Queensland Government

6 July 2007

Department of **Main Roads**

The Honourable Paul Lucas MP
Minister for Transport and Main Roads
GPO Box 2644
Brisbane Qld 4001

Dear Minister

Re: Review, south-bound ramp, Sunshine Motorway, Tanawha - 6 July 2007

As requested by you on 23 May, please find enclosed a report entitled "Main Roads investigation into the fatal crash on south-bound ramp from Bruce Highway to Sunshine Motorway at Tanawha – 6 July 2007".

The report only investigated the road at the scene of the fatal crash – it did not investigate or consider any other factors that may have contributed to the fatal crash, such as vehicle or driver-related factors. I understand that these factors are being considered as part of the Queensland Police Service investigation into the crash and will be included in their report, which is now being finalised.

The report has taken into account:

- the standard crash investigation report carried out by North Coast Hinterland District. These investigations are undertaken after every fatal crash
- a specialist investigation into the roadway geometry where the crash occurred, carried out by experts in Main Roads' Planning and Design Branch
- a specialist investigation into the ramp's surface skid-resistance characteristics, carried out by experts in Main Roads' Pavements and Materials Branch
- road-related information made available by the Queensland Police Service arising from investigations they are carrying out into the same crash.

It does not take into account a separate, independent investigation by Professor Rod Troutbeck into the road safety performance of this ramp and other sections of roadway. That report is due to be provided to Main Roads by the end of July.

Based on the information contained in this report, including analysis and conclusions drawn by the Department and confirmed by my Chief Engineer, I advise that:

- The report states a surface contaminate, perhaps oil or diesel, was the most likely road-related factor that contributed to the crash and concludes "while the

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condition of the surface on 21 May would not necessarily have led to the driver losing control, the presence of a contaminant or fuel spill (according to eye-witness advice) is likely to have greatly exaggerated all other contributing factors."

- The ramp demonstrates a low crash rate. To elaborate, it is estimated more than 11.2 million vehicles have used this ramp over the period from October, 1995, to date, for a total of seven reported crashes. Under all Main Roads criteria for investigating crashes (including the comprehensive criteria developed after a series of crashes on the Bruce Highway at Federal), the ramp had not been identified as one requiring detailed investigation.
- The investigation shows the geometric design of the ramp is satisfactory for the requirements placed upon it – the ramp joins two motorways, and includes a further diverge to give traffic access to Wilsons Road.
- The ramp configuration does require drivers to pay attention and, in some circumstances, to brake and corner heavily. The crash history at this site shows the vast majority of motorists have been able to do this in all weather conditions without incident. Speed monitoring carried out as part of the investigation reinforce this, showing more than 7000 vehicles – some 15% of the 50,644 motorists using the ramp over a two-week period – were travelling at more than 80 kilometres per hour in all weather conditions, with no further reported crashes. This translates to 225,000 vehicles per annum that safely (albeit potentially illegally) traverse the ramp at speeds in excess of 80 km/h – strongly suggesting that there may have been some unusual factor present at the time of the crash for two vehicles to lose control in close succession.
- An increase in vehicle numbers (doubling between 2000 and 2007), when combined with the extra braking and cornering at the ramp curve, has led to the stone in the surface of the road "polishing" more quickly than would otherwise reasonably have been expected.
- Polishing is normal in all stone surfaces, and relates to the wearing away by traffic. This takes place regardless of the asphalt used. Testing shows that on this ramp the polishing has taken place at different rates. Over time, this has meant the surface has gone from one with adequate surface friction to one where the surface friction, while adequate in dry conditions, is now marginal in wet conditions at the previously posted speed of 80km/h.
- The report concludes that the two surfaces used to date on the ramp (spray seal and Stone Mastic Asphalt) have been appropriate for the circumstances.
- Based on these findings, the report makes five recommendations specifically related to this ramp, and six more general recommendations, including one relating to ramps in similar situations. The site-specific recommendations include

actions to improve signage and visibility, and the installation of a high-friction surface. The report also recommends Main Roads review advisory speed signs on ramp curves more generally to confirm they remain appropriate. These 11 recommendations, and the actions and proposed timing for implementation I have actioned, are provided as Attachment 1 to this letter.

I further advise that a copy of this letter, the reports and attachments will be provided to Professor Rod Troutbeck to assist in his investigations.

Yours sincerely

Alan Tesch
Director-General

Enc (1)

Attachment 1

Recommendations	Progress
Recommendations for improved safety measures at this location	
1. Since the fatal crash on 21 May, Main Roads has temporarily reduced the advisory and regulatory speed limits on the ramp from 80 km/h to 70 km/h. It is recommended that this change be made permanent.	Agree with recommendation • Implemented 70 km/h signage 14 June 2007. • Temporary speed limit VMS installed 26 June 2007 – to be removed after Rec 2 implemented.
2. It is recommended that enhanced warning signs be installed (including chevron alignment markers on the outside of the curve, higher impact exit advisory speed sign and "slippery when wet" sign).	Agree with recommendation • Planned to be in place by end July 2007.
3. It is recommended that visibility on the inside of the curve be improved by removing vegetation.	Agree with recommendation • Planned to be completed by end July 2007.
4. It is recommended that a new calcined bauxite surfacing be applied to improve and maintain skid resistance. (Once the surface is installed, the high-impact "slippery when wet" warning sign can be removed).	Agree with recommendation • Planned to be completed by end August 2007 (weather permitting)– works will require ramp closures - night works may be necessary to minimise disruption. • Line marking will be reinstated by the end of August, weather permitting.
Recommendations to address general road safety improvements at this ramp, not related to the crash	
5.1 Replacement of the "Wrong Way Go Back" sign to improve night-time reflective performance.	Agree with recommendation • This work will be programmed into normal maintenance activities to be undertaken during 2007-2008 in accordance with the District's prioritised maintenance work program.

5.2 Replacement of existing guardrail (behind the chevroned area) with an improved terminal treatment to align with current standards.	Agree with recommendation • This work will be programmed into normal maintenance activities to be undertaken during 2007-2008 in accordance with the District's prioritised maintenance work program.
5.3 Undertake regular inspections to address general maintenance issues such as ensuring guide posts and delineators are in place.	Agree with recommendation • This work will be programmed into normal maintenance activities to be undertaken during 2007-2008 in accordance with the District's prioritised maintenance work program.
5.4 Increase in guardrail height by approximately 100mm.	Agree with recommendation • This work will be programmed into normal maintenance activities to be undertaken during 2007-2008 in accordance with the District's prioritised maintenance work program.
5.5 Improvements to road lighting to align with current standards.	Agree with recommendation • This work will be programmed into normal maintenance activities to be undertaken during 2007-2008 in accordance with the District's prioritised maintenance work program.
5.6 Clearing of large trees on the outside of the ramp curve to improve safety in the event of run-off-the-road events.	Agree with recommendation • This work will be completed by the end of July 2007.
General recommendations	
6.1 Delays in crash data reporting be addressed.	Agree with recommendation • Details (Actions, timetable and so on) included in a works program to be available by end October 2007.

6.2 On other off-ramps from 100 and 110 km/h motorways and highways, Main Roads undertakes detailed measurements of friction demand and supply in wet conditions, to confirm that adequate margins of safety exist.	Agree with recommendation • Details (Actions, timetable and so on) included in a works program to be available by end October 2007.
6.3 Main Roads purchases dual-axis acceleration measuring equipment to undertake lateral acceleration tests; and ensure that relevant Districts are supplied with this equipment and have officers on staff experienced in its use for this purpose. (Skid test measurements using such equipment may need to be procured from QPS[1]).	Agree with recommendation • Details (Actions, timetable and so on) included in a works program to be available by end October 2007.
6.4 Main Roads reviews its design methods and its guidelines and specifications to ensure, in areas of roadway with increased surface friction demands and potential for increased polishing (such as at tight curves and approaches to intersections on heavily trafficked roads) that better performing aggregates (with higher polished aggregate friction values) are specified.	Agree with recommendation • Details (Actions, timetable and so on) included in a works program to be available by end October 2007.
6.5 Main Roads progressively undertakes a state-wide review of advisory speed signs on curves, to confirm advisory speeds remain appropriate using the procedures in the Manual of Uniform Traffic Control Devices.	Agree with recommendation • Details (Actions, timetable and so on) included in a works program to be available by end October 2007.
6.6 Main Roads develops a program of activities by October 2007 that addresses recommendations 6.1 to 6.5.	Agree with recommendation • Program to be available by end October 2007.

[1] As the friction supply tests require the test vehicle's ABS braking system to be disabled, and for the vehicle to skid in a controlled manner (at low speed), it is probable that workplace health and safety issues preclude Main Roads officers from undertaking this assessment.