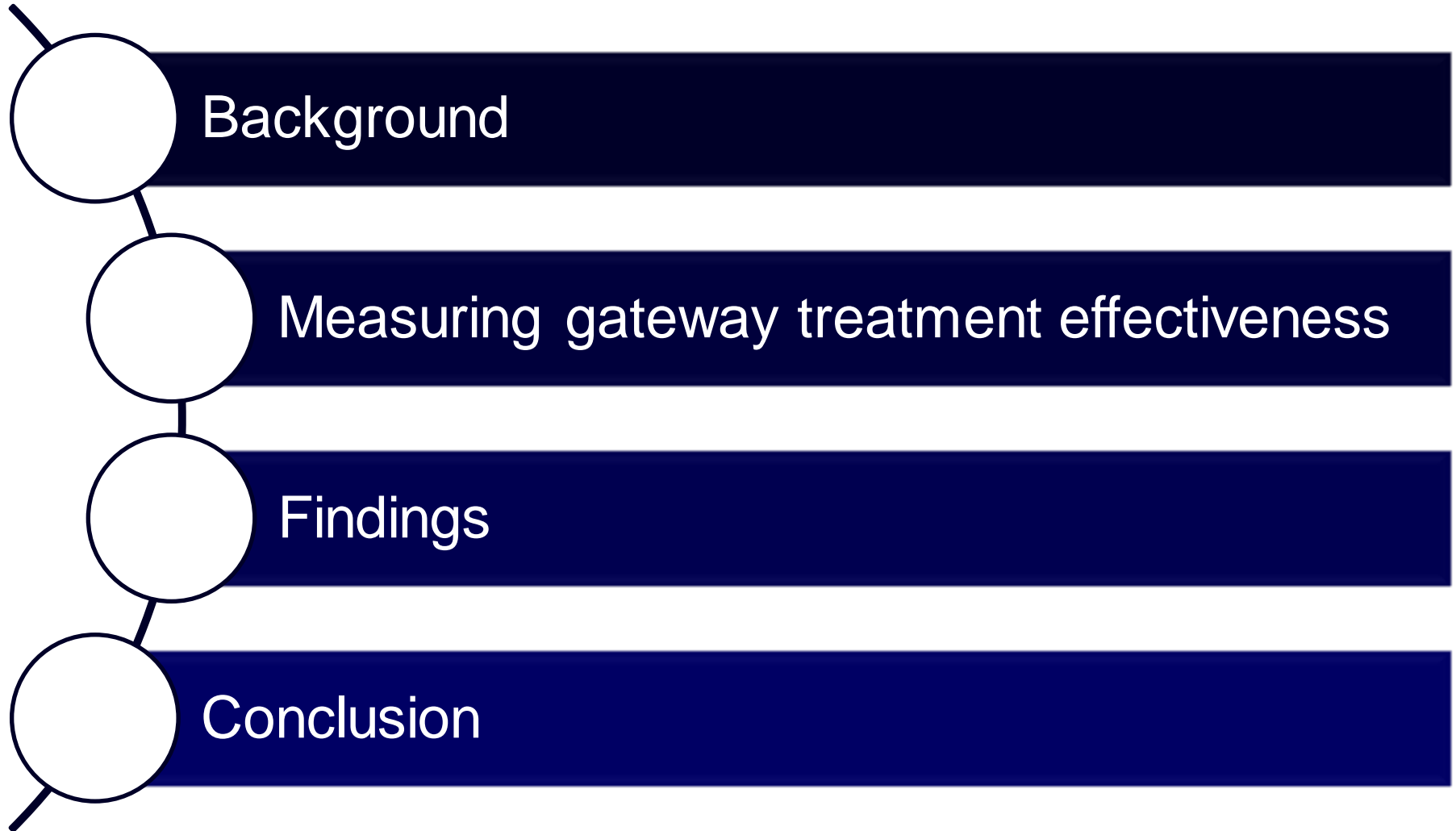


Evaluating rural-urban gateway treatments in New Zealand

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Overview



Scale of the problem

- Speed has been identified as a major factor in the occurrence and severity of road crashes, particularly on high speed rural roads.
- Crucial to rural speed management is the point between high speed rural roads and built-up areas (transition zone) as it is generally associated with inadvertent speeding.
- Speed reduction methods within the transition zone include advanced warning, buffer zones, rural-urban thresholds or gateways and vehicle activated devices.

Background: what is a gateway treatment

- Gateways were identified as a possible speed management measure at transition zones in an Austroads research on effective speed management measures for rural roads (Austroads ST1426).
- They are used to clearly define a change in the road use or function and bring about a change in driver behaviour.
- Treatments include the use of lighting, signage, lane narrowings, surface markings, median treatments and vegetation.

Background: sign only gateways



Masterton gateway photo courtesy of Gary Veith, ARRB Group

Background: pinch point gateways



Background: Why gateway treatments?

- Need for a comprehensive evaluation on gateway effectiveness in Australia or New Zealand.
- Evaluation was a collaborative effort with New Zealand Transport Agency
- Study was aimed at:
 - Measuring the overall effect of gateways on crashes
 - Checking if the effectiveness differed for the sign only and pinch point gateways
 - Measuring differences in effectiveness by gateway layout and features
- Study was designed as a non-equivalent retrospective quasi-experiment.

Measuring gateway treatment effectiveness

Step 1

Identifying comparison sites and verifying treatment sites

Step 2

Crash data

Step 3

Analysis process

Step 4

Statistical analysis and effectiveness measures

Results presentation

Crash reduction factor (CRF):

CRFs represent the expected percentage reduction in crashes after implementing safety countermeasures. Negative CRFs indicate net increases while positive ones indicate net reductions in crashes.

Crash modification factor (CMF):

CMFs show the relative change in crash frequencies due to safety countermeasure implementation. A CMF above 1 indicates a net increase in crashes while below 1 indicates a reduction.

Findings: overall results

Severity	CRF	CMF
Fatal and serious	23%	0.77
Fatal	-79%	1.79
Serious	32%	0.68
Minor	27%	0.73
Overall	26%	0.74

All results in **bold** are statistically significant

Findings: by gateway type

Gateway type	Severity	CRF	CMF
Sign only	Fatal	-35%	1.35
	Serious	-66%	1.66
	Minor	9%	0.91
	Fatal and serious	-16%	1.16
	Total	-3%	1.03
Pinch point	Fatal	-106%	2.06
	Serious	51%	0.49
	Minor	33%	0.67
	Fatal and serious	41%	0.59
	Total	35%	0.65

All results in **bold** are statistically significant

Findings: Pinch point gateway features



Flush median and solid island CRF 38%; CMF 0.62



Flush median and hatched edges CRF 28%; CMF 0.72

Results are statistically significant

Findings: speed zone and gateway type

Sign only:

100-70 km/h transition

- CRF **-12%**; CMF **1.12**

100-50 km/h transition

- CRF **-1%**; CMF **1.01**

Pinch point gateway:

100-70 km/h transition

- CRF **53%**; CMF **0.47**

100-50 km/h transition

- CRF **2%**; CMF **0.98**



All results in **bold** are statistically significant

Findings: by gateway and crash type

- Main interest from this sub-analysis were pedestrian and speed-related movements

Sign only gateway

Head-on crashes

CRF: **62%**

CMF: **0.38**

Run-off-road crashes

CRF: **46%**

CMF: **0.54**

Pinch point gateway

Run-off-road rashes

CRF: **4%**

CMF: **0.96**

Pedestrian-related

CRF: **72%**

CMF: **0.28**

All results in **bold** are statistically significant

Conclusion

- Gateways are effective in lowering crashes (26% net reduction)
- Pinch point more effective than sign only gateways (35% net crash reduction)
- Pinch point effectiveness varies by gateway features
- Pinch point gateways are effective in lowering crashes, particularly pedestrian related crashes at 100-70 km/h transition zones.

Questions?

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