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Road Safety Committee

BY:.....Improving Safety at Level Crossings

SUBMISSION to

Inquiry into

Improving Safety at Level Crossings

From

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11 September 2007

Improving Safety at Level Crossings

The Sub-Committee of Standards Australia which re-wrote AS 1742.7 in 1992 (dated 1993) aimed to:

- a. remove the signs which were NOT well-recognised by motorists;
- b. introduce symbolic **signage** to differentiate between active and passive protected crossings; and
- c. improve the visibility of signs to motorists.

The signs which were removed from the Standard were: red triangle pointing up; yellow diamond with black crossbuck; and "GIVE WAY TO TRAINS". Unfortunately some of these signs are STILL on Victorian roads.

The new symbolic **signage** included the road-rail geometry signs and "Steam Train" as well as now using the in-use STOP and GIVE WAY signs and "STOP sign ahead" and "GIVE WAY sign ahead".

Sign visibility was improved with an optional red backboard for the crossbuck and more reflectorisation of signs.

VicRoads included the new **signage** in the Driver Training Handbook and was to include the new **signage** in the Road Design Manual, as this is more used by road designers and councils than the actual Australian Standard. Vic Roads funded the changes in regulatory signs at crossings as a Road Safety measure to be certain that the changes were made promptly. But VicRoads expected the warning signs to be replaced by the road authorities (VicRoads and municipal councils) over the next seven years. Alas, this upgrading to the newer Standard has NOT yet been fully accomplished.

This means that before any mass advertising campaign for level crossing safety:

- a. complete the removal of the old (now non-Standard) signs; and
- b. bring the warning **signage** for all crossings up to the newer Standard.

Driver Behaviour

The two very different driver behaviours that are required are:

- a. When the first advance warning sign indicates that the crossing ahead is actively protected (ie has crossbucks, flashing lights and bells and MAY also have boom barriers), then the driver should KEEP THEIR EYES ON THE ROAD AHEAD and BE PREPARED TO OBEY THE ACTIVE PROTECTION, IF IT IS ACTIVATED.
- b. When the first advance warning sign indicates that the crossing ahead is only passively protected (ie has crossbucks and regulatory signs), then the driver should prepare to TAKE THEIR EYES OFF THE ROAD AHEAD and actively LOOK FOR AN APPROACHING TRAIN. The second advance warning sign assembly should now indicate to the driver whether the crossing has a STOP or a GIVE WAY sign at the crossing. If the crossing has a GIVE WAY sign then the warning assembly should indicate to the driver the point at which an approaching train may be visible and the extend to which the driver must LOOK FOR AN APPROACHING TRAIN on each side of the road (ie when the road and rail cross at other than right angles). If the crossing has a STOP sign then the warning assembly should indicate that fact to the driver. The regulation signs at the crossing tell the driver whether they MAY either proceed or GIVE WAY or MUST STOP and then LOOK FOR AN APPROACHING TRAIN.

Approaching Train Visibility

The front of an approaching locomotive should be painted in highly visible colours to contrast with the surrounding landscape.

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VicRoads and VLine have conducted trials of the lighting of locomotives for best visibility. VLine had decided that the cross-eyed ditch lights are the best form for providing the large triangle of light to attract the eyes of the motorist and provide the best indication to the motorist's eyes of the distance and speed of an approaching locomotive. The concept of large flat lighting panels on the sides of locomotives has NOT YET been investigated. The joint VicRoads and VLine trials of rotating lights or strobe lights on the roofs of locomotives were successful. However, the required height clearance from the roof of the locomotive to the roofs of tunnels and bridges was NOT adequate for those lights, at that time. The new low-profile flashing lights used on the roof of new police vehicles MAY fit within the height clearance, and be suitable to be placed on the roofs of locomotives. The **rooftop** lights MAY only be needed for the period from the time the locomotive engineer sounds the whistle at the whistle board until the locomotive has reached the crossing.

All locomotives to operate on railways in Victoria SHOULD, by law, be required to comply with the installation of headlight, ditch lights and, if suitable, **rooftop** flashing warning lights.

Visibility of Rural Trains

Another consideration is the visibility of rural trains. Trains, such as the grain trains, may be stationary across a roadway near the grain silo, or may be very long and travelling at low speeds in darkness. Rural passive crossings may be lighted with solar-powered street lights (at least one on each side of the crossing) to make a train visible at night. VicRoads also has conducted trials and has supplied VLine with large reflective panels which were placed, three on each side of all wagons of the 713 grain wagon fleet). These would show up in a vehicle headlights at night regardless of whether the grain train was stationary or moving. The United States had also been conducting similar trials and may have developed a suitable layout for reflectors on the sides of flat bed wagons. At least one United States railway had been painting their large logo on the sides of wagons with white paint to improve their visibility at night in vehicle headlights.

Road Pavement Markings

The AS 1742.7 – 1993 and 2007 include a **RAIL X** pavement marking. This marking is a design suitable for a single lane pavement. VicRoads Road Design Manual has a wider **RAIL X** pavement marking which is more suitable for application on the narrower pavement of most Victorian rural roads. The very low road traffic volumes on these rural roads means that there is a very low probability that opposing traffic vehicles would prevent a driver from seeing the wider marking.

Active Advance Warning Signs

The new AS 1742.7-2007 includes details of active advance warning signs. These would assist active protection at places like Kerang with a curved approach which MAY have obscured the flashing lights at the crossing. It is understood that Western Australia has been installing this type of active advance warning signs. VicRoads Signals had also developed an **active** advance warning sign. This was a **fiber-optic** sign with the alternating messages in red saying TRAIN AHEAD and in white the outline of a steam locomotive. At least two of the signs were fabricated and installed – one facing northbound road traffic on Frankston-Flinders Road at Baxter and one facing westbound traffic on the Princes Highway at the papermill siding crossing at **Maryvale**. The Baxter installation was located correctly based on the sharp curve in the road before the crossing. A VLine inspector testing the flashing lights at the crossing would also activate the advance warning sign, without leaving the crossing, and see that a small light on the rear of the sign was operating. If the light did not operate, then the inspector was to report the fault to the VicRoads signal section.

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High Cost of Flashing Lights

Mr Phillip Jordan of VicRoads Principal Traffic Engineers Department had been investigating a new system of lower cost train detection and flashing lights. He has since left VicRoads. Dr Eric Wigglesworth of Monash Accident Research was one of the observers of these trials on the then unused railway line between Ballarat and Beaufort near Burrumbeet. With lower costs per crossing, then more crossings could be protected.

Improved Boom Barriers

The visibility of boom barriers may be assisted by the addition of free hanging "skirts" and lower rail with reflectors. The skirts and rail fold up when the boom is raised, but hang down and swing free when the boom is lowered. The Paperlinx papermill at Maryvale has such skirts on the vehicle boom barriers where loaded log trucks enter their mill property. The last episode of Midsommer Murders on the ABC in August or September 2007 showed such skirts operating on a British railway at night.

Suggestions

1. All old non-standard warning signs before crossings be removed and new warning signs in accord with AS 1742.7-2007 be installed. This may need financial assistance to municipal road authorities.
2. All locomotives to be operated on Victorian railways be required to have and operate headlight and cross-eyed ditch lights.
3. Further investigation be made for the possible fitting of low-profile flashing or strobe lights on the roofs of all locomotives to be operated on Victorian railways.
4. Further investigation be made for the possible installation of solar-powered streetlights at rural passive crossings.
5. Further investigation be made for the possible installation of reflective material on the sides of all Victorian railway wagons. And could be proposed for all Australian railway wagons.
6. Further investigation be made for the development of lower cost flashing lights and train detection systems which do not require rail track circuits.
7. Further investigation be made for the installation of modified boom barriers which include the use of "skirts" to improve their visibility.

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Road Safety Committee

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The Executive Officer

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Dear Ms Douglas,

Improving Safety at Level Crossings

After posting my submission to you earlier today, I thought of a further item for addition to the submission.

Reliability of Flashing Lights and Boom Barriers

Nearly every morning on the Melbourne radio drivetime shows there is a report of one or another level crossings being blocked by boom barriers in the down position. While this is the 'fail safe' condition for total safety, it does not inspire driver confidence in the reliability of the boom barrier system operation. In these days of separated ownership of track, signals and operating fleet, it is difficult to know which organization is responsible for which aspects of the failure of boom barrier operation at a crossing.

Have an independent consultant, not the system operator, obtain statistics on the boom barrier locked down frequency, and propose means of greatly reducing that frequency.

Regards,



Charles B. Uber