

# Over-height Strikes – A Human Factors Perspective

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# How Often?

No good data to quantify this – however we do know:

- Structure strikes happen (evidence on structures, video and debris on the road)
- Auckland motorways had an average of 25 bridge strike incidents per year (from NZTA press release, 2009)
- This has been reduced down around 2 to 5 per year though strategic interventions

**Serious safety concerns, disruption and cost impacts**



# What has been done?

- Education, measuring devices, working with the Police and recovering costs



# Scope

- Use Human Factors Principals
- Improving tactical responses (strike is about to occur)
- Strategic responses have been considered in order to understand timeline of events
- To inform the design of a tactical over-height system from a human factors point of view



# How did we go about this?

- International Best Practice
- Specific Auckland Motorway Incidents (6 sites, 20 crashes – 5 years to 2013)
- Talk to the Police
- Talk to the Auckland Motorway Alliance

# Literature

- Incorrect or no knowledge of load height (strategic)
- No route planning (strategic)
- Poor Implementation of Over-height Signage – (tactical)
- Drivers making incorrect assumptions - tactical
- Poor Geometrics – (tactical)

# Auckland Strikes

- No measuring of load height (8)
- Incorrect measuring of load height (2)
- Incorrect stowing/load moved (7)
- Driver inattention (4) (warning activated)
- 2 cases where they knew the height but drove through anyway



# I'll give it a go.....

*“Once a driver arrives at a bridge, the likelihood of trying to squeeze under the bridge is increased RSSB, 2012*

- Uncertainties in relation to bridge height & safety margins
- Difficulties involved in turning around and time lost retracing steps
- Psychological mechanisms which lead people to ignore evidence that contradicts their beliefs or course of action. RSSB (2012)
- Drivers deliberately choose the tunnel route because using the alternative route involves a lengthy diversion (PIARC, 2008)





# Mental Models are Important.....

- Too many false warnings and I'll ignore you
- Driver assumptions about how the system works – unintended consequences



# Why is it called Tunnel Vision?



# Why is it called Tunnel Vision?

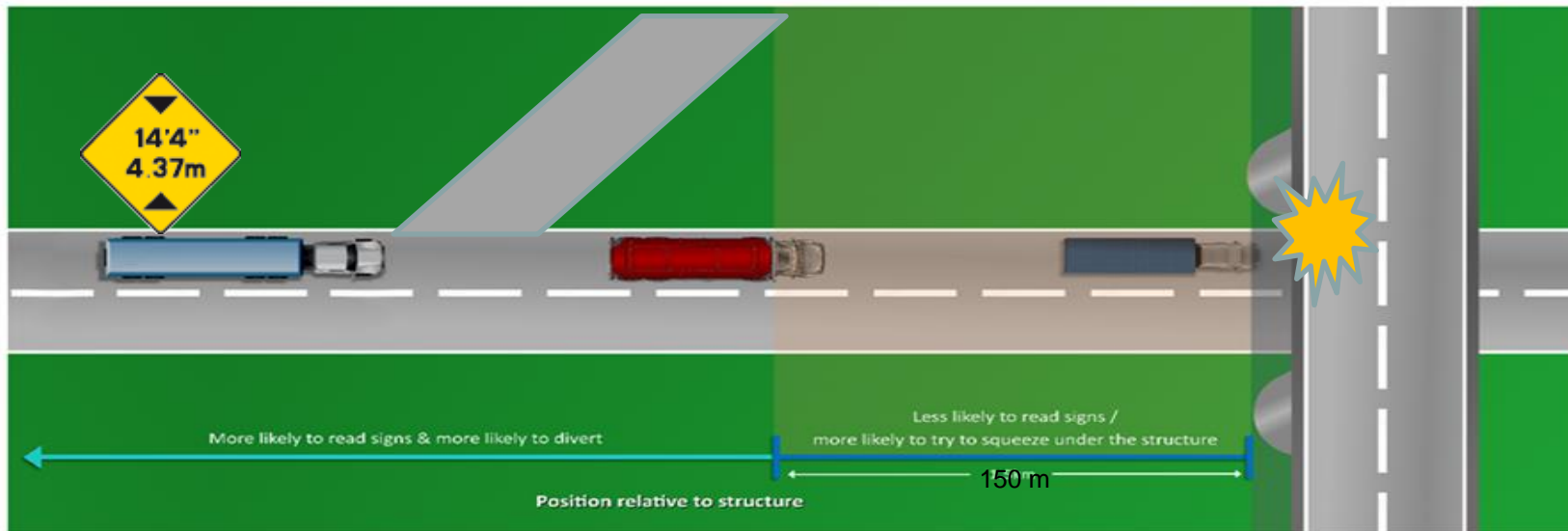
*“If you are not familiar with a route & tunnel entrance you won’t notice the signs” (PIARC, 2008)*

Where did you look first? and then where?

- Eye blink frequency decreases at 200m
- Vision starts to narrow at 150m back
- Drivers do seek out speed signs in this area



# Compliance Risk



Closer to event  
the more likely  
it is to occur

# Recommendations

System Component	Recommendations
Load height knowledge/Signage	Divert early Time to comprehend/select action Avoid manoeuvres areas Visually link measuring & indicating Consistent approach Lighting
Mental models/loads	Limit false warnings Provide alternative route Clear instructions & room to achieve Escalation of event (fail-soft)
Geometrics	Check heights are accurate

# What Next?

Review current designs and test findings by trial.

next  
steps 

# Thinking Smarter

