

## **DRAFT REPORT**

### **7<sup>th</sup> and 8<sup>th</sup> meeting of the GRRF informal group on**

### **Advanced Emergency Braking and Lane Departure Warning Systems**

Venues: 7<sup>th</sup> meeting: UK DFT Offices, 76 Marsham Street, London  
8<sup>th</sup> meeting: UNECE, Palais de Nations, Geneva  
Chairman: Mr. Johan Renders (EC) (johan.renders@ec.europa.eu)  
Secretariat: Mr. Olivier Fontaine (OICA) (ofontaine@oica.net)

#### **1. Welcome and Introduction**

The Chair of GRRF welcomed the participants to the meeting. He stressed the need for the informal group to finalise soon its work as deadlines are pressing. GRRF is committed to deliver on the draft LDWS and AEBS Regulations and counts on the informal group's creativity and cooperative spirit to succeed in solving the challenge of agreeing on harmonized technical requirements to be introduced into the draft Regulation on AEBS. He reminded that the informal group faces a very tight timeframe as there is a need to finalize regulatory texts for adoption at the WP29 session of June 2011.

#### **2. Approval of the agenda**

Document: AEBS/LDWS-07-01 (Chair)

The agenda was adopted with no modification.

#### **3. Outcome of the 6<sup>th</sup> meeting of the AEBS/LDWS IG**

Document: AEBS/LDWS-06-13 (draft minutes)

The minutes were approved with no modification.

#### **4. ITS related issues**

Document: AEBS/LDWS-07-03 Driver in the loop (UK)

UK presented the above document, explaining that it primarily aims at gaining feedback from the group. The expert informed that the document is separate from the WP29 Informal Group guidelines (document WP29-150-22) as it is of broader interest to the group, and pointed out the need to keep the driver in the loop of the emergency braking process. The expert summarized the content of the document as describing some of the human factors issues associated with driving task automation and providing a set of basic design principles with the aim of helping to limit

some of the problems associated with out-of-loop driving. The document main purpose is supporting a global agreement of what is the correct approach for ITS.

The expert from OICA requested some clarification with regard to the link between this document and the EU Human Machine Interface guidelines (document Commission Recommendation 2008/653/EC). He also questioned the wording used in the document concerning the necessity for the driver to be aware of the “operating status” of the system (paragraph 4.4.). The expert from the UK welcomed these comments, recognized the language ambiguities, and committed to provide a satisfactory answer at a later stage.

The Chair suggested to comment and to provide inputs to the WP29 informal group on ITS when this GRRF AEBS informal group has finished its work. He additionally suggested that the WP29 informal group on ITS revises their guidelines in accordance with what the AEBS experts will have produced, this being considered as the proper way to address the concern of ensuring coherence between guidelines and regulations.

## **5. LDWS draft regulatory proposal:**

Preparation of submission to GRRF68

Documents: ECE/TRANS/WP.29/GRRF/2010/29  
ECE/TRANS/WP29/GRRF/2010/18e, § II.2  
ECE/TRANS/WP29/GRRF/2010/18c1e, corrigendum n° 2

The Chair pointed out the necessary full support of the informal group for the text of document GRRF/2010/29.

J confirmed their full support for the text of the LDWS draft Regulation but nevertheless questioned the way to implement the lane markings into Annex 3, i.e. whether new lane markings would have to be implemented via new Series of Amendments or Supplements to the text in force at the time of the amendment. OICA in addition requested clarification on the way the regulation would be implemented in practice (would the Annex 3 be blank at the beginning?) and on the process the member states of a region of economic integration would follow to apply this Regulation. Japan in addition requested clarification as to which series of amendments of Regulation N°10 would be referred to in the LDWS Regulation.

The Chair clarified that the idea of the draft text of the Regulation on LDWS is to collect in the dedicated annex (Annex 3) the lane markings of the contracting parties signatories to the regulation. Contracting Parties which envisage to sign the Regulation are consequently urged to provide the relevant information concerning their lane marking. The Chair added that further amendments, after the entry into force of the Regulation, would be implemented via the existing procedures as they are currently described in the 58 Agreement. Concerning the cross-references in the Regulation, the Chair suggested to request guidance to GRRF.

## **6. AEBS:**

### **6.1. Presentation of and preliminary exchange of views on new documents submitted:**

Documents:	AEBS/LDWS-07-02	AEBS proposal concerning driver overreliance (Japan)
	AEBS/LDWS-07-04	AEBS implementation proposal (Japan)
	AEBS/LDWS-07-05	Driver reaction time (CLEPA)
	AEBS/LDWS-07-06	AEBS phase-in example (OICA)

### 6.1.1. Staggered technology introduction

Documents AEBS/LDWS-07-04 and 07-06 were presented to the informal group.

The Chair summarized the presentations as requests from some parties to investigate the possibility for introducing within the draft regulatory text on AEBS a staggered approach and questioned the participants on whether the informal group would be ready to consider such an approach.

ACEA pointed out that nor the Terms of Reference nor the European Commission have the power to change the implementation dates specified in the General safety Regulation (GSR). The Expert from ACEA hence questioned the possibilities for the GRRF informal group to consider a staggered implantation. The Chair questioned this analysis for what concerns the Terms of Reference because they do not refer to implementation dates, so the question is whether the informal group could consider the idea for a staggered implementation of the requirements. The Chair mentioned some precedents in UNECE Regulations with phase-in introduction dates, (in some cases proposed by European Commission), but reminded that the 58 Agreement is not designed to mandate the application of the Regulations by the Contracting Parties. In addition, the informal group has been set up by WP.29 based on a proposal by the European Commission in the context of the need to adopt implementing measures in accordance with the deadlines set out in the European General Safety Regulation. Therefore, the European Commission does not consider to be bound to support any different implementation dates for AEBS requirements that would be proposed within the UNECE context. He acknowledged that the dates for Step 1 in the OICA presentation (document AEBS/LDWS-07-06) are in accordance with the GSR deadlines, but that for the other steps these dates are limiting contracting parties in applying them in their territory as they would consider appropriate. He hence had some question marks whether a phased-in approach would be acceptable for this informal group.

The Chair informed that the European Commission has consulted the EU Member States on a phasing-in approach, and the outcome was that the European Commission should continue to endeavour for a timely solution within the UNECE framework that is compatible with the GSR. Should UNECE fail to deliver on time and in accordance with the provisions of the GSR, the European Commission would have to use other means for proposing the implementing measures on AEBS for the purpose of the GSR, which could be one of those explained in the UK presentation (document AEBS/LDWS-07-07).

CLEPA could support a phase-in approach restricted to the vehicle categories, rather than linked to e.g. the target speeds (as proposed in the OICA document).

Japan welcomed and thanked UK and OICA for their documents. The delegate from Japan considered that the option proposed by the UK for 2 Regulations on collision mitigation and on collision avoidance. He also appreciated that OICA succeeded in agreeing on a common approach after having been urged to do so by Japan. The delegate also commented that the OICA approach for step 1 & 2 is similar to the Japanese proposal, except for the deletion of the stationary target test in Step 1. The delegate reminded that there is a social demand in Japan for stationary target test as soon as possible. The UK mentioned the need that the regulatory approach should also address and include requirements for M2 and N2 vehicles.

### 6.1.2. Regulatory approach

The group acknowledged the difficulty in gathering one common set of requirements for all scenarios and vehicle categories into one unique Regulation, and considered it relevant to find a regulatory mechanism which would enable to adopt requirements for the different scenarios simultaneously. Separation in two Regulations, namely stationary vs moving target (as proposed by UK) would satisfy NL, D (with limitation), J and OICA. The group agreed this approach deserves some in-depth discussion. The group also considered the possibility of establishing four Regulations, i.e. stationary vs. moving target and collision mitigation vs. collision avoidance. CLEPA favoured establishing one unique Regulation, with relevant annexes, taking into account the expectable technology evolution.

The group investigated the possibility of one Regulation in different parts, some of them not being signed by some Contracting Parties. It was finally considered relevant to work in the direction of the establishment of two Regulations, one addressing systems primarily designed for reacting to moving targets, and the other addressing systems primarily designed for reacting to stationary targets. Some confirmation was still needed on whether a Contracting Party could apply one part of the Regulation.

Germany raised the concern that the 2 Regulations approach could fail if one of the Regulations were not to be adopted due to a blocking majority in the voting procedure.

Japan subsequently proposed the following regulatory approach, in order to by-pass the danger of being the sole signatory of a Regulation aiming at “stationary target AEBS”:

- Introduction of an “if fitted” stationary target annex in Regulation N°13, aiming at collision mitigation;
- Introduction of an “if fitted” moving target annex in Regulation N°13, also aiming at collision mitigation. This annex could be mandated by any Contracting Party;
- As a second step establishing a new, more severe, moving target AEBS Regulation aiming at collision avoidance. Ultimately the Regulation N°13 annex on moving target would disappear as it would be assumed that complying with the new Regulation implies complying with the relevant annex of Regulation N°13.

Germany expressed support for this alternative approach proposed by Japan, and the United Kingdom could support the principle of this new proposal, as it would offer the targeted flexibility. OICA, supported by the NL, found inappropriate to regulate the same system in two different Regulations, where the change of one parameter like the Delta V would oblige the manufacturer to apply for another Regulation, just for the sake of satisfying one Contracting Party. The expert from OICA added that the only way to discriminate the vehicles fitted with “stationary target AEBS” from the ones fitted with “moving target AEBS” would be via adapted marking provisions.

The group then held a debate on the necessity to align all provisions other than the test method in both UNECE R13 and the new Regulation, and on the consequences for the mutual recognition principle. The Japanese approach was supported by UK, subject to in-depth investigation of the other regulatory approach, and D. It was challenged by the NL, S, OICA and CLEPA. The Chair invited Japan to consider and to indicate to the informal group how they would envisage to capture M2/N2 vehicles into their new regulatory approach.

#### Conclusion:

- Chair to report to GRRF about the two regulatory approaches discussed.
- J to provide information on the way to capture vehicles of Category 2 in their proposed approach.
- Chair to seek guidance from UNECE Secretariat on the compatibility of the approaches with the 58 Agreement.

- According to the guidance received, discussions in Tokyo to be based on relevant documents.
- If the approach of two regulations is confirmed, necessary that the two Regulations are adopted as a package, otherwise there is the risk that the stationary target Regulation is not adopted at UNECE level.

The group then initiated in-depth discussion concerning the above possible solution.

### 6.1.3. Staggered introduction of the requirements

CLEPA could accept a 2-step approach, rather than considering 3 steps as proposed by OICA. CLEPA considers that the 1<sup>st</sup> step proposed by OICA is not necessary. For M2/N2, CLEPA expressed confidence for vehicles > 8 tons as they are mainly equipped with pneumatic braking, but found it difficult for vehicles < 6 tons because they are equipped with hydraulic braking. Between the two weight limits above, the braking system depends on the manufacturer's choice in accordance with the technical parameters relevant for the final usage of the vehicle.

OICA committed to create a consolidated stepped approach based on the document AEBS/LDWS-07-06. The expert from OICA insisted that a staggered approach is a must to OICA.

UK could accept a phased approach if there is clarity about the dates. Industry should inform the informal group about technology feasibility and deliverables. Concerning the Regulatory approach this could be achieved via different series of amendments, or phased dates in the transitional provisions of the Regulation. The expert from the UK considered there is some need to investigate the different possibilities.

Germany insisted that high performance should be mandated as from the beginning because the technology is available.

NL felt confused because the OICA proposed step 2 seems to be already the state of the art. However the delegate stated that if step 1 is really necessary it could be acceptable, under the condition that implementation of step 2 follows within 3 years.

Japan supported step 1 because of the need to check the ratio of AEBS switch-off by the driver before considering step 2 via e.g. new series of amendments. Concerning the N2/M2 categories, the delegate reminded that N2 category is wide and not homogeneous and hence deserves in-depth consideration.

Conclusion:

- Staggered approach considered worthwhile further consideration by most participants of the informal group in general
- Divergence of views concerning the number of steps and the level of performances to be mandated in each step

## 6.2. AEBS warning cascade

### 6.2.1. Driver's overreliance

J presented document AEBS/LDWS-07-2.

OICA stressed that the danger of the drivers being over confident in a technology exists with all safety technologies, like ESC, LDWS and ABS. Therefore the requirements should focus on system performance. The Chair wondered whether overreliance must anyway be addressed within the framework of the 58 Agreement, as the Vienna Convention covers that. CLEPA pointed out that the J proposal for a late warning is design-restrictive, e.g. in the case of a system capable of detecting the low adhesion to the road surface.

Conclusion: J committed to re-consider their position for the 9<sup>th</sup> (Tokyo) meeting of the informal group.

### 6.2.2. Warning cascade

OICA presented the document AEBS/LDWS-07-06.

The Chair systematically reviewed the position of each party towards the main criteria defining an AEBS following a possible approach in three steps, i.e.

1. AEBS primarily designed for reacting to a moving target, with a low difference of speed between the subject vehicle and the target vehicle,
2. AEBS primarily designed to react to a stationary target, and
3. AEBS primarily designed for reacting to a moving target, with a high difference of speed between the subject vehicle and the target vehicle.

The positions were sought about the principle of a warning cascade and the moments at which the warnings should be initiated, taking the scheme of Figure 1 as a basis.

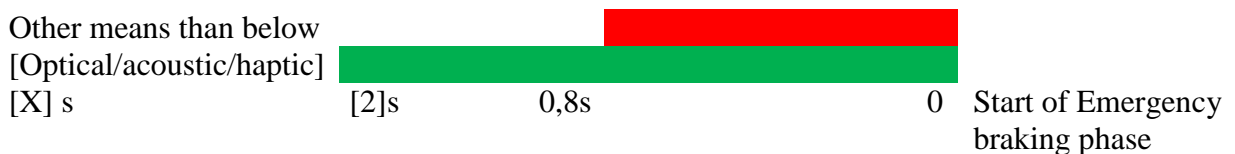


Figure 1

The Parties took the following positions toward a warning cascade:

Party	Moving target, low Delta V		Stationary target		Moving target, high Delta V		Comment
	1 <sup>st</sup> warning	2 <sup>nd</sup> warning	1 <sup>st</sup> warning	2 <sup>nd</sup> warning	1 <sup>st</sup> warning	2 <sup>nd</sup> warning	
<b>J</b>	1.4s	0.8s	1 phase warning: 0.8s		no position		Supports warning cascade, does not support CLEPA window. 1 <sup>st</sup> warning at 1.4s (not later)
<b>D</b>	Cascade, compromise possible	Cascade, compromise possible	1 phase warning: compromise possible		cascade 2s	?s	need for a time for driver's reaction. Hence 2 seconds for the 1 <sup>st</sup> warning
<b>UK</b>	1.4s	0.8s	1 phase warning: compromise possible because technical challenge		1.4s	0.8s	Supports the principle of a warning cascade. Concerns about optical as 1 <sup>st</sup> warning
<b>NL</b>	cascade Same time for all scenarios	cascade Same time for all scenarios	cascade Same time for all scenarios	cascade Same time for all scenarios	cascade Same time for all scenarios	cascade Same time for all scenarios	driver must have time to react. Seems 2.0 or 2.5 is reasonable. But 1.4.s seems acceptable as well
<b>S</b>	cascade 1.4s	0.8s	Cascade XXs	0.8 s	1.4s	0.8s	
<b>CLEPA</b>	2.0s	0.8s	2.0s	0.8s	2.0s	0.8s	Rejects test for low delta V, optical should not be the 1 <sup>st</sup> warning

### 6.2.3. CLEPA proposal for a warning window

CLEPA presented a proposal for mandating an “earliest time for the emergency warning”. The expert from CLEPA proposed that the start of the warning phase should be somewhere between 2.5 and 2.0 second before Emergency Braking phase within the test conditions, i.e. at a relative speed of about 70km/h. He justified this proposal as a means to avoid driver’s annoyance: there is no benefit at all if the driver switches off the system in the case of “low-cost” systems.

The Chair systematically reviewed the position of each party toward the earliest moments at which the warning should be initiated.

The parties had the following positions toward a warning time window:

J:

- No support for the warning time window
- Justification: there is no necessity to have a window because the warning time will be automatically adapted by the manufacturer and according to the circumstances. Japan however stressed the need for an appropriate minimum latest warning time. J is favourable to give more time to the driver in view of the risk of nuisance alerts. But mandating a warning time window could oblige the manufacturer to design according to the window. If there is a decision in favour of a window, it should be decided based on experience. If a manufacturer is able to design a system with no nuisance alerts, it is not good to prevent him to do so. A requirement for the latest warning is necessary. On the contrary a requirement for the earliest warning is damageable to the system. The expert took the example of LDWS where the informal group specified the latest warning only, and claimed that there is currently no evidence data in favour of the CLEPA proposal for a warning time window. If they exist, Japan is keen to get them from CLEPA. In view of timeframe for establishing a draft regulatory text on AEBS, it is considered appropriate to avoid such long discussions.

D:

- Supported the CLEPA proposal
- Need for supplementary time to investigate the proposal.
- Type Approval conditions are different to real traffic situation.

UK:

- no objection to a CLEPA warning time window
- no idea about the value.
- Some merit in a warning time window, but design restrictive. We could extend the window to be less design restrictive.

NL:

- Does not favour the warning time window
- Window is OK if there is a fear that the manufacturer does not want to take his responsibility.

S:

Does not favour a warning time window

Australia:

no position on warning time window

DK: no position on warning time window

France:

- not necessary to request a warning time window
- design restrictive

China: no position

IND: no position

RUS: no position.

OICA:

- Questioned whether such requirement is a good solution for preventing too simple systems
- Stressed that this would not prevent nuisance alerts.
- In addition, a warning time window is design restrictive because future technology like car2car communication, adhesion sensoring, infrastructure2car communication, will permit earlier warnings.
- Won't prevent the manufacturer to design the system with the focus of passing the warning time window requested in the regulation.

The Chair made the following proposal: “as the problem of nuisance warning was lengthy discussed, addition of a general qualitative requirement in the general performance requirements, to be read e.g. as “...a warning shall be provided sufficient time in advance to provide the driver with the time to react, and designed such that the nuisance alerts are prevented”. In addition, clarifying the time values for the 2 latest warnings in the test scenario.

CLEPA could accept to open up the window, but would prefer a narrow window. The expert did not find such warning time window design restrictive, as the Regulation could be amended afterwards. The expert from CLEPA, considering the low support in the room for the CLEPA proposal, reluctantly accepted the Chair proposal, i.e. opening up the window: [2.5] second earliest regulated warning – [1.4] second latest warning.

The proposal of the Chair was supported by: UK, S, RUS, NL, DK, F, PRC, IND.

J and AUS requested CLEPA to provide data justifying their proposal

D continued to favour the CLEPA proposal.

OICA continued to challenge the CLEPA proposal for a warning window, for the reasons described above.

Conclusion:

- Agreement to transfer the proposed values, between brackets, to the test requirements
- general qualitative text to be introduced in the general requirement part of the draft Regulation.

#### 6.2.4. Warning means

The Chair systematically reviewed the position of each party toward the main criteria defining an AEBS following a possible approach in three steps, i.e.

1. AEBS primarily designed for reacting to a moving target, with a low difference of speed between the subject vehicle and the target vehicle,
2. AEBS primarily designed to react to a stationary target, and
3. AEBS primarily designed for reacting to a moving target, with a high difference of speed between the subject vehicle and the target vehicle.

The positions were sought about the nature of each warning means in relationship with its time of initiation.



The Chair requested each party to state their position about the warning means

Party	Moving target low Delta V		Stationary target		Moving target high Delta V		Comment
	1 <sup>st</sup> means	2 <sup>nd</sup> means	1 <sup>st</sup> means	2 <sup>nd</sup> means	1 <sup>st</sup> means	2 <sup>nd</sup> means	
<b>OICA</b>	2 <sup>nd</sup> means different to the 1 <sup>st</sup>		2 <sup>nd</sup> means different to the 1 <sup>st</sup>		2 <sup>nd</sup> means different to the 1 <sup>st</sup>		
<b>J</b>	1 <sup>st</sup> warning not optical	2 <sup>nd</sup> means different to the 1 <sup>st</sup>	2 means out of 3		1 <sup>st</sup> warning not optical	2 <sup>nd</sup> means different to the 1 <sup>st</sup>	1 <sup>st</sup> warning not optical, as a wish for compromise
<b>UK, CLEPA, D, NL</b>	1 <sup>st</sup> warning not optical	2 <sup>nd</sup> means different to the 1 <sup>st</sup>	1 <sup>st</sup> warning not optical	2 <sup>nd</sup> means different to the 1 <sup>st</sup>	1 <sup>st</sup> warning not optical	2 <sup>nd</sup> means different to the 1 <sup>st</sup>	1 <sup>st</sup> warning not optical, as a wish for compromise
<b>S</b>	no position						(position to be clarified)

### 6.2.5. Test speed

The experts from Japan and the UK clarified their support for one single test at high speed, as it is considered being the worst case scenario.

Conclusion: the document AEBS/LDWS-04-08 will be updated according to the information above.

## 6.3. Outstanding issues from previous meeting

### 6.3.1. Proposed test scenarios for moving and stationary targets

Document: AEBS-LDWS-04-08-r2e – AEBS proposed test scenario with S position (Secretariat)

The group requested the Secretariat to update the document according to all the discussions above.

OICA requested a clear commitment from the informal group to go along with the stepped approach proposed per document AEBS/LDWS-07-06. The expert from OICA insisted that OICA is ready to prepare a finalized table if such approach is supported by the informal group. The Chair clarified that in his opinion, accommodating the 2 philosophies, i.e. the Japanese stationary target detection with late warning vs. the European moving target detection with early warning, is impossible in the remaining time frame. He reminded that this was the very reason why the informal group investigated the different regulatory possibilities. He acknowledged that OICA sought support for the “2 step approach (collision mitigation / collision avoidance)” with the phases proposed in the OICA document. However, he insisted on the need to check legal feasibility of the paths, and recommended OICA to clarify their table.

### 6.3.2. Warning requirements

Document: AEBS/LDWS-06-06r2e – Draft proposal for AEBS HMI provisions (OICA-CLEPA)

The group approved a copy/paste of the PTI requirements from the LDWS draft Regulation (document GRRF/2010/29).

#### **6.4. List of action items:**

The Chair requested the members of the informal group to organise themselves in two editorial groups for establishing the relevant proposals for two Regulations, in accordance with the approach which would be decided at the 68<sup>th</sup> session of GRRF, in order to be well prepared for the 9<sup>th</sup> meeting of the informal group, to be held in Tokyo, at the invitation from the Japanese authorities.

#### **6.5. Schedule for further meetings**

The group was made aware of the next steps and the remaining time before submitting an official document to GRRF at its 69<sup>th</sup> session (February 2011).

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