

Memorandum

To	Nancy Wain	From	s 9(2)(a)
Copy	Alex Jeffcoat, Nigel D'Ath, Adam Francis	Reference	500753
Date	2018-12-04	Pages (including this page)	5
Subject	SH 5 Hemo Road VMS		

1 Background

The original proposed location for the SH 5 VMS signs was south of the 100/80 speed threshold, approximately half way between the SH 30 intersection and the spiked pole/guard railed entry structure to Rotorua. These locations presented foundation issues on the eastern side with the concrete pad located on the edge of a steep slope to the Hemo Gorge below. On the western side it would have been difficult to install power to the site due to the lack of space between the entry structure and the adjacent batter slope.

The National Speed Management process was underway with reviews of state highway speed limits occurring. The expectation at the time of undertaking design was that a change in speed limit would occur at around the same time. The VMS were moved to the existing speed threshold location as the expectation was that these would be relocated when the speed limit was changed. Adam Francis has advised that the speed limit change is potentially 18 months away. This results in an issue with VMS sign placement adjacent to the speed threshold, relating to advance visibility of the signs for the higher speed limit and the VMS message taking drivers attention away from the speed limit.

MOTSAM requires different signs to be located a minimum of $(0.6V_{85})$ apart, where V_{85} is the 85th percentile speed of traffic, in km/h, at the sign location.

Adam Francis has advised that the mean speed at this location is between 60 and 64km/h. This suggests that the 85%ile is in the 70 to 75km/h range.

If the speed threshold signs remain in their current location the VMS signs will need to be between 42m and 45m away.

2 VMS Types

NZTA P36N: 15 JUNE 2011

There are four regional sign types:

	Character Height mm	Number of Lines
Type A	300	4
Type B	300	2
Type C	200	4
Type D	200	2

Type A was selected as it provides maximum character height and 4 lines of message, giving flexibility on the amount of information that can be displayed.

3 Sight distance

For rural VMS clear sight distance to the sign of at least 375 metres for 300mm character height, and at least 250 metres for 200mm character height, when travelling 100 km/h. In lower speed environments the distances can be reduced proportionally.

The proposed VMS sign locations will ultimately be in a 60km/h speed zone. (As advised by Adam Francis on 7 November 2018). As discussed above, the current 85thile speed is assessed between 70 and 75 km/h, based on the mean speed (60 – 64km/h).

The following sight distances are recommended for advertising signs. (Traffic control devices manual part 3), so will be similar for highway information signs.

Posted speed limit (km/h)	Minimum visibility (m)
50	80
60	105
70	130
80	175
100	250

This indicates that for a 75km/h 85thile speed, around 150m advance visibility is satisfactory.

4 Advice from NZTA Auckland (Kevan Fleckney)

Kevan has provided the following feedback in relation to positioning a VMS on the RHS of the road and the proximity to the speed threshold signs. He raises similar issues to those that we discussed at our meeting.

"I have installed one EJT VMS on the offside on Tidal Road in Auckland because the sign was for the traffic in the right lane approaching the signals. However, it is not recommended and is considered bad practice as the sign will be obscured by oncoming traffic. Especially for VMS in busy or higher speed environments, or where a lot of information is to be delivered.

If they are Type A Regional VMS (or similar) used for general VMS messaging purposes, they are best located away from speed limit thresholds, as their presence can take the road user's attention away from the signs delivering the change in speed limit message.

If they are 300mm font, they are suited for both 100 and 80kph limits."

5 Options

5.1 Change the sign type

With the current posted speed limits of 80 and 100km/h, sign Type A or B is recommended, with a letter height of 300mm. For the future speed limit of 60km/h, Type C or D is appropriate. With the

recorded mean speed of 60 to 64km/h, Type C or D could be installed. The risk is that those drivers travelling faster will not be able to read the smaller text and assimilate the message.

Recommendation

Use Type A or B depending on how much text will be required.

5.2 Locate sign on RHS of direction of travel

Locating the signs on the right-hand side of the direction of travel, would result in high sided vehicles blocking the view of the VMS.

Advice has been sought on this from Kevan Fleckney and is provided in section 4 above.

Recommendation

Both VMS to be on the left-hand side of direction of travel.

5.3 VMS placement alternatives

To provide the recommended separation from the speed threshold signs and the necessary advance visibility, the following locations for the VMS should be considered.

5.3.1 Southbound VMS LHS

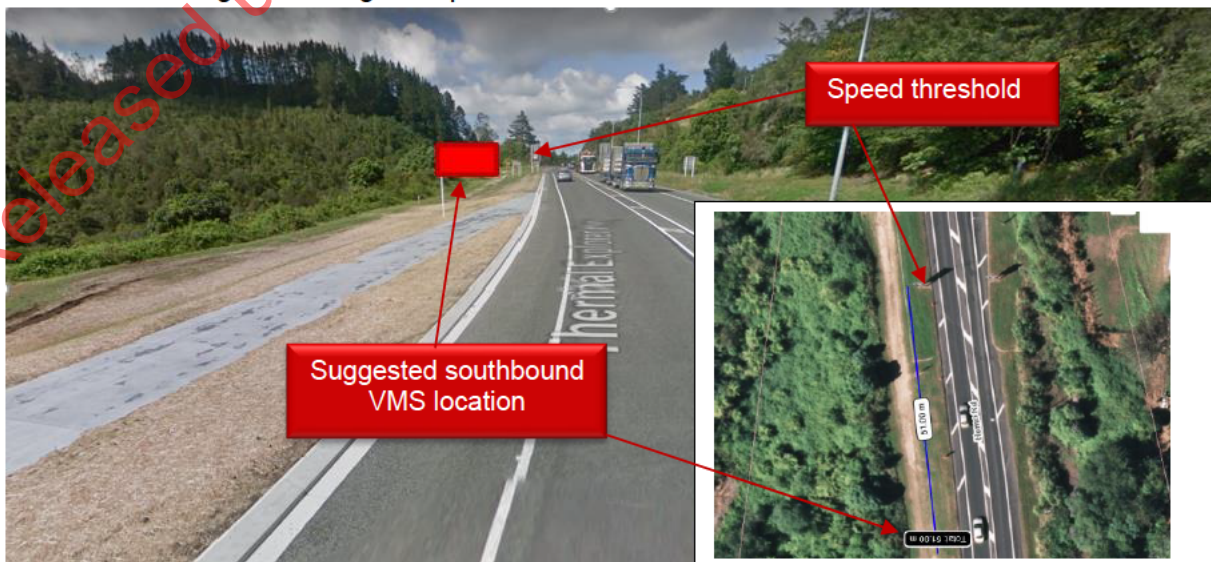
After the point where the new off-road path re-joins the carriageway, approximately 50m north of the speed threshold. Refer photos below:

There is a wide clear berm that provides unobstructed advance visibility of the sign, around the left-hand bend, for over 200m prior.

To provide guardrail protection of the VMS, this can be achieved with a standalone section of guardrail or by extending the guardrail to the south, north past the speed threshold and new VMS. A continuous guardrail is preferred, which will add further 100m or so of additional guardrail.

A guardrail on kerb line will result in a shy line effect for cyclists using the on-road path. Those that remain on the grass berm however will feel more protected.

An increase in length of underground power cable will also result.

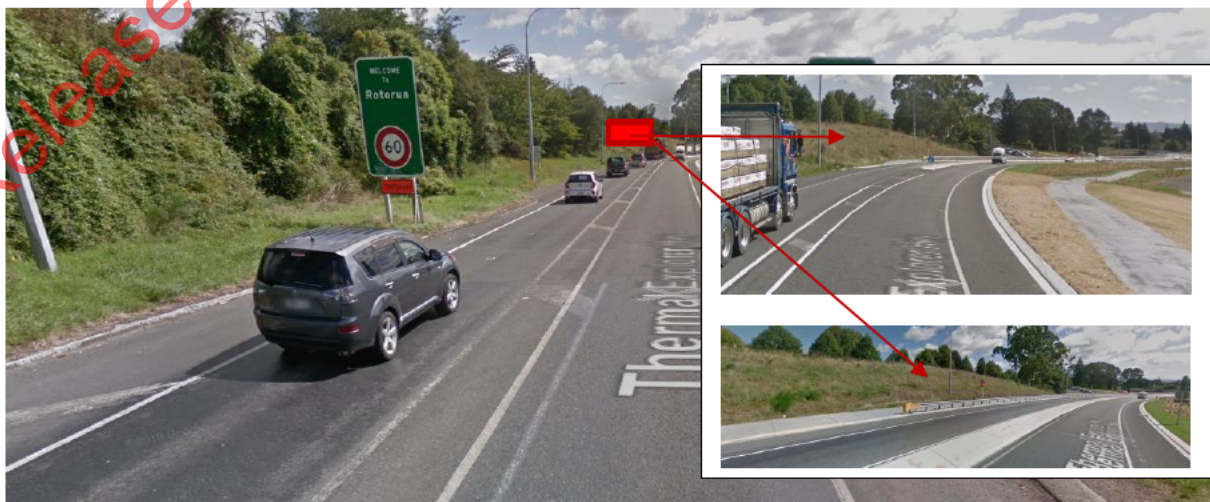


5.3.2 Northbound VMS LHS

The trees on the bank adjacent to SH 5 visible in the aerial photograph are no longer there. The bank above the newly constructed kerb and guardrail is clear.

The northbound sign could easily be mounted above the road, on the slope anywhere in the vicinity shown in the street views below.

It is approximately 190m from the speed threshold north to where the new central median island commences, where the VMS can be mounted. Additional guardrail is unlikely to be needed at this location.



6 NZ Transport Agency feedback on the above options

Position of VMS signs agreed as follows:

- Locate the southbound VMS sign on the increasing RP (true left) side of the highway at approximately RP 54/0.260 (50m north of the existing speed limit threshold change point).
- Locating the northbound VMS sign on the decreasing RP (true right) side of the highway at approximately RP 54/0.120 (190m north of the existing speed limit threshold change point).

Type A or B sign:

- MegaMaps Edition II indicates a safe and appropriate speed limit of 60km/h for this location. This will be confirmed through a technical assessment as there may be a number of factors used to determine the infrastructure risk rating within MegaMaps that should be modified, potentially resulting in a higher safe and appropriate speed.
- With the signs located close to the roundabout the speed environment will be lower and a minimum 150m sight distance would be sufficient.
- A 5 second travel time at 80km/h equates to 110m, so 150m sight distance will be sufficient for reading alternative message displays if choosing a Type B sign.

7 Recommendation

- Review and update the design to reposition the VMS signs as above;
- NZ Transport Agency to confirm Type A or B; both are acceptable;
- Updated design to include guardrail protection for the southbound VMS
- NZ Transport Agency to provide work platform details for Type A and Type B VMS signs, as previously requested.

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