

RUMBLE STRIPS – QUESTIONS AND ANSWERS

Rumble strips are a key safety initiative that help prevent crashes by providing drivers with a 'wake up call' if they stray over the edgeline or centreline. The NZ Transport Agency (NZTA) is set to significantly increase their presence on the state highway network with installation of approximately 750 kilometres planned in the first half of 2009.

What are rumble strips?

Rumble strips are raised plastic 'ribs' spaced at regular intervals along or adjacent to a road's edgeline or centreline.

How do they improve road safety?

Rumble strips help prevent drivers from running off the road or straying across the centreline as they can be felt and heard as car wheels cross over them. They help to reduce crashes caused by driver inattention or fatigue because the noise and feel of the strips can provide a 'wake-up' before a crash happens.

When laid along edgelines they help prevent both run-off-road crashes and head-on crashes. Head-on crashes can be caused by a driver first veering off the side of the road then over-correcting and crossing the centreline. Laid along centrelines they also help to improve driver's lane-keeping and prevent head-on crashes.

How are they currently used on New Zealand roads?

Rumble strips have been used on New Zealand roads for many years and were a key safety initiative of the former Transit New Zealand (now the NZTA). There are currently around 600km of rumble strips installed along the state highway network (representing coverage of around 5%).

What are the future plans for installation of rumble strips?

The use of rumble strips on the state highway network is set to significantly increase. The NZTA is embarking on new large-scale installation of approximately 750 road km of rumble strips in the first half of 2009. This will increase the total length of the state highway network fitted with rumble strips to approximately 1,350 kilometres, or 12% of the network.

The rumble strip installation programme has been significantly expanded due to additional funding for state highways being made available through the Government's Jobs and Growth plan.

Further installation may be carried out over the next few years subject to funding, and the experience and effectiveness of 2009's installation programme.

Why is there going to be an increase in installation?

Recent research and trials have strongly suggested that significant safety benefits could be gained by increasing installation along the state highway network. Rumble strips are a cost-effective means of making our roads safer.

What sort of research has been undertaken?

Three research reports prepared by Transport Engineering Research New Zealand for the former Transit New Zealand and Land Transport New Zealand (now combined as the NZTA) confirm that increased use of rumble strips on the state highway network would equate to a significant reduction in crashes.

The first report, *Review of lane delineation*, contained a large review of international literature and showed that the crash reductions that can be expected from rumble strips are high. The second report demonstrated that relatively high benefit cost ratios (BCRs) can be expected from rumble strip applications and provided a spreadsheet based tool that is widely available for calculating BCRs for individual projects.

The third report, *The Usability and Safety of Audio Tactile Profiled Road Markings*, documents an extensive consultation process that was carried out to work through the practical implications of more widespread use of rumble strips throughout New Zealand. This report concluded that with a few precautions, there are no significant barriers to installing rumble strips on a much greater proportion of New Zealand's roads.

In addition, KiwiRAP 2008 identified rumble strips as being one of the most effective road improvement tools available, with the potential to reduce injury crashes by 20 to 45% in the locations where they are installed (KiwiRAP is a road assessment programme managed by New Zealand Automobile Association in partnership with the NZTA, Ministry of Transport, Accident Compensation Corporation and the New Zealand Police).

The NZTA has also carried out successful new trial installations through the Central Waikato, Bay of Plenty and Northland.

Where will installation take place?

In 2009 rumble strip installation will primarily be along State Highway 1 between Ohaewai (South of Kaitaia) and Milton (South of Dunedin). Some other high risk lengths of other highways will also receive rumble strips.

High-risk routes will be targeted first, including stretches of highway that have a high crash density, high traffic flows and/or are used for long distance travel. Routes that are over represented in fatigue or inattention type crashes will also be targeted. This includes tourist routes as drivers who are unfamiliar with a particular stretch of road are often over-represented in these types of crashes.

Why isn't the installation just targeting stretches of the state highway network where there has been a high incidence of crashes?

Continuous installation along a significant length of highway will be favoured over a series of localised or spot treatments at crash black spots, as the warning to a driver that they are leaving their correct traffic lane may occur some distance before the location of a potential crash. A consistent road environment in itself also brings safety benefits. Research also indicates that drivers can run off the road through fatigue on easier sections of road where the demands on driver concentration is low and speeds are often higher.

How will they be laid out on roads?

Rumble strips will be installed along edgelines, as this is where they offer the greatest safety benefits. Specifications for installation are as follows.

Edgelines:

- 150mm wide ribs at 250mm spacings placed immediately outside the standard 100mm edgeline where a 1m shoulder width can be retained.
- 150mm ribs placed directly over the top of the 100mm edgeline, protruding 50mm into the shoulder, where the shoulder width is less than 1m.

Centrelines:

- Double yellow no-overtaking lines: 150mm wide yellow ribs at 250mm centres on each 100mm wide centreline protruding 50mm into the lane. On right hand

- bends, adjacent to residences, it may be appropriate to omit the nearside yellow ribs to avoid the frequency of them being tracked over.
- Single yellow centrelines: 150mm long yellow ribs along the yellow line as above and 150mm long white ribs, projecting 50mm into the lane on the dashed centreline.
 - White dashed centreline. 200mm long (wide) ribs placed over 100mm wide painted lines, projecting 50mm into the traffic lane on each side.

Will they be visible?

Generally yes. Whether they are placed alongside or on top of a centre /edgeline they will typically protrude onto the road creating a 'tooth effect'. Rumble strips also have good night time/ wet conditions reflectivity, providing superior visibility to a conventional flat line in adverse conditions.

Will drivers be alerted to the fact they are approaching an area where new rumble strips are installed?

Yes, temporary warning signs will be installed to signal the beginning of newly installed rumble strips. It is envisaged these will be removed once road users are familiar with them in a given location.

What are they made out of?

The plastic ribs are made from either cold applied plastic or thermoplastic – materials chosen for their durability.

How much is being spent on the rumble strip installation programme?

The budget for the programme in 2008/09 is approximately \$10m. It costs around \$13,000 to install one kilometre of rumble strips.

RUMBLE STRIPS – Q&As FOR CYCLISTS

What size shoulder width will there be for cyclists to ride within where rumble strips are laid?

Where possible a clear sealed shoulder space of 1m or more will be maintained outside rumble strips. Efforts will be made to ensure that this is clean, clear and well maintained, so cyclists are not required to frequently cross the line to avoid hazards.

On stretches of road where this is not possible, but where rumble strips would provide significant safety benefits, cyclists needs will be taken into account before installation. The extent of cycle use on the road will be considered and local cycle groups will be consulted.

On very narrow roads, where there are effectively no shoulders, but where rumble strips would provide significant safety benefits, they will be placed hard up against the edge of seal, in a location cyclists are unlikely to ride.

Are there any benefits to cyclists?

Yes. Rumble strips improve the lane-keeping of motorists and the separation between cyclists and motorists. This is particularly useful on the inside of curves where the rumble strips may discourage drivers from cutting the corner.

Some cyclists have reported feeling a higher level of security riding on a road shoulder which has rumble strips. Rumble strips will have the same skid-resistant properties as painted centre/edgelines

Will cyclists have to ride over the rumble strips when crossing roads?

Not necessarily. To enable cyclists to easily cross over the edgeline at key junctures, gaps in rumble strips will be provided. These will appear 20m in advance of locations where cyclists are required to cross (such as before bridges or at a localised narrowing of sealed shoulder width) and intersections where cyclist numbers are high.

How can cyclists find out about the installation plans for their area?

The NZTA will be advising regional cycling groups of installation plans in their area. Alternatively the NZTA's regional offices may be contacted for this information.