

VRU-Proxi IWG

Direct Vision for trucks and buses

draft UN Regulation

European Commission DG GROW I.2 Mobility Unit

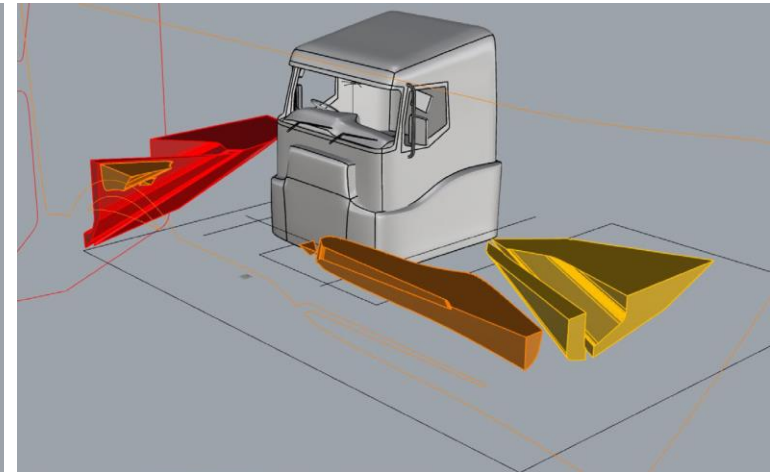
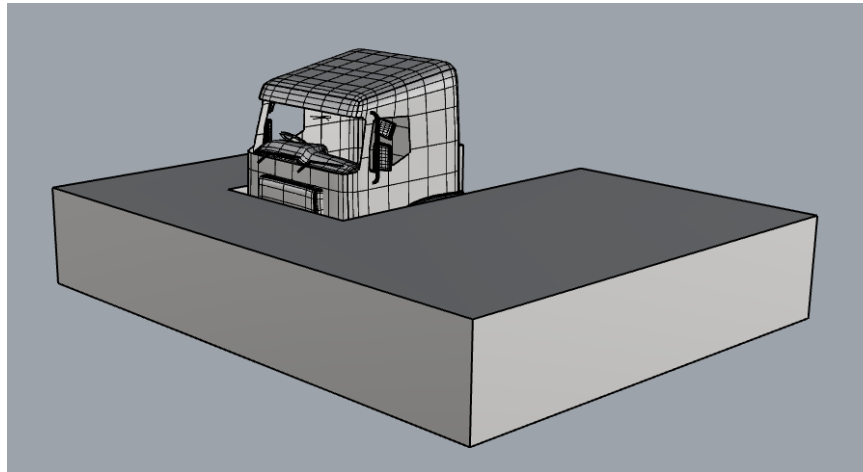
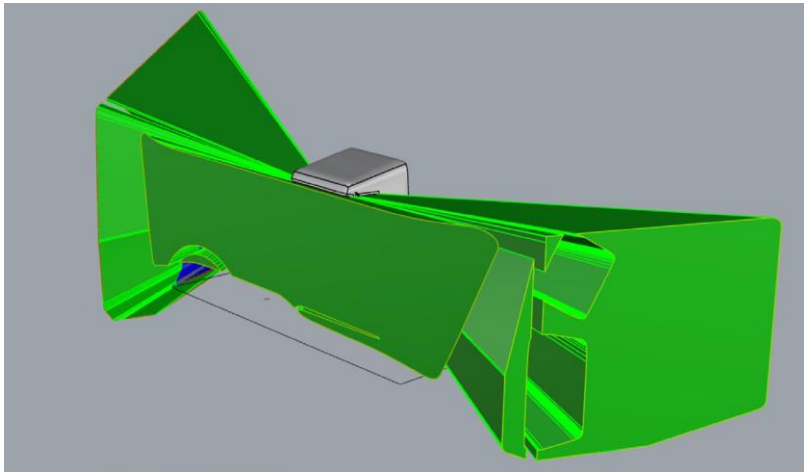
Peter Broertjes on behalf of co-chair **Yasuhiro Matsui** and the members of the **Informal Working Group on Awareness of Vulnerable Road Users proximity in low speed manoeuvres**

Direct vision requirements in GSR 2019/2144

- (22) ... the high position of the driver led to an increased blind-spot area and poorer direct visibility around the truck cab. This is a major factor in truck accidents involving vulnerable road users. The number of casualties could be reduced significantly by improving direct vision. Requirements should therefore be introduced **to improve direct vision** to enhance the direct visibility of pedestrians, cyclists and other vulnerable road users from the driver's seat **by reducing to the greatest possible extent the blind spots in front and to the side of the driver**. The specificities of different categories of vehicles should be taken into account.
- Article 9(5) Vehicles of categories M₂, M₃, N₂ and N₃ shall be designed and constructed to **enhance the direct visibility** of vulnerable road users from the driver seat, **by reducing to the greatest possible extent the blind spots in front of and to the side of the driver**, while taking into account the specificities of different categories of vehicles.

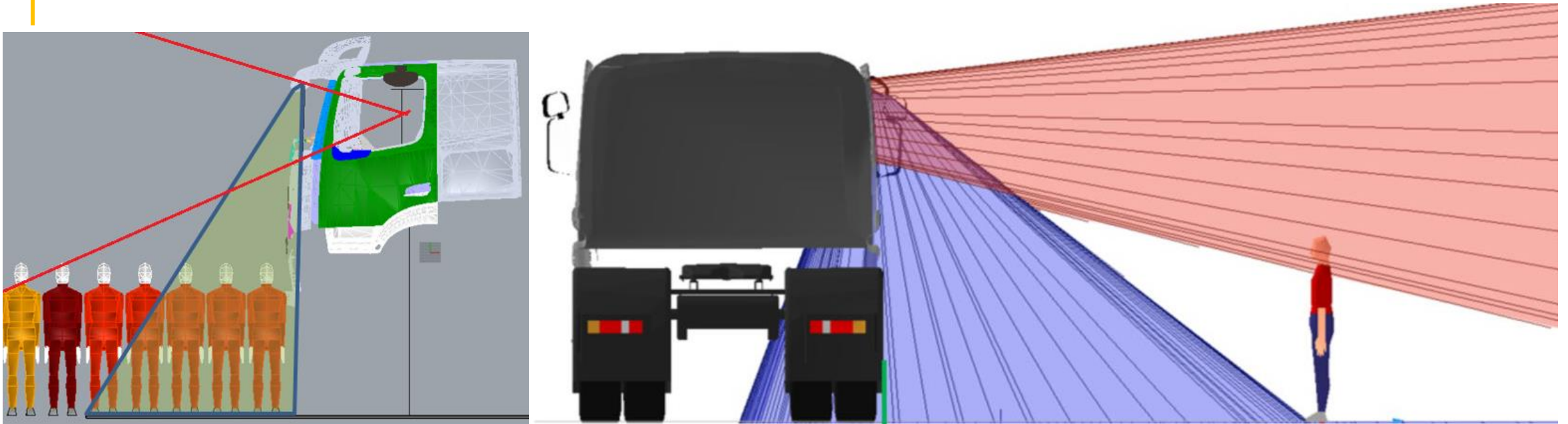
Direct vision concept

- Based on the Transport for London (UK) scheme for Direct Vision
- Can be checked by means of CAD data of the cab (either scanned by third party or provided by the manufacturer)



- Necessity to transform this approach into a type-approval procedure
- Can now also be checked by means of simplified test as per the proposed new draft UN Regulation – with excellent correlation

Direct vision concept – simplified UN test

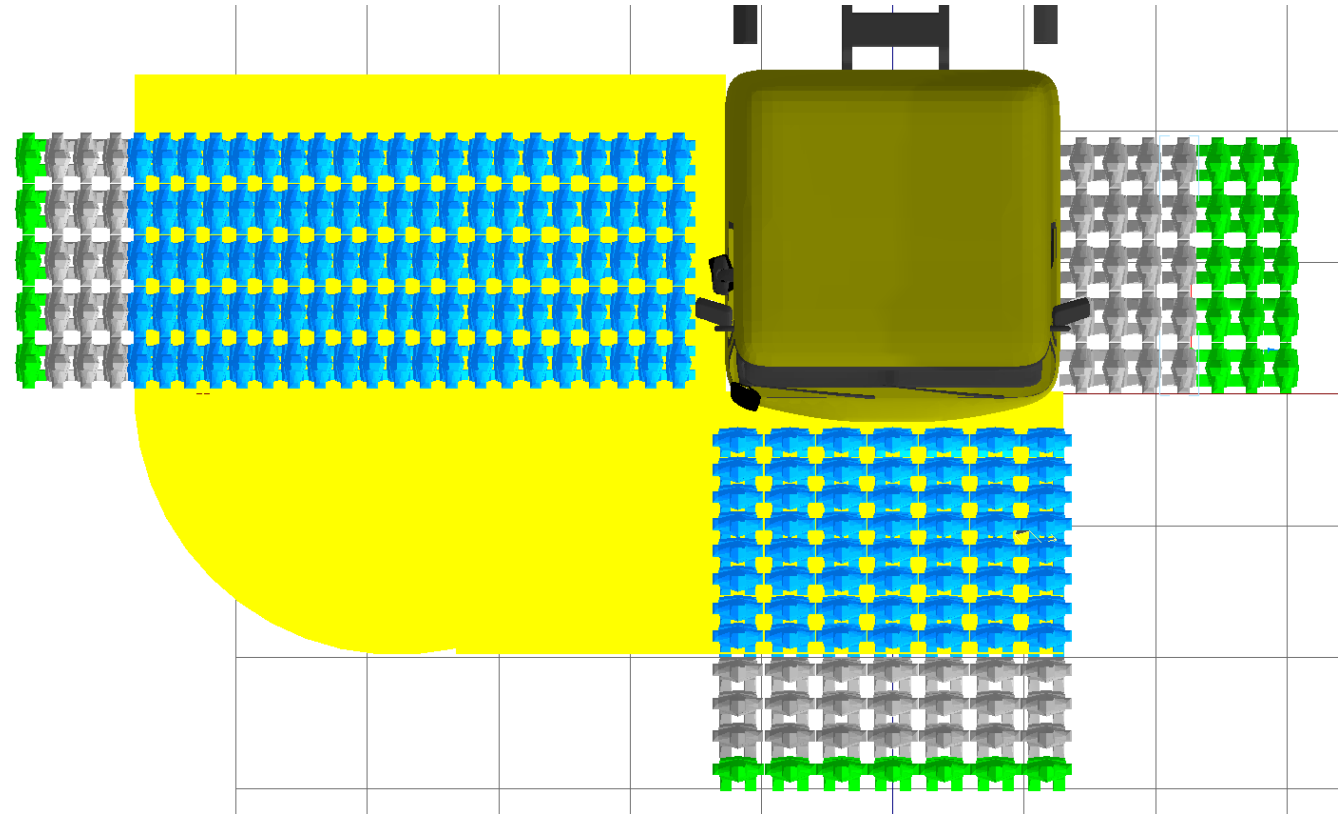
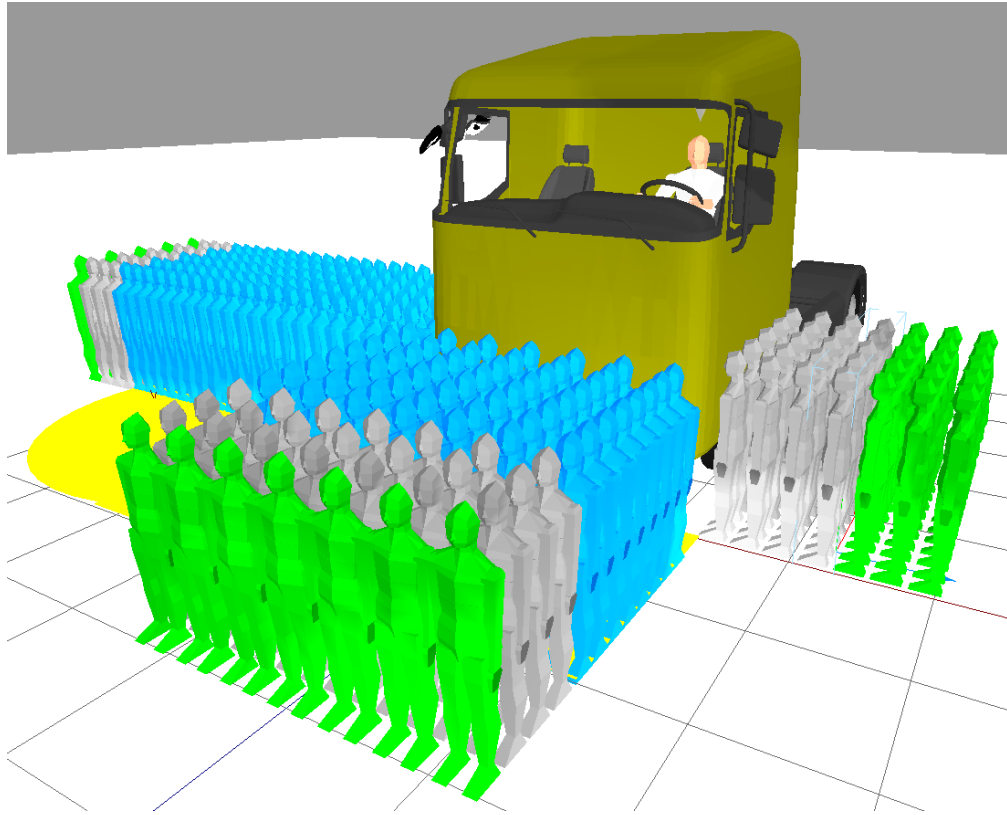


- A 'translation' has been made between the quantification of visible volume determined in computer environment 3D-space and on-the-ground placement of elements – with a given height marking – and the mapping in the X-Y plane of where the markings are visible or not
- Basic principle is visibility from a height covering at least the top-half of the head of an upright standing small 5th percentile (Italian) female

Direct vision concept – simplified UN test



Current state-of-play



■ = Directly visible ■ = Visible through indirect vision devices only ■ = Not visible

Images kindly provided by Dr Steve Summerskill, Loughborough University

Interpretation of images and considerations

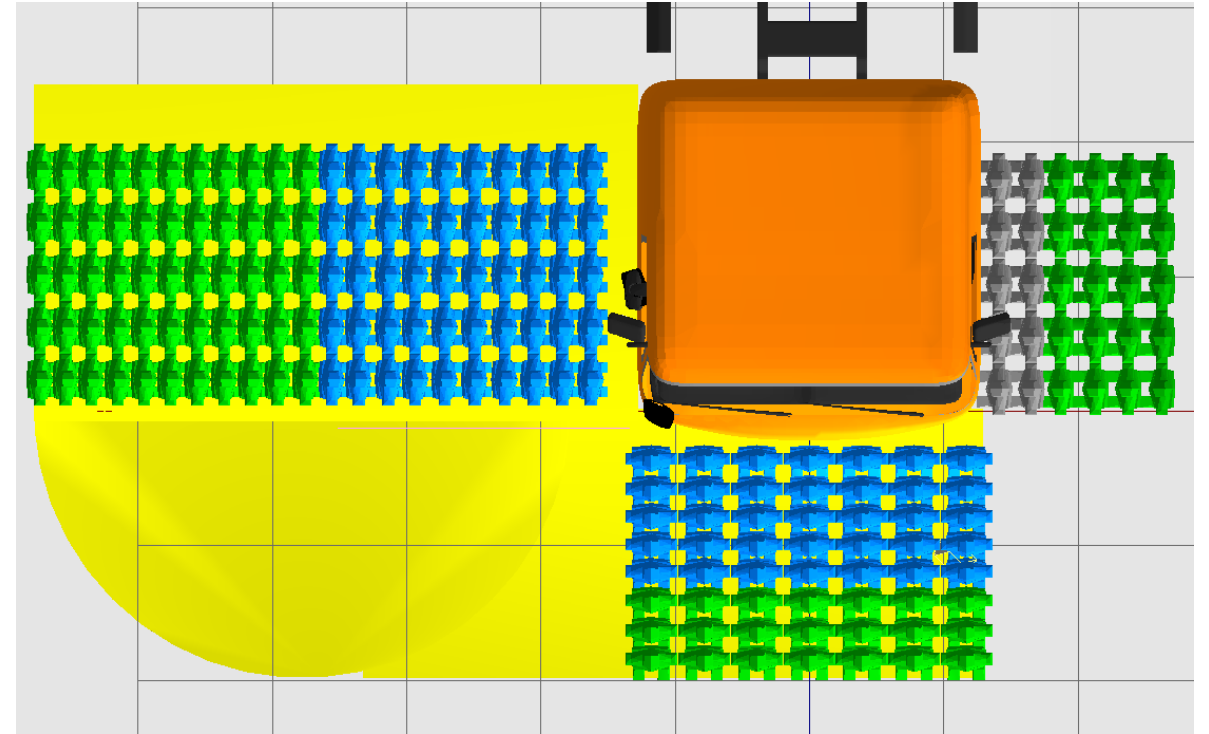
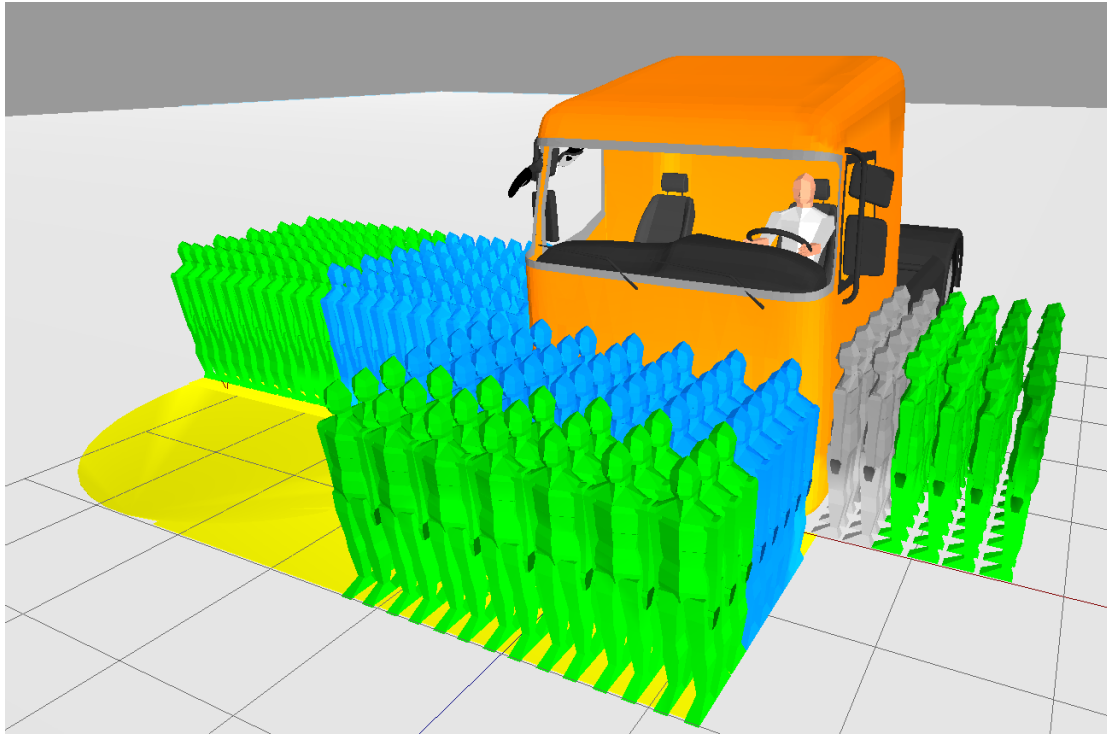
- **Yellow pattern** on the floor is the combined mandatory UN Regulation No 46 **field for Class V and VI** indirect vision devices (i.e. mirrors or CMS)
- **Blue** human surrogates are visible **indirectly**
- **Grey** human surrogates **may not be visible at all**
- **Green** human surrogates are **directly visible by the driver**

- The visibility in Class V and VI mirrors suffers from distortion and also from mal-adjustment
- Some field data suggested that mirrors are often mal-adjusted
- IWG chose to consider implementation with a safety margin / overlap
- IWG agreed on differentiation based on the use of vehicles in the real-world

Differentiation methodology

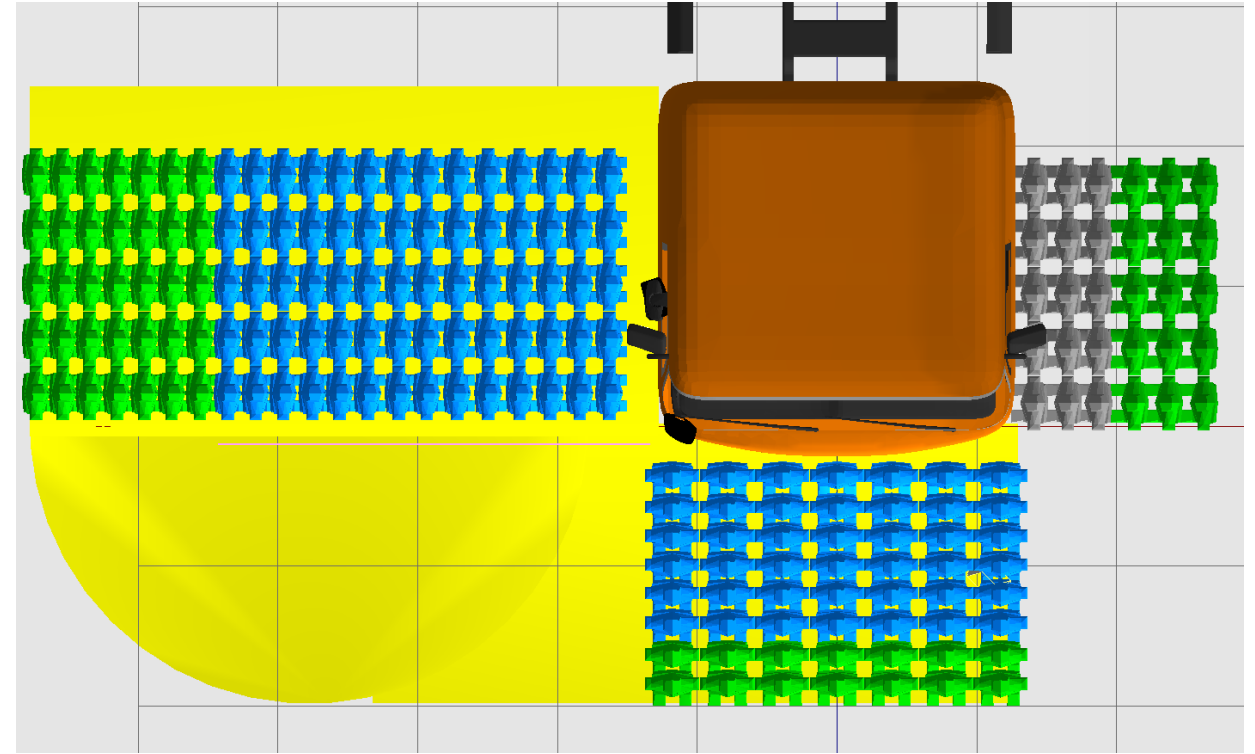
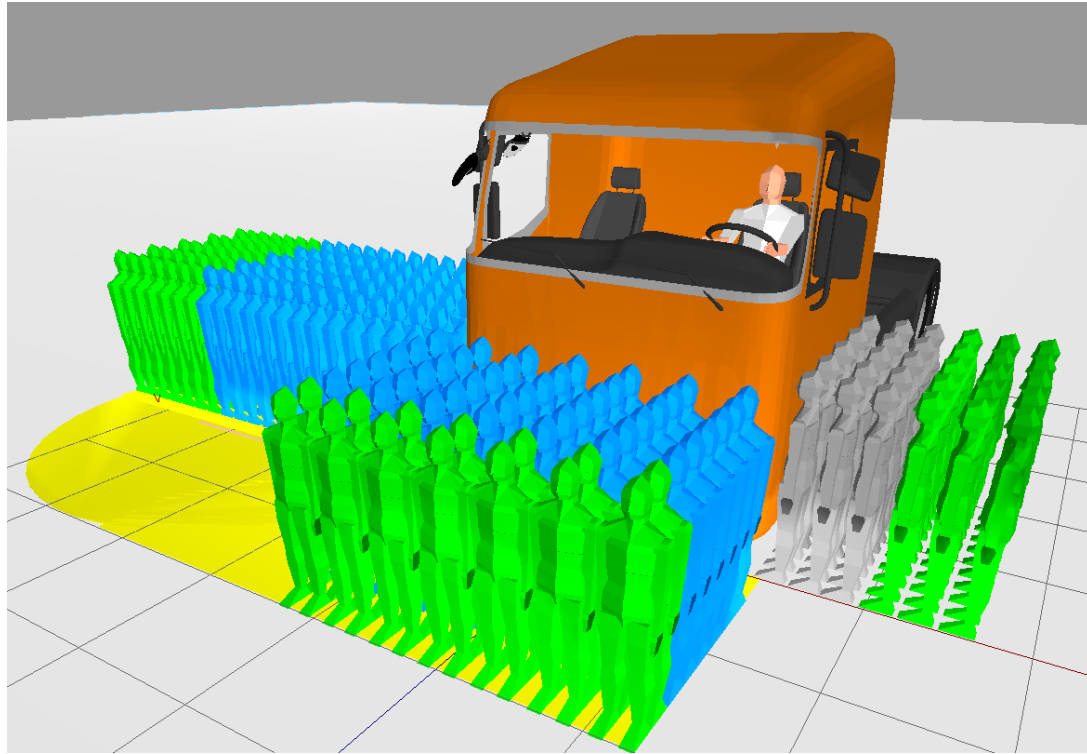
- Developed in the IWG VRU-proxi (under T&E leadership)
- On basis of EC legislation VECTO criteria linked to real-use field data
- 3-level approach:
 - Level 1 city trucks and buses
 - Level 2 off-road (trucks that may however also travel in cities)
 - Level 3 motorway long-hauling
- Concept captured in a table with specific criteria:
 - Number of axles
 - Sleeper cab
 - Engine power
 - ...

Proposed Level 1 (city trucks and buses)



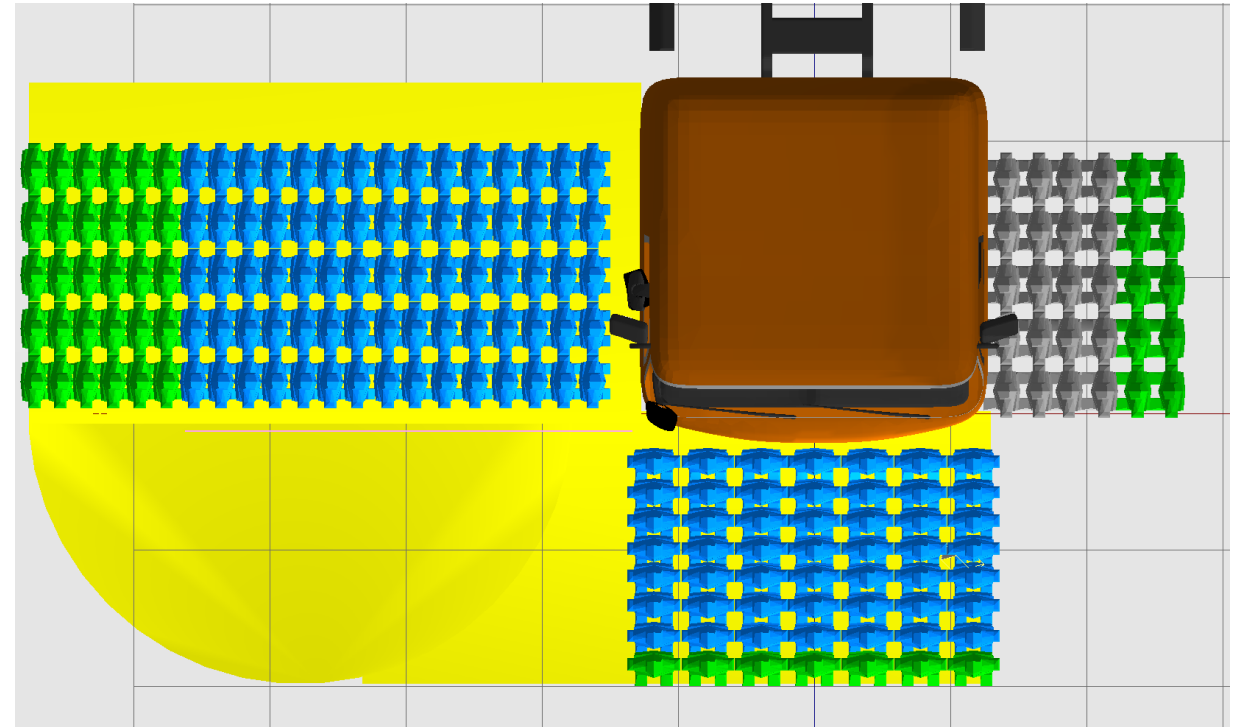
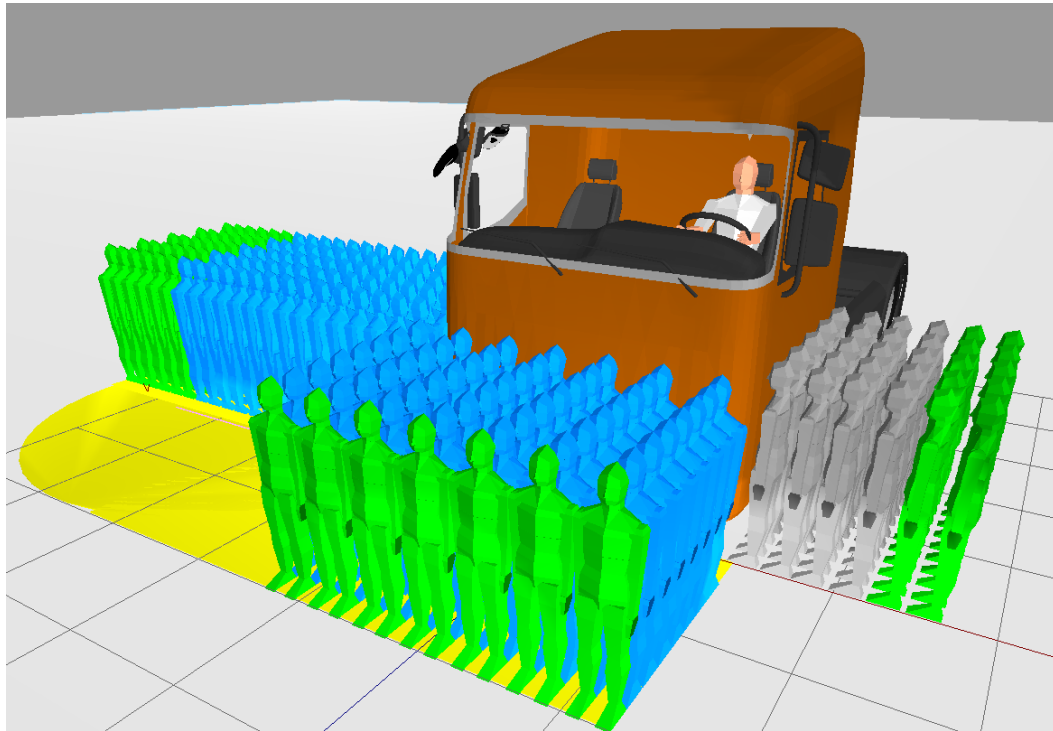
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Proposed Level 2 (off-road)



■ = Directly visible ■ = Visible through indirect vision devices only ■ = Not visible

Proposed Level 3 (motorway long-hauling)



■ = Directly visible ■ = Visible through indirect vision devices only ■ = Not visible

Proposal conclusions

- The co-chairs of the IWG are of the opinion that the draft new UN Regulation proposal fulfils the obligations as agreed in the Terms of Reference – and are also in line with EU obligations in the GSR – as regards:
 - Scope
 - Purpose
 - Ambition levels
 - Differentiation taking into account specificities of different categories of vehicles
 - Overall objectives of the initiative

Open points

- Draft text is **not completely technology neutral** and has some drawbacks in case of very unique designs
 - Conventional trucks not affected for pass/fail assessment
 - Already agreed in the IWG VRU-Proxi to amend in the future
- Industry highlights that it is ‘**impossible**’ for some **existing truck models** to meet the requirements. **Forced production end in 2029** will be the result. Industry proposes a **reduced** level of direct vision for existing types, but specifically coupled with highly advanced safety systems to be added
 - EU-level discussion in the Technical Committee – Motor Vehicles meeting of 30 September 2021, however concluded that no data was provided that would allow to change the nature of the conclusions on the scale of changes for existing types

Reality check

- We expect that this vehicle, to be available from start of 2022, is very close to or exceeding the proposed thresholds



Images <https://www.daf.nl>

Next steps in UN GRSG and WP.29

- Delegates are asked to consider and to support this draft new UN Regulation, on basis of
- GRSG informal document today's session October 2021
- GRSG working document for vote in April 2022
- EU position, based on Member States that have been consulted in the Technical Committee – Motor Vehicles meeting of 30 September 2021, is to endorse the proposal
- Ready for WP.29 vote in November 2022

Thank you

Images:

First slide: youtube – Kubo-SK and Dr Steve Summerskill, Loughborough University

For further information:

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