



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

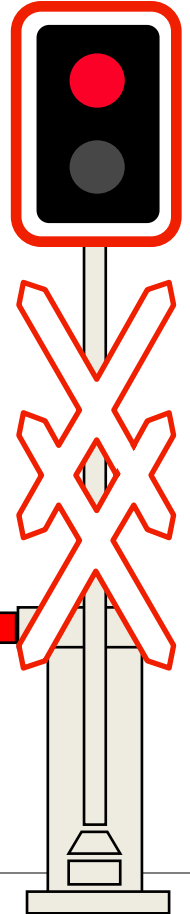
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J. Grippenkoven - German Aerospace Center e.V. (DLR)

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

S

Speed road 1

Drunk driving 1

Miscalculation 1

Fainting 1

Results of human factors - questionnaire

24 feedbacks received from 22 countries

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

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:

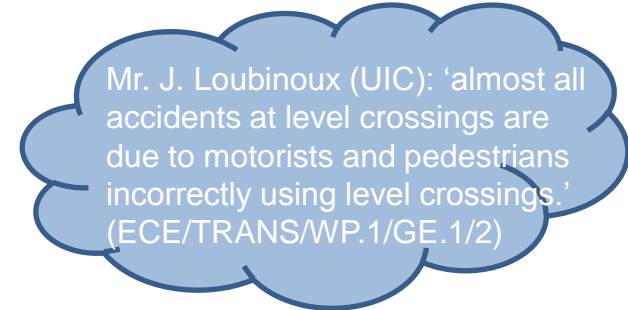
-trial and error attitude leads to nowhere

-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



SUCCESS
EVITUBE

**Failure Is The Key To
Success!**



⚠ CAUTION

↑	EPIC FAILURE
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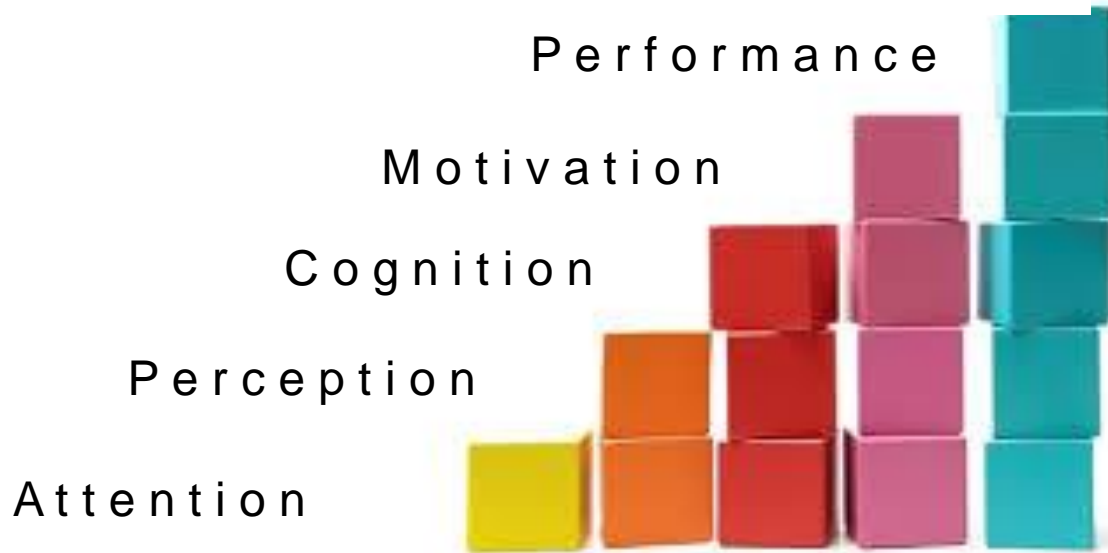


Contents of current data bases



STEP BY STEP

PROCESS



STEP BY STEP

PROCESS



Attention



In vehicle

Outside of vehicle

Related to driver

Competing activities



STEP BY STEP

PROCESS



Perception

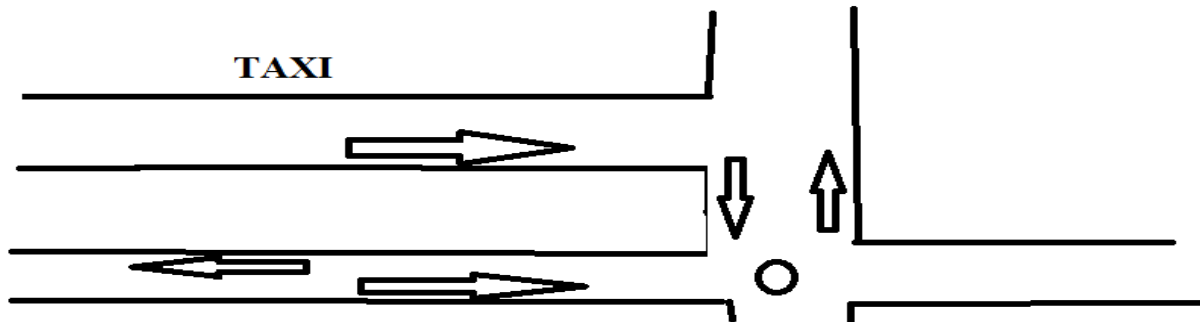
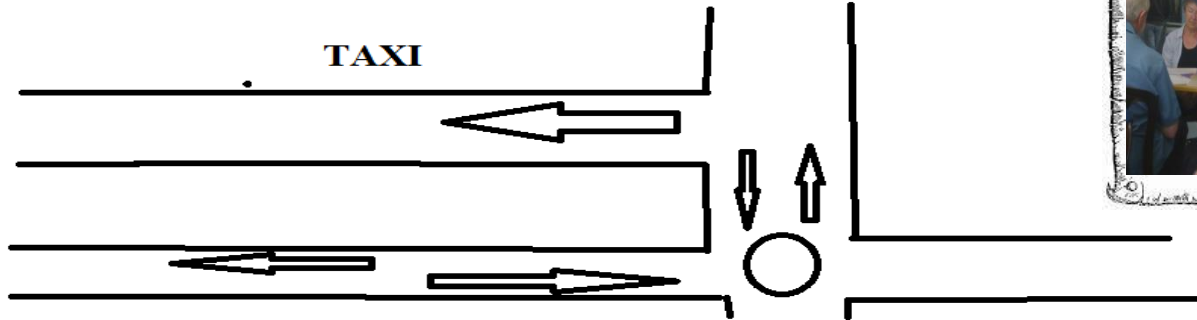


General
perception
issues



Level
crossing
related
issues
(permanent
or
temporary)

Criminal or not criminal



STEP BY STEP

PROCESS



Cognition



Related to
specific level
crossing

Related to
environment

Related to
driver



STEP BY STEP

PROCESS



Motivation



Related to
general
environment

Related to
driver

Related to
clinical
issues of
driver



STEP BY STEP

PROCESS



Performance



Related to
specific level
crossing

Related to
driver

Related to
vehicle

Please name the colors of the boxes from left to right and top to bottom (1)

red	white	blue	yellow	red	blue	yellow	white
yellow	white	red	blue	white	blue	yellow	red
blue	red	yellow	white	yellow	blue	red	white

Please name the colors of the boxes from left to right and top to bottom (2)

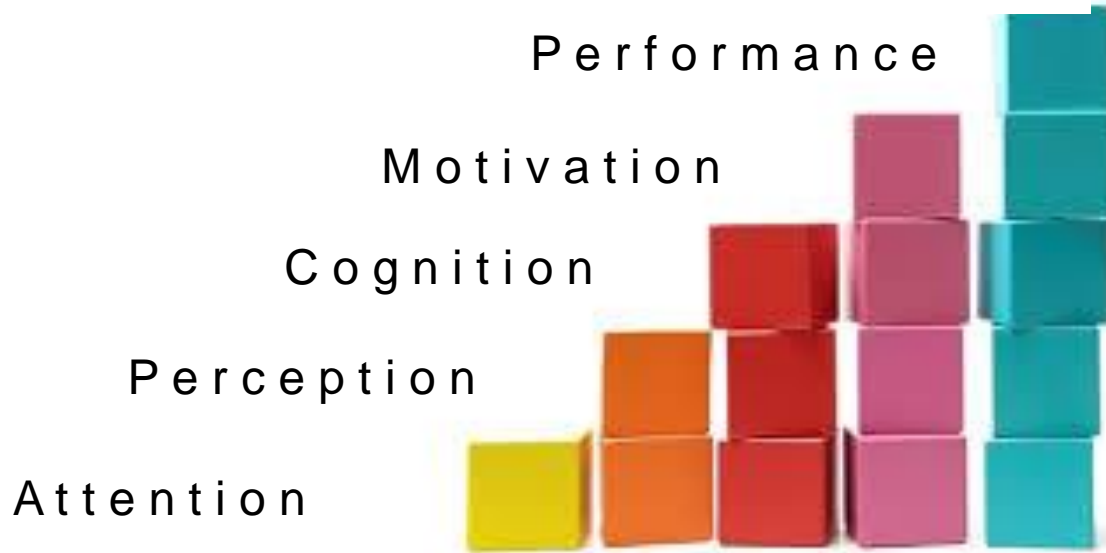
red	blue	white	yellow	blue	white	red	blue
white	yellow	blue	red	yellow	red	white	blue
red	white	blue	yellow	red	blue	yellow	white
yellow	white	red	blue	white	blue	yellow	red
blue	red	yellow	white	yellow	blue	red	white

Please name the colors of the boxes from left to right and top to bottom (3)

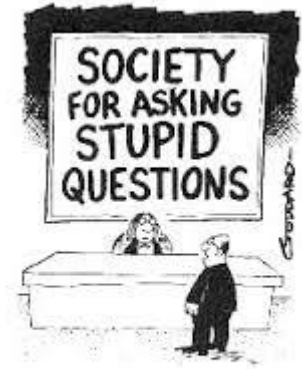
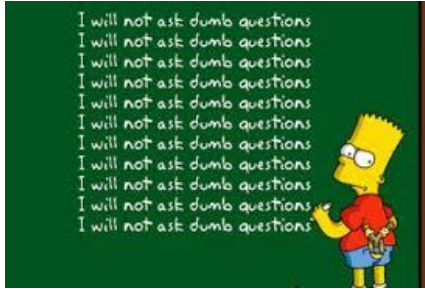
blue	yellow	white	red	red	white	white	yellow
red	blue	white	blue	red	white	blue	yellow
white	green	red	white	blue	yellow	yellow	red
blue	blue	white	red	blue	black	red	white
yellow	blue	white	yellow	red	white	blue	red

STEP BY STEP

PROCESS



There are no stupid questions in
this context



"Excuse me, but is this The
Society for Asking Stupid
Questions?"

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

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