Development & test
Crossing assistent at level crossings

June 7th 2018, Brenda Struve
Introduction
Challenge with several experts on level crossings and human behaviour in traffic.

Subject: mapping conscious and subconscious behaviour at level crossings

The crossing assistant was one of the ideas from the challenge
Why a crossing assistant?

Numbers show that older, less mobile pedestrians more often are involved in incidents at level crossings.

Reasons: panic when the bells ring and the barriers are closing, they freeze or fall while rushing over and falling. Or they get locked within the barriers.

Trend: people get older over the years and participate longer in traffic.
Design proces Crossing assistent
First idea Jeroen Nederlof, ProRail

From idea to prototype

In order to test the crossing assistant at a level crossing, the project team had to develop the first idea of Jeroen Nederlof into a prototype. We involved TNO, a research institute with knowledge of human behaviour in traffic, and DoubleYou, a product design company.

When the green light is on, it will take at least 30 seconds before the barriers close, you can cross calmly.
Conditions design prototype

- Product will not reduce the safety at level crossings!
- The signs of the level crossing are always superior to the crossing assistant.
- Information display near to the level crossing so pedestrians can relate it to the level crossing.
- Clear message to target group, no room for misinterpretation.
First concepts

<table>
<thead>
<tr>
<th>1. BASIS</th>
<th>2. BORD</th>
<th>3. VERKEERSBORD</th>
<th>4. INDICATIE</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Basis Image" /></td>
<td><img src="image2" alt="Bord Image" /></td>
<td><img src="image3" alt="Verkeersbord Image" /></td>
<td><img src="image4" alt="Indicatie Image" /></td>
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<thead>
<tr>
<th>5. BARRIERE</th>
<th>11. LICHTBAK</th>
<th>13. LANGZAME ZONE</th>
<th>14. RAILING</th>
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<tbody>
<tr>
<td><img src="image5" alt="Barrier Image" /></td>
<td><img src="image6" alt="Lichtbak Image" /></td>
<td><img src="image7" alt="Langzame Zone Image" /></td>
<td><img src="image8" alt="Rail Image" /></td>
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### Morphological Scheme Design Decisions

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<td>Drukknop</td>
<td>Bewegingssensor</td>
<td>Graadlens</td>
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<td>Toegel</td>
<td>Op de slangboom</td>
<td>Verkennersboord</td>
<td>Over hangend</td>
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### Additional Notes

- For more details, refer to the original source. (Reference Information)

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*Source: Dreven.nl (accessed 08.07.2016) | Original document (translated)*
Design lay out prototype Crossing assistant
Information display Crossing assistant, evaluation by target group

The information at the display is presented to the target group by TNO. A number of options for the signs and also if explanatory text is needed.

Results:
- The green sign of the man with a walking stick is a bit offensive to the target group.
- The turtle wasn’t clear: “Can you only pass if you are very slowly?” and is also a bit offensive.
- The green man is favorite, the meaning is equal to a traffic light, recognizable.
- The white train (train passes soon) was not clear to the target group, extra information before and during the test is needed.

Situation ‘Train passes soon’  
Situation ‘Green’
The crossing assistant, final design

**Situation ‘You can pass calmly’**

Two green men are shown, one on eye height of a standing person and one for a passant with a rollator of mobility scooter and the text: you can pass calmly.

**Situations ‘Train will soon pass’ and barriers are down**

When the white train appears the barriers will close soon. Slow pedestrians can decide to wait until the train has passed, to be sure not to be confronted with ringing bells and closing barriers when they pass.

This sign will also be showed when the barriers are down.
Test
Execution test Crossing assistant at level crossing Haarlem Westergracht

Date test: 10 January - 21 March 2018

TNO was responsible for the behavioural research during the test. They interviewed pedestrians from the target group before and during the test. They asked on what level the pedestrians feel safe, secure and relaxed during the crossing.
Results research effects behavior

INTERVIEWS

50 pedestrians from the target group were interviewed. 24 pedestrians from that group used the crossing assistant. All these pedestrians say the crossing assistant is very useful.

The pedestrians feel significantly more safe, secure and calm during their crossing. The pedestrians were very cooperative and told the interviewer how happy they were with the crossing assistant. Some of them even told they are not scared anymore to cross.
Next steps ......

• Functional requirement specifications.
• Technical requirement specifications.
• Completing Business Case.
• Decision about product development and implementation.
Thank you!