

Informal document GRE-89-15 (Germany)

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Item 6 (c) of the provisional agenda

Installation UN Regulations:

UN Regulation No. 53 (Installation of Lighting and Light-Signalling Devices for L3 Vehicles)

# MOTORCYCLE ADAPTIVE FRONT LIGHTING SYSTEM (AFS): MOTIVATION

# DEFINITION.

## Motorcycle Adaptive front lighting system or AFS

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It means a lighting device providing beams with differing characteristics/Light modes for automatic adaptation to varying conditions of use of the dipped-beam (passing-beam).



## Light modes

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The light modes are automatically controlled depending on the vehicle speed and leaning angle.

Motorcycle light modes:

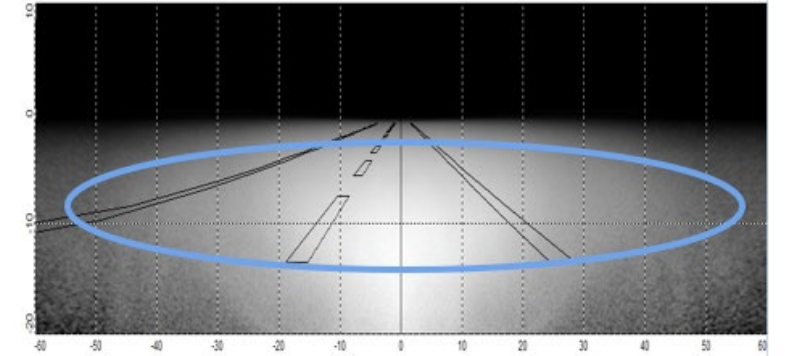
- Light mode 1 – “City”
- Light mode 2 – “Country road”
- Light mode 3 – “High way”

# MOTIVATION.

Adaptive Front Lighting System (AFS) for motorcycles.

## Light intensity

Adaptive Front Lighting System increases the light intensity in the relevant areas of the field of view.



City-Mode: wide close-field illumination

## View guidance

Adaptive Front Lighting System leads rider to focus on relevant areas.

## Häufigkeitsverteilung in Stadtgebiet

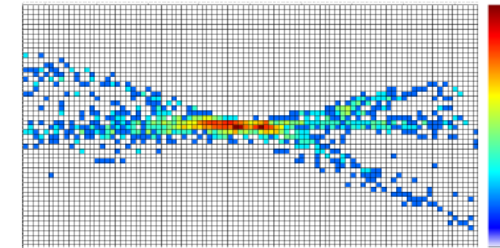


Abb. 5.7: Histogramm Stadtfahrt

# MOTIVATION.

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Adaptive Front Lighting System (AFS) for motorcycles.

**Glare**

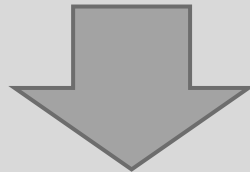
Adaptive Front Lighting System reduces light intensity in irrelevant areas and minimizes glare of other road users.

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# MOTIVATION.

Since a while, requirements of adaptive front lighting system for M and N category vehicles are implemented. The introduction of this system has led to a safety increase for these vehicles.

According to UNECE-R53 it is not possible to change the light intensity in close field, near middle, left and right field illumination (Image.1) as allowed by UNECE-R48 (Image.2 page.4). This means, in many driving condition (depending on speed and leaning angle) the road illumination is limited.



**The same safety increase (for M and N category) could be taken also for L3/L3e category vehicles.**

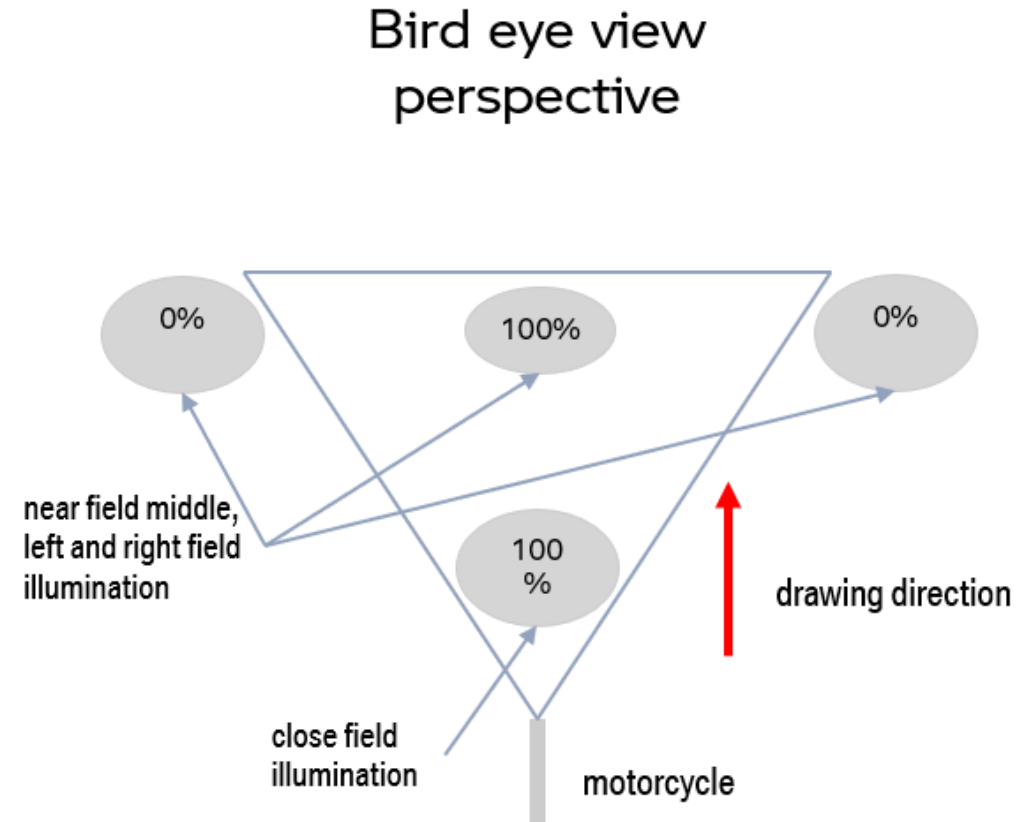


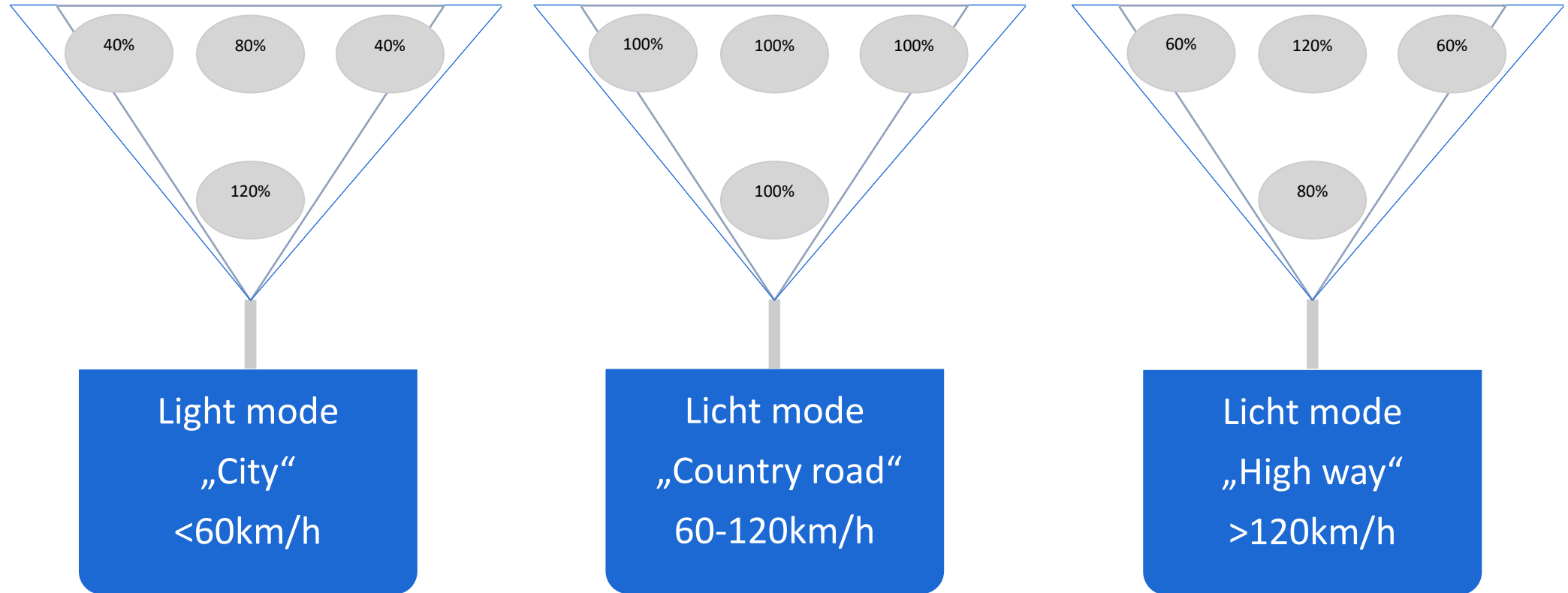
Image. 1

Thank You!

# Backup

# MOTIVATION.

## MOTORCYCLE ADAPTIVE FRONT LIGHTING SYSTEM LIGHT DISTRIBUTION.





## DESCRIPTION OF DEVIATION FROM APPLICABLE REQUIREMENT.

### **The deviation from the applicable requirements relates to the following Regulations:**

*Delegated Regulation (EU) 3/2014, Article 13 in connection with Annex IX, paragraph 1.3 in connection with Regulation UN-R53, paragraph 5.17, the use of lighting equipment with Adaptive front lighting system (AFS) is not permitted.*

*In the paragraphs 5.14 and 5.15 of Regulation UN-R53 stipulates the prescribed and permissible lighting and light signal devices, so others may not be used. According to the definition in UN-R48, which does not apply to the vehicle class concerned, an AFS is a system that is defined in paragraph 2.7.4 and has special requirements in paragraph 6.22. In particular, these are those that cannot be integrated into the requirements of high beam and low beam. In terms of the system within the UN-R48 regulation, the AFS is equated with the high beam and low beam lighting devices. From this it can be deduced that this system should be found in the same way in the context of UN-R53 in the future. However, since the AFS is currently neither found in paragraph 5.14 nor in paragraph 5.15, the AFS can be assumed to be inadmissible.*