

Eliminating head-on crashes

Safe System case study



Aligning our transport system to a Safe System will create a forgiving environment where people won't be killed or seriously injured if a mistake was to happen.

Flexible median barriers are described as a primary Safe System intervention because of their ability to eliminate the occurrence of fatal and serious injuries.

By separating opposing traffic flows, while still retaining opportunities for overtaking where appropriate, high severity crashes are less likely to occur because road users are physically separated from opposing traffic flows with which they may otherwise have head-on collisions.

The most common type of flexible barriers are wire-rope barriers, made up of three or four tensioned wire cables supported by steel posts. They are known as flexible barriers because they stretch to absorb the force of the crash.

The barriers use a dual mechanism to slow down and divert excessive force away from the people inside the vehicles. The ropes deflect and absorb the energy and the posts collapse, slowing down and redirecting the vehicle away from the hazard with very little rebound.

nzta.govt.nz/safety/safety-resources

Flexible median barriers are a critical intervention in aligning our transport network with a Safe System

Fatal and serious injuries are most often a result of head-on crashes – more than any other crash type. Evidence has shown that the chance of being involved in a fatal or serious head-on crash greatly increases on roads where traffic flows are at or above 6000 vehicles each day. A median barrier will effectively eliminate 100% of head-on and 50% of run-off-road type crashes.

SH2 River Road median barrier project

In September 2011, the State Highway 2 River Road median barrier project was officially opened. The SH2 River Road project was approximately 3.4 km long between Ferguson Drive and Moonshine Hill Road.

An average of 24,000 vehicles each day use this section of SH2.

It follows the Hutt River down the valley, passing the cities of Upper Hutt and Lower Hutt to the west, to reach the northern end of Wellington Harbour at Petone.

The road was undivided and, as a result, there were numerous crashes involving vehicles crossing the centreline. The objective of the project was to reduce crash severity through the use of a median flexible safety barrier, while maintaining overtaking opportunities.

The project included the installation of a flexible median barrier, widening the road to provide 2.5 metre shoulders either side of the carriageway and a three-metre median. Roadside barriers were installed where the road embankment slope was particularly steep, to prevent vehicles crashing into culvert headwalls. Clear zone principles were adopted on other roadside sections resulting in expensive earthworks and unprotected roadside hazards and slopes.

Key project facts

- The corridor is rural and curvilinear alignment.
- The speed limit is 100km/h.
- In the five-year period before this project began, there were seven head-on crashes on this stretch of road, with two tragically resulting in fatalities.
- The project construction period to undertake the widening and barrier installation took approximately 18 months at a cost of \$5.2 million.

Key tips for practitioners

- On high volume corridors where flexible median barriers are installed, the predominate high risk crash type will change from head-on crashes to loss of control and will result in a significant decrease in fatal and serious injury crashes.
- The cost to widen the road to provide a median width that allows the full containment of the barriers potential deflection is not cost-effective, it is better to provide the barrier in a narrower median, knowing that residual risk of an impact due to the barrier deflecting into the opposing lane is very uncommon.
- To minimise the amount of pavement works and costs, roadside barriers should be offset as much as possible into the unsealed shoulder or berm, this provides cost effective protection of roadside hazards.
- On high volume corridors installation of continuous roadside safety barrier will be more cost effective and safe system aligned than attempting to provide wide embankments or clear zones.
- Installation of audio tactile pavement markings along median edgelines, can potentially reduce the number of nuisance barrier strikes and the associated maintenance costs.

Median and roadside safety barriers are the best solution currently available if we want to continue to move around New Zealand at the speeds we have been used to.



For more information:

Check out the Standard Safety Intervention Toolkit which details more about why, when and where this treatment may best be suited. www.nzta.govt.nz/resources/standard-safety-intervention-toolkit/

Check out this short video on median barriers. www.youtube.com/watch?v=bGbBiW6FhzO