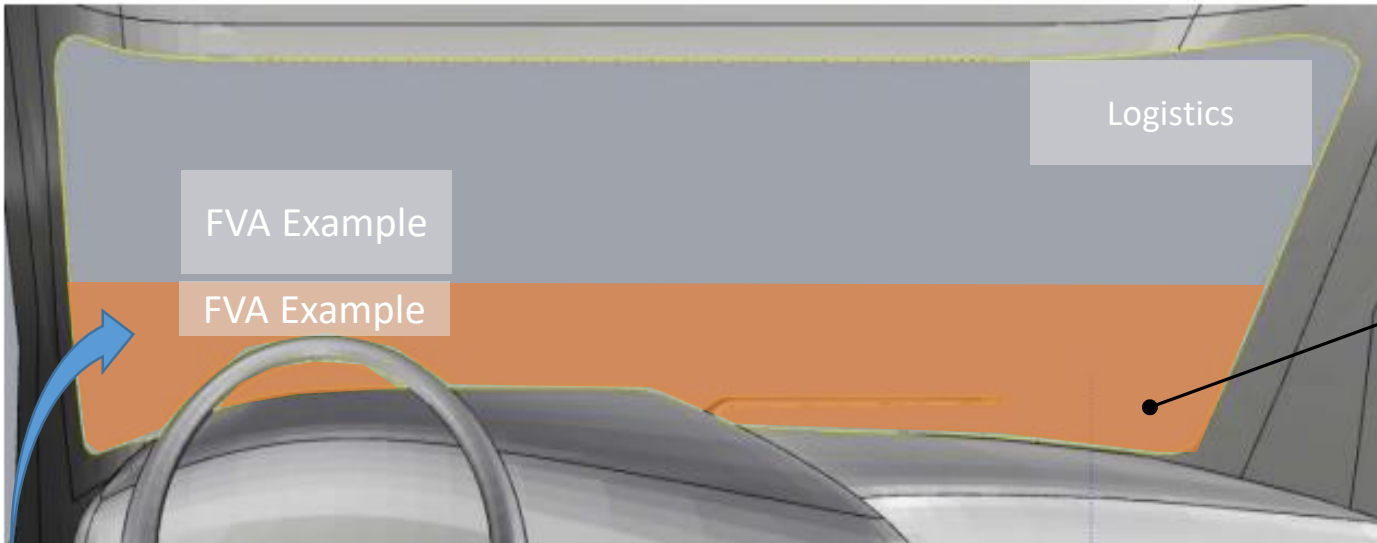


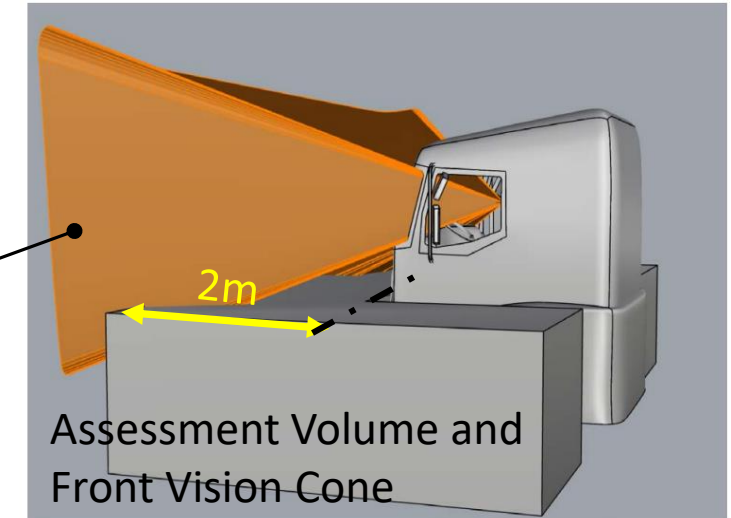
# HV Direct Vision & FVA

Minimum virtual image distance

link to Regulation on direct vision? Evaluation not anymore 2d but 3D (volume)



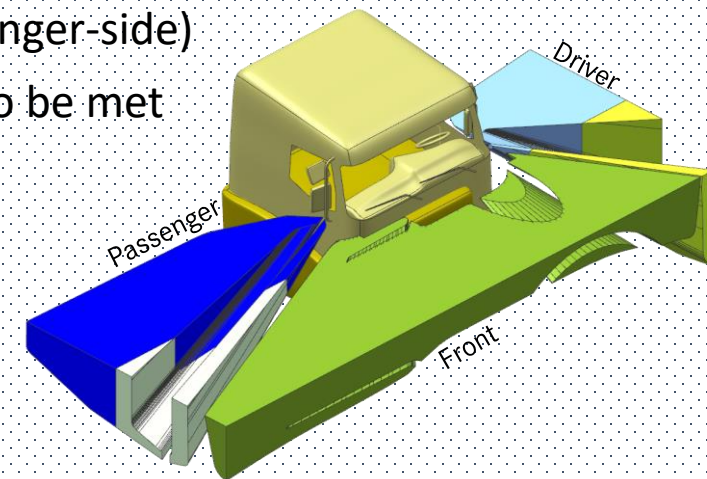
Direct Vision Regulation: Assessment Volume and intersection with drivers sight



FVA images with all virtual image distances always block the view to the DV assessment volume  
Even if the virtual image distance is at 5m (outside the assessment volume), it still overlays the assessment volume

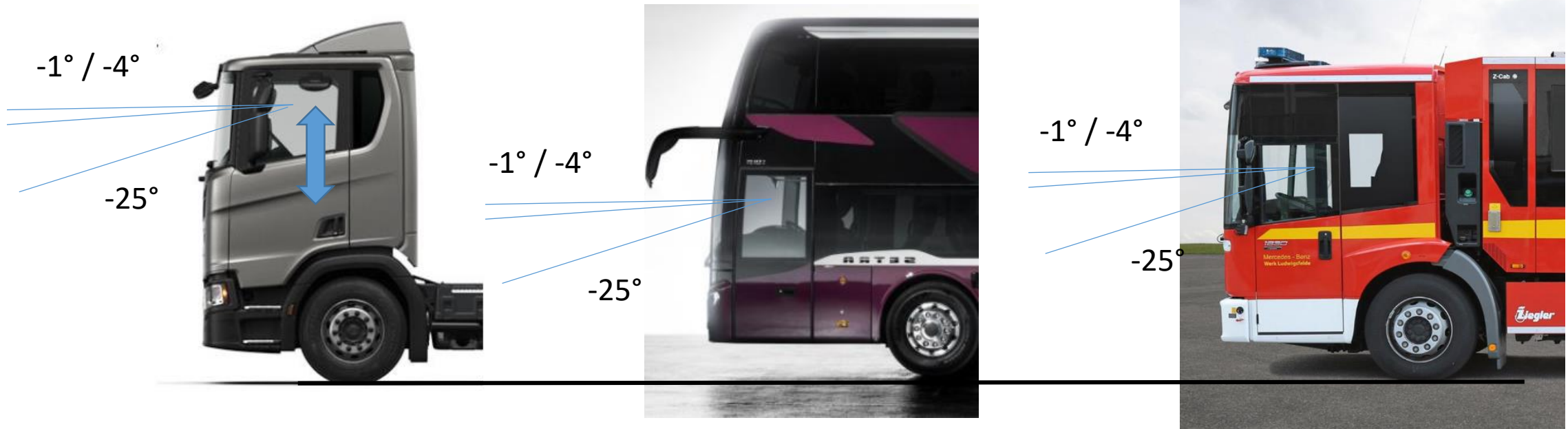
Example of all volumes (front/driver/passenger-side)  
Dedicated minimal volume requirements to be met

Category	Driver side [m <sup>3</sup> ]	Front [m <sup>3</sup> ]	Passenger side [m <sup>3</sup> ]	Total Volume [m <sup>3</sup> ]
Level 1	2.8	1.8	3.4	11.2
Level 2		1		8
Level 3		1		7



# HV Direct Vision & FVA

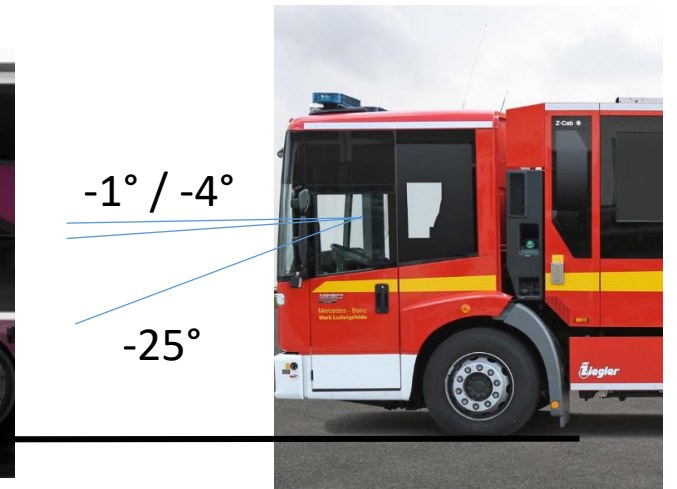
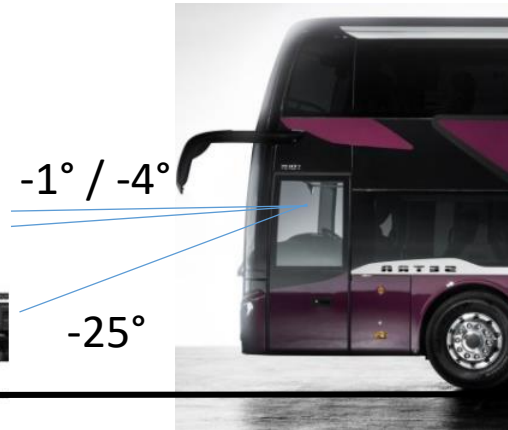
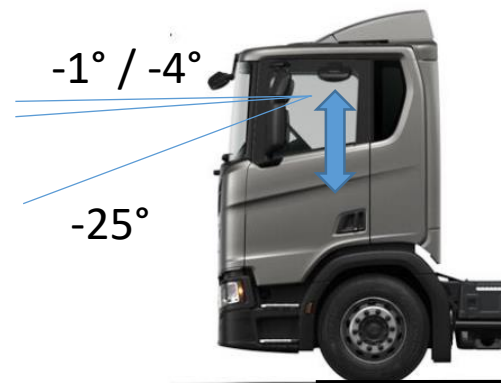
- Direct Vision Regulation will impact the cab design in order to improved the driver's view
- Nevertheless high driving positions are required to integrate combustion engines, H2 stacks and cooling in multiple application/ vehicles types
- This will result in an improved/lowered window line (larger windows) for specific trucks
- Due to DV regulation the windscreen size may increase, which will give some display options – FVA obstructions may counted in R167 volume (see page 1)
- DV Regulation R167 differs between Distribution, Construction and Long Haul vehicles (level1-3), challenging each category, however results in different nominal VRU distances



# HV Direct Vision & FVA



- This high eye-point range will affect the content area massive
- Especially if you approach and stand next to a ped. Crossing/VRU
- In high vehicles the content will move more to the bottom if they approach such a close situation
  - Option one: Lower edge: extend the  $-4^\circ$  angle way further down, this may not address the vehicles (M2;M3;N2;N3) adequate
  - Option two (preferred): not to further define this for HDV by Regulation, but ensure in the text of the Regulation that the manufacturer has to demonstrate the performance in such case to the satisfaction of technical service and type approval authority



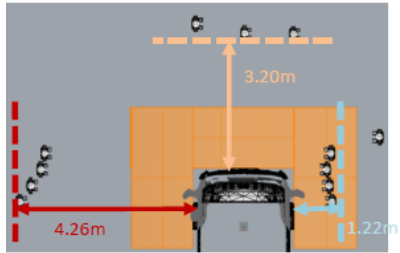


# HV Direct Vision & FVA

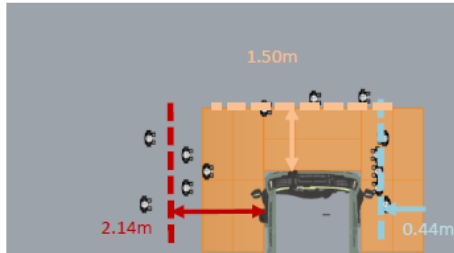
Images only for demonstration, does not represent eye-point E2 of UN-R 167

Example VRU distances of HV on the market

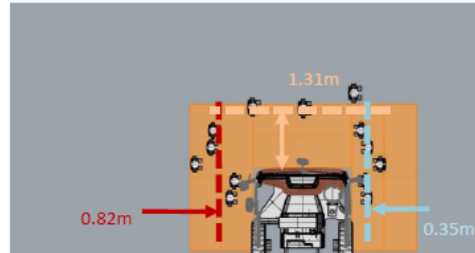
Mercedes 2.3m cab (H)



Volvo FE LEC



Mercedes Econic



Images show average distances VRUs can be seen to each side of the cab

Driver's view depended on cabin geometry & height + eye-point location within the cabin

