Child cyclist requirement

- Proposal:

No requirement now. We propose to include, when dummy charasteristics will be known by all counterparties, child cyclist requirements

Problem on child cyclist dummy

- No experience in industry to test with child cyclist dummy
- No guarantee fulfilment of the specification of ISO by current available child dummy because of absence of “Workshop”

What is workshop?

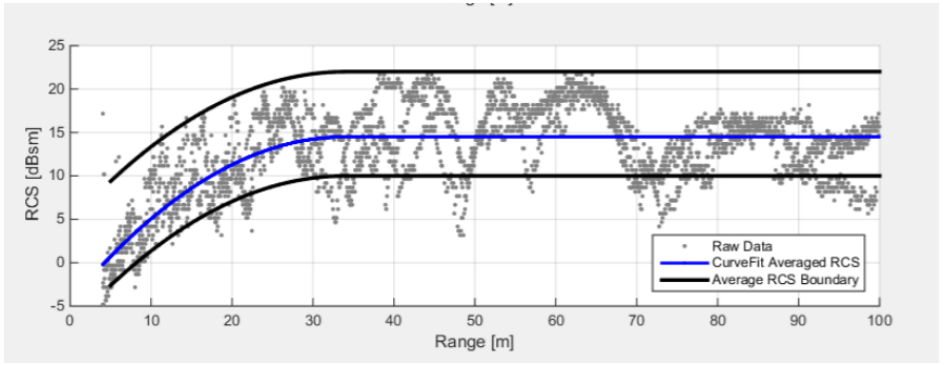
- Purpose: To ensure dummy (target and platform) specification and real vehicle sensing characters defined by EURO NCAP and ISO

- Many stakeholders (mainly: technical service, dummy suppliers and sensor suppliers) contribute to finetuning the dummy specification to reflect real vehicle or VRU

Experience on GVT

- Global Vehicle Target (GVT) is representing a vehicle for automotive sensing technologies to be detected from any angle (3D vehicle dummy)
- Required more than 10 workshops (more than 1 yr) to reach technically valid target designs for various sensor technologies

All angle



All Sensing characters (e.g. radar RCS)

Minimum forward separation plane distance

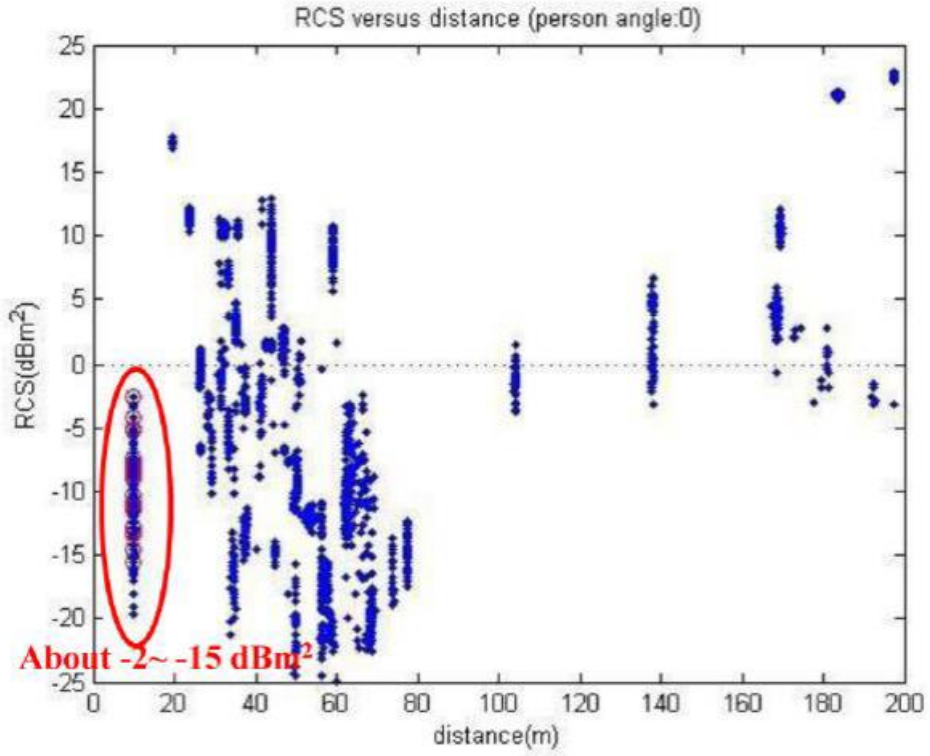
Proposal: 2.29. "Minimum forward separation plane" means the plane perpendicular to the longitudinal plane of the vehicle representing the shortest forward separation distance that the MOIS is required to detect the presence of a VRU. The distance of this plane from the vehicle front shall be ~~0.35m~~ **0.8m**.

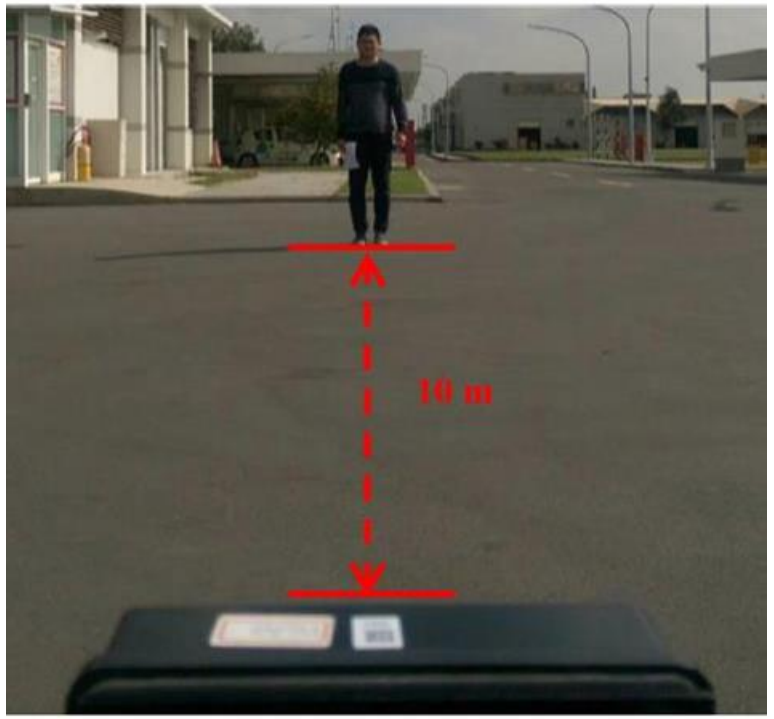
Justifications:

- To harmonize the values between vehicle categories, we may propose only one value
  - Minimum requirement for all MOIS vehicle categories
  - Compromise value that will give more flexibility on the sensor height installation according to the vehicle body

Radar - introduction

RCS: Radar cross section

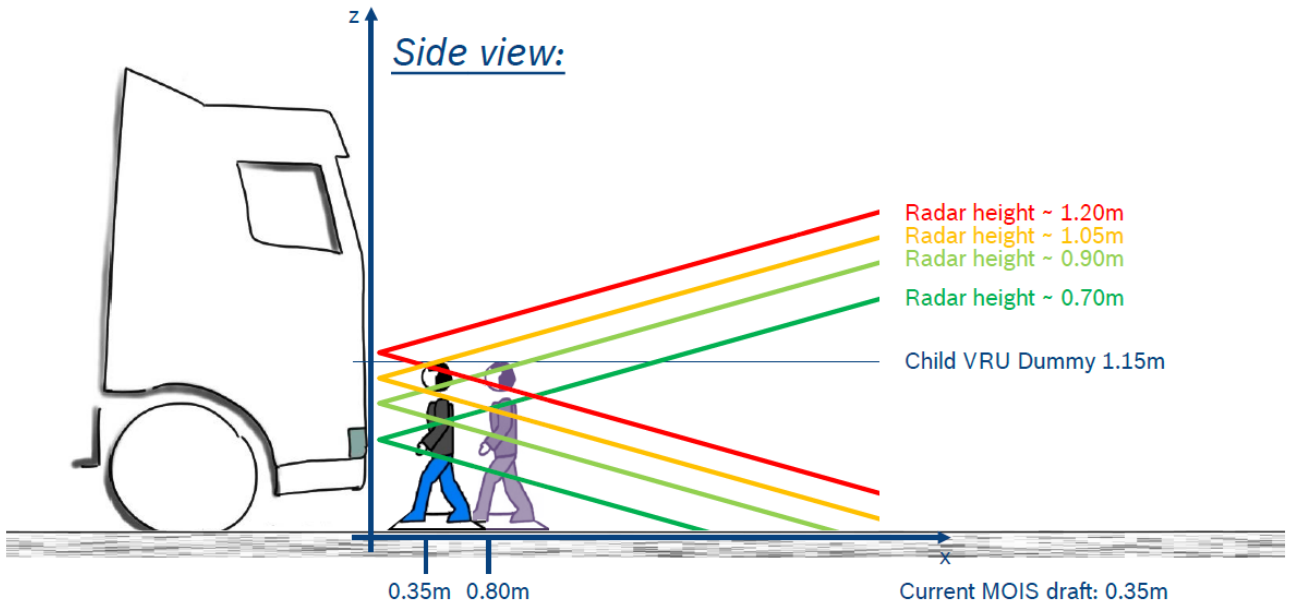




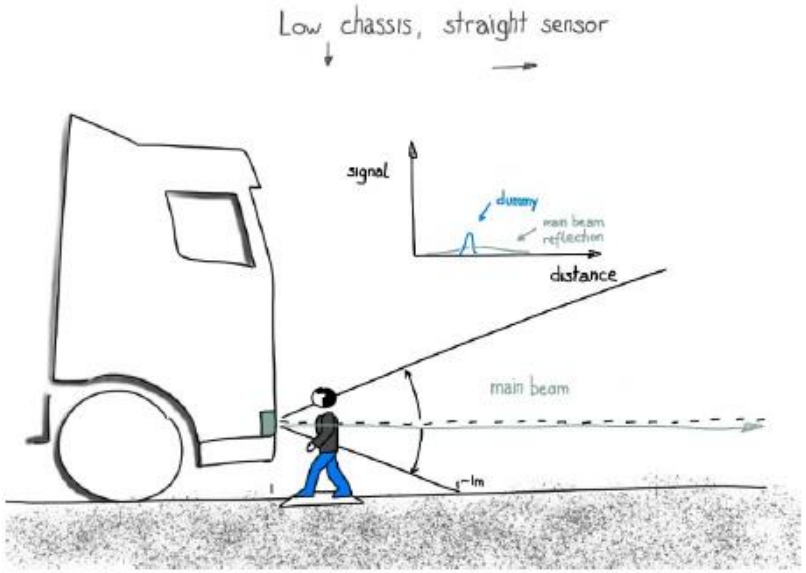
BACKGROUND

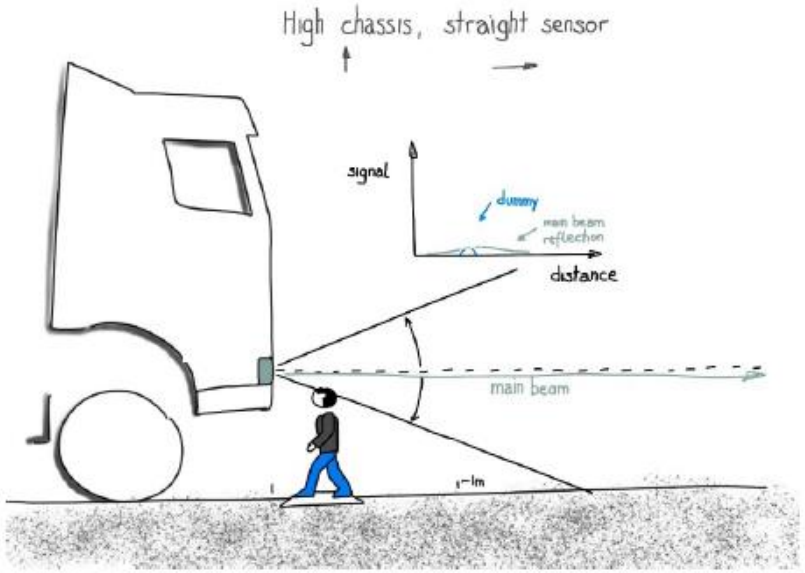
- To support the MOIS discussion on the mounting issue as described in the image below, this presentation lays out:
    1) The required vertical opening angle of the radar
    2) The degree to which the child dummy in the opening radar cone to obtain robust detections and classifications

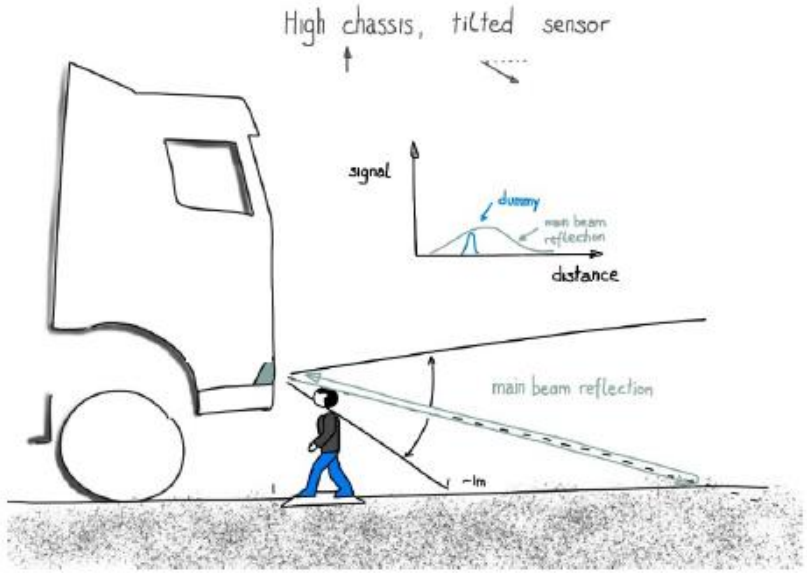
- Objective: To devise a value laying out at which height the sensor has to be mounted given the limitations, as the currently used opening angles (+/-10° elevation) do not allow such detection at short distances, especially at high installation positions.



CONSTRAINTS 1







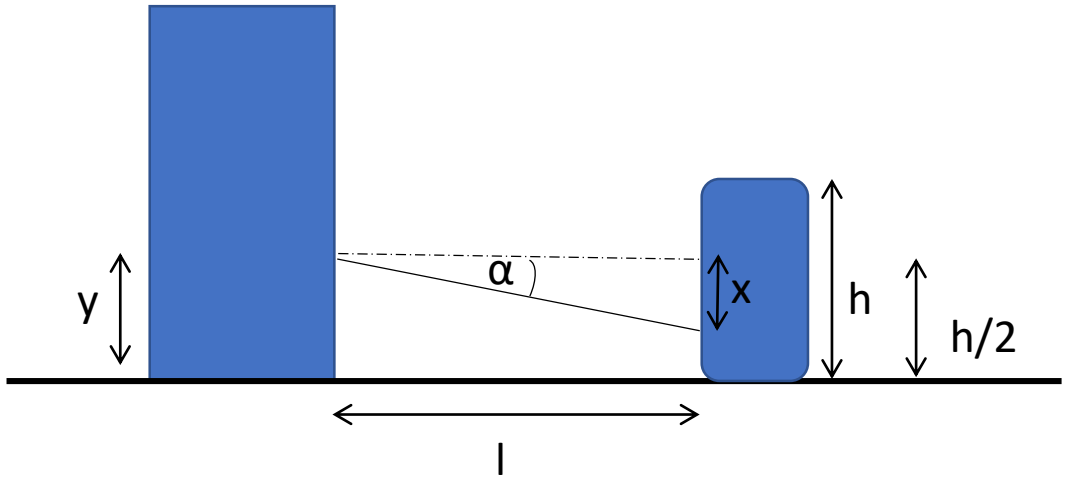
1. Based on theoretical assumptions there are negative implications (reflections, implausible signals,…) with tilted mounting

2. No knowledge on detection performance with tilted mounting under real life conditions (series / series development)

CONSTRAINTS 2

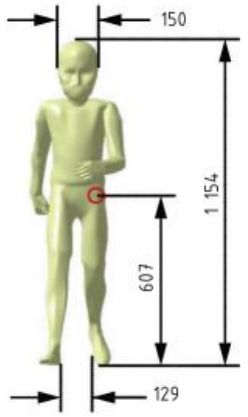
- Vertical opening angle α ≈ ±10° Elevation
- Distance to dummy l = 0.35m
- Dummy height h = 1.154m
- Body of dummy to cover whole FoV (Elevation)
- RCS value mostly generated by chest of dummy
- Legs of dummy helpful for doppler effect

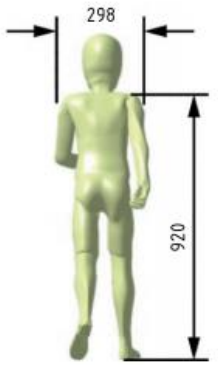
Replacement diagram:



ISO 19206-2:

Child	Body height (inclusive shoes)	Running posture	mm	1 154	±20	Figure A.2 c)
	H-Point height		mm	607	±20	Figure A.2 c)
	Heel to heel distance[b]	longitudinal	mm	494	±10	Figure A.2 a)
		lateral	mm	129	±10	Figure A.2 c)
	Shoulder height		mm	920	±20	Figure A.2 d)
	Shoulder width		mm	298	±20	Figure A.2 d)
	Head height		mm	250	±10	Figure A.2 b)
	Head width		mm	150	±10	Figure A.2 c)
	Torso depth	longitudinal	mm	139	±10	Figure A.2 b)
	Distance front hand – back side	longitudinal	mm	362	±10	Figure A.2 a)
	Torso angle	longitudinal	deg (°)	78	±2	Figure A.2 a)
	Upper arm angle	right side	deg (°)	50	±2	Figure A.2 b)
		left side	deg (°)	112	±2	Figure A.2 a)





CONCLUSIONS

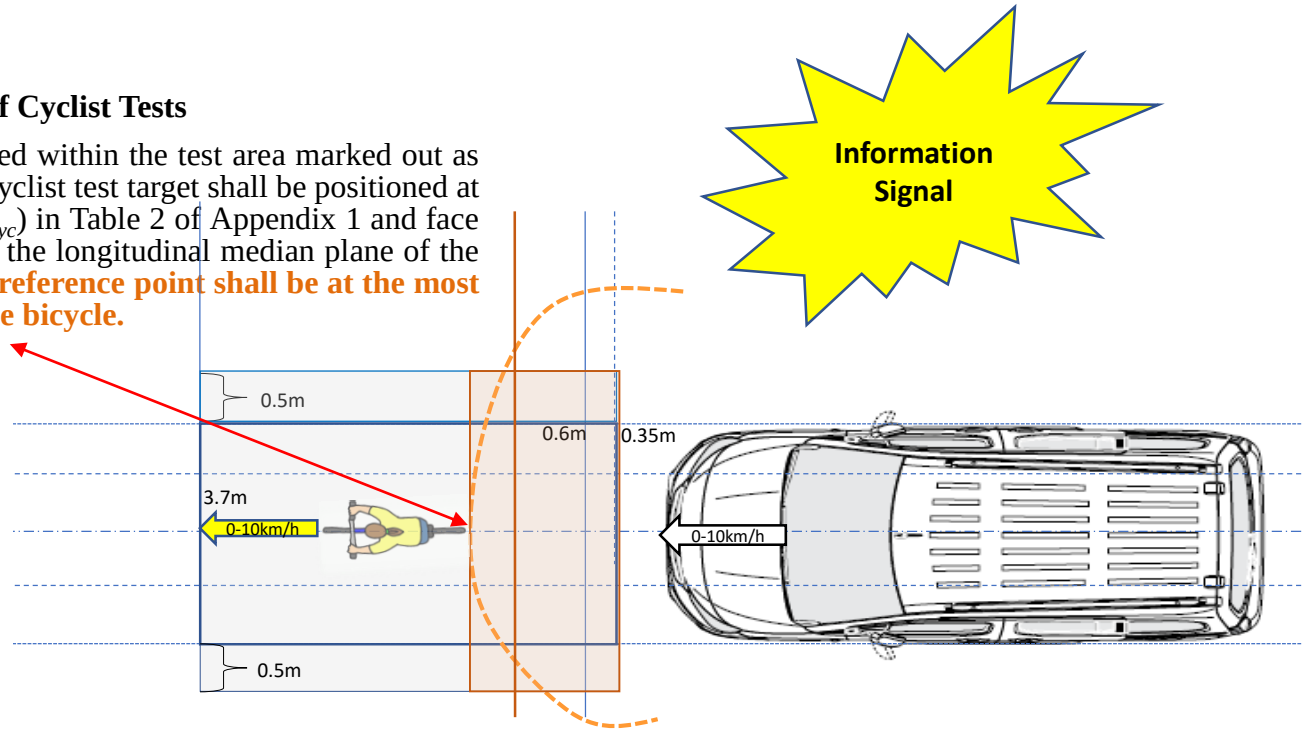
- Proposed mounting position *y for a 0.35 m min forward distance*:

  0.5-0.75m above ground

Proposal for Longitudinal Test

6.6. Longitudinal Stopping for Moving Off Cyclist Tests

6.6.1. The cyclist test target (*T*) shall be located within the test area marked out as shown in Figure 2 in Appendix 1. The cyclist test target shall be positioned at the relevant test target starting point (p_{cyc}) in Table 2 of Appendix 1 and face in the direction of travel and parallel to the longitudinal median plane of the subject vehicle. **The cyclist test target reference point shall be at the most rearward point on the centreline of the bicycle.**



Proposal:

This cyclist is fully visible to the driver (what is the height of a child cyclist target? – supposed >90cm), so that it would be justifiable to set the reference point at where the highest point of the target is (this is presumably somewhere at the CoG of the cyclist) – otherwise we would also contradict to the Blind-Spot principle, in that we are warning/ informing about an object that is visible to the driver.

We have to keep in mind that the purpose of the regulation is to enable detection and recognition, not to automatically prevent a collision.

Driver eyes

- Direct vision
  - DVS eyes for N3 vehicles (and big N2?)
  - New (to be consolidated): for M2, small N2, alternative compliance with UN-R125 (125 eyes' points)

- MOIS
  - Proposal: definition of the blind zone area based on
    - DVS driver eyes or
    - UN-R125 driver eyes

- The driver eyes shall be harmonized between direct vision and MOIS for each catgory of vehicles.
  - It should not be possible to approve the direct vision of a vehicle with DVS driver eyes and the MOIS with UN-R125 driver eyes