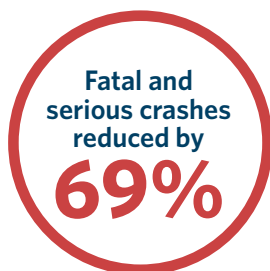
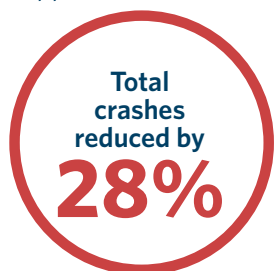




Intersection speed zones improve safety at rural intersections

Intersection speed zones are used to improve the safety at rural intersections along high-speed roads. They detect when a driver is approaching on a side road and activate an electronic variable speed limit sign to temporarily show a lower speed limit on the main road.

The aim is to temporarily slow oncoming traffic down to 60 or 70km/h, making it easier and safer for people to pull into or out of a side road across a high-speed rural road. This takes the pressure off at intersections and makes the road safer for everyone by reducing the risk someone is killed or seriously injured if a crash happens.



Intersection speed zones are part of the Safe System approach to road safety

The Safe System approach aims to create a forgiving environment and reduce harm when people make mistakes.

Reducing the speeds people travel at through the intersection means that crashes are less likely to happen because people will have more time to react to mistakes and avoid collisions.

If a crash does occur, it is less likely to result in harm because the slower speeds mean the crash forces are lower. Together with braking, crashes that involve vehicles being hit on the side should be closer to 50km/h, which should be more survivable¹.

As well as reducing harm through lower speeds, intersection speed zones also seem to increase the awareness of people travelling along the main road – leading them to be more responsive to unexpected events like another vehicle turning in front of them. It's likely that this is because reacting faster gives people more time to brake or swerve, which reduces the likelihood and severity of crashes².

nzta.govt.nz/safety/safety-resources



How long does it take to create an intersection speed zone?

It takes around six months to investigate and complete an intersection speed zone, depending on procurement, access to power and related intersection improvements.



How much do intersection speed zones cost?

Intersection speed zones cost approximately \$200,000 for design and installation, which may be higher or lower depending on site characteristics. These costs don't include ongoing maintenance costs - which relate to use of the data network for communication with the sensors and signs, collection of speed data (where this is measured), and repair of damage occurring from crashes and system malfunctions.



How effective are intersection speed zones?

We monitored intersection speed zones across New Zealand, and our research found that they successfully reduced speed along main (priority) roads.

It showed that when signs are activated, modal (the most common) speeds were close to the variable speed limit displayed, whereas mean speeds were well above the posted variable speed limit¹.

Mean speed reduction range

Sign on vs sign off	3-10 km/h
Before signs were installed vs signs on	4-19 km/h



Across all sites, we see a reduction in mean speeds of 3-10km/h, when simply comparing when they are turned on versus when they are turned off.

For some sites we can also compare data collected before signs were even installed. Comparing this to once the signs are turned on, it showed a reduction in mean speeds of 4-19km/h.

Intersection speed zones were found to reduce both total crash rates and fatal and serious crash rates³.

Looking at the 10 sites installed in the first trial, in the years after installation compared to the five years before, we saw:

- total crashes reduced by 28%
- fatal and serious crashes reduced by 69%.

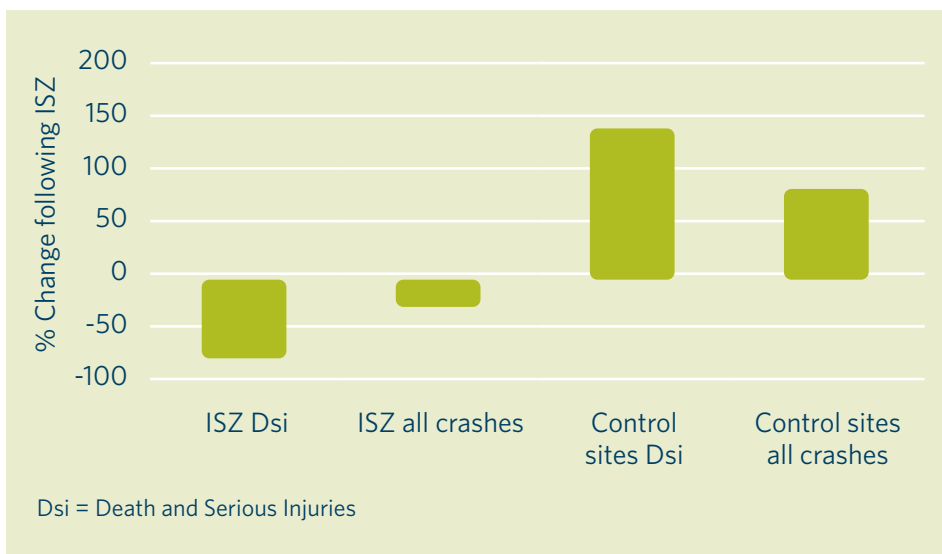
Comparison sites did not show the same reduction in crash rates and national trends across all rural intersections show crashes have been increasing since 2013.

A small number of high-severity crashes involving turning vehicles have still happened at intersection speed zone sites. We know they do not completely prevent these kinds of crashes, but reduce the risk they will happen, and how severe outcomes could be when they do.



Key tips for practitioners

- Intersection speed zones are effective in improving safety at high-risk intersections and there are many cases where severe trauma has been avoided; they can be used as an interim measure before more expensive roundabouts are constructed, or as a way of improving safety over a wider area at multiple sites to improve region-wide safety.
- Along with research showing they successfully reduced vehicle speeds along priority roads, it found bigger speed reductions were shown on straighter higher speed roads⁴ and these speed effects remained fairly consistent over several years.
- In delivering safe system outcomes, intersection speed zones are a supporting (step towards) safe system treatment⁵, as they will improve the overall level of safety at the intersection however, they will not be as effective as a primary safe system treatment as primary treatments are capable of virtually eliminating the potential risk of death and serious injuries.
- The standard safety intervention toolkit includes intersection speed zones, rural intersection activated warning signs (RIAWS) as a 'safer intersection treatment', although they may still be a viable solution for safe system transformation intersection sites if primary safe system solutions are not possible.
- Care is needed to make sure the design of the system works for each site, with curves, approach site distances and intersection layout needing consideration.
- Maintenance costs should be built into the whole-of-life costs of intersection speed zones.
- Intersection speed zones cost approximately \$200,000 for design and installation, which may be higher or lower depending on site characteristics.



Thank you to Mackie Research & Consulting for compiling this case study www.mackieresearch.co.nz

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- Austrroads. (2016e), Safe system assessment framework, AP-R509-16, Austrroads, Sydney, Australia



For more information:

Check out the **Standard Safety Intervention Toolkit** which details more about why, when and where this treatment may best be suited. Check out **this short video** on intersection speed zones.