NEW AFFORDABLE LEVEL CROSSING PROTECTION SYSTEMS

Human Factors specifications

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Outline

- Background – News report
    – CRC for Rail Innovation
      project R3.111
- Costs – Lives; materials; business
    – Upgrade costs
- Human Factors Engineering
- Surveys, observations
- Specs for safer user responses

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Background

Shell-shocked train drivers in North Queensland can't believe it's happened again.
He said to me, 'We've crashed...we're facing back the way we came ... It's a bloody disaster ... It's bloody happened again!'
"The loss grips you."
"There are children now without a father. Nothing is more tragic."

CRC for Rail Innovation's aim is to "examine new technology options for level crossings that are cheaper … Combinations of … technology … will be considered in conjunction with vital systems and human factor system elements."

Costs

- 606 vehicles and 78 pedestrians in RLX collisions in Australia during 2001-2008

- 352 fatalities; over 800 serious injuries

- Rail infrastructure, rollingstock, business losses

- Crossing upgrades cost $300k~500k per crossing, or more - 8 RLX upgrades in North Queensland in 2009 cost $10m!

- New technologies under consideration preferred to cost only $100k~150k

Human Factors

- The goal of human factors has been defined as
  **"making the human interaction with systems one that
  enhances performance,
  increases safety, and
  increases user satisfaction"**.

  Elements relevant to this project include:

  Signal Detection Theory   Attention demands

  Human error   Risk taking as a decision process

  Accident sequence model   Signals and warnings

  Latent errors   Fatigue

Research

- Three phases:
  - QSS09 by CQUni's PRL; over 1200 respondents
  - Local survey re human factors elements of passive RLX; over 100 respondents
  - Observations of road user responses at local passive RLX; over 1600 observed.

Specifications for Safer User Responses

- Based on data analysis, human factors elements shown to have significant impacts on road user responses to RLX systems will be identified

- Compiling these into a set of specifications for assessment of candidate technologies is the critical outcome for this project

- The assessment process is a subsequent phase of the CRC project

- Less costly, safer RLX will be the benefit derived through this project

- Governments, rail industry, local communities will all benefit

Something to think about…

Do we want to hear

"It's bloody happened again!"

any more??

Direction of travel, *The Ghan*

Direction of travel
road-train truck

RAIL CROSSING WAY

STOP. OR GET STOPPED IN YOUR TRACKS.

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