

To: Safe Roads / NZ Transport Agency
Attn: Liv Theunissen
Date: 21 August 2018
Re: ATP installation issues near SH6 Kingston / SH83 Otematata

Quality Assurance Statement	
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1. Background

This memo summarises options for addressing concerns raised about some audio-tactile profiled (ATP) line-markings installed on SH6 near Kingston and on SH83 near Otematata. These issues have been raised by various cycling groups in the Wakatipu and North Otago region in meetings with the Transport Agency and Safe Roads.

2. Review of each site

Each site has been reviewed by means of inspecting the available RoadRunner video footage of the site and additional information such as photos of the installed ATP. We have provided treatment options for each site and discussed their relative merits. All route positions indicated are approximate and may need to be confirmed on site. While recommendations have been made, some of them have notable cost implications; therefore, the lowest-cost option of simply removing certain sections of ATP on shoulders may need to be considered in the interim.

2.1. Site 1: SH6 South of Kingston decreasing direction (RP: 1024/12.5 approx.)

This is a straight 100 km/h section of road that features two vertical crest curves at ~12.70 and ~12.32, with a left-hand curve (decreasing direction) ~12.35-12.20. AADT is approximately 2500 vehs/day. The section features a double yellow centre line with ATP installed on it. Cycling groups have noted that *"left rumble prevents cyclist from keeping far left as brow of hill is approached."*

The figure below shows the crest at RP 12.70 (decreasing direction), prior to ATP installation (no photo available post-installation). The decreasing direction shoulders outside the edgeline are relatively narrow, typically 300 mm or less; for this reason, ATP has probably been installed outside the edgeline. However, the crest curves have very limited sight distance, which typically warrants not installing ATP over the crest until sight distance improves again. There are also notable downhill gradients (e.g. 12.7-12.4) where riders can pick up speed and care needs to be taken if riders were in close proximity to the ATP. However, again the limited shoulder would preclude riders from being placed inside the ATP here.





Options:

- a) **Remove ATP** from crest areas with limited sight distance (i.e. Incr direction: 12.18-12.32, 12.48-12.70. Decr direction: 12.80-12.62, 12.42-12.20). While this removes the restriction for anyone cycling, it doesn't address the lack of shoulder space and hence overall cycle safety.
- b) Provide additional **seal widening**, particularly where sight distance is limited or there is serious edge-break (i.e. Incr direction: 12.08-12.74. Decr direction: 12.80-12.10). There appears to be sufficient space to ensure at least (say) 600 mm consistently of clear sealed shoulder (i.e. clear of the ATP) with negligible earthworks, which would greatly improve cycling safety. However, there is a notable cost implication for such work.
- c) **Relocate shoulder ATP** to the edgeline, to maximise the available shoulder space for cycling. This option is only useful on its own if there is sufficient clear shoulder width available (i.e. at least 400-500 mm outside the ATP; more on the downhill sections); for most of this section that doesn't appear to be the case (unless it was placed inside the edgeline), which would therefore still require some seal widening. There is also a reasonable cost to remove and reinstall the ATP.

Recommended treatment: *b) seal widening at indicated locations*

2.2. Site 2: SH6 North of Kingston decreasing direction (RP:1024/9.3-9.1)

This is a left-hand curve (decreasing direction ~9.39-9.20), followed immediately by a vertical crest curve on a straight and another left-hand curve. AADT is approximately 2500 vehs/day. The 100 km/h section features a double yellow centre line with ATP installed on it. Cycling groups have noted "No room for cyclist to ride on left side of rumble."



While there appears to be a reasonable shoulder width through this section (at least 500 mm, wider through the horizontal curve), the available clear width is narrowed by installation of ATP outside the edgeline (see photo). Coupled with the limited sight distance through the horizontal and vertical curves, this creates problems for any riders who are compelled to ride in the traffic lane instead.



Options:

- a) **Remove ATP** from sections with limited sight distance (i.e. Incr direction: 8.99-9.27. Decr direction: 9.35-8.95). For this section, that should provide sufficient remaining shoulder space and thus improving cycle safety.
- b) Provide additional **seal widening**, particularly where sight distance is limited or there is serious edgebreak (i.e. Incr direction: 8.98-9.17. Decr direction: 9.39-8.98). There generally appears to be sufficient space to ensure at least (say) 600mm consistently of clear sealed shoulder with minimal earthworks; more work may be required on the inside of the horizontal curve. However, there is a notable cost implication for such work.
- c) **Relocate shoulder ATP** to the edgeline, to maximise the available shoulder space for cycling. This option on its own would generally provide sufficient clear shoulder width available through this section (i.e. at least 400-500 mm outside the ATP); there may be a few isolated patches that would still require some seal widening to achieve this. There is also a reasonable cost to remove and reinstall the ATP.

Recommended treatment: a) remove ATP at indicated locations

2.3. Site 3: SH6 Rock corner at Garston increasing direction (RP: 1046/6.89-7.17)

This is a large left-hand horizontal curve (increasing direction) on a flat grade, notable for a rocky outcrop extending close to the roadway for about 40 m at ~RP 6.94. AADT is approximately 2500 vehs/day. The 80 km/h section is just on the approach to Garston and has a dashed white centreline with no ATP.

The increasing direction shoulders in the vicinity are reasonably narrow at 300-400 mm typically. The shoulder ATP has been placed outside the edgeline (see photo), requiring cyclists to ride in the traffic lane. This is problematic due to the poor forward sight distance around the corner (down to 80 m), because of the bank and vegetation, and it is notable that a WU6 “cyclists” warning sign has been installed just prior to the curve. By contrast, the decreasing direction shoulder (adjacent to the guardrail) is generous and appears to pose no problems with ATP installed.



Options:

- a) **Remove ATP** from narrow section with limited sight distance (i.e. Incr direction: 6.85-7.09). Although this provides some shoulder space for cyclists to use, it is still somewhat narrow in parts with limited sight distance, minimising the improvement to cycle safety.



- b) Provide additional **seal widening**, particularly where sight distance is limited (i.e. Incr direction: 6.87-7.09). There generally appears to be sufficient space to ensure at least (say) 600 mm consistently of clear sealed shoulder with minimal earthworks; that width may not be fully achievable in front of part of the closest rockface and ATP may still need to be removed there (~6.93-6.98), especially as additional drainage work such as kerbing may also be required there. There is also a notable cost implication for such work.
- c) **Relocate shoulder ATP** to the edgeline, to maximise the available shoulder space for cycling. This option is only useful if there is sufficient clear shoulder width available (i.e. at least 400-500 mm outside the ATP); for most of this section that doesn't appear to be the case, which would therefore still require some seal widening (unless it was placed inside the edgeline). There is also a reasonable cost to remove and reinstall the ATP.

Recommended treatment: *b) seal widening with localised ATP removal around rock outcrop*

2.4. Site 4: SH83 Otematata decreasing direction (RP: 96/1.420 - 85/6.417)

This section features a series of long straights and sweeping curves with a gradual climb from the Sailors Cutting Campground turn-off (RP 96/1.41) up to the Otematata saddle summit (RP 85/6.95). Generally, sight distance is good, and shoulders are only about 300-400 mm at most outside the edgeline. AADT is approximately 1200 vehs/day. No specific site concerns have been identified, so a re-review of the whole section has been undertaken.

Although no photos are available post-installation, given the available shoulder width presumably the ATP has been placed just outside the edgeline, to encourage riders to ride inside it. The original desktop review only specified a few gaps in the ATP installation, mostly where there was shoulder widening or narrowing at side roads, curves and bridge approaches, as well as specific geometric restrictions at RP 85/7.51-7.23 and 85/6.85-6.65. On further review, it may also be appropriate to remove ATP on some partly obscured left-hand bends (see photo below), and to extend the excluded sections around the Otematata saddle.



Options:

- a) **Remove ATP** from narrow sections with limited sight distance; suggested sections are the partly obscured left-hand bends at RP 85/9.90-9.62 and RP 85/8.49-8.27 and around the



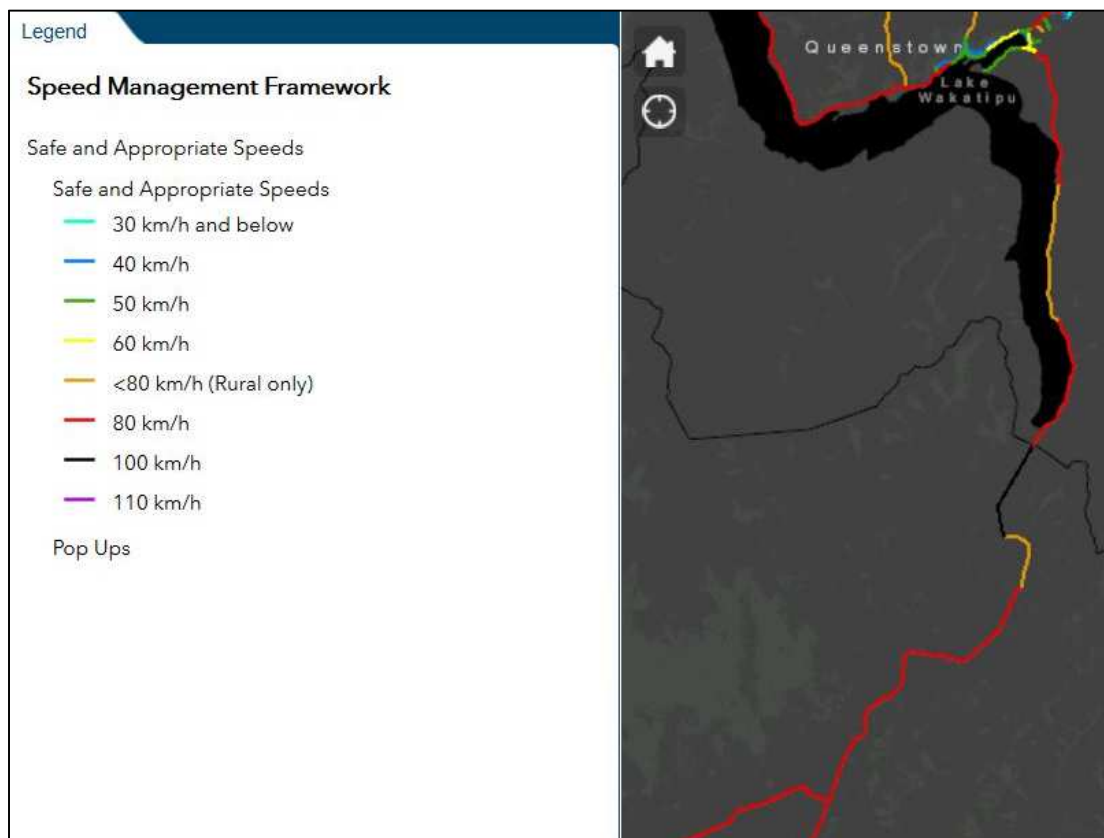
Otematata saddle between RP 85/7.60-6.85. Although this provides some shoulder space for cyclists to use, it is still somewhat narrow in parts with limited sight distance, minimising the improvement to cycle safety.

- b) Provide additional **seal widening**, particularly where sight distance is limited (i.e. locations noted above). There generally appears to be sufficient space to ensure at least (say) 600mm consistently of clear sealed shoulder with minimal earthworks. However, there is a notable cost implication for such work, especially given the length of highway being investigated.
- c) **Relocate shoulder ATP** to the edgeline, to maximise the available shoulder space for cycling. This option is only useful if there is sufficient clear shoulder width available (i.e. at least 400-500 mm outside the ATP); for most of this section that doesn't appear to be the case, which would therefore still require some seal widening (unless it was placed inside the edgeline). There is also a considerable cost to remove and reinstall the ATP over this length.

Recommended treatment: a) remove ATP at indicated locations

3. General treatments

In all cases but site 3 (and for much of the highway networks treated recently with ATP as part of the Safety BOOST programme), **reducing the speed limit** to 80 km/h would be very effective to reduce the likelihood and severity of cycle crashes with motor vehicles. The calculated “safe & appropriate speed” for the roads investigated in this report (from NZTA Risk Assessment maps) is 80 km/h or less (e.g. see extract below).



The Transport Agency is also drafting a new *Specification for Design, Construction and Maintenance of State Highway Walking and Cycling Facilities*. This document will guide the standards required for those sections of the network that are designated part of the State Highway

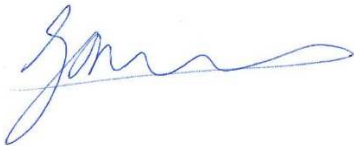


cycling network (expected to comprise about 2000 km, including parts of NZ Cycle Trail and Heartland Rides, popular sports cycling routes, and strategic urban routes).

For low-volume rural roads (i.e. 1000-5000 AADT), the target shoulder widths are expected to be 0.75 – 1.0 m, which will require some considerable investment in many areas. Of the sections investigated above, only SH83 would probably fall under the SH cycling network (and even that is only until an off-road alternative is constructed), so it is not likely that major seal widening is warranted. However, the fact that cycling groups have noted their concerns about sections of SH6 suggests that further improvements there may need to be considered.

Recommended treatment: lower speed limits to 80 km/h on sections of concern

Regards,



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