



TASK FORCE DIRECT VISION: PROGRESS & STATUS PHASE 2

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OBJECTIVES

- From Terms of Reference
 - Amending the alternative testing method for innovative vehicle designs (e.g. aerodynamic narrow A-pillar designs) by replacing paragraph 5.3. (April 2023 or earlier if possible)
 - For vehicles with competing objectives (e.g. improved direct vision versus high capacity transport, high efficiency, new powertrain technology, impact on freight industry) with direct vision challenges an alternative approach could be considered. It shall be limited to Level 3 for N3 category of vehicles and shall be based on quantified data. (October 2023 or earlier if possible)

DESIGN NEUTRALITY – WHAT IS THE PROBLEM?

- Method development to date based on past/current cab design
- Future truck design may vary: narrower distance between A pillars a particular feature of aerodynamic concepts
- Current method defines front, nearside and drivers side view based on A-pillar and sets a limit value to each side
- Making the A pillars closer together laterally will make the view out of the front window smaller and the view out of the side windows bigger. A vehicle that passes the regulation with a standard cab configuration, could fail on frontal limit if A pillars are moved closer together and nothing else changes



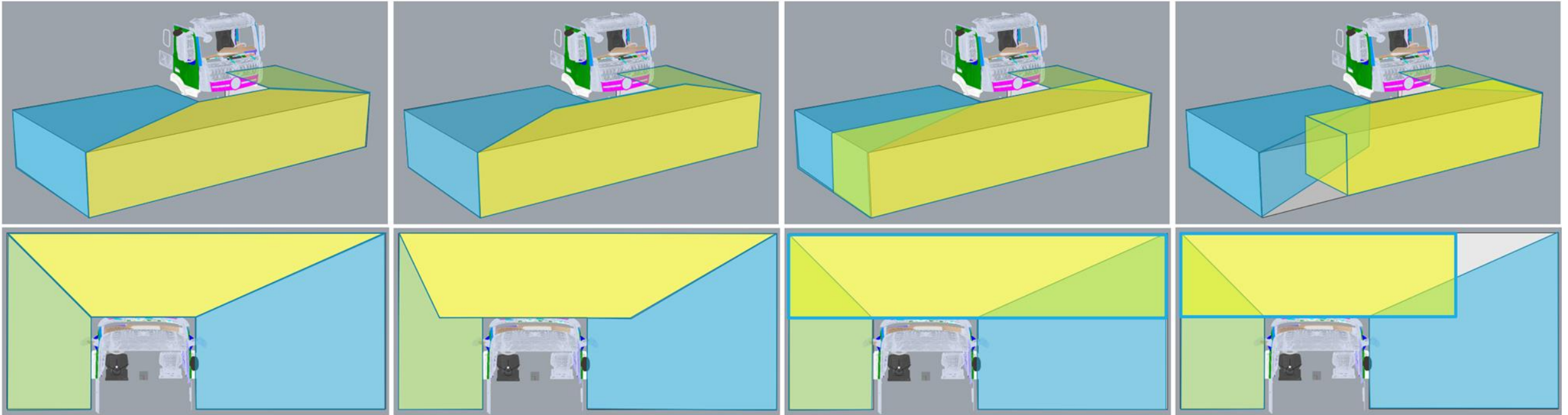
DESIGN NEUTRALITY – WHAT SOLUTIONS ARE PROPOSED?

Option 1

Option 2

Option 3

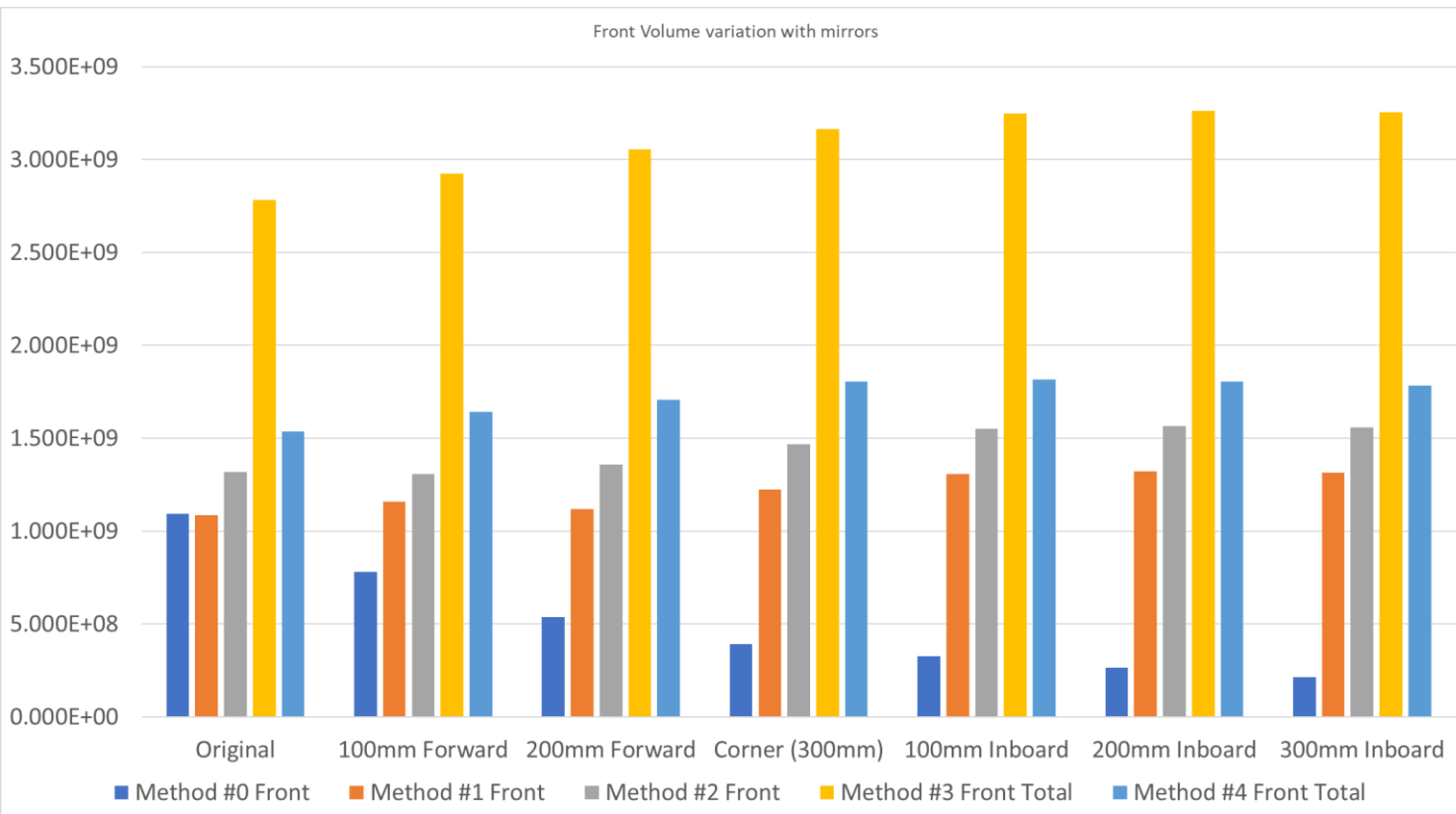
Option 4



- Vision to the front
- Vision to the passenger side
- Vision to the driver's side

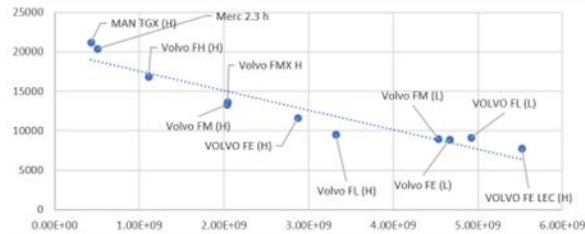
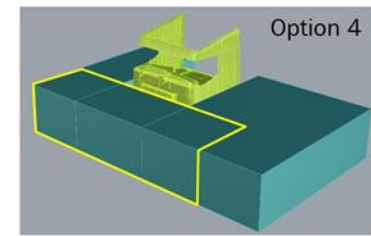
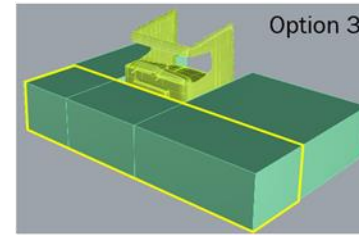
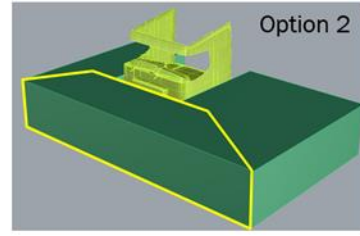
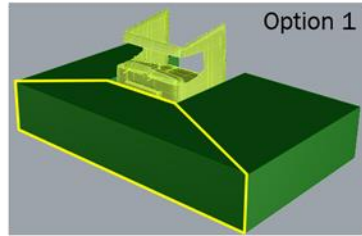
- All options involve defining at least the front view as a section of assessment volume. Deemed visible whichever area of the cab (windscreen, side window, lower door window etc) they are seen through
 - Options 1 & 2 have 3 discrete views all defined independently of vehicle configuration
 - Options 3 & 4 have independently defined front zone but side zones remain tied to A-pillar position

RESULTS OF THE ANALYSIS: TECH NEUTRALITY

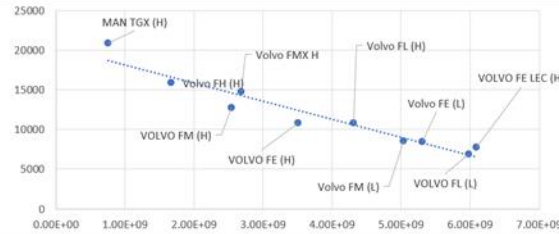


- Regulated method is #0 (Dark blue)
 - As A-pillar moves from original position, volume reduces substantially – Not tech neutral
- All new methods #1 to #4 are substantially less variable – large improvement in tech neutrality
- Least variation is method #4 (light blue), because with current designs the amount of volume visible is low in front of the vehicle but larger to the side. A pillars do move from outside to inside of frontal zone though
- Variability is larger with method#3 but A-pillars are always in the frontal zone in realistic ranges.

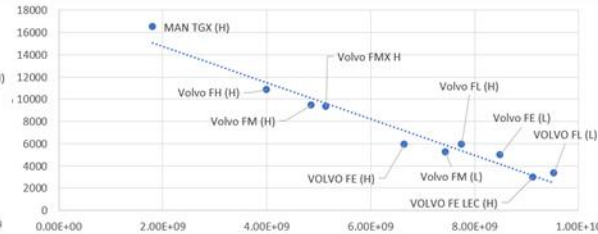
RESULTS OF THE ANALYSIS: EQUIVALENT SAFETY



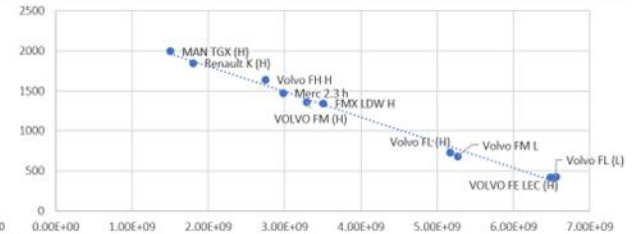
Correlation coefficient = -0.947



Correlation coefficient = -0.961



Correlation coefficient = -0.978



Correlation coefficient = -0.995

- Whatever new frontal zone is chosen, a new limit value is required and this needs to be demonstrably equivalent to the existing value in terms of safety.
- Original method derived the limit from correlation analysis of VRU distance and volume
- Concerns are that this approach will be less valid the wider the front zone is, a particular issue for method #3. However, correlation remains strong based on a sample of 10 existing vehicles
- The best correlation is achieved with method #4

CURRENT STATUS: TECH NEUTRALITY

- We have 4 candidate methods – all are substantially better than the regulated version in this respect
- Task force is agreed that we shouldn't use method #1 or #2
- Work is continuing to either:
 - Reach consensus on a single approach
 - Bring a clearly explained choice between method #3 and #4 to VRU Proxi CPs
- Remaining work
 - For the selected method, doing additional analysis to support the selection of the limit value
 - Drafting the regulatory text
- Question: Should the new approach be a REPLACEMENT of the existing method, or an ALTERNATIVE (similar to the R151 approach)?

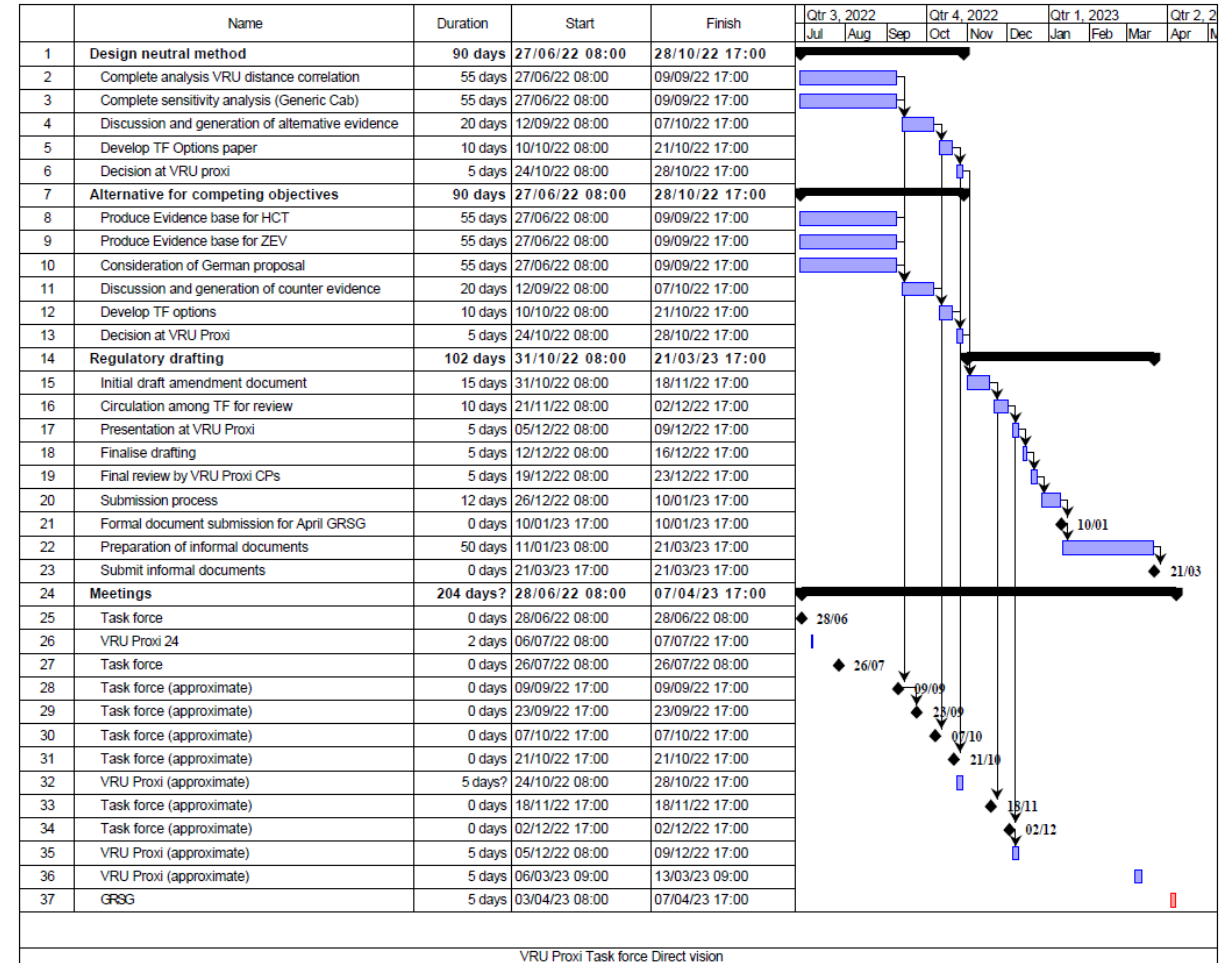
ALTERNATIVE APPROACH FOR COMPETING OBJECTIVES

- High Capacity Transport (HCT) Concept
 - Sweden has presented a case for why they consider it essential that vehicles capable of use in HCT must remain available through full type approval & proposed some simple amendment text
 - Await a proposal from industry explaining why that can't be met with existing DVS limits and what the alternative approach should be
- Zero Emission Vehicles
 - Limited progress to-date



WORK PLAN AND TIMING

- Design Neutral Method
 - With work to establish limit value still to be completed, we are around one month behind schedule
 - Propose beginning to draft text in parallel with the limit value work
 - Recovery of time remains possible but challenging
 - Decisions needed quickly
 - Replacement method or alternative
 - Method 3 or 4. Task force aims to agree. Whether this proves possible will be known very soon. If not possible a CP decision would be needed urgently if April GRSG deadline is to be met
- Zero Emission Vehicles
 - Ambition was to exceed TOR deadline (October 23 GRSG) by submitting for April
 - More significantly behind the schedule required to achieve that.





SUMMARY

- Task force has made good progress on design neutrality and has candidate methods that are much improved
- Timescales are challenging and some key analyses and decisions are still required
- Very fast progress will be needed on ZEV if the more ambitious April GRSG target is to be met, but October remains possible as a fall back.