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**Economic Commission for Europe****Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on General Safety****117th session**

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Item 7(b) of the provisional agenda

**Awareness of the proximity of Vulnerable Road Users****UN Regulation on Blind Spot Information Systems (BSIS)****Proposal for amendments to UN Regulation No. [151] (Blind Spot Information Systems for Heavy Vehicles)****Submitted by the Informal Working Group VRU-Proxi\***

The text reproduced below was prepared by the Informal Working Group on the Proximity of Vulnerable Road Users to (i) clarify test procedures allowing non-random selection of parameter combinations and (ii) provide for protrusion requirements for Blind Spot Information Systems (BSIS) external elements. The modifications to the existing text of the draft Regulation (see ECE/TRANS/WP.29/2019/28) are marked in bold for new or strikethrough for deleted characters.

**I. First proposal**

*Insert a new paragraph 0.7., to read:*

**“0.7 This regulation allows the technical services to test other, more or less random, parameter combinations that are not laid down in the table 1 in Appendix 1. It is anticipated that the systems will be more robust, but it makes the test procedure also more complex:**

**To be able to appropriately analyse the pass or fail of the system according to the requirements in section paragraph 5, annex 3 is included to calculate pass and fail values. There could, however, be contradicting requirements where an information signal is not allowed for one test case, but is required for another, in the exact same relative positions of bicycle and vehicle, but for different assumed turn radii and impact positions (which are not detectable by the system at the points of information).**

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\* In accordance with the programme of work of the Inland Transport Committee for 2018–2019 (ECE/TRANS/274, para. 123 and ECE/TRANS/2018/21/Add.1, Cluster 3.1), the World Forum will develop, harmonize and update UN regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

**Therefore, the evaluation of the criterium “first point of information” is not carried out for these kind of tests; it shall be considered sufficient if the false information test (traffic sign) is passed.”**

*Paragraph 5.3.1.4., amend to read:*

- “5.3.1.4. The BSIS shall give an information signal at last point of information, for a bicycle moving with a speed between 5 km/h and 20 km/h, at a lateral separation between bicycle and vehicle of between 0.9 and 4.25 metres, which could result in a collision between bicycle and vehicle with an impact position 0 to 6 m with respect to the vehicle front right corner, if typical steering motion would be applied by the vehicle driver. **However, the information signal is not required when the relative longitudinal distance between bicycle and front right corner of the vehicle is more than [30] m to the rear or [7] m to the front.”**

*Paragraphs 6.5.9 to 6.5.10., amend to read :*

- “6.5.9. Repeat paragraphs 6.5.1. to 6.5.8. for test cases shown in Table 1 of Appendix 1 to this Regulation.

Where this is deemed justified, the Technical Service may select **additional** test cases different than shown in Table 1 of Appendix 1, within the range of vehicle speed, bicycle speed and lateral clearance as indicated in paragraphs 5.3.1.3. and 5.3.1.4.

The Technical Service shall check that the parameter combination in the selected test cases would lead to a collision between the bicycle and the vehicle with an impact position in the range as specified in paragraph 5.3.1.4. and shall assure that the vehicle is moving with the selected speed when crossing line C in Figure 1 of Annex 1 by appropriately adjusting starting distances and corridor length for the vehicle and the bicycle.

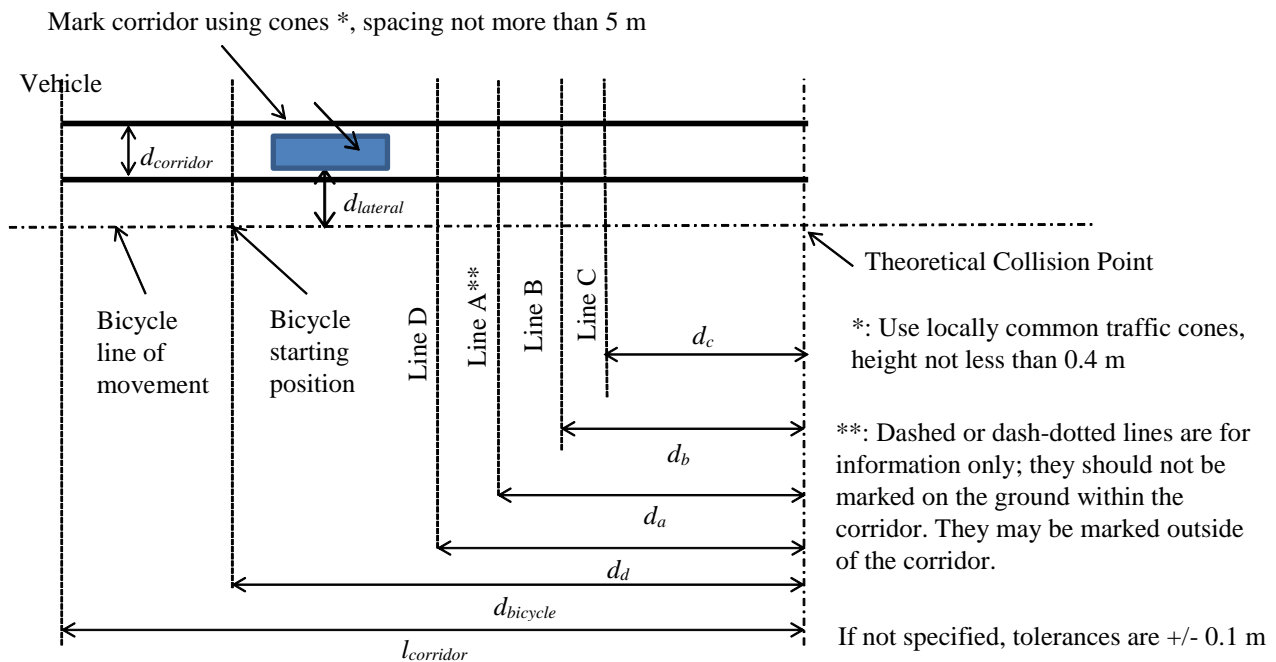
**The criterium “first point of information” is deemed to be complied with when test cases other than those from table 1 in appendix 1 to this regulation are carried out.”**

- 6.5.10. The test is passed when the Blind Spot Information signal has been activated in all test cases as shown in Table 1 of Appendix 1 to this Regulation before the **foremost point of the vehicle has reached** ~~crossed~~ **line C but not before the foremost point of the vehicle has reached line D** (see paragraph 6.5.7. above, **where line D is only relevant for test cases taken from Table 1 of Appendix 1**) and the Blind Spot Information signal has not been activated in any test run when the vehicle passes the traffic sign (see paragraph 6.5.8. above). **However, the information signal is not required when the relative longitudinal distance between bicycle and front right corner of the vehicle is more than [30] m to the rear or [7] m to the front.**

For vehicle speeds up to 5 km/h, it is deemed satisfactory if the information signal is activated 1.4 seconds before the bicycle has reached the theoretical collision point as specified in Appendix 1, Figure 1. ~~For vehicle speeds between 5 and 10 km/h, the value  $d_c$  shall be 5 m.~~

For vehicle speeds above 25 km/h, where the stopping distance is higher than 15 m,  $d_c$  as specified in Appendix 1, Figure 1 shall be as specified in Appendix 1, Table 2.

Appendix 1, Figure 1, amend to read:



Appendix 1, Table 1, amend to read:

Test Case	V <sub>bicycle</sub> [km/h]	V <sub>Vehicle</sub> [km/h]	d <sub>lateral</sub> [m]	d <sub>a</sub> [m]	d <sub>b</sub> [m]	d <sub>c</sub> [m]	d <sub>d</sub> [m]	d <sub>bicycle</sub> [m]	l <sub>corridor</sub> [m]	d <sub>corridor</sub> [m]	For information only (not influencing test parameters)	
											Impact Position [m]	Turn Radius [m]
1	20	10	1.25	44.4	15.8	15	26.1	65	80	vehicle width + 1 m	6	5
2	20	10			22	15	<b>38.4</b>				0	10
3	20	20			38.3	38.3	65				6	25
4	10	20	4.25	22.2	43.5	15	<b>37.2</b>				0	25
5	10	10			19.8	19.8	65				0	5
6	20	10			44.4	14.7	15				<b>28</b>	6
7			17.7	<b>34</b>		3					10	

Annex 3, final paragraphs, amend to read:

“For vehicle speeds below 5 km/h, it is sufficient if the information signal is given at a distance corresponding to a TTC value of 1.4 seconds (similar to the static tests) ~~and for vehicle speeds above 5 and below 10 km/h, the value d<sub>c</sub> is reduced to 5 m.~~

Finally, ~~d<sub>a</sub> is the first point of information. It can be calculated by adding the distance corresponding to 4 seconds of vehicle travel time to d<sub>c</sub> and correcting for the impact position in case the impact position is not 6 m:~~

$$d_a = d_c + 4s \cdot v_{\text{vehicle}} + (6m - \text{Impact Position}).$$

These formulas allow to completely populate Table 1 in Appendix 1 for test cases other than those defined there.”

## II. Justification to the first proposal

1. The new UN Regulation on Blind Spot Information Systems incorporates a new concept for the definition of test cases: Technical Services are allowed to check parameter combinations other than those defined in Table 1 in Appendix 1. A procedure to calculate the required outcomes (e.g. Last Point of Information, First Point of Information) for a given parameter combination is included in Annex 3.

2. During final discussions in the Informal Working Group, however, it was identified that the procedure in Annex 3 leads to the following problems:
  - (a) The required detection distance, which was agreed to be limited to 30 m to the rear and 7 m to the front, exceeds these limits in rare parameter combinations.
  - (b) The concept of the “First Point of Information” can lead to contradictions where in one combination of expected impact position and expected turn radius, an information signal is required, while in another combination of those parameters, it is not allowed. Both parameters cannot be known by the blind spot information system at the first point of information.
  - (c) Minor corrections.
3. To correct issue (a), an explicit requirement for the maximum detection distance was added in paragraphs 5.3.1.4. and 6.5.10. Industry has questioned the values of 30 m and 7 m and proposed to deliver test data supporting other values for the next IWG meeting in September; until then, the values of 30 m and 7 m are kept in brackets.
4. To correct issue (b), the Informal Working Group decided NOT take the “First Point of Information” into account in cases where test cases with parameter combinations other than those in Table 1 in Appendix 1 have been selected by the technical service. The “First Point of Information” only needs to be checked when performing the tests in Table 1 in Appendix 1, and the requirements in that table with regard to the value ‘dd’ have been corrected to not lead to any contradictions (e.g. “worst case” for dd has been selected).

### III. Second proposal

*Paragraph 5.2., amend to read:*

- 5.2. General requirements
- 5.2.1. The effectiveness of the BSIS shall not be adversely affected by magnetic or electrical fields. This shall be demonstrated by compliance with the technical requirements and transitional provisions of UN Regulation No. 10, 04 series of amendments or any later series of amendments.
- 5.2.2. **With the exception of BSIS external elements which are part of another device subject to specific protrusion requirements, BSIS external elements may protrude up to 100 mm beyond the width of the vehicle.**

### IV. Justification to the second proposal

5. The regulation on Blind Spot Information Systems is drafted as a new Regulation, without an integration of new provisions or a takeover of UN Regulation No. 46 provisions regarding the overall vehicle width.
  6. For a capable and reliable Blind Spot Information System ensuring a minimal number of false-positive warnings, a further extension of the BSIS sensors is necessary, therefore the Informal Working Group agreed on paragraph 5.2.2..
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