

**Draft minutes of the 11<sup>th</sup> Session  
GRSG informal group on  
awareness of Vulnerable Road Users proximity  
in low speed manoeuvres (VRU-Proxi)**

Dates: 24-26 September 2019  
Venue: Holywell Park Conference Centre  
Holywell Way  
Loughborough University Science and Enterprise Park  
Loughborough, United Kingdom  
  
Contact: Mr. Macdonald (UK Department for Transport)  
  
Chairs: Mr. Matsui (J) and Mr. Broertjes (EC)  
Secretary: Mr. Broeders (OICA)

**1. Adoption of the agenda**

Document: VRU-Proxi-11-01 (Chair)

The proposed agenda and running order as presented by the Chair were adopted by the group.

**2. Adoption of the report of the 10<sup>th</sup> VRU-Proxi session (Berlin, Germany)**

Document: VRU-Proxi-10-12 (Chair)

UK commented to the written UK position regarding exemptions for reversing motion regulation. At point 1.4 in section 6 of the draft report VRU-Proxi-10-12 the UK statement was noted that a reversing beep for tractors (if applicable) shall not be switched off in case a trailer is coupled to the vehicle. This shall be replaced by the statement from UK that the reversing safety system shall be required on trailers and shall be activated in case a trailer is coupled to the vehicle. Document VRU-Proxi-10-12 shall be corrected accordingly.

There were no further comments, under the condition that the UK statement is corrected the report was adopted.

**3. State of play of close-proximity vision and detection rulemaking in the contracting parties**

UK expressed that the intention of the UK is to be fully aligned with the EU regulations at the point of exit (Brexit). Subject to any negotiated agreements with the EU, a decision on whether to require compliance with EU regulations in the future will be made by the Government at that time. The UK will continue to be a contracting party to the UNECE 1958 agreement and to apply UNECE regulations.

#### 4. Accidentology

Document: VRU-Proxi-11-08 (TRL)

TRL presented an update of the Collision Landscape Analyses, the summary/conclusions are given below:

- Key BSIS Collision Characteristics:
  - Cyclists leading casualty type, but pedestrians not insignificant cost to society
  - Cyclists and Powered Two-Wheelers (PTW) primarily travelling straight ahead, being overtaken by vehicles (mainly nearside turn collisions with heavier vehicles and overtaking collisions with lighter vehicles)
  - Pedestrian crossing from the nearside during vehicle nearside turn (impact to nearside of heavier vehicles and front of lighter vehicles)
- Key Reversing Collision Characteristics:
  - Pedestrians leading casualty type
  - Pedestrians primarily crossing from nearside/offside:
    - Much smaller casualty numbers for collisions where pedestrians were already in the carriageway
  - Majority of vehicle categories dominated by driver failing to look properly causation factor (when compared to vehicle blind spots):
    - M3 is exception to this finding – where the vehicle blind spot causation factor dominates
- Key MOIS Collision Characteristics
  - All VRU casualty types affected:
    - Pedestrians leading casualty type for heavier vehicles
    - Cyclists/PTWs leading casualty types for lighter vehicles
  - Pedestrian primarily crossing from the nearside, but also offside (pedestrians maybe also be masked by other vehicles)
  - Cyclists primarily crossing from offside at junction as vehicle moves off for M1/M3/N1/N2, cyclist moving off /waiting within vehicle path most important for N3 vehicles when moving-off
  - PTW moving off/waiting important for all vehicles but particularly for heavier vehicles in both moving off as slowing/stopping manoeuvres. PTW crossing most important for lighter vehicles.
- Key Direct Vision Collision Characteristics:
  - Pedestrians leading casualty type:
    - Pedestrians primarily crossing from nearside/offside
  - Pedestrians primarily injured by N1-N3 vehicles during moving off manoeuvres
  - Pedestrians primarily injured by M1 vehicles during offside turn manoeuvres (related to blind spots caused by driver side A-pillar?)
  - Pedestrians primarily injured by M3 vehicles during nearside turn manoeuvres (related to blind spots caused by driver cab screens/frame and offside A-pillar?)

## 5. Status and developments of detection and vision technologies

Document: VRU-Proxi-08-07 (CLEPA)

This subject has not been discussed in this meeting.

## 6. Reversing motion

Documents: ECE/TRANS/WP.29/GRSG/2019/16

VRU-Proxi-11-09 (OICA & Japan)

VRU-Proxi-11-12 (OICA & Japan)

VRU-Proxi-11-13 (OICA & Japan)

VRU-Proxi-09-05 (Reversing Motion Task Force)

Working Document ECE/TRANS/WP.29/GRSG/2019/16 was submitted to GRSG 117<sup>th</sup> session in October 2019. J presented document VRU-Proxi-11-09 containing adaptations to the submitted Working Document as prepared by OICA and J. Below the discussions and outcomes on these adaptations are given. The indicated paragraphs numbers are related to the original Working Document ECE/TRANS/WP.29/GRSG/2019/16.

1.1 (Scope) Is a component approval needed?

- In case there are typical component level requirements in the draft regulation a component approval is basically needed.
- The Chair proposed to park this question and to discuss this topic in a later stage.

1.4 (Scope) Exemption for tractor-units allowed?:

- OICA showed based on a sample of 10.000 trucks with a driving time between 400 hours and 2 years that 95% of N3 tractors are driving 6% or less of the driving time as solo vehicles (without semi-trailer). According OICA based on this data exemptions for tractor units can be justified.
- The Chair asked the contracting and other parties and to react on this OICA proposal:
  - J accepted proposed exemption as there are no relevant accidents with solo tractors.
  - F will investigate if exemptions could be accepted.
  - UK stated that accident analysis is needed, especially in off-road areas. UK will consult the UK Health and Safety organization for these specific data.
  - T&E stated that an exemption based on cost-benefit analysis (accidents) does not make sense as the GSR Phase 2 already incorporated the Reversing Safety for all N3 vehicles. Response from the group was that VRU-Proxi focuses on UN regulations and for GSR phase 2 also exemptions can be argued.
- The Chair explained that there is communication with the Taskforce (TFRWS) of GRBP that is drafting a regulation for external reversing sound alert to warn VRUs behind vehicles. An external reversing sound could be considered as an alternative for a Reversing Motion system for tractors. This TF is also evaluating deactivation of the sound alert if a Reversing Motion system is activated. This will be discussed with TFRWS.
- EC proposed to use a new way of wording for definition of exemptions as now is implemented in ECE R73: "Vehicles where installation of any device for reversing safety is incompatible with their on-road use may be partly or fully exempted from this Regulation, subject to the decision of the Type Approval Authority". With this

new wording it is expected that the number of exemptions will be reduced.

- The complexity of implementing regulation for reversing safety systems on trailers was discussed. In particular the interface between different technologies on the trailer (CMS or detection) and the HMI in the towing vehicle will be very difficult to regulate. The Chair asked the opinion of the group if mandating reversing safety systems on trailers is supported: UK would support it, J and OICA would not support it, ETSC support it if accident data would justify it.

*Conclusions:*

- **UK** to inquire UK Health and Safety organization data on reverse driving accidents with solo N3 tractors in particular in off-road conditions.
- **J & OICA** to submit the following options in the document for discussion in GRSG:
  - Put in square brackets the new definition of exemptions as proposal;
  - Propose reverse alarm (GRBP) as fall-back for exempted vehicles.

1.5 (Scope) “Manufacturer must provide general description of other device”

- F proposed in VRU-Proxi-10 that the manufacturer must provide a general description of other devices.
- From OICA perspective this shall not be laid down in the definition section and besides that the definition of “other devices” is not clear. Also requirements (if any) shall be moved to the requirements section.
- EC proposed to keep it as defined “If a vehicle has multiple device, the manufacturer may designate the device that meets the provisions of the regulation. The manufacturer must provide a general description”. The Industry raised the issue when a manufacturer decide to put an optional system (device) at a later stage in the market, this will be subject to type approval and will make the approval invalid.
- The group agreed to the proposal from OICA (but “may” to be replaced by “shall”) resulting in: “If a vehicle has multiple device, the manufacturer shall designate the device that meets the provisions of the regulation.”

Part I

2. (Definition)

- OICA explained the complexity of the regulation structure and illustrated this in the figure “Understanding of some definitions used in the regulation”.
- OICA proposed to use the naming Rear-View Camera (RVC) for indirect vision devices, the group agreed. Definition of Rear-View Camera to be added to the definitions section.
- Proposed changes to paragraphs 2.1.1.1, 2.1.1.2, 2.1.1.3, 2.1.2, 2.1.6, 2.1.7, 2.1.9, 2.1.12, 2.1.3, 2.1.14, were accepted by the group.
- Proposed changes to paragraphs 2.1.2.1 and 2.1.2.2 were not accepted by the group.
- OICA proposed to add paragraph 2.1.15 (definition of haptic information). Japan’s opinion was to not allow haptic information because of reduced effectiveness compared to visual and audible information. OICA explained that in buses a haptic seat is preferred in order to avoid annoying bus passengers by generating a sound. It was concluded to keep the definition of haptic feedback (possibly to be considered for buses only).
- The Chair proposed to add “rendering an image of the outside world” to the camera definition. There were no objections to this proposal.

## 6. (Requirements)

- It was agreed to put paragraph 6.3.2 (impact test) in between square brackets.
- Paragraph 6.1.1.3 is referring to paragraph 6.3.2 and shall be deleted but requirement for radius of curvature shall be maintained.
- According the outcome of the discussions in VRU-Proxi 10 a combination of RVC and direct vision could be acceptable for some situations (e.g. a small and low car but not a high van). However, as it was expected that some CPs might not accept this, CPs were asked to give their opinion. See also questionnaire in VRU-Proxi-9-05. NL, FR and Korea do not accept this for a large M1 (Van) but it may be acceptable for a 2 seater or small passenger car. The Chair proposed OICA to ask CP's opinion on concrete question: is direct view as well as a mirror in the same line of sight acceptable for a 2 seater car, for a small M1, for a 5 seater car, for a van, for a 9 seater car, etc.?
- It was agreed to delete paragraph 6.2.1.1.: adjustment (if needed) is allowed with or without the use of tools.
- Regarding the OICA comment on paragraph 6.2.2 the Chair raised the question whether it is the intention to facilitate component approvals for cameras and sensors. The general opinion of the group was that this is not likely, which implies only component approval for mirrors. It was evaluated that no specific component tests for cameras and sensors are required. Conclusion: Part I shall contain component approval for mirror but not for camera-monitor and sensors.
- The group agreed to remove paragraphs 6.3.2 and 6.2.3.1 as this is out of the scope of this regulation.

## Part II

### 12 (Definitions)

- The group agreed to modify paragraph 12.3.1 and align it with Part I.
- The group agreed to delete paragraph 12.5 (not relevant here) and to move paragraph 15.2.3.1.5 to 12.8 (belongs to definitions section).
- OICA proposed to add 12.9 "Active vehicle mode" to the definitions section. The definitions of "Active vehicle mode" and "Booted Up & Active" were discussed. OICA explained the background as coming from FMVSS: 6.0 sec time after opening door for systems to start-up and 2.0 sec after engaging the reverse gear when systems are up and running.
- Conclusion: take over the requirements from FMVSS but add following underlined modification: "...more than 6.0 seconds or at the earliest possible time" and add "...after vehicle is ready to move the minimum time to start the backing event is [ sec] after that the image shall be displayed within [ sec]". Furthermore in paragraph 15.1.1 "active vehicle mode" shall be added as an additional condition.

### 15 (Requirements)

- OICA proposed to put a description for a new structure of section 15 in paragraph 15.1 for better readability and understanding. This was supported by the group.
- In paragraph 15.1.2 the rationale behind the reference to R43 was not clear as this is only valid for forward looking direction (180° horizontal viewing angle). Wording needs to be improved and light transmission shall not be below 70% (in case direct vision is used for fulfilling the legislation).
- It was agreed to remove 15.2.2.2 as proposed by OICA.

All other proposed improvements of section 15 not mentioned in this report were accepted.

## 16 (Requirements for indirect vision devices other than mirrors)

- Second sentence of Paragraph 16.1.1.3 shall be put in between square brackets.
- As there was no clarity on the meaning of “modifying the view” in paragraph 16.1.1.4 the Chair will inquire NHTSA on what is considered as “modification of the view” as defined in FMVSS111.
- Regarding paragraph 16.1.1.6 (Automatic screen change) OICA proposed to allow an automatic screen change for eCall. EC proposed to show eCall as an overlay and to agree on a transparency value as an additional requirement in paragraph 16.1.1.3. OICA stated that transparency is not desired for supporting trajectory lines. There was consensus in the group but for other information there shall be a transparency. The Chair asked **OICA** to come with proposals on transparency levels.
- The defined response time of 2.0 sec in paragraph 16.1.2.1 was agreed.
- There was no consensus on the wording of paragraph 16.3, further discussion needed.

Due to lack of time the remaining part of the document could not be discussed in this meeting, in light of the upcoming GSRG meeting the Chair proposed the following way forward:

- Report to GRSG that VRU-Proxi will not recommend to vote on the regulation and present an update of the progress and status on Reversing Motion.
- The Taskforce Reversing Motion has to make serious progress before next VRU-Proxi meeting in November 2019.
- Next VRU-Proxi meeting shall only be a discussion on high level. The details shall be clarified and nailed down before next VRU-Proxi session in specific TF web meetings to be organized by **J & OICA** (Mr. Hirao):
  - Web meetings dedicated to test procedures and test protocol.
  - Web meetings for finalizing on the requirements text.
- It was remarked that accident statistics indicates that moving pedestrian (crossing at the rear) ought to be addressed as Reversing Motion scenario. Chair took notice and proposed after consideration to move this to a second phase in order to avoid jeopardizing the deadline for submission of the draft regulation (April 2020). UK, J, F and the Industry agreed.

## 7. Forward motion Vehicle turning - Blind Spot Information System

Documents: ECE/TRANS/WP.29/GRSG/2019/25  
VRU-Proxi-11-04 (OICA)  
VRU-Proxi-11-07 (CLEPA)

A Working Document with following amendments to the BSIS regulation (ECE R151) has been submitted by G to the GRSG 117<sup>th</sup> session:

- Reduced area of detection to the rear;
- External projection allowed for BSIS components.

OICA presented VRU-Proxi-11-04 to explain the situation of cranes above the cab that stick out at the front of the vehicle. The group supported this proposal (2m shall be written as 2.0m). **OICA** shall write an informal document on behalf of VRU-Proxi.

CLEPA presented VRU-Proxi-11-07 containing proposals for textual improvements and issues regarding the positions and the height of the cones. Using cones with a height of at

least 0.4 m could obstruct the view of the sensors in case the bicycle is in the detection area far behind the vehicle. Furthermore defining only a maximum spacing could lead to very small spacing of the cones which increases the obstruction problem even more. Both issues were confirmed by OICA.

CLEPA also showed simulation movies of the test cases. Main issue was that a FPI cannot be determined in case the vehicle and bicycle are moving with the same speed (test case 3 and 5). The presented movies will be uploaded to the UNECE-wiki.

The Chair requested OICA to discuss the issues regarding the crane, the cones and  $d_d$  for test cases 3 and 5 offline with BASt. If BASt agrees OICA will write an informal document on behalf of VRU-Proxi for next GRSG session in October 2019.

From GSR Phase 2 perspective the vehicle categories N2, M2, N3 and M3 shall be fully in scope of the BSIS regulation. OICA expressed their concerns about the small N2 and M2 vehicles as the current BSIS regulation does not match to these type of vehicles. It was agreed that **OICA** will provide a document with proposals on the BSIS scope for discussion in next VRU-Proxi meeting.

## **8. Forward motion Vehicle driving straight or taking off from standstill**

Documents: VRU-Proxi-10-05 (TRL)  
VRU-Proxi-11-03 (TRL)  
VRU-Proxi-11-14 (Japan)

J presented VRU-Proxi-11-14 with a proposal for a close proximity mirror.

- On slide 4 “visible” must be replace by “perceived”.
- EC explained the outcome of negotiations in the past between EU and J. The agreement was that J would adopt UN regulations as ECE R46 with the possibility to keep in parallel the front and close-proximity mirror on passenger side as separate national regulation. It seems not possible to implement this additional mirror in the UN regulation R46.
- J confirmed the domestic regulation for this mirror but raised the concern that for WVTA purposes this might not be a useful situation. J proposed a new stand-alone regulation without relating to MOIS. UK stated that in UN context it seems basically not right if only one CP will adopt a certain regulation and moreover ECE R46 already gives room for J to regulate the Class X mirror on national level.
- Japan will discuss internally how to proceed.

TRL referred to the accident landscape analysis of MOIS as presented in VRU-Proxi-11-08.

- Only focusing here on the contributory factor “Driver failed to look properly”.
- Clarification of the used terminology:
  - Masked = driver’s view obstructed by an object like a parked car
  - Offside = driver side
  - Near side = passenger side
  - Facing Traffic = face of VRU to vehicle
  - Back to traffic = back of VRU to vehicle
- Catalogue of accident scenarios and description to be added.

TRL presented the status and feedback of the questionnaire on Moving Off Information System (MOIS):

Question 1 (vehicle category scope):

- EC position is to include at least M2/N2/M3/N3 in scope of MOIS, M1/N1 may not be required in MOIS scope because of AEB (for EU initiated by GSR Phase 2). CPs agreed that M2+/N2+ shall be in scope.
- Agreed direction: J and other CPs to decide whether they specifically wish to have optional M1/N1 requirements in scope. If yes, include optionality - if no, leave out.

Question 2 (VRU scope):

- There were basically no objections to include adult and child pedestrians.
- EC proposed to include cyclists and children cyclists. OICA explained that it depends on the test scenarios and the technical feasibility as e.g. fast cyclists that cross the streets are hard to detect in time.
- The group agreed to include children and children cyclist dummies (in line with BSIS) depending on the test scenarios. Consensus that PTWs shall not be included as there are no test targets under development and collision characteristics are supposed to be similar to cyclists.

Question 3 (what functionality):

- Options are: information, warning, motion inhibit, moving off AEB or low speed AEB.
- UK mentioned that there is a motion inhibit in legislation R107 for buses when the door is opened. However, according the ToRs intervention is not in scope of IWG VRU-Proxi. The group agreed to regulate only information/warning signals. AEB and motion inhibit will be out-of-scope but MOIS regulation shall not prohibit active systems. GRVA to be consulted on motion inhibit / integration with AEB regulation.
- There was consensus on the proximity informational signal. Regarding a collision warning signal OICA stated that this would be ok to include but technical feasibility shall be considered (esp. TTC) in test case scenarios where the speeds are low and the vicinity to the vehicle is small.
- The group agreed to regulate information and warning signals but not require TTC based warnings at this stage. However, the option to regulate TTC based warnings may be considered if it is/becomes technically feasible.

Question 4 (motion of vehicle):

- According ToRs the MOIS regulation shall only focus on straight ahead manoeuvres, not on turning manoeuvres. Turning manoeuvres should be addressed by BSIS
- A question was raised on the collision analysis regarding offside turns as these are particularly occurring with M3 vehicles. The Chair asked contracting parties to look into M3 turning accidents at the offside and consider if BSIS would also be needed for the offside.

Question 5 (speed of vehicle):

- The group agreed to consider an operational speed range from 0 to max 20 km/h.

Question 6 (motion of VRU):

- Obstruction / masked by stationary vehicle can also not be detected by sensor systems so should be taken into account in test scenario.
- According TRL the vehicle and VRU speeds of accidents caused by obstruction are

not known or not available.

- Outcome of discussions (all depending on the scenarios, speeds/locations):
  - Include pedestrians (adults and children) crossing/moving from nearside and offside with no obstructions;
  - Include cyclists crossing from the offside and nearside (as starting point, as concerns may be raised on technical feasibility);
  - Include cyclists standing in lane or moving forward in vehicle path;
  - Exclude pedestrians standing in lane or moving forward in vehicle path (not expected that a pedestrian is standing still in front of a vehicle).

Question 7 (vehicles with good direct vision):

- Although answers were given in the direction that vehicles with good direct vision don't need MOIS, TRL stated that driver failed to look properly is a leading contributory factor. EC agreed to not exclude MOIS for vehicles with good visibility (for now). OICA raised the issue that there is also no confidence that a distracted driver will notice the information/warning signal.

## 9. Direct Vision

Documents: VRU-Proxi-11-05 (T&E)  
VRU-Proxi-11-06 (OICA)  
VRU-Proxi-11-11 (LDS)

TfL explained that the DVS scheme for London is on schedule, permits to London for 2020 will be given starting in October 2019.

LDS gave an update of the real-world (physical) testing method.

- LDS is investigating a new proposal for the real-world test method which is analogous to the digital TfL DVS technique without the need for bespoke software (in an earlier meeting indicated as an issue for Type Approval / check by Technical Services). The new method is based on real test objects (sticks) with the height of the smallest VRU as used for the DVS. Test objects are positioned such that a specific part of the object (initially head and shoulders) shall be visible from drivers eye point measured by an eye point rig with cameras installed. Based on the average distance of all the sticks to the vehicle the correlation to the star rating was investigated. Conclusion was that distinguishing between zero and 1 star vehicles can be distinguished as in this area a good correlation is found between the stick and volumetric method.
- For correlation purposes these initial tests were performed with over a hundred sticks. In the next stages the number of sticks will be reduced as long as still good correlation is found with the CAD data (volumetric score).

*Discussions:*

- OICA raised a concern about the definition of the Accelerator Heel Point (AHP). LDS explained that the AHP definition was thoroughly discussed in the expert panel meetings from TfL and in the end it was concluded to use the SAE standards with the fixed angle and heel point position. **OICA** (Volvo Trucks) will check if AHP definition according SAE is in line with the Volvo Trucks definition.
- It was questioned why not use a shadow based approach by putting the vehicle in a dark area, emitting light from drivers eye position and measuring the shadow lines on ground level. LDS explained that this method would rather be very complex (how to

- record the shadow lines?) and difficult to correlate to the volumetric approach.
- OICA asked how a lower door window will be taken into account in this method? LDS responded that this has not been taken into account yet, will be considered for a next step.
  - OICA expressed that in the area of the mirror locations the head and shoulders may not be visible but driver can see and recognize a pedestrian or cyclists with other visible body parts. Vehicle manufacturers pay a lot of attention to the mirror designs in order to achieve as less obstruction of the direct view as possible (e.g. separation between Class II and Class IV mirrors, lean design of mirror housings). LDS mentioned that this was not yet considered and effectiveness can be investigated. TfL responded that head and shoulders are most important. OICA pointed out that these are standing still exercises and in reality the truck and/or pedestrian are moving which makes the pedestrian more eye-catching for the driver even when the head and shoulders are not visible. It was suggested to allow any part of the stick with a defined size to be visible, The Chair asked to think about this proposal and come back to this in a next session.
  - The presented method can be used to distinguish between 1 star and zero star vehicles. For levels above the 1 star boundary there might be correlation issues for example when looking to Volvo FM and DAF LF. These vehicle models have basically the same volumetric score but a significant difference in the average stick distance. LDS will try to understand why there is this difference.
  - Positioning of components like LDWS/AEBS camera and rain-light sensor below to the windscreen has an effect on the distance of the sticks. OICA argued that this shall not influence the rating significantly as vehicle manufacturers have good reasons (performance) to mount it at a low position and systems like AEBS/LDWS are also beneficial for road safety.
  - The Chair expressed that LDS has made good progress with a method that looks promising. From EC perspective a manufacturer may choose for the volumetric approach (on condition that volumetric test will not produce better results than the stick method). Technical Services can perform a real-world test on a particular cab height and checking the correlation with volumetric scores.
  - T&E asked if a Vecto-like approach based on simulation models with input variables and a verification test with defined tolerance would work. Feedback from the group indicated that in this case it will be too complex to define the required input variables.
  - The Chairs raised the question if it is possible to lay down verifications based on simulations in a UN regulation. UK responded that there are possibilities for virtual testing like UN R66 Rollover strength for buses and coaches where results of component tests (roll-over bar) are included in the calculations. This is basically virtual testing but consistency in the results of this virtual test method might be an issue. EC stated that for direct vision physical tests are preferred in order to avoid any uncertainties / doubts. It was also suggested to implement the stick test from LDS as a virtual test and to be used as approval test.

*Conclusions:*

- The Chair concluded and summarized the discussions by putting the following options on the table and asked the group to think about the preferred way forward:
  1. Mandate a minimal star-rating based on the volumetric approach for the vehicle in such a way that the vehicle will always pass the physical test used for Technical Services.
  2. Regulate both methodologies (stick and volumetric method). Whatever the

vehicle manufacturer chooses it should give the same results within a defined tolerance band between the results (methods need to be equivalent).

3. Mandate the physical stick test but allow alternatives to the discretion of the manufacturer.

OICA presented their position on the regulation for Heavy Vehicles Direct Vision in VRU-Proxi-11-06:

- OICA supports:
  - an objective methodology to evaluate close proximity DV with a sound definition of a baseline level;
  - A common DV requirement for all vehicles within a vehicle category (as agreed in EU GSR phase 2);
  - Type approval of systems based on the worst case vehicle of the family with verification by simulation to cover a whole vehicle range.
- OICA recommends:
  - No connection between direct vision regulation and cab elongation as enabled by W&D;
  - Direct vision requirements shall be feasible with economically reasonable re-designs of conventional cabs due to very high investments for re-designs;
  - Use of potential measures not impacting cab structure is promoted.
- OICA explained that re-designing the cab is very complex due to the required space for the engine and cooling system together with the packaging of required components in the frontal area of truck cabs. Also the height of trucks is very diverse due to different factors like load capacity, application (off-road) and engine power. Furthermore driver healthiness and cab design constraints are important factors for vehicle concepts.
- OICA emphasized that current typical long-haulage and construction vehicles are zero star vehicles and it will be a huge effort to improve these vehicles towards a 1 star level. As 1 star level for all trucks will be very challenging, OICA argued for an active (intervention) detection system as alternative for direct vision.

T&E presented VRU-Proxi-11-05 with their view on the future direct vision demands for heavy vehicles:

- Truck industry has new opportunities to improve direct vision of trucks with the introduction of the new W&D regulation. Research showed that use of an additional 800mm aero front can bring some zero star trucks up to 2 stars.
- T&E reaction on OICA presentation
  - Will an elongation of the cabs as allowed by the new W&D regulation be an issue for contracting parties outside EU? OICA may investigate this.
  - T&E expects issues with detection systems because of system failures by (dirt on the sensors) and driver failed to react on the warnings. OICA commented that sensor blockage can be detected and an active intervention system will overrule the driver (driver is taken out of the loop).
  - ECF stated that active safety systems will be switched off by the drivers. According OICA there is no evidence that drivers switch off these systems and also after every key-cycle the systems are automatically switched on. In GSR phase 2 switching off ADAS systems will be less easy by requiring more driver actions for de-activation.
- T&E claimed that, based on 1-to-1 conversations with truck manufacturers, a 1 star level would be feasible even for long haul trucks. Therefore T&E suggested to

- follow a 2-step approach: start with 1 star requirement (following GSR timeline in 2025/2029) and increase the requirement to 2 star level at a later stage.
- T&E and ECF supports the proposal from LDS as stated in VRU-Proxi 10 (2 stars for N3 and 4.5 stars for N2).

*Conclusion:*

- OICA to investigate and show:
  - What is feasible on the best case construction and line-haul truck.
  - What are the options to improve and what are their contributions to direct vision.
- OICA (Volvo) may present in the next session the required modifications and faced issues for achieving 1 star on a highway or construction vehicle.

## **10. Evaluation of Pedestrian and Cyclist Warning Systems for Trucks**

This subject was not discussed in this meeting

## **11. Closure of the meeting and next meetings**

At the end of the meeting the Chair explained how to proceed in the coming period:

- J (Mr. Hirao-san) to setup webex meetings for Reversing Motion.
- TRL (Mr. Martin) to setup webex meetings for a steering group / task force for drafting regulation text on MOIS (if new steps have to be made).
- OICA to discuss Blind Spot Information System issues and new issues / corrections with BASt and, if accepted, submit informal documents to 117<sup>th</sup> GSRC.
- LDS to continue their work on real-world test for direct vision. The direct vision discussion and progress is going well and looking to the deadline (April 2021) there is still time for drafting the regulation text.
- GRSG:
  - EC will explain status and progress of VRU-Proxi (collegeau from van
  - Japan will explain the status and progress of Reversing Motion
  - G will explain BSIS proposals on detection area and external projections
  - OICA will explain BSIS proposals on cranes, cone height/locations and  $d_d$  (if accepted by BASt).

The meeting was closed and the Chairs kindly thanked Mr. Macdonald for the hospitality and arranging the meeting.

Next meetings:

12<sup>th</sup> meeting planned on 26-28 November 2019 at CLEPA offices in Brussels, Belgium.

13<sup>th</sup> meeting planned on 4-6 February 2020 at Kinki Transportation Bureau in Osaka, Japan.

## **12. Any Other Item**

No other items discussed.