Human Factors at Level Crossings
The birth of a toolbox

UN-ECE Group of Experts on Safety at Level Crossings
Subgroup on Human factors:
M. Cale - CogniTo
G. Dinhobl - ÖBB-Infrastruktur AG
J. Grippenkoven - German Aerospace Center e.V. (DLR)

Geneva, 23.10.2014
Content

• 1. Responses to the questionnaire
• 2. Psychological theories
• 3. Existing data collection
• 4. Introduction of ASAP (accident safety analysis procedure)
• 5. Next steps
Results of human factors - questionnaire

• 24 feedbacks received from 22 countries

1. Assumed human factor reasons for accidents at level crossings

Lack of risk awareness of driver/pedestrians 24 (=46%)
Lack of care/distraction 16 (=31%)

Education 3  Legal 3  Sun glare/weather condition 2
Responsibility 1  Finance 1  Failure of technology 1  Speed 1
Drunk driving 1  Miscalculation 1  S  Peed road 1
Fainting 1
2. Does your country have any solutions and/or creative and innovative countermeasures to solve these problems?

„No“: 7 (=25 % )

Awareness campaign 4 Over & underpasses 3 Obstacle detection 2

- Illusions at LC
- Snake‘ path for pedestrians
- Design rules
- Presence of Police
- Complete covering by long barriers
- LED lights
- Reduction of width and number of lanes
- Technical measures
- Action plan
- 300mm STOP Line 2 m before track
- Delay of closure of barrier
- Rumble strips

Results of human factors - questionnaire

24 feedbacks received from 22 countries
Results of human factors - questionnaire

24 feedbacks received from 22 countries

3. Do you have any research studies or papers on human factors relating to the behavior of road users around level crossings which you could share?

„No“: 17 (=63% )
Some (not specified) 2
Yes (at least one source quoted) 8
Results of human factors - questionnaire

24 feedbacks received from 22 countries

4. Are there any educational programmes in your country that focus on the awareness of the road users concerning level crossings safety?

„No“: 15 (=50%)

General awareness campaigns 9

for schools & children, in general 4
other single actions
Results of human factors - questionnaire

24 feedbacks received from 22 countries

5. Referring to the list of human factors at the start of this section E, has your country taken any action to improve safety at level crossings on the basis of these causative factors?

„No“: 9 (=31%)

General awareness campaigns (9)

Visability improvement (3) Wide angle LED (2)
Police (1) Vertical signing for better attention (1) Barriers (1)
Elastic plates instead of asphalt (1) Rail side protection system (1) Barrier I=1
Social advertising of the rules(1)
Results of human factors - questionnaire

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6. Do you have any other comments?

„No“: 20 (=83%)

...we do....

Human Factors are central reasons for accidents at LCs, but:
- trial and error attitude leads to nowhere
- lack of relation to causal reactions
- lack of scientific model
- now an ineffective battle

-remember: HF are most significant parameter to increase level crossing safety!

Mr. J. Loubinoux (UIC): ‘almost all accidents at level crossings are due to motorists and pedestrians incorrectly using level crossings.’
(ECE/TRANS/WP.1/GE.1/2)
Introducing our new health reform
Failure Is The Key To Success!
Contents of current data bases
STEP BY STEP
PROCESS

Attention

In vehicle
Outside of vehicle
Related to driver
Competing activities

Perception

STEP BY STEP
PROCES"
Criminal or not criminal
STEP BY STEP
PROCESS

Cognition

Related to specific level crossing
Related to environment
Related to driver
Related to general environment

Related to driver

Related to clinical issues of driver

Motivation

STEP BY STEP
PROCESS
STEP BY STEP

PROCESS

Performance

Related to specific level crossing

Related to driver

Related to vehicle
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STEP BY STEP

PROCESS

Performance

Motivation

Cognition

Perception

Attention
There are no stupid questions in this context
Status report of LC-human factors subgroup

January 2015

• **Toolkit model:**
  A model has been prepared to identify and evaluate solutions for different LC-situations (initially accident investigation and not LC planning) - *as promised at spring meeting 2014*
In vivo experience

• Access to accidents in real time
• Organizational support
• Financial support
Let’s do it ASAP!

Human Factors Workgroup

Michael Cale
Guenther Dinhobl
Jan Gripenkoven