

**Draft updated Terms of Reference and Rules of Procedure for the "Informal Working Group on Visibility, Glare and Levelling (IWG VGL)"**

**I Introduction**

1. At its sixty-fifth session, GRE considered ECE/TRANS/WP.29/GRE/2011/27, introducing mandatory automatic levelling for headlamps (superseding ECE/TRANS/WP.29/GRE/2011/2 and ECE/TRANS/WP.29/GRE/2011/22). The proposal received comments from the experts of GTB (GRE-65-03 and GRE-65-17) and OICA (GRE-65-16) among others. The expert from Poland presented "Analysis of the influence of aiming, on visibility distance and glare" (GRE-65-30) concerning important aspects of present state of aiming/levelling in Regulation No. 48.
2. GRE adopted ECE/TRANS/WP.29/GRE/2011/27, as amended by Annex IV to this report. GRE agreed that this adoption was subject to the development of a further proposal to be prepared by the expert from GTB who would lead a comprehensive study of the whole issue of glare and visibility during night-time driving. Accordingly, it was agreed in case the results of the study revealed alternatives to the adopted mandatory requirements for automatic levelling and cleaning, the provisions of Regulation No. 48 would be re-examined at any time during the 90 months transitional period provided by ECE/TRANS/WP.29/GRE/2011/27. It was further agreed that, while the study would be managed by a dedicated working group based on the GTB structure, participation would be open to any GRE expert wishing to contribute. The secretariat was requested to submit ECE/TRANS/WP.29/GRE/2011/27 to WP.29 and AC.1 at their November 2011 sessions as draft [06] series of amendments to Regulation No. 48 (ECE/TRANS/WP.29/GRE/65, para. 17).
3. At its 155th session, WP.29 agreed to defer consideration of document ECE/TRANS/WP.29/2011/99 and Corr.1 to its June 2012 session, subject to a final review by GRE at its March 2012 session (ECE/TRANS/WP.29/1093, para. 55).
4. At its 156th session, WP.29 agreed to defer consideration of the amendments to Regulations under agenda items 4.16.1 to 4.16.3 to the next session of WP.29 (ECE/TRANS/WP.29/1093, para. 79).
5. At its 157th session, WP.29 also agreed to refer back the documents of agenda item 4.14.2 to GRE for its further consideration. In this respect, the EU requested a cost/benefit analysis (ECE/TRANS/WP.29/1097, para. 55).
6. In conjunction with the further consideration in GRE, GTB (Groupe de Travail "Bruxelles 1952") established a Task Force Coordination of Automotive Visibility and Glare Studies (TF CAVGS). The tasks of TF CAVGS were defined as follows: project management and quality control of activities by GTB working groups in relation to automotive visibility and glare studies; informal communication with GRE, OICA and CLEPA through liaisons in this TF, optional collaboration with SAE and CIE through liaisons; communication via GTB to GRE and to a public accessible section on the GTB web site.
7. In the meantime, the expert from Poland prepared for all consecutive GRE sessions formal and informal documents with proposals based on the basic analysis of photometry and geometry with explanations according GRE comments and suggestions (ECE/TRANS/WP.29/ GRE/2011/32 (initial Polish proposal for aiming/levelling tolerance connected with objective road illumination

distance of 75m +/- 25 m), GRE-66-17, ECE/TRANS/WP.29/GRE/2012/21, GRE-67-33, GRE-67-37, ECE/TRANS/WP.29/GRE/2012/27, GRE-68-31, GRE-68-32, GRE-68-34, ECE/TRANS/WP.29/GRE/2013/15, GRE-70-41, ECE/TRANS/WP.29/GRE/2013/57 and ECE/TRANS/WP.29/GRE/2014/11 (coming back to the values in the initial Polish proposal)). The Polish proposals aimed to guarantee the minimum range of illuminated road while ensuring the avoidance of glare regardless of the historical requirements oriented to the design.

8. At the seventy-first session of GRE, the experts from GTB presented the outcome of a study on visibility and glare of automotive low beam headlamps (GRE-71-32). The study concentrated on levelling in relation to load. The major objectives of the study were to improve the understanding of different factors that influence visibility and glare and to identify results of the study that might reveal alternatives for automatic static levelling. According to the GRE suggestion, it also included the studies done by Poland (GRE-71-32). The resulting proposal for amendments to Regulation No. 48 based on this study was presented to the seventy-second session of GRE (GRE-72-07).
9. At its seventy-third session, GRE considered a joint proposal by the experts from the International Organization of Motor Vehicle Manufacturers (OICA) and GTB to introduce new criteria on the automatic levelling of headlamps based on the GTB glare and visibility studies (ECE/TRANS/WP.29/GRE/2015/5). The expert from Poland suggested further modifications to this proposal (GRE-73-18 and GRE-73-28). The experts from Germany and Japan proposed to impose automatic levelling in all cases, in order to reduce glare problems for drivers (GRE-73-17). Following an in-depth exchange of views on these three documents, GRE realized that no consensus could be found as long as there was no single proposal.
10. To make progress on this issue and prepare a comprising proposal, GRE decided to establish an Informal Working Group with a draft title "on Visibility, Glare and Levelling" (IWG VGL), for which the experts from Germany and Poland agreed to act as Chair and Secretary, respectively. GRE requested IWG VGL to submit its terms of reference for consideration at the next session of GRE and mandated the Chair to obtain, in June 2015, the consent of WP.29 for the establishment of this IWG (ECE/TRANS/WP.29/GRE/73, paras. 17 and 18).
11. During the 166th session of WP.29, AC.2 considered the possibility of establishing an Informal Working Group (IWG) on Visibility, Glare and Levelling. Germany expressed its interest to chair the group, Poland to be Vice-Chair and OICA the secretary. WP.29 was requested to provide advice on this issue (ECE/TRANS/WP.29/1116, paragraph 12). WP.29 noted that, to prepare a consolidated proposal on new criteria for the automatic levelling of headlamps, GRE decided to establish a new Informal Working Group on Visibility, Glare and Levelling (IWG on VGL). WP.29 gave its consent for establishing this IWG (ECE/TRANS/WP.29/1116, para. 25).
12. At the same session of WP.29, the representative of France proposed to delete a design restrictive requirement in Regulation No. 48 for auto-levelling of headlamps equipped with any Light Emitting Diodes (LED) light sources (ECE/TRANS/WP.29/GRE/2015/21, ECE/TRANS/WP.29/GRE/73 and WP.29-166-23). The representative explained that, if LED were treated the same way as other light sources, more LED headlamps would be fitted on new vehicles, and thus improving road safety and reducing CO<sub>2</sub> emissions. WP.29 noted that recent studies indicate that the type of light source does not seem to be a major factor of headlamp glare, and that GRE had established an IWG to review all levelling requirements in Regulation No. 48. The EU representative stressed that also for this subject OLA should be involved to provide their analysis and preferred option.
13. WP.29 stressed that, in line with the text and spirit of the 1958 Agreement, Regulations should be technologically neutral and performance based. Therefore, WP.29 advocated the French proposal and invited GRE to adopt it and to submit it to WP.29 for consideration. WP.29 also pointed out the importance of the newly established IWG for finding a general solution for glare and visibility issues. WP.29 also instructed IWG and GRE to verify, as a matter of priority, that

LED headlamps do not produce more glare compared to other light sources, to review all levelling requirements and to report back to WP.29 (ECE/TRANS/WP.29/1116, paras. 50 and 51).

14. At its seventy-fourth session, GRE reverted to the proposal by the expert from France to delete a design restrictive requirement in Regulation No. 48 for an auto-levelling device for low beam produced by light emitting diodes (LED) light sources (ECE/TRANS/WP.29/GRE/2015/21 and ECE/TRANS/WP.29/GRE/73, para. 20). The secretariat informed GRE about the discussion on this issue at the June 2015 session of WP.29. The World Forum had stressed that Regulations should be technologically neutral and invited GRE to adopt the French proposal and to submit it to WP.29 for consideration (ECE/TRANS/WP.29/1116, paras. 50 and 51).
15. GRE was not in a position to reach a consensus on this matter. The experts from Germany and Japan did not support the French proposal and suggested that it first be referred to the Informal Working Group on Visibility, Glare and Levelling (IWG VGL) and considered in one package with various other proposals. The experts from Belgium, Italy, Finland, France, Spain, **EEU Commission**, CLEPA and OICA supported the French proposal and called for its adoption independently from the IWG VGL activities. The experts from Austria and Poland reserved their positions. Finally, in view of the WP.29 guidance, GRE agreed to adopt the proposal in ECE/TRANS/WP.29/GRE/2015/21 and to submit it to the March 2016 session of WP.29 for a final decision. The Chair was also requested to brief WP.29 on the different views expressed by experts in GRE (ECE/TRANS/WP.29/GRE/74, paras. 14 and 15).
16. The WP29 / AC1, at their March 2016 session, adopted the GRE proposal for amendment to UN Regulation 48 to introduce the same 2000lm criterion for all light source including LED to decide what type of levelling device has to be installed on the vehicle (documents ECE/TRANS/WP29/2016/20, ECE/TRANS/WP29/2016/19 and ECE/TRANS/WP29/2016/18) respectively as Supplement 16 to the 04 series of amendments, Supplement 9 to the 05 series of amendments and Supplement 7 to the 06 series of amendments. However other amendments to UN Regulation 48 on headlamp levelling still need to be considered updated. For instance as the limit value of 2000 lumen limit for light source luminous flux currently presently used to discriminate the need for automatic levelling.
17. Terms of reference was adopted at WP29 in March 2016 (GRE-74-21 Rev.1 amended by Annex 3 of the GRE 74<sup>th</sup> report ECE/TRANS/WP.29/GRE/74). Based on the above situation, after two meetings of the IWG VGL, the need to update for an updating of the Terms of reference, including the work plan and time schedule is deemed necessary.

## II Objectives

18. The following Terms of Reference describe the principle tasks of the new IWG focusing at the development of a proposals for the amendment to UN Regulations No. 48, which takes into account to reduce and possibly solve the visibility and glare concerns deriving from vehicles and headlamps characteristics and performances.
19. The IWG on VGL shall:

### ~~Phase 1~~

- a) - Define ~~technology neutral requirements as instructed by WP.29, in particular to find a general first step, provisional solution for visibility and glare and visibility issues, by means of an amendment to UN Regulation 48 for vehicles of categories M and N for the headlamp review all levelling requirements;~~
  - develop suitable criteria and a test procedure to evaluate the headlamp levelling performances;
  - consider ~~carry on a cost/benefit analysis and an impact assessment on the proposed requirements;~~

**Commenté [SF1]:** Request from WP.29 nevertheless keeping in mind that currently for other categories than M1 & N1, we have no data and no technology available

**Commenté [SF2]:** Request by the EC at 157<sup>th</sup> WP.29 – to be confirmed by the group

**Commenté [SF3]:** Request from Japan

- define suitable transitional provisions for the introduction of the proposed requirements.

The amendment will be prepared mainly taking into account the proposals and studies on this specific matter already presented in GRE ~~by various governments, universities and non-governmental organizations.~~

For preparation of the proposals ~~in Phase 1~~ the following issues influencing visibility and glare will be taken into consideration:

- the relevant general data such as roads characteristics, standard use of vehicles, ~~light sources characteristics,~~ etc. explaining the different situations of glaring and the critically situations with regard to visibility;
- the relevant parameters for installation of headlamps with regard to visibility and glare, such as:
  - initial aiming of the headlamps;
  - levelling of the passing beam based on the cut-off position;
  - mounting height of the headlamps, with a clear definition of reference condition;
  - ergonomic aspects such as accessibility of manual levelling device, ~~[such as the amount of light projected in the area where the eyes of an oncoming vehicles driver are located],~~ etc ...

According to the discussions and the results of this phase, additional researches and studies related to visibility and glare issue could be necessary for taking into consideration:

- categories of vehicles;
- headlamp beam pattern and related distribution of the light/illumination intensity;
- future technologies for illuminating systems (new light sources, adaptation of the light distribution, etc.);
- future technologies for vehicles (levelling systems, automatic lights control, autonomous driving, etc.);

and any other if needed.

~~Phase 2~~

- ~~Define a general solution for visibility and glare issue, by means of amendments to the involved UN Regulations for forward illumination systems including their fitting and orientation on vehicles;~~
- ~~develop a suitable test procedure to evaluate the illumination system performances in both visibility distance of illumination and glare control;~~
- ~~carry on a cost/benefit analysis on the proposed requirements, taking into account both the illumination system and its installation/levelling on vehicle;~~
- ~~define suitable transitional provisions for the introduction of the proposed requirements for both the illumination system and its installation/levelling on vehicle.~~

The amendments will be prepared taking into account:

- ~~Identify, review and assess the status of the already published various researches and studies being carried out by various governments, universities and non-governmental organizations on visibility and glare;~~
- ~~Invite, consult with and consider the input of safety experts.~~
- ~~Develop if necessary additional researches and studies related to visibility and glare issue specifically promoted and conducted by the governments, university and non-governmental organization involved;~~
- ~~Determine potential visibility and glare characteristics and mechanisms that convey desired~~

**Commenté [SF4]:** Not useful because we can work with any interested parties/organizations

**Commenté [SF5]:** Deleted because of the deletion of "Phase 2"

**Commenté [SF6]:** If needed, will be possible because included in "etc."

**Commenté [SF7]:** The problem is more having a clear and easy access to the command by the driver to be able to modify the beam during driving

**Commenté [SF8]:** Added because of the deletion of the Phase 2

**Commenté [SF9]:** Phase 2 is deleted because too early to decide if it will be necessary and define precisely what to do. It will be updated after the outcome of the phase 1

- vehicle performance information to the human by focusing on:
- (i) ~~the relevant general data such as (roads, environment and ecology, standard use of vehicles, future technologies, [light sources characteristics,] etc.) explaining the different situations of glaring and the critically situations with regard to visibility;~~
  - (ii) ~~the relevant parameters for installation of headlamps with regard to visibility and glare, taking into account such as:~~
    - ~~-initial aiming of the headlamps;~~
    - ~~-levelling of the passing beam based on the cut-off position pattern;~~
    - ~~-mounting height of the headlamps, with a clear definition of reference condition;~~
    - ~~-ergonomic aspects to be investigated [(amount of light projected in the area where the eyes of an oncoming vehicles driver are located)];~~
    - ~~-washing;~~
    - ~~-other requirements.~~

For preparation of the proposals in Phase 2 the following additional issues influencing visibility and glare will be taken into consideration:

- (i) ~~headlamp beam pattern and related distribution of the light/illumination intensity;~~
- (ii) ~~future technologies for illuminating systems (new light sources, adaptation of the light distribution, etc.);~~
- (iii) ~~future technologies for vehicles (levelling systems, automatic lights control, autonomous driving, etc.);~~

In both Phase 1 and Phase 2 the glare issues related to the maintenance of vehicle in circulation and the periodical inspections will be taken into consideration but no proposal to solve the related problems will be prepared since out of the competence of the IWG VGL.

~~[If any, information on the amendments proposed to the vehicles/illumination systems requirements and suggestions on how to manage them in PTI and circulation could be addressed to the competent bodies in UN ECE.]~~

- ~~f) Develop test procedures for evaluating the conformity of visibility and glare characteristics and mechanisms. Define as good as possible the essential requirements in performance (technology neutral) terms to provide opportunities for innovation and to prepare acceptable transitional provisions.~~
- ~~g) Develop a proposal for amendment to Regulation No. 48 accordingly and if needed headlamps beam pattern will have to be considered with necessary additional amendment to headlamps Regulations.~~
- ~~h) Determine the costs and benefits associated with this proposal of amendment of Regulation No. 48. Note that the analysis is not intended to address specific countries or regions, but rather general considerations each Contracting Party (to WP.29) should consider when implementing the potential proposal.~~
- ~~i) Provide a draft proposal to the GRE by April 2017 and to the WP.29/AC.1 by November 2017.~~

### III Rules of Procedure

20. The Informal Working Group on Visibility, Glare and Levelling (IWG on VGL) is a subgroup of GRE and is open to all participants of GRE, including Contracting Parties to the 1958 and 1998 Agreements and non-governmental organizations. However, it is recommended that a maximum of three technical experts per country and organization participate in this group.
21. IWG will be chaired by ~~Germany and co-chaired by~~ Poland. OICA will act as Secretary.

22. The official language of the informal group will be English.
23. An agenda and related documents shall be made available on the dedicated UNECE website (<https://www2.uncece.org/wiki/pages/viewpage.action?pageId=26903055>) by the Secretary of the group in advance of all scheduled meetings.
24. All documents and/or proposals shall be submitted to the Secretary of the group in a suitable electronic format in advance of the meetings. The group may postpone discussing any item or proposal which has not been circulated five working days in advance of the scheduled meeting.
25. The Secretary of the group shall distribute the draft meeting minutes to the informal group members within fifteen working days after the meeting of the group. The draft minutes shall be considered and adopted at the next session of IWG. The adopted minutes shall be submitted to GRE and will be used by the IWG Chair as a basis for his reporting to GRE about the activities of the IWG.
26. IWG shall develop its opinions and draft proposals by consensus, and submit these to GRE for further consideration and decision. If IWG cannot reach common agreement on particular items or proposals, the Chair shall present the issue to the GRE and/or the WP.29/[AC-1] for resolution. The IWG Chair may seek guidance from GRE as appropriate.
27. Sessions shall be held in agreement with the majority of the participants after the group has been established in a constitutional meeting. Sessions may be in person or virtual using web-based technology.
28. A provisional agenda shall be drawn up by the Secretary in accordance with the proposals and requests received from the members of the group and with the agreement of the Chair. The first item upon the provisional agenda for each session shall be the adoption of the agenda.
29. The second item on the provisional agenda shall be the discussion on matters arising and adoption of the minutes of the previous session.
30. IWG shall provide GRE with status reports at each GRE session.

#### IV. Work plan and time schedule

31. The ~~aim of~~ IWG VGL ~~is to~~ will present to GRE an informal document ~~related to Phase 1~~ for consideration at the ~~seventy-fifth and seventy-sixth (76<sup>th</sup>) sessions of GRE in April 2016 and October 2016 and at the seventy-seventh (77<sup>th</sup>) session in April 2017, respectively.~~
32. ~~According to the guidelines of the GRE, the final objective of~~ IWG VGL ~~is to~~ will present a formal document ~~related to proposal for Phase 1~~ for consideration at the ~~seventy-seventh~~ eighth (78<sup>th</sup>) session of GRE in ~~April~~ October 2017 and then for consideration at the ~~173<sup>th</sup>~~ 174<sup>th</sup> session of WP.29 in ~~November 2017~~ March 2018.
33. The time-line for ~~future works if needed~~ Phase-2 shall be proposed at the ~~seventy-sixth~~ seventh (77<sup>th</sup>) session of GRE in ~~October 2016~~ April 2017.
34. Meetings of the informal group shall be scheduled to meet the ~~above~~ timeline. ~~for deliverables. These meetings may be "in person" or virtual (WebEx or similar).~~

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