Institute of Public Works Engineering Australia
Victoria Division **Limited**

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10 October 2007

Mr John Eren MP
Chair
Road Safety Committee
Parliament House
Spring Street
MELBOURNE VIC 3000

Dear Mr Eren,

Inquiry into Improving Safety at Level Crossings

The Institute of Public Works Engineering Australia (Victoria Division) welcomes the opportunity to make a submission in relation to the Inquiry into improving safety at level crossings.

Briefly and by way of background, the IPWEA:

- (and its predecessor) has served Victorian local government engineers for more than 50 years;
- is a national organisation with divisions in each State;
- is a technical division of Engineers Australia;
- is recognised as the pre-eminent technical advisory body for public works engineering;
- is accepted by the Municipal Association of Victoria as its public works engineering technical advisory arm;
- has formal alliances with the Municipal Works Officers Association and the Civil Contractors Federation;
- is an active member of the Victorian Civil Construction Industry Alliance and a member of a number of State Government advisory bodies;
- has taken a leadership role in relation to the development of a number of initiatives that have the potential of benefiting the public works sector; and
- has almost three hundred members from public works engineering, including State and Local Governments, and the private sector.

Identification of Crossings

The IPWEA believes that for rail crossings to be safe, approaching motorists need to be made aware that they are in a rail crossing "zone".

By the term zone, we mean the sight/recognition/decision distance in which the driver is aware and prepared to take whatever action is necessary.

Naturally, the size of this zone varies with the approach speed of the vehicle and the geography of the road/rail intersection, but nevertheless, conditions within these zones have to be different enough to forewarn drivers and encourage them to slow down, be aware and be prepared to take necessary action.

Furthermore, visibility in either direction along the tracks for at least a distance proportional to both the vehicle and train approach speeds is vital if sufficient time for appropriate action is to be allowed.

According to Murdoch University research, 90% of the information we require to drive is obtained visually. Therefore, by increasing the visual input to drivers so that they are physically aware of being in a rail crossing zone, an environment will be created that will enhance the safety of rail crossings.

In February 2007, Standards Australia published the latest revision of AS/NZS 1906.1 "Retroreflective materials and devices for road traffic purposes, Part 1: Retroreflective sheeting".

This was the first revision of this standard for 13 years and incorporated a number of new technologies that had evolved since the previous publication. Among these was the introduction of Fluorescent Reflective sheetings which combine the benefits of high visibility fluorescent colours during the day and superior retroreflective optics for night time visibility. The most commonly used colours are Fluorescent Yellow, Yellow Green and Orange.

As a result of this revision, VicRoads upgraded the sheeting requirements for the majority of traffic signs used on their roads to a minimum of Class 1 as described in the above standard and required the use of Fluorescent Yellow Green for pedestrian and school related signs. Fluorescent Yellow Green has been reserved by all road authorities in Australia for specific use in these areas to give the motorist a sense of pedestrian or school related zones.

The concept of using fluorescent colours to distinguish specific areas of roadway could also be used for warning signs approaching rail crossing related zones.

Fluorescent colours work by converting invisible ultraviolet wave lengths of light into visible wave lengths thereby providing greater luminance, particularly during dull days or during the hours of dawn and dusk.

A mid 1990's study titled "An assessment of the performance of Fluorescent Retroreflective Traffic Control Materials" by the Department of Transport Engineering, SINTEF Civil and Environment Engineering in partnership with the Norwegian Public Roads Administration and 3M Traffic Control Materials found the following:

- Fluorescent Yellow and Yellow Green with black legend or symbol ranked #1 when compared with other conventional traffic colours.
- Using fluorescent materials on chevrons, directional arrows and text signs exhibited significant increases in both daytime and night time sign detection and shape recognition distances when compared with non-fluorescent signs
- The results of eye-tracking studies of drivers during the day showed that in all cases:
  1. *Fluorescent signs were first looked at by the driver at distances greater than identical signs made with non-fluorescent materials.*
  2. *A mean first fixation distance of 130m Vs 75m.*
  3. *A driver travelling at 80km/h, has an additional 2.5 seconds of decision and reaction time.*
- Driver attention before and after replacement of conventional signs with fluorescent signs resulted in:
  1. *A decrease in average speed (2.3 km/h) and 85th percentile speed (2.0 km/h).*
  2. *Lower speeds as drivers approached roadworks and better compliance.*
  3. *89% of drivers rated fluorescent signs as conspicuous compared to 68% for conventional signs.*

Other studies have found that: *"Fluorescent retroreflective materials are detected with higher frequency and are recognized with greater accuracy at further distances than the corresponding standard highway colours".* (The Visibility of Durable Fluorescent Materials for Signing Applications" D.M. Burns & L.A. Pavelka, 3M, 1994)

Furthermore, a study conducted by the United States Federal Highway Administration between 1974 and 1995 into " Highway Safety Improvements with the Highest Benefit-Cost Ratios", found that improved

traffic signing resulted in a benefit-cost ratio of 22.5 and ranked third out of 20 other highway safety improvements.

In addition to improved warning signs using Fluorescent Yellow sheetings, much can be done to improve the approach linemarking within the rail crossing zone.

Improvements within the roadmarking/linemarking industry can now provide products that not only work well in day and night conditions, but also have superior wet weather reflectivity and skid resistance performance.

It is understood that the Victorian Government is currently undertaking the improvement of some 200 rail crossings with the addition of rumble bars on the approach carriageways in an attempt to alert the driver that they are approaching a rail crossing.

It is also understood that these bars are to be highlighted with a retroreflective roadmarking treatment to increase visibility and highlight the approach to the crossing.

The use of a yellow coloured marking treatment for these bars, the centre barrier and edge lines would further reinforce the concept of a rail crossing zone, heightening the driver's experience of being in an area of special concern.

These treatments, used in combination with fluorescent yellow warning signs would provide a high benefit, low cost remedy for these rail crossing zones and would go a long way to alerting the driver of the possible danger ahead.

Safety At Existing Uncontrolled Rail Crossings

It goes without saying that there needs to be a substantial increase in funding towards the installation of boom barriers at existing uncontrolled railway crossings.

For instance, there are 21 active railway crossings within the Mornington Peninsula Shire, with only 8 having boom barriers. Only 2 more boom barrier installations are proposed in current programs. The Shire has recently had two separate fatal crashes at railway crossings without boom barriers.

The existing program VicTrack is undertaking to develop improvements at railway crossings is strongly supported and actively involves road authorities in the development of solutions. The VicTrack program should be given priority and an additional funding boost.

Upgrading Existing Crossings In Response to Growth

Interface Councils provide the majority of the residential growth opportunities in response to the State Government's Melbourne 2030 strategy. These areas are experiencing major challenges at existing rail crossings from the perspective of community safety and crossing capacity.

Most of these existing at-grade rail crossings were constructed to meet the needs of small semi-rural township environments. In some cases, pedestrian rail crossings were limited to one side of a crossing. In others, they were simply not provided. The rapid growth in commuter parking needs has seen the use of rail sidings for carparking with no provision to get rail travellers safely to and from the carpark, let alone across the rail crossing itself. Responding to these challenges is made all the more difficult for the State Government. Its policy regarding safety/OH&S issues associated with at-grade rail crossings controls the form of any upgrades to these crossings.

As an example, a major single carriageway arterial road with an existing rail crossing cannot be duplicated with the construction of a median to divide the carriageways. This is deemed to be the creation of a new at-grade crossing which is against State Government policy. The only way the duplication and dividing of the carriageway can occur to meet the demands of residential growth is for the State Government to make additional funding provision to grade separate the crossing. This

additional funding requirement will often delay the road upgrade for many years, detrimentally impacting community safety, not just at the crossing but along its approaches. The delay also materially impacts the economics of the transport task from use of the road.

If the State Government is committed to improving all forms of safety at existing rail crossings (vehicular and pedestrian), two options require consideration:

1. Provide a significant increase to the financial resources dedicated to the task; and
2. Accept interim standards that significantly improve safety without demanding that grade separation is the only acceptable upgrade.

The IPWEA would be pleased to meet with you to discuss this submission.

Yours sincerely,

Maurice Stabb.

MAURICE STABB
PRESIDENT