

# Road Safety

Evidence of what works

*Speed and infrastructure*

NZ Case studies

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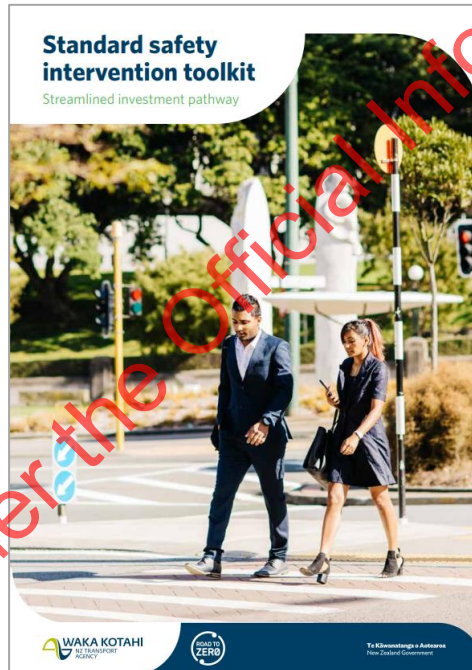


# Road Safety Interventions

DSI effectiveness based on research and evidence used to forecast predicted benefits for SIP

## Summary of DSI effectiveness of standard safety interventions

Standard Safety intervention	DSI effectiveness references and research	SSI Toolkit Assumed DSI Reduction
<b>Median barrier</b>	<ul style="list-style-type: none"> <li>92% Reduction in head on DSI, 67% reduction in all DSI: Safe Roads NZ Rural SH mid barrier site before/ after study Feb 2018</li> <li>60% Reduction or more: IRAP safety tool kit</li> <li>70% - Flexible median barriers (undivided rural highways): Austroad's Road Safety Engineering Toolkit</li> <li>Austroads Research Report AP-R560-18: Towards Safe System Infrastructure - A compendium of Current Knowledge March 2018                             <ul style="list-style-type: none"> <li>Queensland - Bruce Hwy Head on and loss of control over centreline crashes reduced by 75%. Reduced fatal crashes by 75%</li> <li>Ray, Silvestri et al. (2009) 100% reduction in median cross over incursions and &gt;90% reduction in cross median road departures</li> <li>DoT (2009) 64% reduction in severe injury median crashes</li> <li>44% reduction in fatal median crashes</li> <li>FHWA and Turner-Fairbank Highway Research Centre (2008) 83% reduction in fatal cross median crashes</li> <li>89% reduction in all cross median casualty crashes</li> </ul> </li> </ul>	65%
<b>Intersection speed zone</b>	<ul style="list-style-type: none"> <li>69% reduction in Fatal and Serious crashes: Waka Kotahi Intersection speed zone Safe System case study</li> </ul>	65%
<b>Speed management (speed limit changes)</b>	<ul style="list-style-type: none"> <li>30% reduction in death and serious injury equivalents: Waka Kotahi speed Safe System case study</li> </ul>	Varies based on Nilsson's Power Model but typically 15% - 30%



## Summary of DSI effectiveness of standard safety interventions

Standard Safety intervention	DSI effectiveness references and research	SSI Toolkit Assumed DSI Reduction
<b>Roundabout</b>	<ul style="list-style-type: none"> <li>75% reduction in death and serious injury equivalents: Waka Kotahi rural roundabout Safe System case study</li> <li>90% reduction in serious and fatal crashes: HRIG</li> <li>70% for rural roundabout: Austroad's Road Safety Engineering Toolkit</li> <li>65% Reduction in casualties: Austroad's AP-R556-17 Understanding and improving Safe System intersection performance</li> <li>75% reduction in crashes: Austroad's AP-T330-17 'Safe System infrastructure on mixed use arterials'</li> <li>90% reduction in fatal and serious crashes &amp; 25-80% reduction in all crashes from uncontrolled intersection (urban/rural not defined): HRRRG</li> </ul>	75%
<b>Raised intersection platforms (at existing signalised intersection/ roundabouts)</b>	<ul style="list-style-type: none"> <li>50% reduction in injury crashes: Bruce Corben (2014) Criteria for the use of elevated stop lines at traffic signals</li> <li>53% reduction in casualty crashes (urban roads): ARRB Criteria for the use of elevated stop lines at traffic signals</li> <li>Reduction from 80km/h to 50km/h operating speed will reduce risk of fatal side impact crashes by 65% based on Nilsen curves</li> <li>40% decrease in fatal and serious crash risk Source: Jurewicz et al. (2016) based on Bahouth et al. (2014), Davis (2001)</li> </ul>	40%

<https://www.nzta.govt.nz/assets/resources/standard-safety-intervention-toolkit/standard-safety-intervention-toolkit.pdf>



# Road Safety Interventions

Some interventions are more effective than others

Table 4.6: Head-on treatments

Hierarchy	Treatment	Influence (E = exposure L = likelihood S = severity)
Safe System options ('primary' or 'transformational' treatments)	<ul style="list-style-type: none"> <li>One-way traffic</li> <li>Flexible median barrier</li> <li>Very wide median</li> <li>Very low speed environment/speed limit.</li> </ul>	L S S L, S
Supporting treatments (compatible with future implementation of Safe System options)	<ul style="list-style-type: none"> <li>Wide median</li> <li>Painted median/wide centrelines.</li> </ul>	L L
Supporting treatments (does not affect future implementation of Safe System options)	<ul style="list-style-type: none"> <li>Non-flexible barrier provision</li> <li>Lower speed environment/speed limit</li> <li>Ban overtaking</li> <li>Skid resistance improvement</li> <li>Audio-tactile centreline</li> <li>Audio-tactile edgeline</li> <li>Roadside barriers</li> <li>Consistent design along the route (i.e. no out-of-context curves)</li> <li>Consistent delineation for route</li> <li>Overtaking lanes</li> <li>Improved superelevation.</li> </ul>	S L, S L L L L S L L L L
Other considerations	<ul style="list-style-type: none"> <li>Speed enforcement</li> <li>Rest area provision</li> <li>Lane marking compatible with vehicle-lane-keeping technology.</li> </ul>	L, S L L

Table 4.7: Intersection treatments

Hierarchy	Treatment	Influence (E = exposure L = likelihood S = severity)
Safe System options ('primary' or 'transformational' treatments)	<ul style="list-style-type: none"> <li>Grade separation</li> <li>Close intersection</li> <li>Low speed environment/speed limit</li> <li>Roundabout</li> <li>Raised platform.</li> </ul>	L, S E L, S L, S L, S
Supporting treatments (compatible with future implementation of Safe System options)	<ul style="list-style-type: none"> <li>Left-in/left-out, with protected acceleration and deceleration lanes where required</li> <li>Ban selected movements</li> <li>Reduce speed environment/speed limit.</li> </ul>	L, S E L, S
Supporting treatments (does not affect future implementation of Safe System options)	<ul style="list-style-type: none"> <li>Redirect traffic to higher quality intersection</li> <li>Turning lanes</li> <li>Vehicle activated signs</li> <li>Improved intersection conspicuity</li> <li>Advanced direction signage and warning</li> <li>Improved site distance</li> <li>Traffic signals with fully controlled right turns</li> <li>Skid resistance improvement</li> <li>Improved street lighting.</li> </ul>	E L L L L L L L L
Other considerations	<ul style="list-style-type: none"> <li>Speed cameras combined with red light cameras.</li> </ul>	L, S

[Austroads Research Report AP-R509-16 Safe System Assessment Framework](#)

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# Raised Safety Platforms



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# Raised Safety Platforms

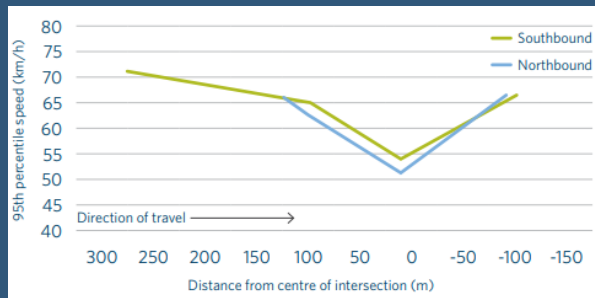
Thomas / Gordonton

## Effectiveness

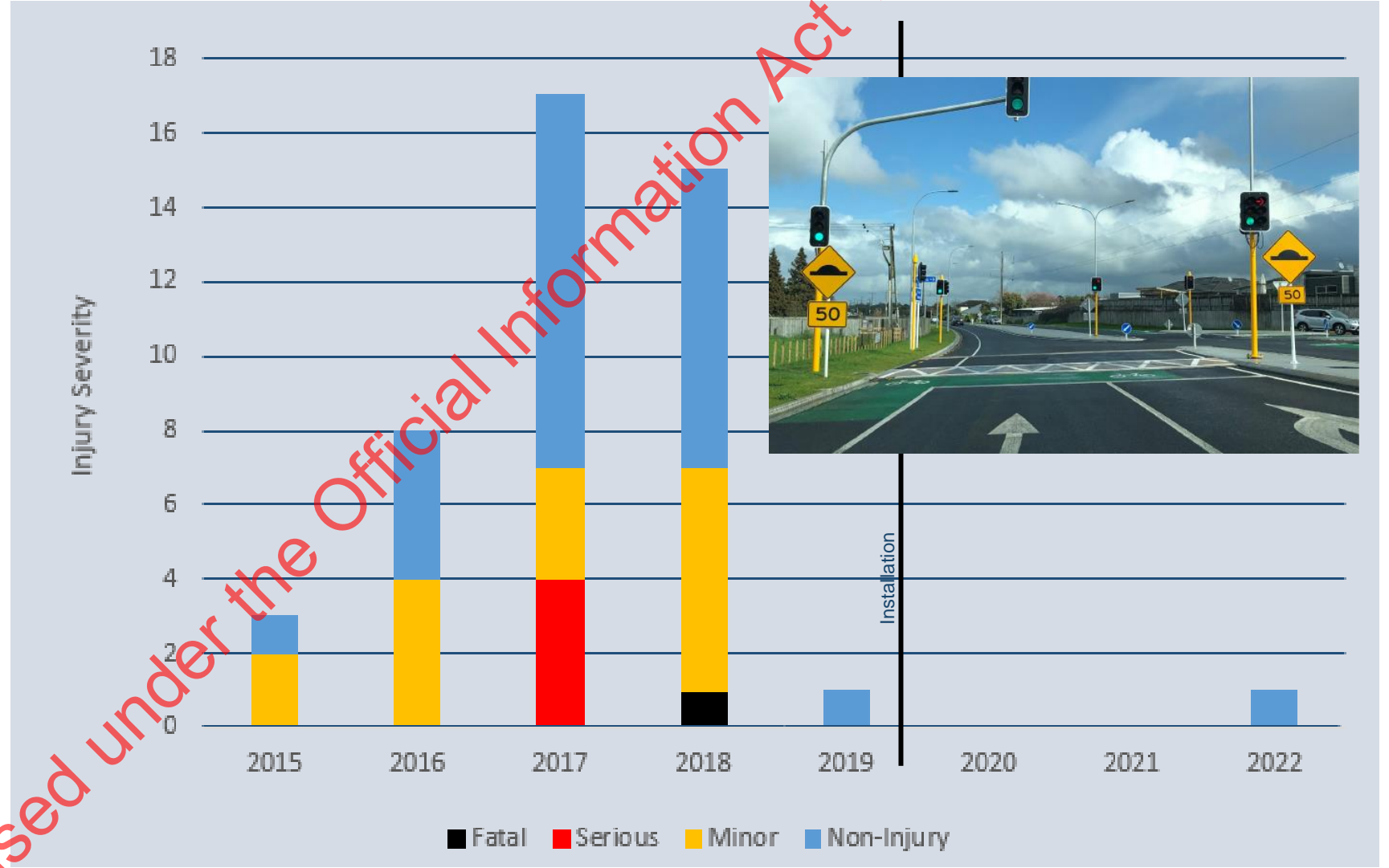
- 100% reduction in DSI crashes
- 98% reduction in all crashes

## Speed profile

High speed environment (70-80km/h approaches) with 50km/h design platforms



Primary treatment



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Case study document link - <https://www.nzta.govt.nz/assets/Safety/docs/road-to-zero/safe-system-case-study-raised-safety-platforms.pdf>

