



SAFER LEVEL CROSSING BY INTEGRATING AND  
OPTIMIZING ROAD-RAIL INFRASTRUCTURE  
MANAGEMENT AND DESIGN

# Design Workshop on Human Centered LC Safety Measures

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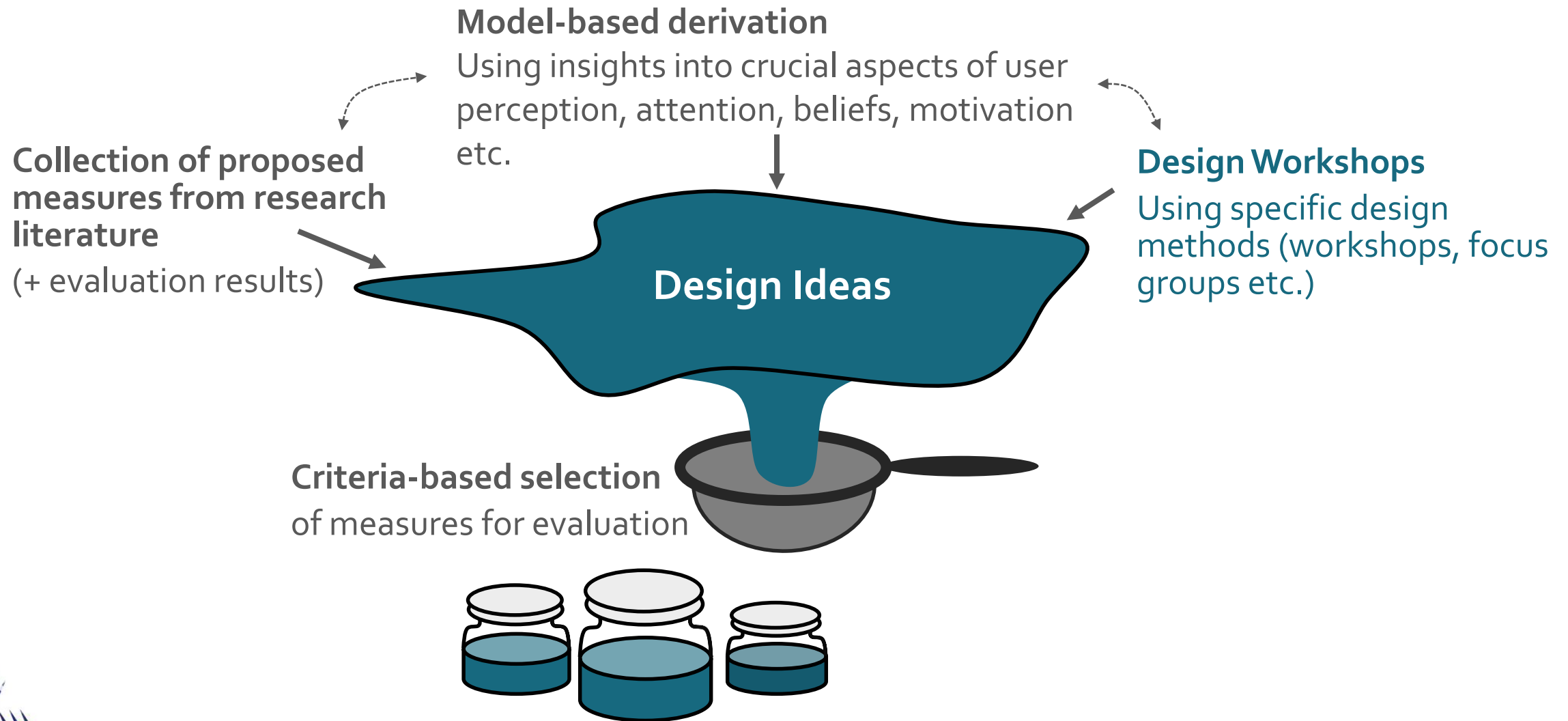
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# Task 2.3 - Design and evaluation of human-centred low cost measures

- ▲ **Design of human-centred low-cost countermeasures**
  - ▲ Identify knowledge gaps, new approaches and out of the box ideas concerning LC safety and design  
... and also existing concepts not implemented yet
  - ▲ Conceive and choose promising countermeasures for evaluation (new ones and / or upgrades of existing measures)
  
- ▲ **Evaluation of human-centred low-cost countermeasures**
  - ▲ based on human factors criteria
  - ▲ using multiple methods (e.g. Simulator tests, behavior studies in real traffic, user interviews)

# Working Approach in the design of measures



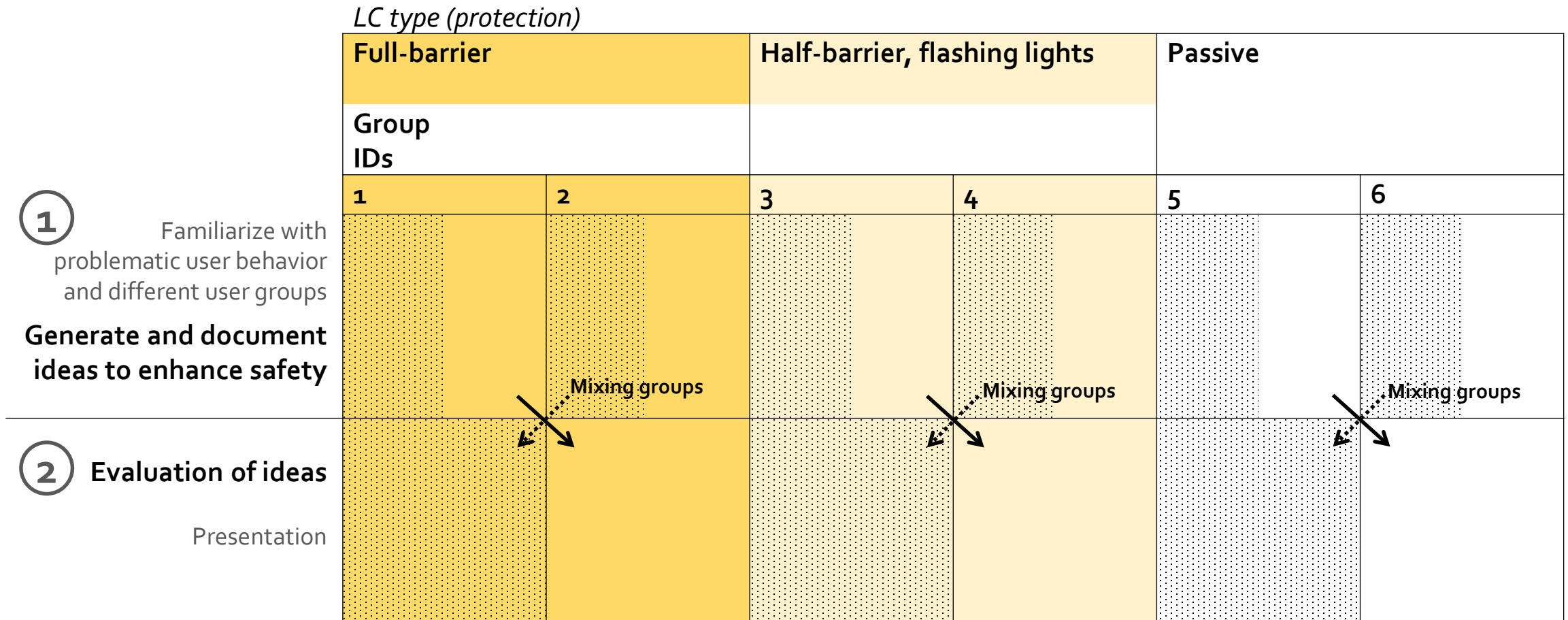
# Our workshop: Scenarios and groups

*LC type (protection )*

Full-barrier		Half-barrier, flashing lights		Passive	
Group IDs					
1	2	3	4	5	6
<b>Motorized</b> Car driver, motorcyclist, truck driver, ...					
<b>Vulnerable</b> Pedestrian, cyclist, VRU with special vehicle (wheel-chair, pram, walker,...)					

*road user type*

# Our workshop: Working Process



# Let's get started!



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## GROUP 1 - ASSIGNMENT

Dear rail systems experts,

Thank you a lot for participating in our design workshop. Today, we would like to draw upon all your experience and creativity to come up with human-centered solutions to make level crossings safer.

### Your schedule for the workshop

<b>Invention Phase</b>	
Invention of safety measures and documentation of your ideas	50 min
Mixing groups	5 min
Short introduction of new group members to the inventions	15 min
<i>Coffee break</i>	20 min
<b>Evaluation Phase</b>	
Complementing the list	15 min
Rating and Ranking of inventions	30 min
<b>Presentation (all groups)</b>	30 min

### Your Scenario: Level crossings with full barriers



Safety-challenging behavior on road user side (examples)

- Circumventing closed barriers (climbing over / under, ...)
- Passing the LC after signaling for closing has begun / while barriers are closing
- Getting caught between the barriers
- Getting stuck on the rails
- ...
- ...
- ...
- ...

Can you think of more? Please add ...

## Your Personae / Road Users

Please take about half of the time in the following invention phase to take the perspective of:

### A vulnerable road user (VRU), e.g.



### A motorized road user (MRU), e.g.



To help you empathize with your personae, here are some questions:

- How does it feel to be me?
- What are my motivations, values and attitudes?
- What are my habits?
- What frustrates me and what I am afraid of?
- What are my social relations?
- Why am I behaving in a way that challenges safety at a full-barrier LC?
- How do I do it?

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## Invention of safety measures and documentation of your ideas (50 min)

The objective of this phase is to generate as many ideas as possible on how to make level crossings with full barriers safer for your personae. For this, please take the perspective of your personae and design for them. You can invent measures on any level (e.g. engineering to influence the direct interaction at LC, road/rail operations, law/regulations, etc.)

Address a central problem in a question that begins with "How might we...?" and do a brainstorming in your group. Any idea in the brainstorming is important, the supposedly "good" ones as well as the supposedly "bad" ones, the rock-solid ones as well as the completely crazy ones. Be crazy! Generate at least 20 ideas in your group. Use the *→proble* templates to sketch and document your ideas for the further process and collect them on the board.

## Mixing groups & introducing new group members to inventions (20 min)

Part I (5 min): Time to meet new people! Count out your position on the table, beginning with the oldest (and probably wisest) person. Everyone with an even number (2,4,6,...) joins group 2, while half of group 2 will join your (former) group. Say hello :)

Part II (15 min): Show the new group members around your collection and shortly introduce your inventions to them.



(20 min)

## Complementing the list (15 min)

During the coffee break, we handed you out a few more profiles of ideas that were collected before. Take a moment to familiarize with them and integrate them into your collection.

## Rating and ranking of inventions (30 min)

Part I (25 min): We now kindly ask each group member to independently use the *→rating* sheet to give their evaluation of all the inventions on three dimensions:

- (1) How effective do you think this measure would be to enhance safety relative to the others?
- (2) How "low-cost" do you think the measure would be relative to the others?
- (3) How innovative do you find this measure overall?

Part II (5 min): Finally, please let the group crown one "king" measure in each dimension. (As your time is limited, one quick way to do this could be that each member nominates one candidate per category and you elect per show of hands.) Use the *→medals* to mark your champions.

## Presentation (5 min per group – 30 min overall)

Present your results to the audience in 5 minutes.

I thank you for your commitment!