

ECE R112 & R123

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Conditions on the luminous flux of light sources

Foreword

- To show that the provisions § 5.3.2.3 of Regulation R112 and §5.1.4 in R123 are useless.
- These prescriptions required a minimum luminous flux of 1000 lumen for the LED modules contributing to the principal Low beam.
- We compare the optical efficiency and the power consumption of LED LB (less than 1000 lm on the source) with two halogen LB.

Optical systems

- **Basic LB 1 – luminous flux of the LED Module= 1000 Lm. ~20W**
- **Basic LB 2 - Luminous flux of the LED Module = 800 Lm. ~16W**
- **H7 Reflector– 1500 Lm @ 13.2V. 58W**
- **H4 Reflector – 1020 Lm @ 13.2 V. 68W**

What the driver sees

Basic LB 1 - Initial LED 1000 lm



Basic LB 2 - Reduced LED 800 lm



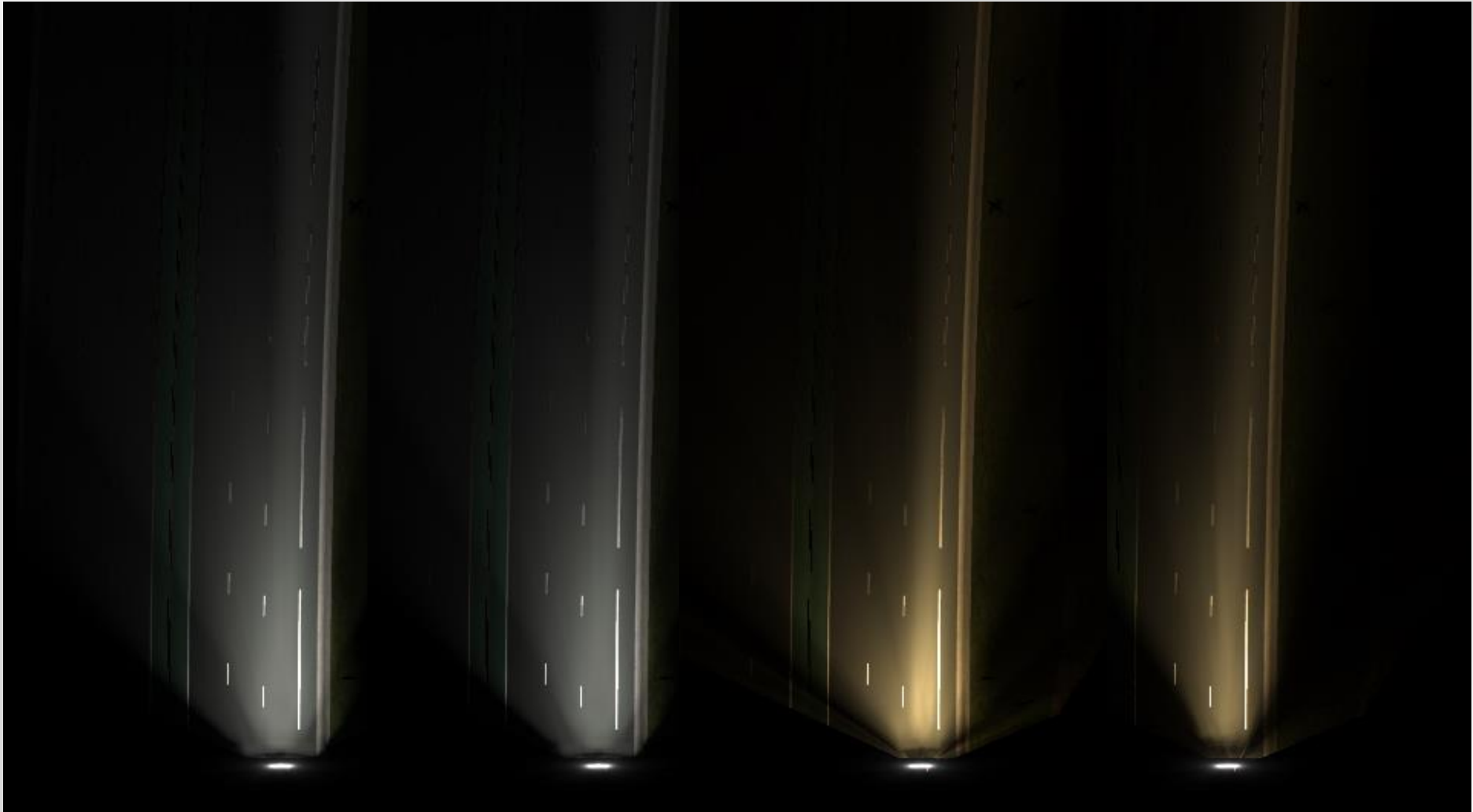
H7 LB Reflector - @13.2V



H4 LB Reflector - @13.2V

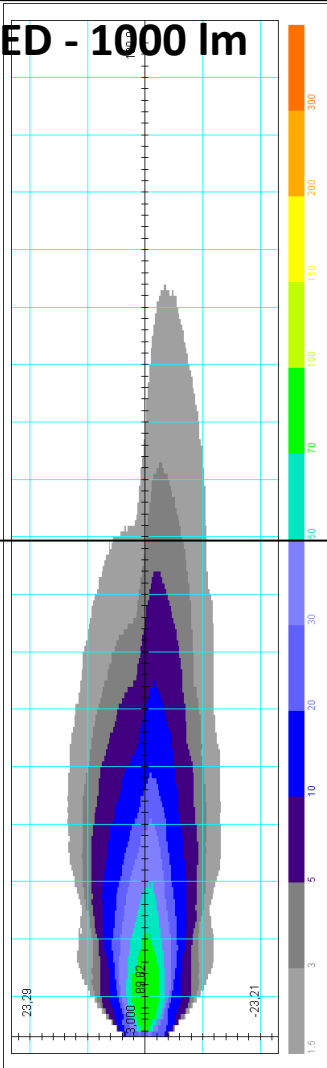


Bird's eye view

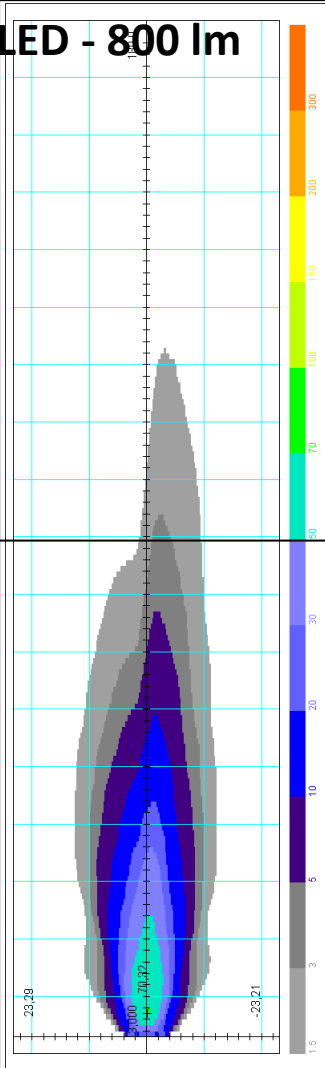


Illumination on the road

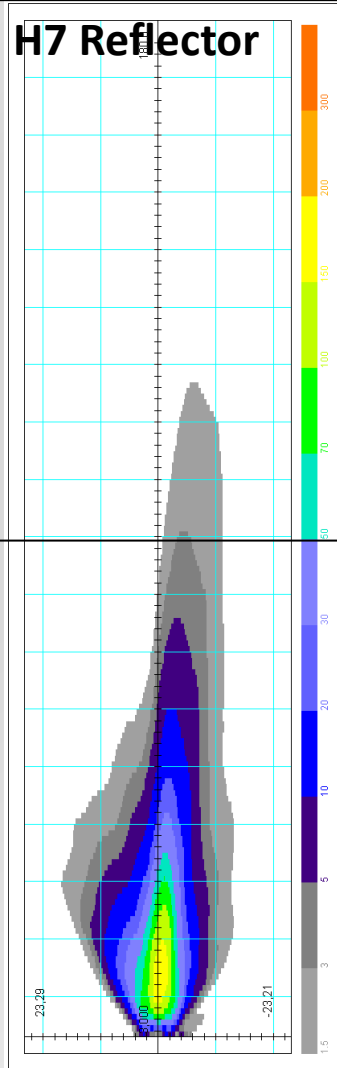
LED - 1000 lm



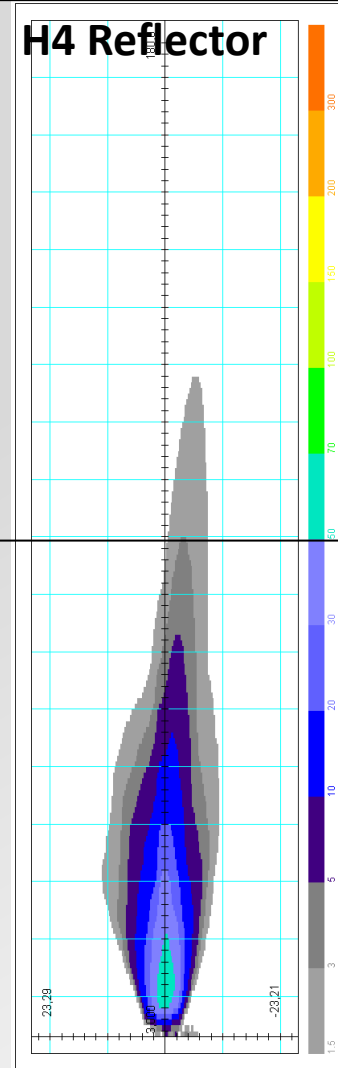
LED - 800 lm



H7 Reflector



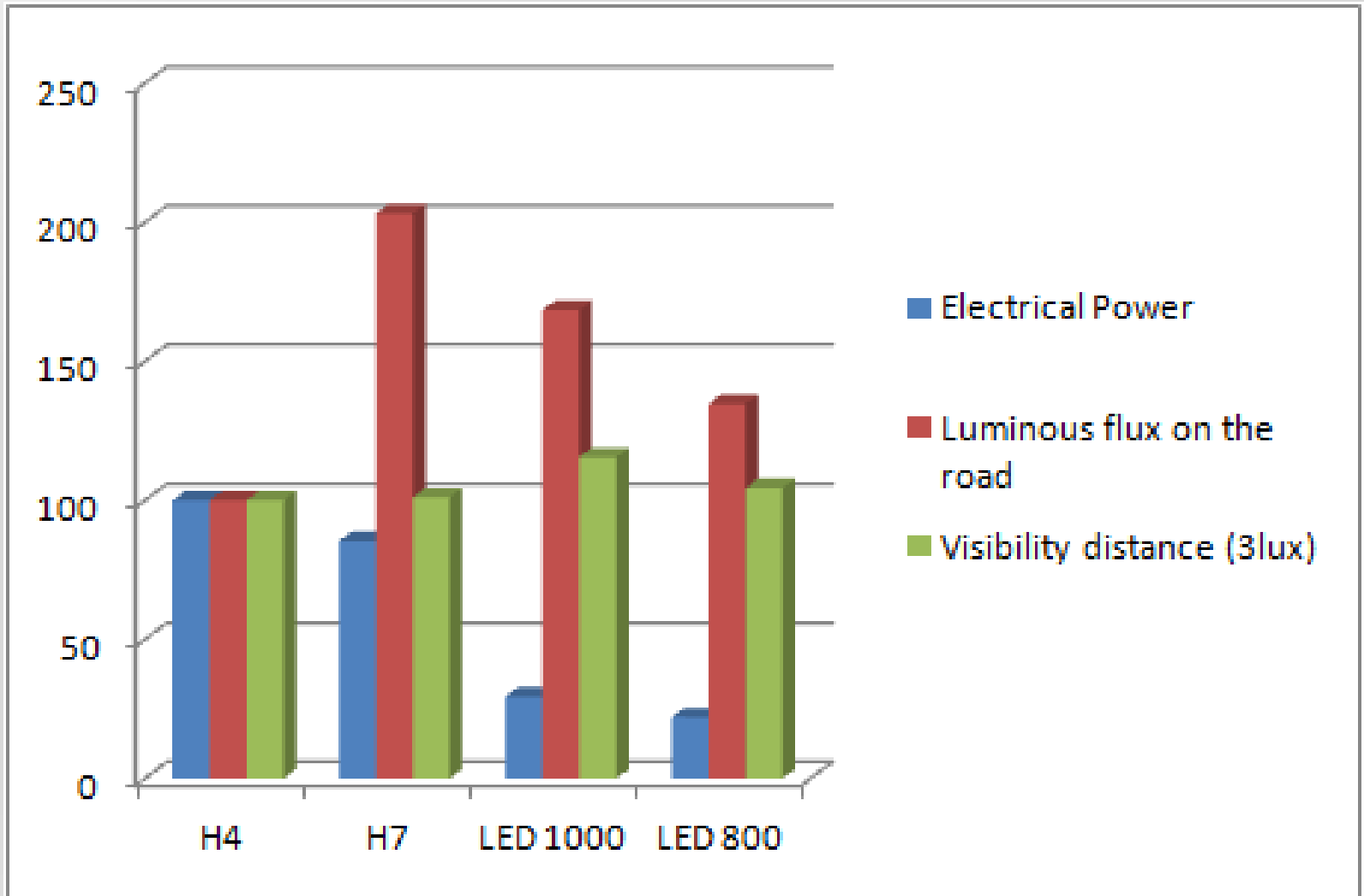
H4 Reflector



180m

90m

Synthesis



GRE Session March April 2014

- During the previous session (71st session) , this proposal was presented as two Informal documents by France.
 - 71/09 and 71/10.
- Some contracting parties were reluctant to adopt such a proposal:
 - Possibility to design a compliant beam with patches on the road
 - Risk of low flux on the road.
- France proposes new formal documents taking into account these comments.
 - TRANS/WP29/GRE/2014/35 and 2014/36.

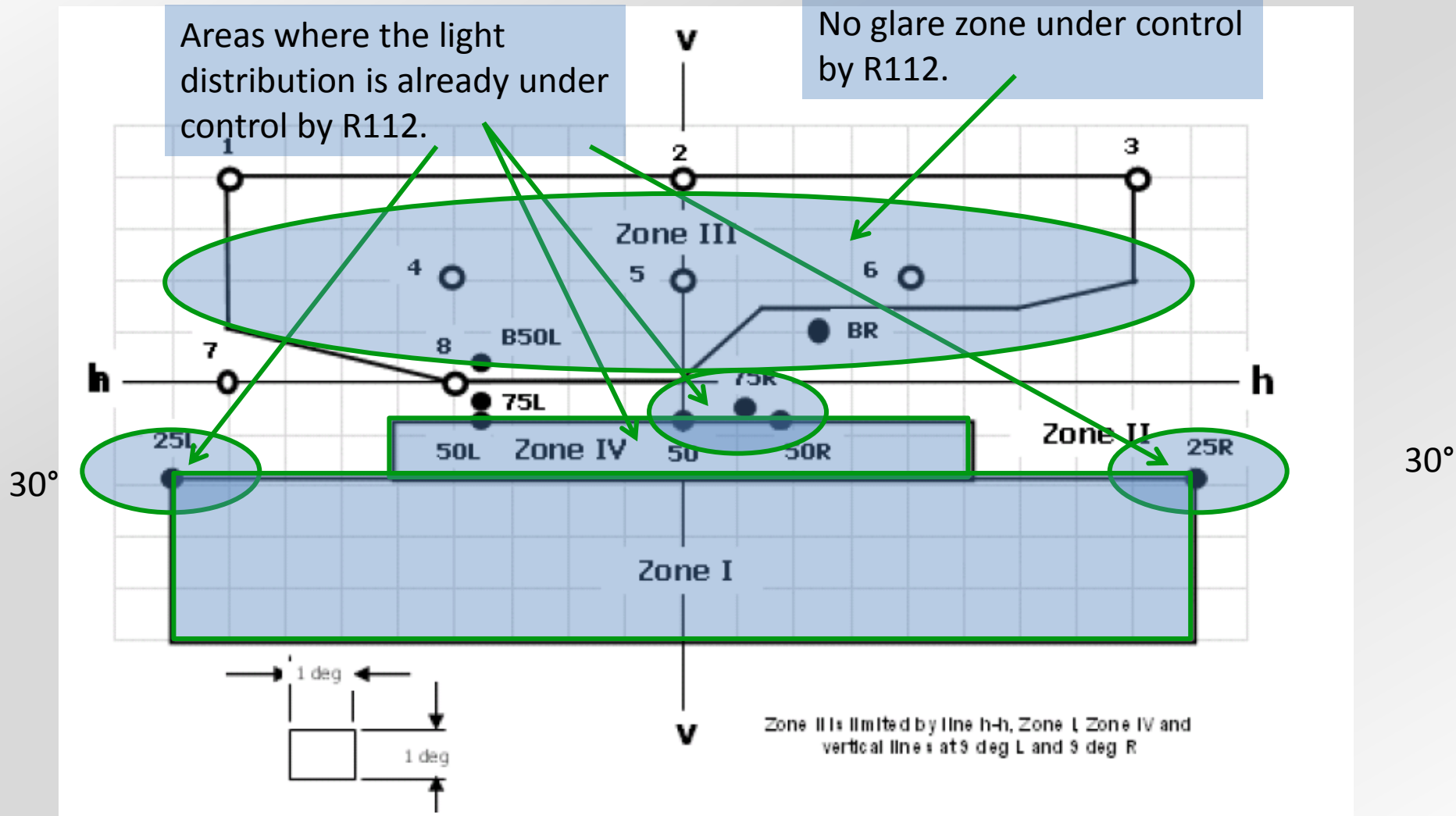
Characteristics of a safe low beam

- No glare.
- Good visibility distance.
- Good road illumination on the road between 25m and 50 m.
- Good width of the beam pattern.
- Not too much light on the foreground.
- Enough light on the landscape.

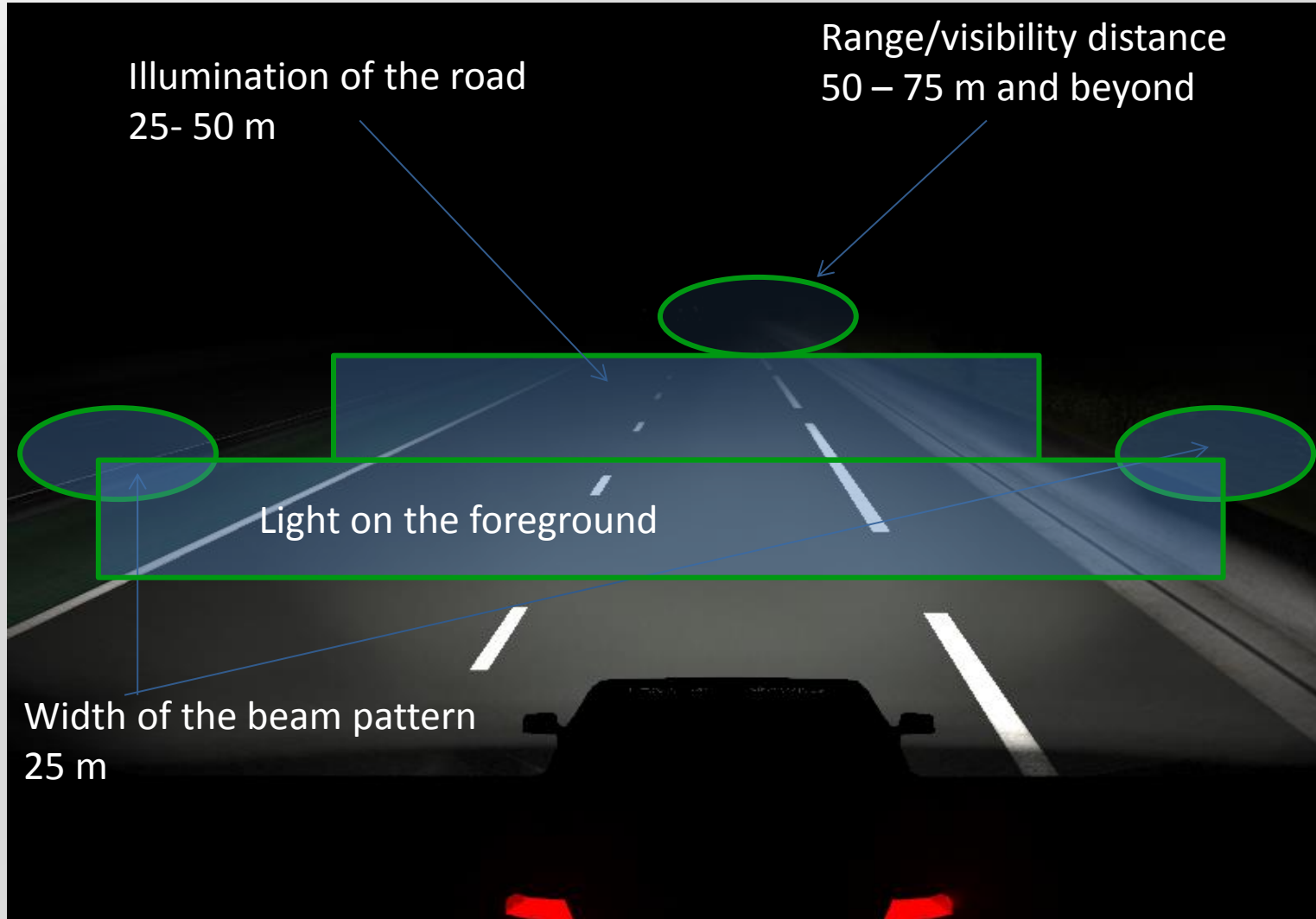
Current requirement of the regulation. (R112)

Areas where the light distribution is already under control by R112.

No glare zone under control by R112.



Requirement of the regulation, on the road



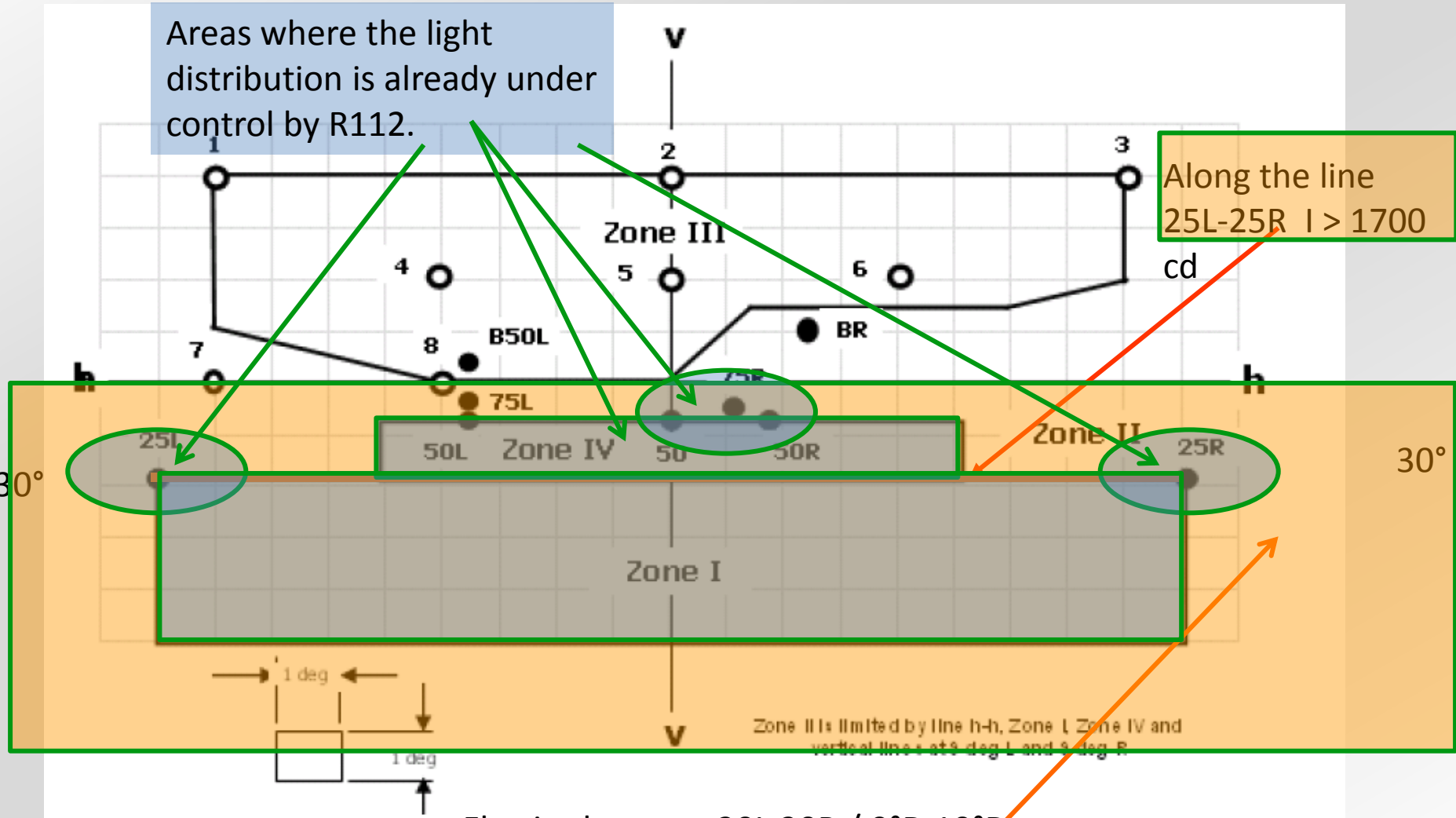
Characteristics of a safe low-beam

- No glare: **OK.**
- Good visibility distance: **OK.**
- Good road illumination on the road between 25m and 50 m: **OK.**
- Good width of the beam pattern: **OK.**
- Not too much light on the foreground : **OK**
- Enough light on the landscape: Not covered by the regulation.

Requirement of the regulation with modification

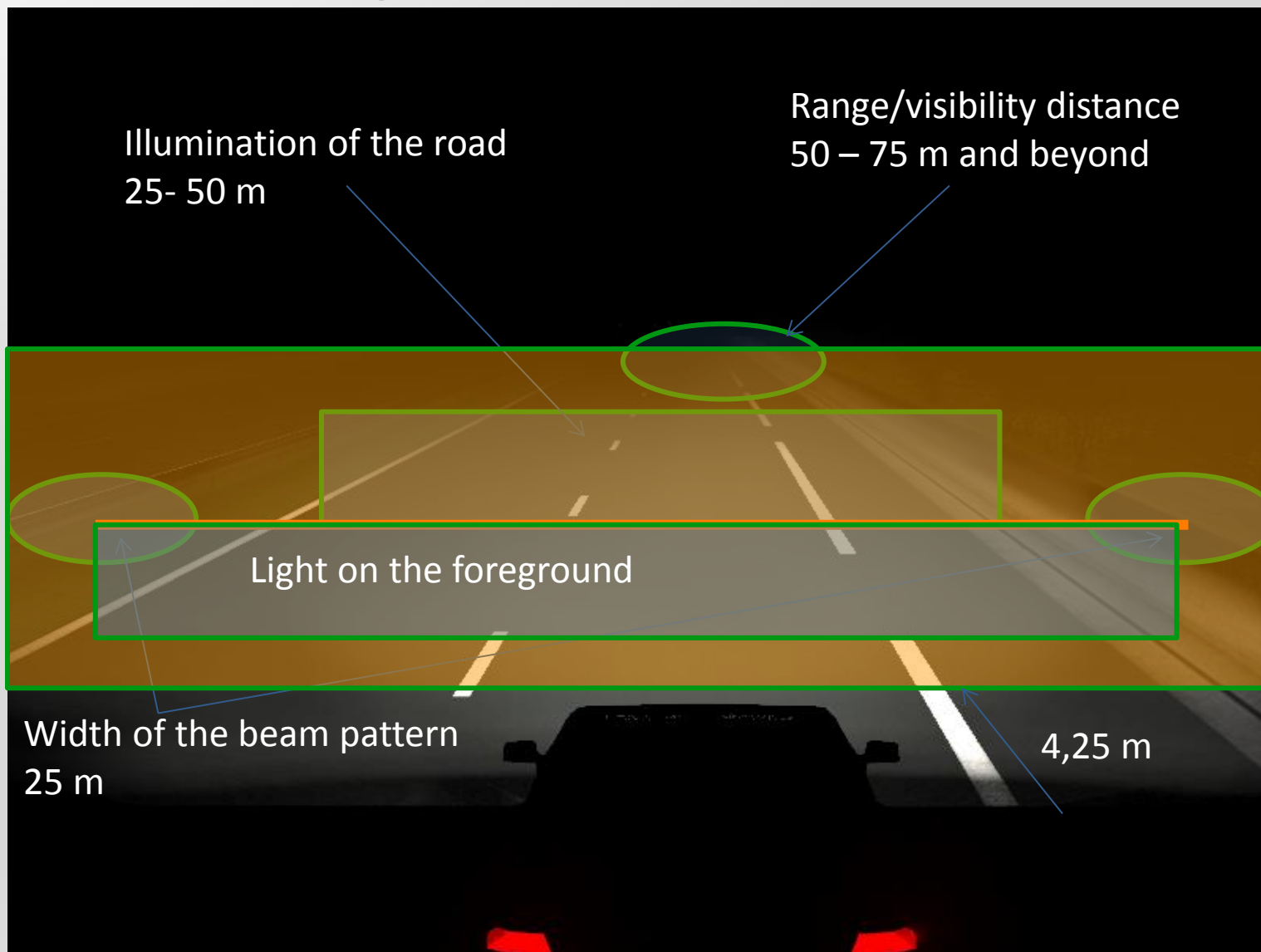
Areas where the light distribution is already under control by R112.

Along the line 25L-25R $I > 1700$



Flux in the area: 30L 30R / 0°D 10°D

Requirement of the regulation with modification, on the road



Characteristics of a safe low beam

- No glare: OK
- Good visibility distance: OK
- Good road illumination on the road between 25m and 50 m: OK
- Good width of the beam pattern: OK and improved
- Enough light on the landscape: Controlled by the regulation: OK.

Conclusion

- The optical efficiency of a LED systems is better than that of a Halogen (60% versus 35%).
- The visibility distance and the light distribution of LED system with a luminous flux lower than 1000 lumen are better than or equal to those of Halogen headlamps.
- The power consumption of the LED system is lower.
- The minimum threshold of the luminous flux for LED modules required in R112 § 5.3.2.3. and R123 §5.1.4 should be removed.
- During the session in March 2014, some Contracting Parties were reluctant to remove the 1,000Lm because of a risk of low luminous flux on the road which is covered by new proposals to be discussed.