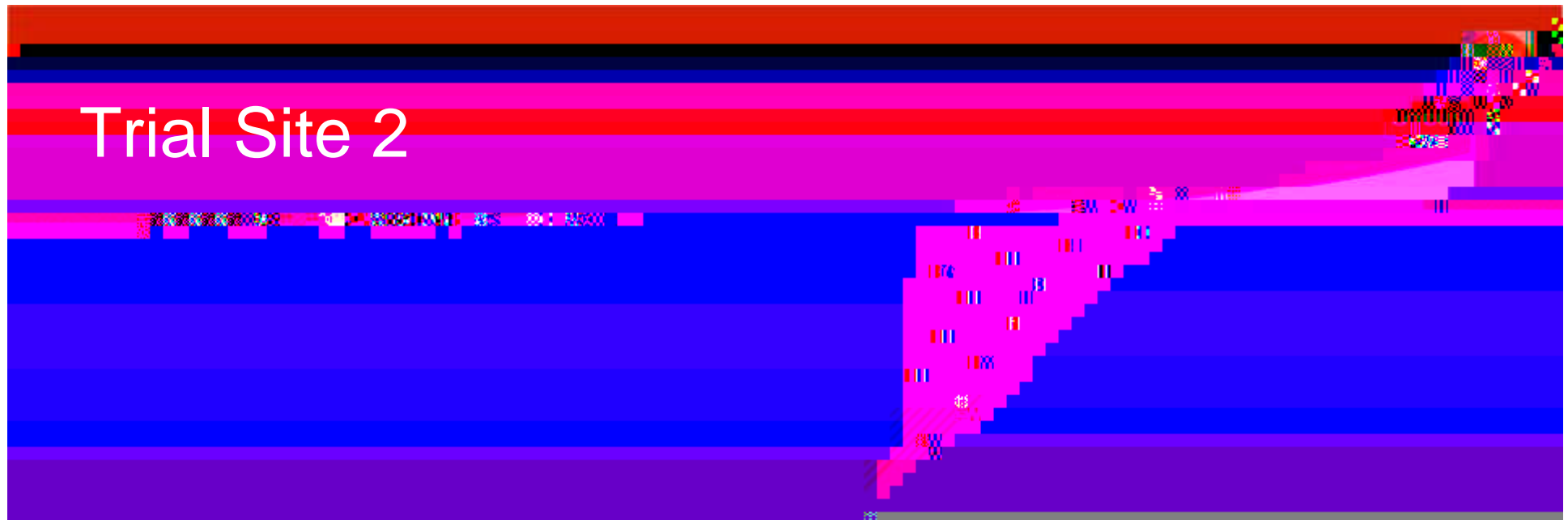








## Trial Site 2





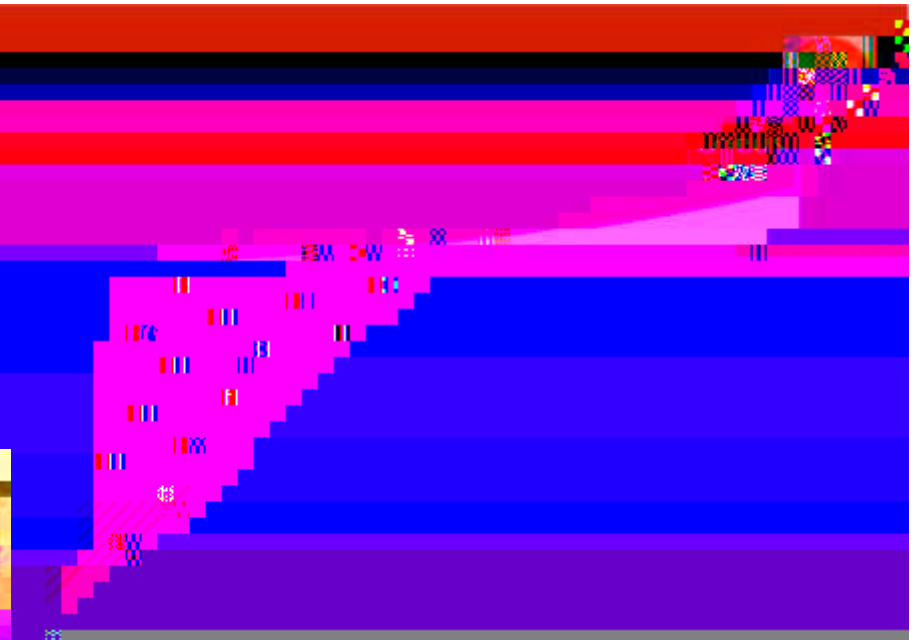
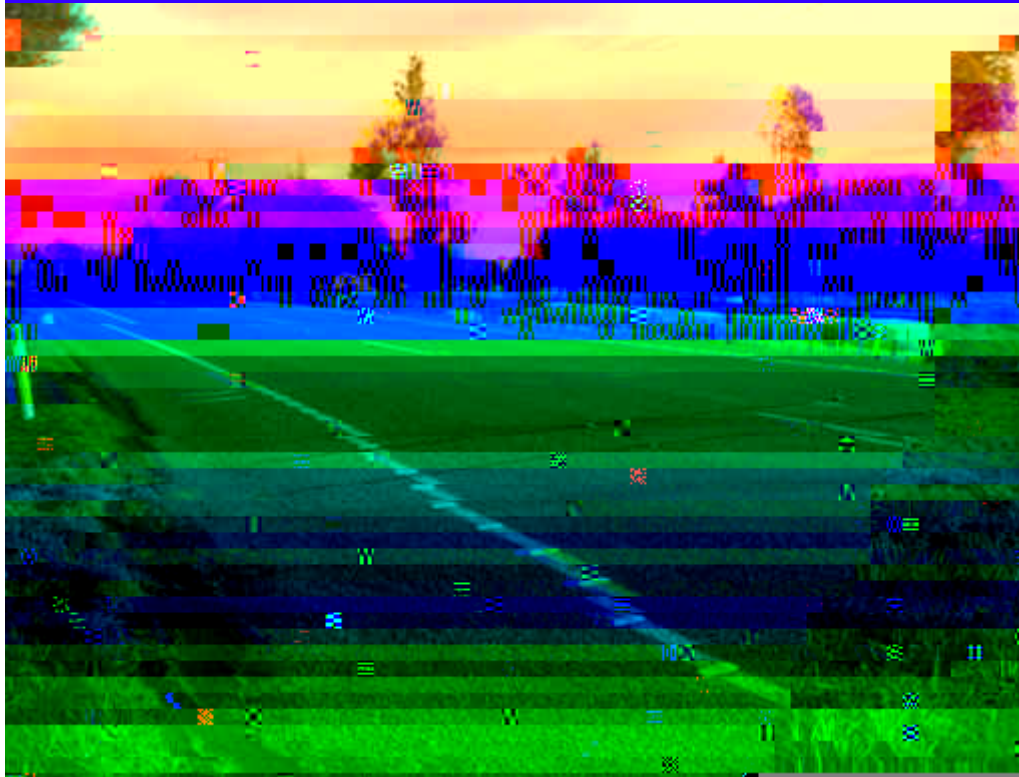
# Installation - ITS





# Before & After Photos

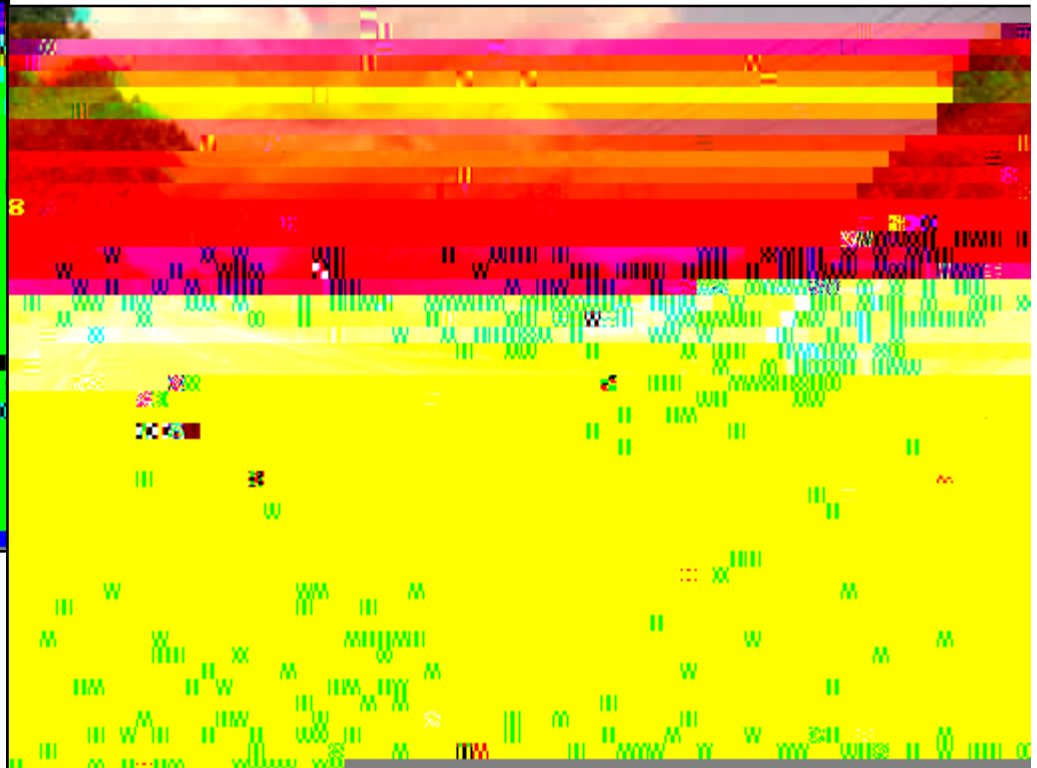
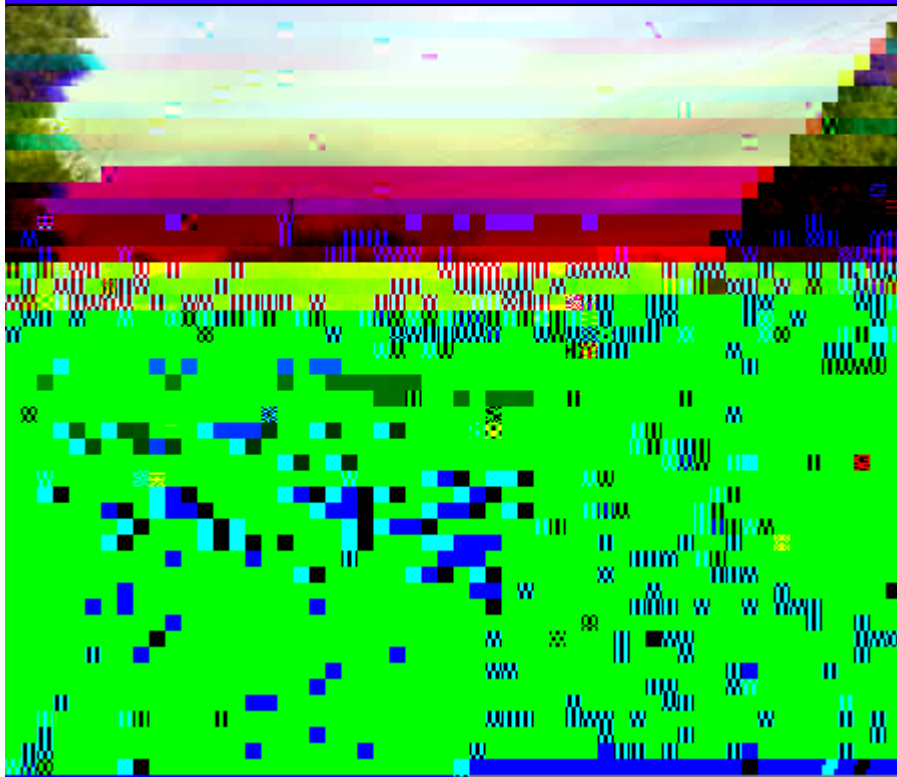
- Site 1 – 410m out from hazard





# Before & After Photos

- Site 1 – 260m out from hazard



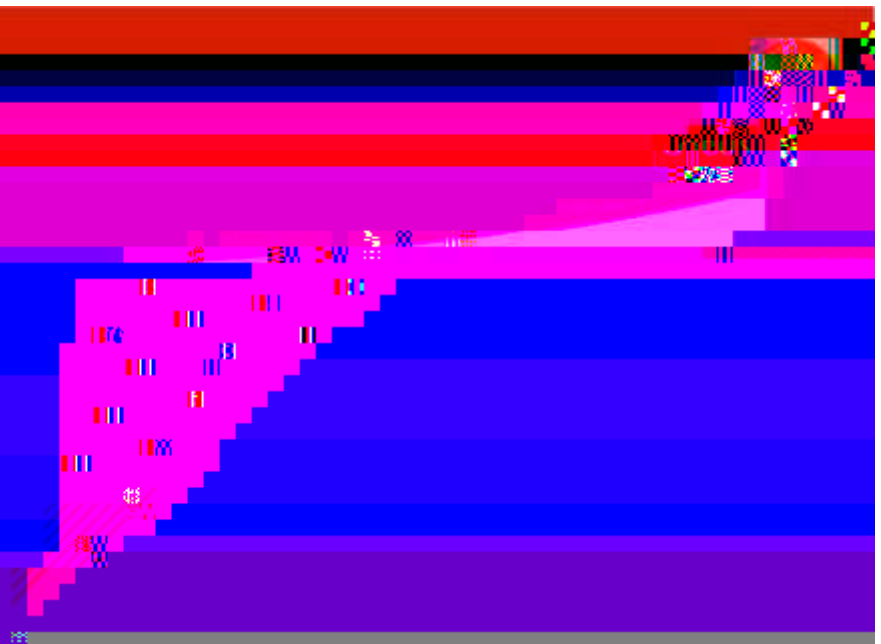






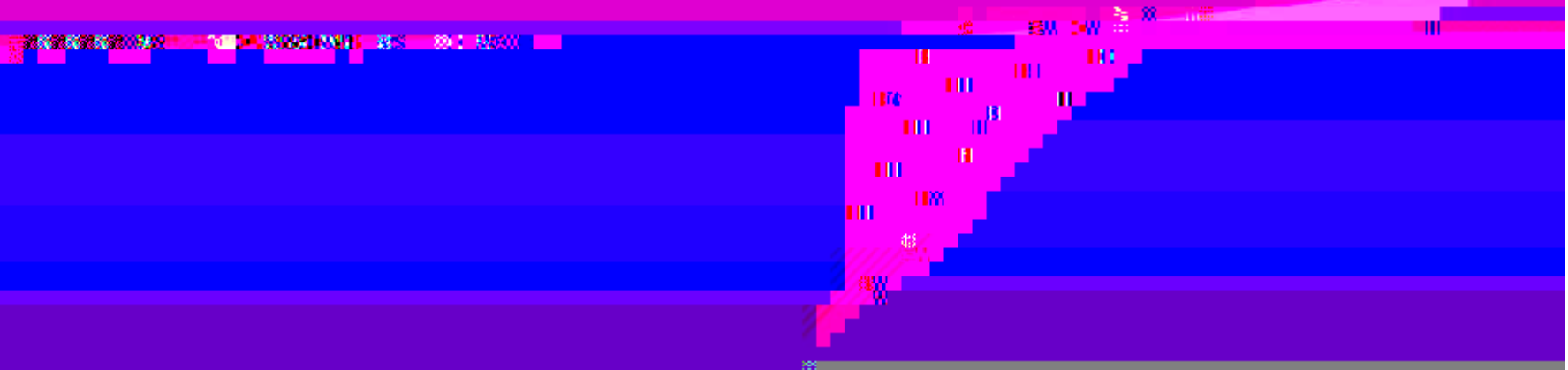
# Before & After Photos

- Site 2 – 260m out from hazard





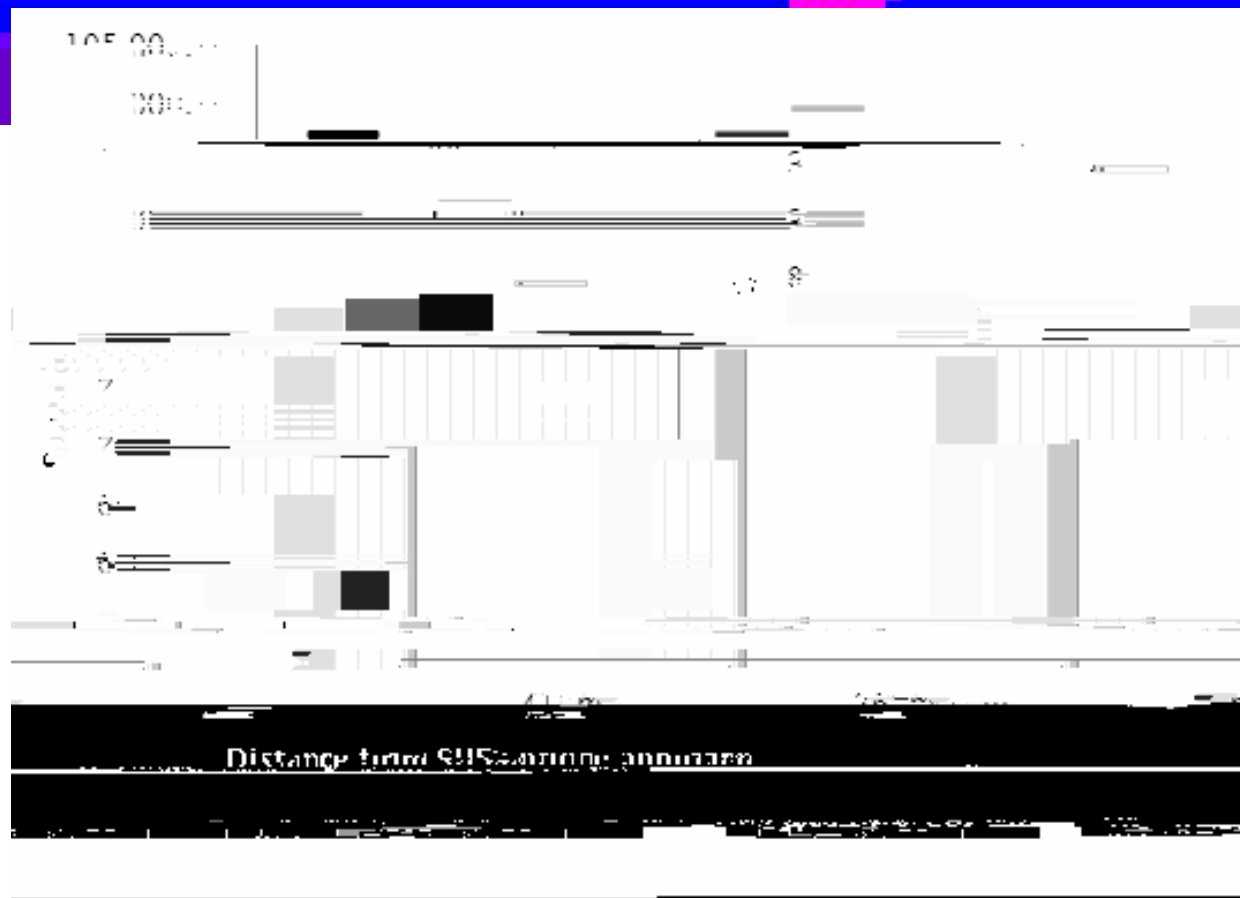
# Results – Overall Speed Change





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- At Trial Site 2 vehicle speeds dropped at both the start & end of the treatment length (statistically)













# Results - Summary





# Conclusions

- The research showed that transverse markings have promise to be used as a speed mitigation device on the approach to high speed rural hazards in a NZ environment.
- Based on the results of field trials a number of recommendations can be made to the arrangement used:
  - Distance between the hazard and the start/end point of the treatment should be reduced
  - Increasing the width of the individual bars to 500mm
  - Distance between the bars should be increased from 3m to 10m
  - Long term assessment period should be increased from 6 to 12 months and additional review of crash history after 5 years.
  - Comparison of day and night speed reduction properties should be investigated
  - Increasing the number of sites for trial



# Conclusions

- More research must occur before they can be more widely implemented.
- Interestingly, there were no crashes for the one-year period (August 2009-2010) at either location for the duration of the trials.



