

Raised safety platforms improve safety at intersections

Raised safety platforms are a treatment increasingly being used to improve safety through intersections and crossings by encouraging safer speeds.

Raised safety platforms make it physically uncomfortable to drive over the platform faster than the advisory speed. When used at intersections, they can take the form of approach platforms just prior to the intersection, or the whole intersection can be raised.

nzta.govt.nz/safety/safety-resources

An innovative new safety treatment for New Zealand

Raised safety platforms were pioneered in the Netherlands and they've recently been successfully trialled in Victoria, Australia. New Zealand's first was recently installed at Thomas/Gordonton intersection in Hamilton.

Gordonton Road is a highspeed rural road on the fringes of a developing urban area in Hamilton, with a recently introduced 60km/h speed limit on the approach to the Thomas Road intersection.

Approach platforms were installed in May 2019, along with traffic signals on the northern and southern approaches to this intersection.

The aim was to ensure that vehicle speeds through the intersection did not exceed 50km/h, to reduce the risk of harm from side-on crashes. The stop line is located before the approach platforms, which means vehicles stop further from the intersection than normal. More recent overseas examples have put the stop line on top of the approach platform.

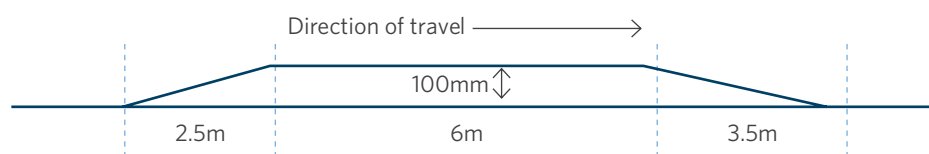


Figure 1: Profile of raised safety platforms used at Thomas/Gordonton intersection



Raised safety platforms are part of the Safe System approach to road safety

The Safe System approach, which underpins New Zealand's Road to Zero road safety strategy, aims to create a forgiving environment and reduce harm when people make mistakes. Speed is the biggest determining factor to how much harm is caused in a crash.

Raised safety platforms are designed to slow traffic, so that if something happens, vehicles are travelling slow enough to give people time to react and avoid a crash. If a crash does happen, the human body can withstand any impact forces at a slower speed.

The raised safety platforms at Thomas/Gordonton are designed to discourage speeds of over 50km/h, which is the upper speed at which people in vehicles involved in a side-on crash are likely to survive¹.

In places with high numbers of people using active modes, raised safety platforms should be designed for 30km/h, which is more likely to be survivable for people walking and cycling.

They are substantially different to conventional speed humps as they have a much gentler ramp specifically designed to achieve the desired speed reduction. what may otherwise be a head-on collision.



How long does it take to implement raised safety platforms?

In terms of actual installation, the asphaltic concrete approach platforms with painted shark's teeth used in this project can be installed in four to five hours. Permanent thermoplastic markings then need to be applied four to six weeks later.



How much do raised safety platforms cost?

The approach platforms installed at the Thomas/Gordonton intersection cost around \$40,000-\$50,000 per approach, including signs and road markings. The cost depends on the type and number of platforms used, and whether they are being installed as part of a new intersection (as was the case here), or retrofitted to an existing one.



How effective are raised safety platforms?

Evaluation of the raised safety platforms at Thomas/Gordonton found them to be an effective treatment for achieving safer speeds². After installation, most drivers travelled through the intersection well below the design speed of 50km/h.

International research has shown raised safety platforms reduce death and serious injuries by about 40%.

Table 1: RSP intersection speeds (approx. 10m from centre of intersection, 7-day data from 17-23 July 2019. Vehicles following another vehicle with less than 3 seconds' headway removed from the dataset)

	Northbound	Southbound
Total vehicle count	12,083	15,639
85th percentile speed (km/h)	43	46
95th percentile speed (km/h)	52	54
Vehicles over speed limit (60km/h)	1.0%	1.6%

It is too early to determine the impact of the changes on crashes at the intersection, and it will be difficult to differentiate between the benefits resulting from the raised safety platforms and those from the signalised intersection.

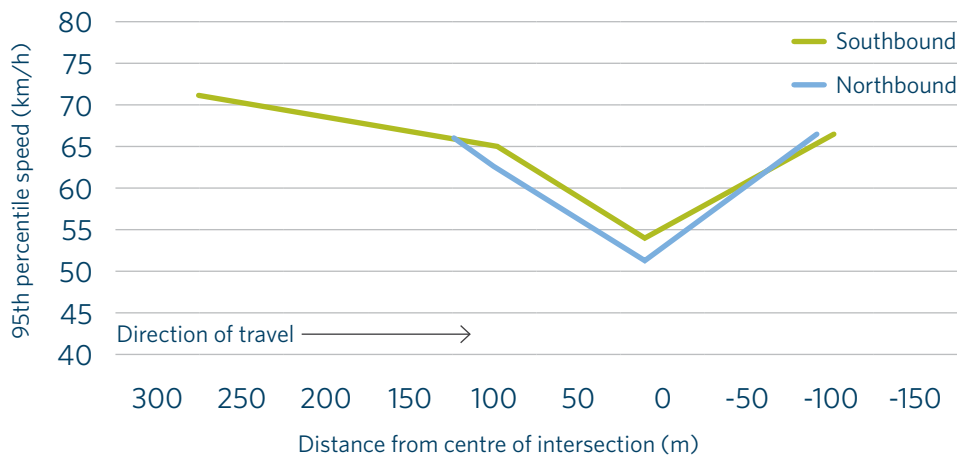


Figure 2: 95th percentile speeds on approach to, through, and departing intersection for northbound and southbound vehicles (mix of radar and tube measurements; 7-day data from 17-23 July 2019; negative distances denote intersection departure. Vehicles with less than a 3-second headway removed.)



The evaluation also showed:

- Most drivers braked well in advance of the raised safety platforms, with only 5 % braking late.
- No instances of obvious hard braking were observed. People tended to slow down as they neared the intersection and were at their slowest speed as they crossed the raised safety platform and moved through the intersection itself (figure 2).
- Most people appeared to understand the layout and stopped before or on the stop line (74% in the through lane and 61% in the right-turning lane). The remaining drivers stopped after the stop line, but before entering the intersection.
- Drivers in the through lane were more likely to stop in the right place than drivers in the right-turning lane.
- ‘Vertical acceleration’ indicates how strong the upward forces are, ie, how uncomfortable or jarring the platforms are to drive over. This was measured as vehicles drove onto the raised safety platforms. The data showed increasing vertical acceleration (and therefore increasing driver discomfort) with increasing speed.
- Speeds of around 50-60km/h caused vertical acceleration of approximately 0.4g, which is the point at which drivers begin to experience some discomfort³.
- Finally, Hamilton City Council found there was no negative impact of the raised safety platforms and traffic signals on intersection traffic flow and throughput.

Key tips for practitioners



We can take some lessons from Hamilton and recent applications in Victoria, including:

- Raised safety platforms are a 'primary safe system treatment' designed to eliminate the risk of fatal and serious injury crashes.
In some instances, they have also been designed as a safe system supporting treatment to achieve speeds of 40km/h in areas with average speeds of 60km/h or more and with limited numbers of pedestrians or people cycling.
- When used at higher speed locations, they tend to have a longer platform and a gentler profile than those used for neighbourhood traffic calming.
- Using a different colour shade on the surface of the platform or ramps can help people to identify and appropriately respond to the raised safety platform as they approach. This was added to the Gordonton/Thomas platforms after evaluation.
- Approach platforms are more appropriate at intersections with raised central medians, while fully raised intersections work well at intersections without raised separation.
- Departure ramps should be shallower than approach ramps along routes where there is a high proportion of heavy or trade vehicles to avoid excess noise pollution. It also reduces discomfort for bus passengers seated at the rear, making this particularly appropriate for bus routes.
- Detailed oversight of construction is needed to ensure the ramp profiles are constructed as designed. This includes ensuring designers and delivery teams understand the project concept and objective well, building the platforms and ramps separately or to a template, and checking ramp grades once constructed.
- Retrofitted raised safety platforms are more expensive and difficult to get right than new builds.
- Marking limit lines on top of (rather than before) raised safety platforms at intersections help to maintain sightlines and signal phase efficiency, and to avoid vehicles getting 'stranded' beyond the limit line when the signal turns red.
- To encourage public understanding, effective public engagement and education activities, particularly the use of variable messaging signage when raised safety platforms are first installed, are recommended. There have been some examples in Victoria, Australia, where there was a lack of public understanding of raised safety platforms, at least initially, when they were installed.

Footnotes

- ¹ International Transport Forum (2016). *Zero road deaths and serious injuries: leading a paradigm shift to a safe system*. Paris, France: OECD Publishing. <http://dx.doi.org/10.1787/9789282108055-en>
- ² Mackie, H, Blewden, M, Thorne, R, & Hirsch, L. (2019). *Raised safety platform evaluation: Gordonton and Thomas Road intersection*. Prepared by Mackie Research for the NZ Transport Agency. Auckland, New Zealand.
- ³ Kennedy, J et al (2004). *Impact of road humps on vehicles and their occupants*. Prepared for Charging and Local Transport Division, Department of Transport. TRL Report TRL 614. Crowthorne, UK.



For more information:

- [Hamilton City Council raised safety platform FAQs](#)
- [VicRoads \(2018\) Road design note 03-07 on raised safety platforms](#)