

TRANSPORT SAFETY AND SECURITY

WORKSHOP



22 MAY, 2024

9:00 AM - 5:00 PM

UK - EGYPT HIGHER EDUCATION TRANS-NATIONAL
PARTNERSHIPS GRANT

PARTNERS:



AIN SHAMS UNIVERSITY-EGYPT

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ENGINEERING AND COMPUTING BUILDING.
COVENTRY UNIVERSITY,
GULSON ROAD, COVENTRY, CV1 2JH.

ASTONRAIL:
Intensive Programme
Safety and Security
*With a focus on Rail
Safety and Security at
Level crossings*

ASTONRail: Advanced approaches and practices for rail training and education TO Innovate Rail study programmes & Improve rail higher education provision



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Part of the AstonRail intensive programme;
Interactive session;
Organised in three parts;
Included a combination of teaching and learning methods;
Handouts were provided;
Loads of opportunities for students to try to answer provocative questions.
A threefold challenge for students to attend to;
Concluded with a discussion on the current practice !



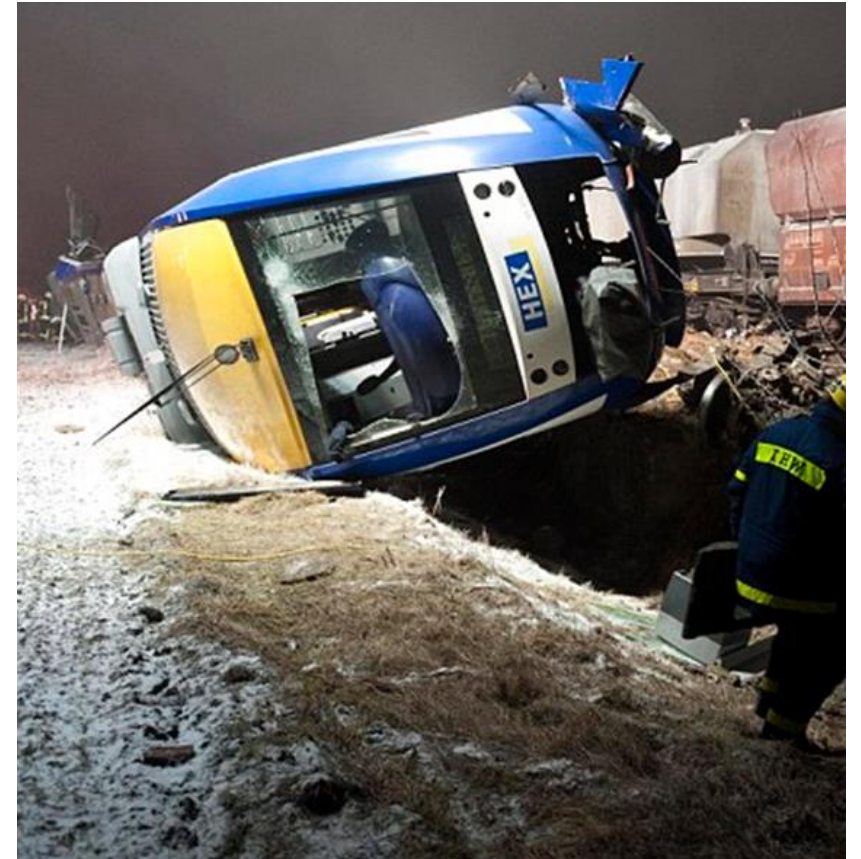
1st Part

- *Safety first;*
- *Feel safe;*
- *Think safe;*
- *Be safe;*
- *Safety before everything else:*
 - *Safety on train;*
 - *Safety at level crossings;*
 - *Other types?*
- How about “Punctuality before Safety”, are you aware of such practice?



How do we ensure safety? What do we need to know to protect ourselves?

- *Collect opinions from the audience (!)*
- *Check some stats about fatalities...*
- Definitions of crash and crashworthiness were provided and discussed
- Primary and secondary collision as well as passive and active safety
- And the like



Primary and secondary prevention in the context of crisis management – we advise you!

Unite, Inspire, Connect

*What is
the
mantra?*

Primary Prevention

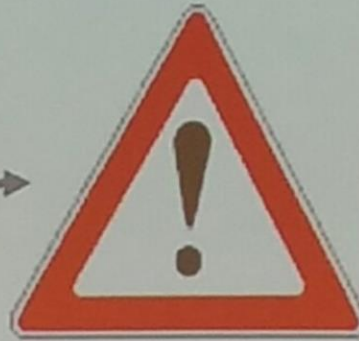
Actions taken **before the occurrence** of a crisis

Goal: To keep the extent of the crisis as small as possible.

Measures of preparation:

- Organization of structure
- Organization of qualification/training
- Organization of communication

Damage/accident



Secondary Prevention

Actions taken **after the occurrence** of a crisis.

Goal: Reduction of acute stress and prevention of long-term impairment.

Measures in case of emergency:

- Advising the management
- Supporting affected customers, family members and employees

2nd Part

How do we define Safety and Security?

- Safety and Security not mutually exclusive:
 - Safety – unintentional failures in the system.
 - Security – intentional attacks on the system.
- Standards:
 - Safety standards exist and provide design guidelines for manufacturers to meet these requirements.
 - Security against terrorist attack is not currently standardised for vehicles.



3rd Part

Accidents at Level crossings in the UK, NetworkRail



	◆ 2014/15 ◆	2015/16 ◆	2016/17 ◆	2017/18 ◆	2018/19 ◆	2019/20 ◆
Level crossing misuse (MAA) Network-wide	25.46	25.92	29.85	31.46	30.23	31.23
Collisions with road vehicles	7	4	6	7	9	6
Train striking pedestrian	12	5	11	7	2	2
Near miss with road vehicle	76	72	95	80	73	75
Near miss with non-vehicle users	236	256	276	314	308	323



There are over 6000 level crossings in Britain and they are the largest single risk to the railways

- *Bear in mind:*

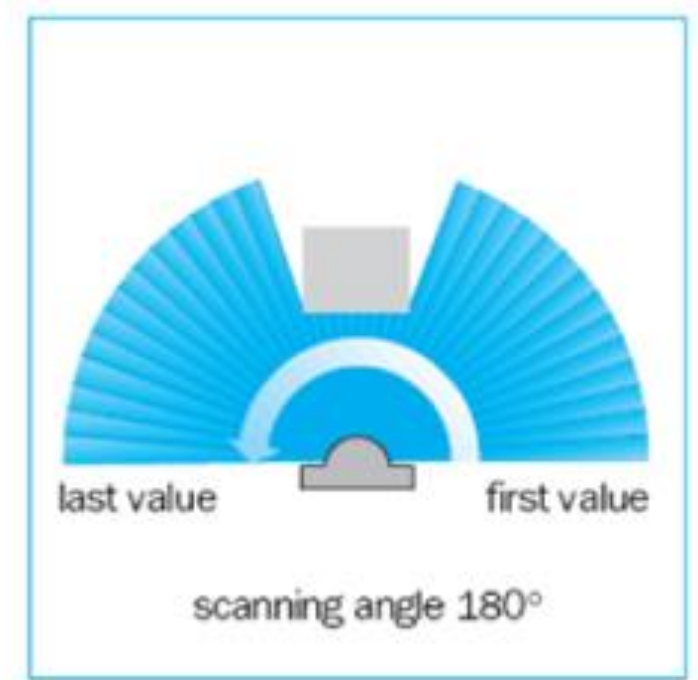
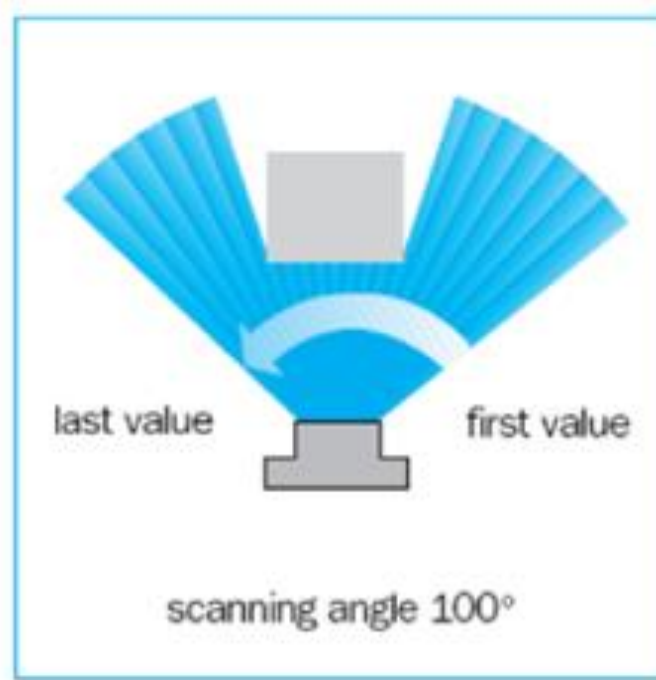
- Trains travel at up to 125mph and cannot stop quickly. You are unlikely to survive a collision.
- The turbulence created by trains can drag you under their wheels if you are too close to the tracks.
- Deliberate misuse of a level crossing is a criminal offence. You could be taken to court and face a £1000 fine. The most serious offences can result in a prison sentence.



Remember this important safety information:

- ALWAYS follow instructions on signs and obey audible and visual warnings of approaching trains;
- ALWAYS be prepared to stop and REMEMBER that there might be more than one train coming;
- NEVER drive through red lights or around barriers, they are there to protect you;
- If you are unsure how to cross safely, use the telephone (if one is provided) or find an alternative route;
- NEVER drive onto a level crossing unless your exit is clear.

Technology – next generation of obstacle detection systems (CCTV+, RADAR, LIDAR, thermal imaging ...)



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Two separate categories:
passive and active crossings

A passive crossing doesn't have any features to show that there is train approaching to the user and they are responsible for deciding whether or not it is safe to use the crossing.

An active crossing is one that shows the user (pedestrian or vehicle user) that a train is approaching by the closure of the crossing and with audible alarms and warning lights.

Passive Crossings: Sub-categories

- 1) **User Worked Crossing (UWC/ UWC-T)**: a gate which either a vehicle user or pedestrian must operate in order to get through the level crossing (with a telephone and without a telephone)
- 2) **Open Crossing (OC)** only has signs to warn drivers to come to a stop before passing these level crossings because the area between the road and the rail is completely open
- 3) **Footpath Crossing (FP)**: designed for the use of pedestrians and not vehicle users; they often have stiles or gates in place to reduce usage.

Active crossing: Sub-categories (Slide 1)

- 1) Manually Controlled Gate (MCG)/ Manned Gates: operated by a crossing keeper or manually by a signaller
- 2) Manually Controlled Barrier (MCB)/ Manned Barriers: similar to manually controlled gate crossings as they are controlled by a signaller or crossing keeper
- 3) Manually Controlled Barrier monitored by Closed-Circuit Television (MCB-CCTV): similar to the manually controlled barrier previously mentioned, except they are monitored with CCTV, which is viewed by a signaller to control the actions of the crossing
- 4) Automatic half barrier crossing (AHBC) has barriers which only extend across the entrance of the road so that the exits are left clear.



Manually controlled barriers (MCB)

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Automated Half Barrier Crossing (AHBC)



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Active crossing: Sub-categories (Slide 2)

5) Automatic Barrier Locally Monitored (ABCL): like an automatic half barrier crossing, however, the crossing is continuously monitored and the train driver must be sure that the crossing is clear before arriving

6) Automatic Open Crossing Locally Monitored (AOCL): has no barriers, but has audible warnings and flashing lights telling vehicle users it is unsafe to cross, which are automatically activated when a train is approaching

7) Footpath Crossing with Miniature Warning Lights (FP-MWL): like Typical FP but with an inclusion of red and green lights to inform the pedestrian whether or not it is safe to cross

8) User Worked Crossing with Miniature Warning Lights (UWC-MWL): has gates or barriers which extend across, with miniature warning red and green lights indicating to the user when it is safe to cross



User Worked Crossing with Miniature Warning Lights (UWC-MWL)

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Risk in the context of a level crossing is defined as the likelihood of an incident to take place, and its severity.

Two types of risks:

Individual Risk - to describe the risk, which applies to only the level crossing users;

Collective Risk - to describe the risk to everyone who is using the crossing: this includes pedestrians, vehicle users, and train drivers and passengers.

Your Challenge is threefold:

- 1) Consider the categories above and determine how safe and secure a level crossing is and whether any action should be taken to improve the safety and security.
- 2) With the use of a scale of your choice, rate and rank the categories above against Individual Risk and Collective Risk. E.g. a scale from 1-10, with 1 having the highest risk to everyone and 10 having little to no risk.
- 3) Based on the outcome of 2), develop strategies to reduce risks for those categories rated and ranked as high risk.



OUTCOME

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Individual risk is rated from A-M, with A having the highest risk and M having almost none at all.

Collective risk is measured on a scale from 1-13, with 1 having the highest risk to everyone and 13 having little to no risk.



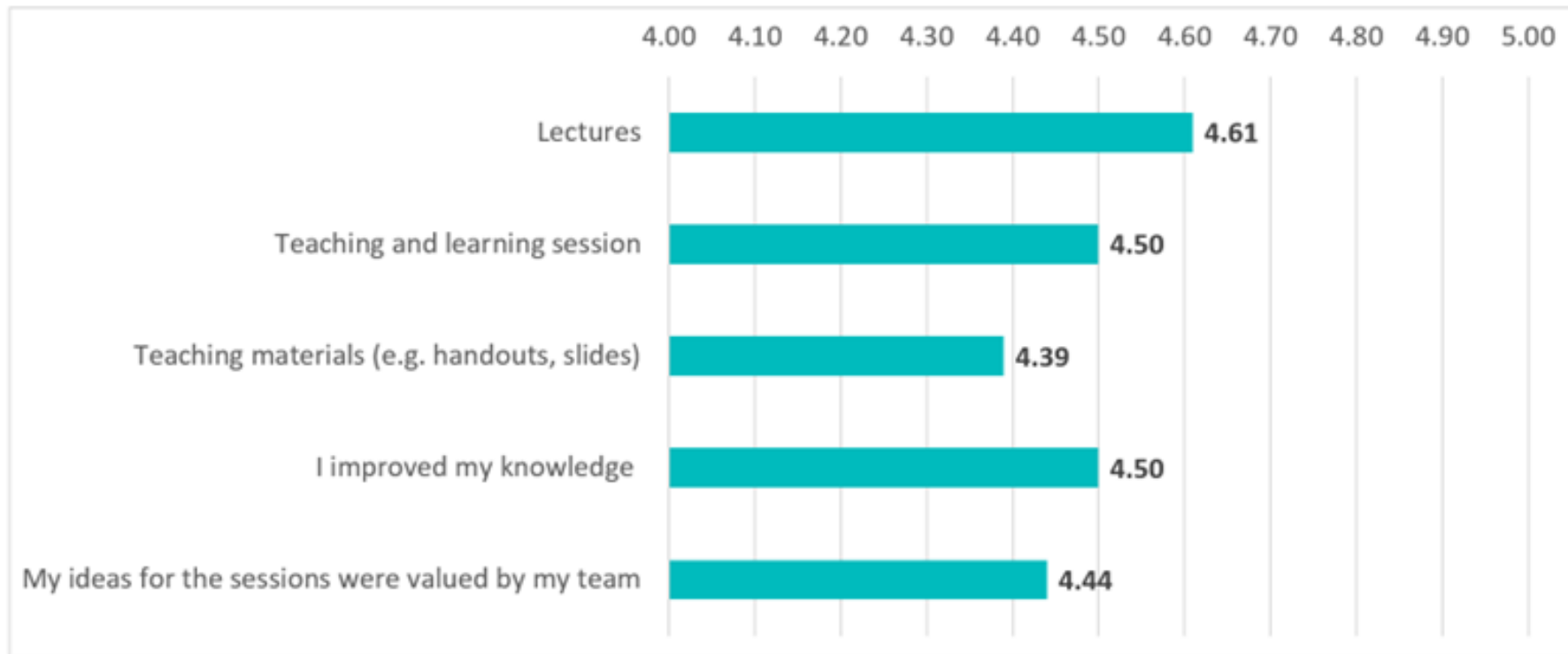
Types of Level Crossing	Average Risk of Level Crossings	
	Individual Risk Letter	Collective Risk Number
Automatic Barrier Locally Monitored	F	5
Automatic Half Barrier	E	4
Automatic Open Crossing Locally Monitored	H	6
Footpath Crossing (FC)	D	7
FC with Miniature Warning Lights	D	6
Manned Barriers (MCB)	H	5
MCB monitored by CCTV	H	5
Manned Gates (MCG)	H	7
Open Crossing (OC)	G	6
User Worked Crossing (UWC)	D	8
UWC with Miniature Warning Lights	C	5
User Worked Crossing with Telephone	C	7

Session effectiveness evaluation

A 1 to 5 scale was used, where 5 was excellent;

As it can be seen, all rubrics and items received 4.30+, suggesting a very good result.

Safety and security



- Any questions?

- **Email:**

m.marinov@aston.ac.uk



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