



GROUPE DE TRAVAIL "BRUXELLES 1952"
WORKING PARTY "BRUSSELS 1952"

AFS Main Beam (Driving Beam) Improvements

Presentation to the 60th Session of GRE
02 October 2008



Technological progress now provides the possibility to produce an adaptive driving beam

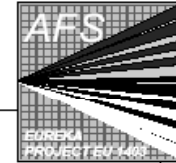
GTB considers that such a system can be introduced into ECE regulations by amendments to Regulations Nos. 48 and 123.

GTB therefore wishes to clarify the current provisions to avoid various interpretations of the requirements and consequential debate between the contracting parties regarding acceptability.

2. 7. 28. " Adaptive front lighting system " (or "AFS") means a lighting device type-approved according to Regulation No. 123, providing beams with differing characteristics for automatic adaptation to varying conditions of use of the dipped-beam (passing beam) and, if it applies, the main-beam (driving-beam);

Main Beam

New / Changed Items



New

- ▶ *number of lighting units per side not restricted*
- ▶ *swivelling of any lighting unit allowed (test provisions)*
- ▶ *automatic beam modifications allowed (to specified/ tested)*

unchanged (compared with R.112 / R.98)

- *photometry provisions (however system based instead for individual lamps)*
- *reference figures system and relevant limitations*
- *time conditions (as R.98)*
- *activation of the main beam (switching on /off)*

AFS is available

- related to dipped and main beam
- applications currently focused on dipped beam

AFS dipped beam solves the problem of :

- Bend situation
- Adverse weather situation
- Town situation
- Motorway situation



Current AFS Situation

The AFS dipped beam does not completely solve the problem of providing sufficient forward illumination.

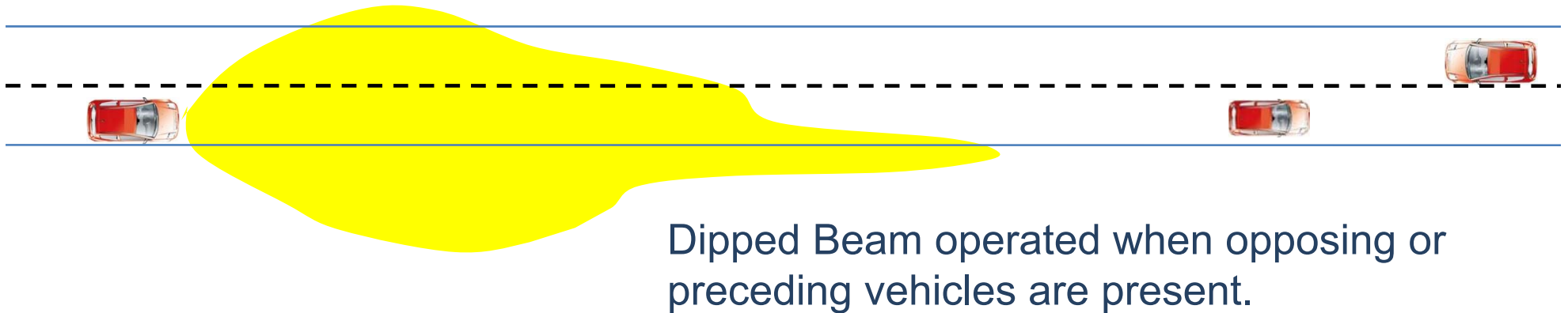
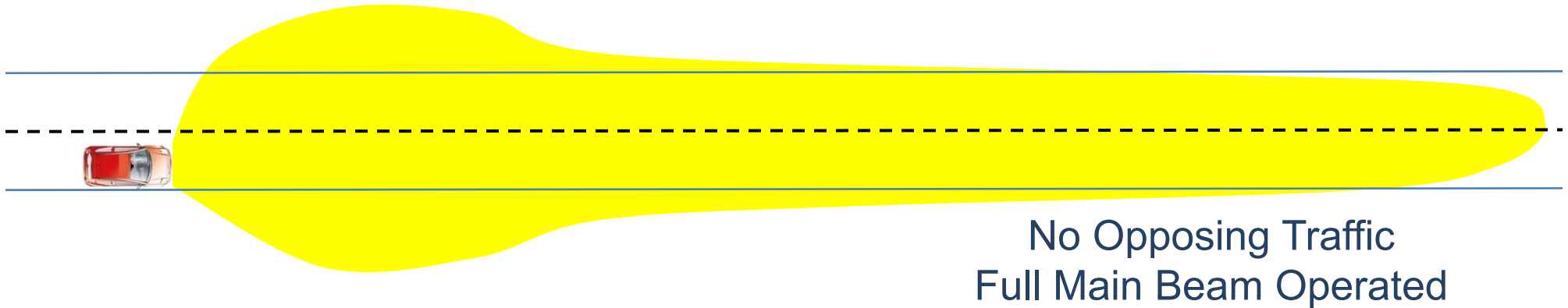
It does not provide a complete answer to ensuring adequate visibility in the case of the random presence of other vehicles.

How to increase viewing distance without causing discomfort to other road users?

- Main beam as it exists today glares oncoming traffic in many situations and cannot be used.
- The separation distance between vehicles means that the dipped beam will not provide sufficient forward illumination.
- Drivers have a reluctance to operate the main beam and frequently select the dipped beam too early as recent research by LLAB shows.



Problems to Overcome



Frequently drivers operate the dipped beam earlier than necessary



The Adaptive Driving Beam

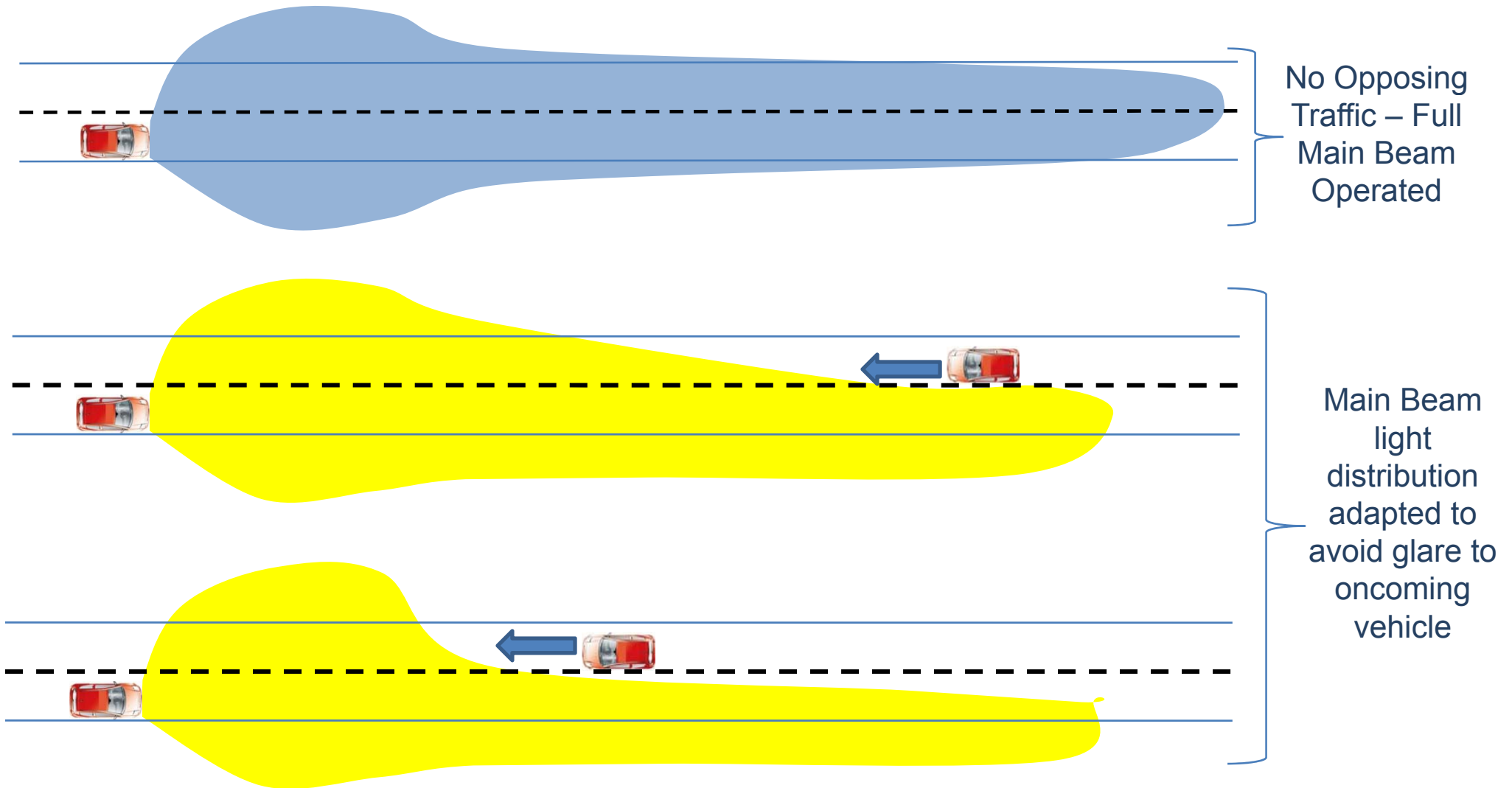
The following diagrams are intended to show the general principle of the automatic adaptation of the main beam to different traffic conditions.

- They do not attempt to represent the actual beam distributions that can be achieved.
- They only consider the case of a straight , flat road although the adaptive main beam responds to all road geometries.



The Solution

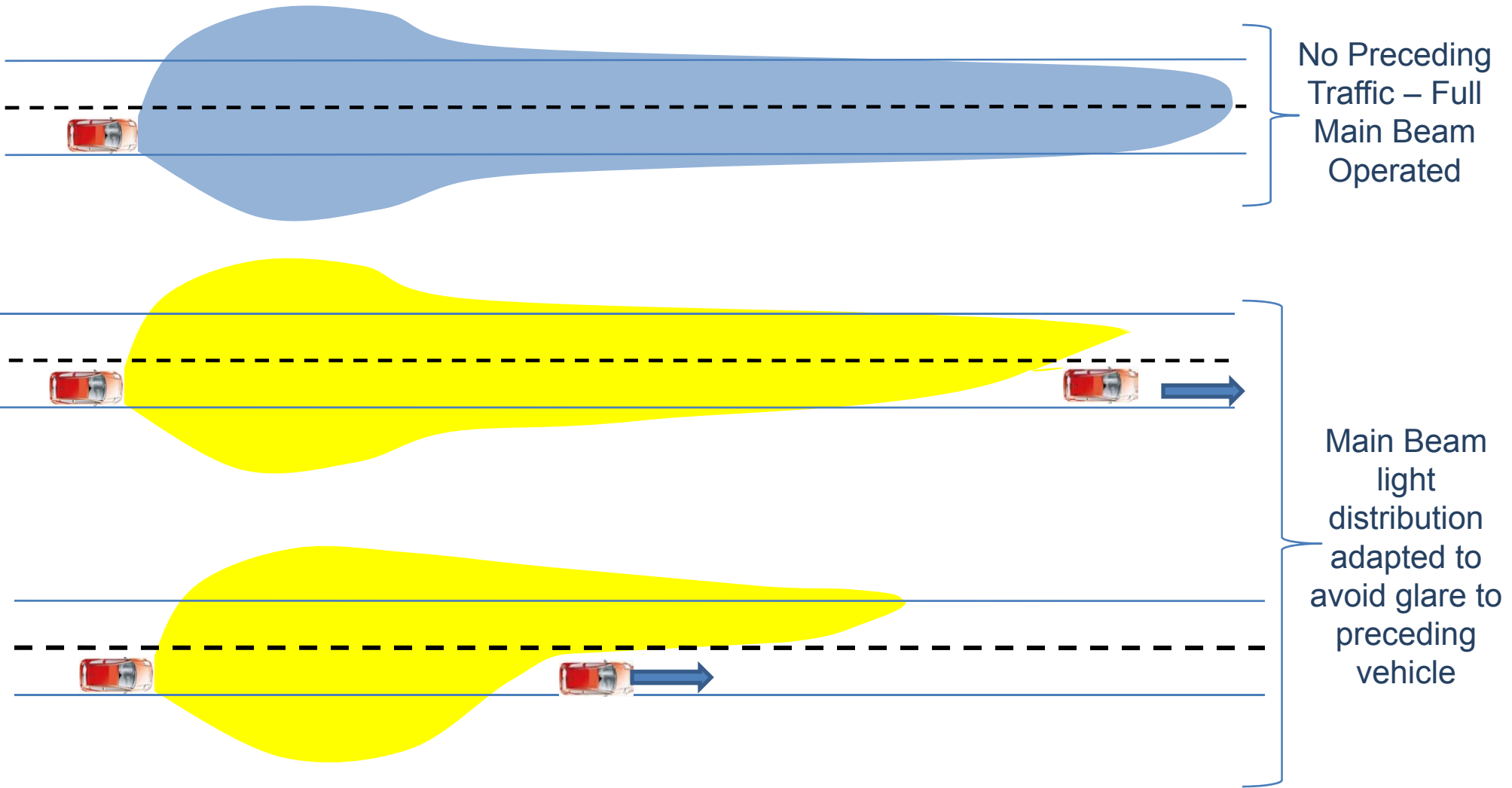
Opposing Traffic



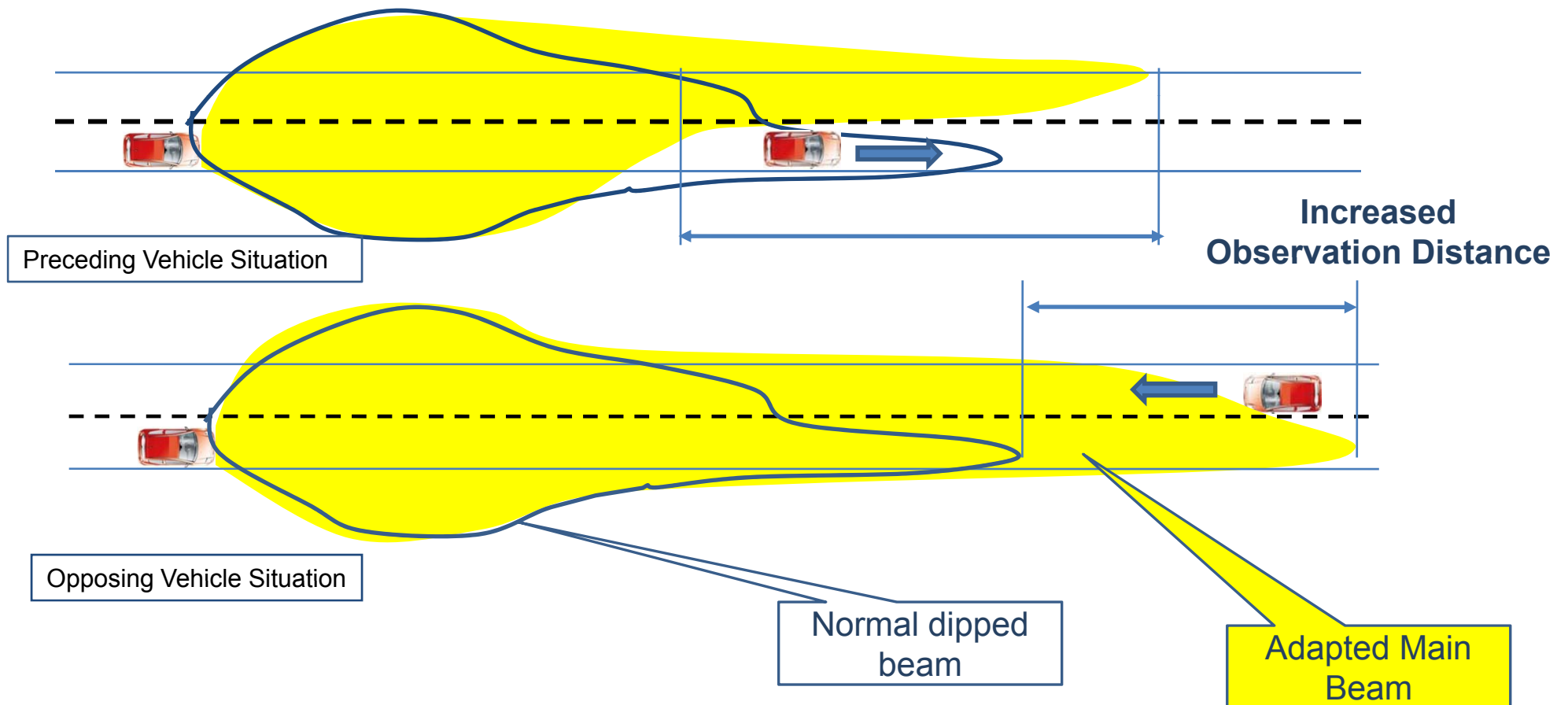


The Solution

Preceding Traffic



The system evaluates the road scene ahead of the vehicle and automatically adapts the light distribution according to the position of the preceding and oncoming traffic.





The Safety Benefit

This is a driver **assistance** system.

The driver remains responsible for deciding when it is appropriate to operate the main beam



Improvement of the observation distance to:

- Reduce driver fatigue
- Enhance the chances of detecting pedestrians and other hazards
- Avoid discomfort to other drivers



Demonstration of prototype systems in the parking garage.

- Simulator to demonstrate the interaction of the sensor system and the headlamp
- Live prototype system installed on a vehicle

Feedback

Input from GRE experts to assist GTB to develop proposals to amend Regulations.



Thank you for your attention

*Your comments
will be greatly appreciated*