A ‘safe system’ process model for level crossings

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UNECE Expert Group tasks

• Enhance safety at level crossings
• Evaluate laws and safety performance
• Evaluate factors leading to unsafe conditions
• Strategic action plan for road/rail interface
  – Develop framework to implement
  – Use ‘safe system’ approach
  – Monitor and report
• Workshops to support core objectives
• Identify future strategic and research needs
‘Safe system’ process model?

areas:
• Infrastructure design & management
• User behaviour management
• National policy and law
• Safety enhancement

elements and process:
• economics, engineering, environment, ergonomics
• enable + educate + encourage (=> empower)
• enforcement, emergency preparedness, expectations
• engage, evaluate, enhance
Level crossing safe system

UNECE ‘approach’ & ‘5 key elements’

- Engage
- Evaluate
- Evolve plan
- Enhance safety

Economics
Engineering
Educate
Enforce
Level crossing safe system

- Engage
- Evaluate key factors
- Evolve plan
- Enhance safety
- Educate
- Enforce

UNECE ‘areas’ to evaluate

Infrastructure management
User Behaviour management
National policy & law
Economics
Engineering
Level crossing safe system

- Engage
- Evaluate key risk factors
- Evolve plan
- Enhance safety

UNECE 'develop strategy'

Infrastructure management
User Behaviour management

National policy & law

Engineering
Economics
Enforce
Educate
Level crossing safe system

Infrastructure management

User behaviour management

National policy & law

Environment

Engineering

Economics

Expectations

Educate

Enforce

Emergency preparedness

- Engage
- Evaluate key risk factors
- Evolve plan
- Enhance safety

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other ‘elements’
Level crossing safe system

- Design &

- Infrastructure management

- User behaviour management

Ergonomics

- Environment

- Engineering

- Economics

- Expectations

- Educate

- Enforce

- Emergency preparedness

- Engage

- Evaluate

  - Key risk factors

- Evolve plan

- Enhance safety
Level crossing safe system

Infrastructure design & management

User behaviour management

Ergonomics

Enable

- Engage
- Evaluate key risk factors
- Evolve & plan
- Enhance safety

Encourage

Educate

Enforce

Emergency preparedness

Expectations

Economics

Engineering

Environment

National policy & law

‘empower user’
Theory of planned behaviour

Beliefs ->
  -> perception:
    (attitude, acceptability & ability)
  -> intention
    -> behaviour

Level crossing safe system

Infrastructure design & management

- Ergonomics
- Environment
- Engineering
- Economics
- Expectations

User behaviour management

- Enable
- Educate
- Encourage
- Enforce
- Emergency preparedness

National policy & law

ISO ‘continual improvement’

Key risk factors:
- Engage
- Evaluate
- Evolve & plan
- Enhance safety

Review & plan

Act

Check

Do

Enhance safety review & plan

Act
Level crossing ‘safe system’

- system approach
- multi-disciplinary
- safe by design & fit for purpose
- empower the users
- manage the risks
- enhance safety