

Informal document No. WP.29-146-21
146th WP.29, 11-14 November 2008,
agenda item 3.5.3.)

AFS Main Beam (Driving Beam) Improvements

Presentation to WP29 - 146th Session
November 2008

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

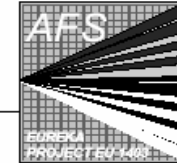
GTB considers that such a system can be introduced into ECE regulations by amendments to Regulations Nos. 48 and 123.

GTB wishes to clarify the current provisions to avoid differing interpretations 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

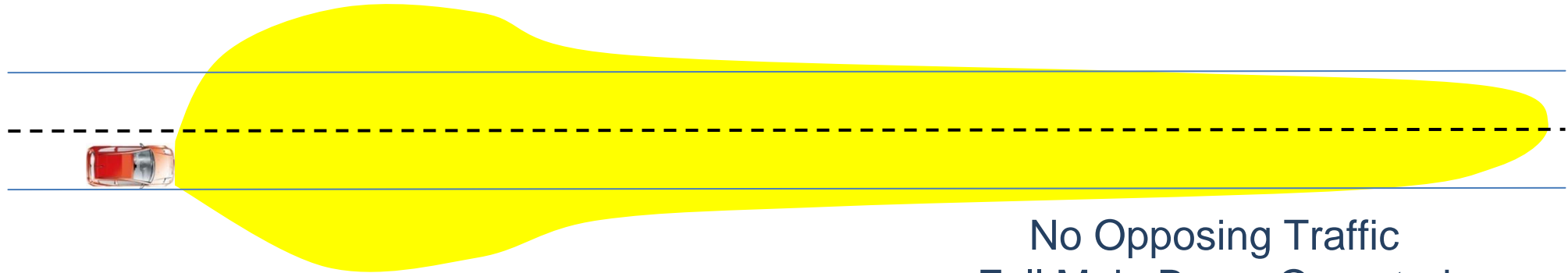
The AFS dipped beam does not completely solve the problem of providing sufficient forward illumination.

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

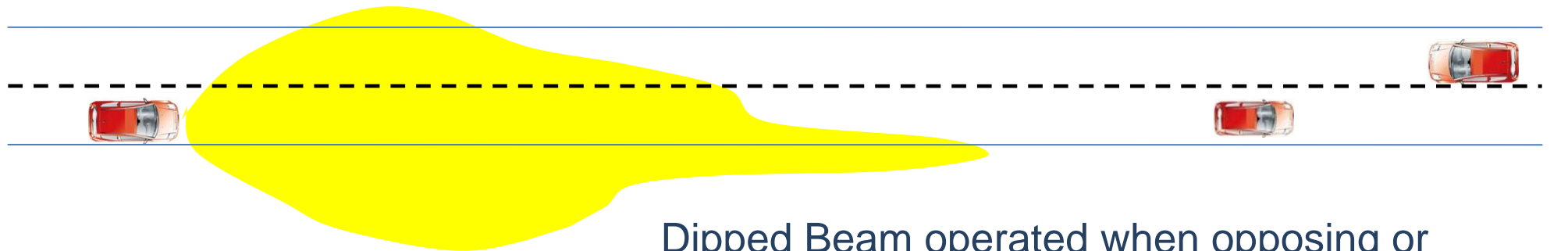
How to increase viewing distance without causing discomfort to other road users?

- 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



No Opposing Traffic
Full Main Beam Operated



Dipped Beam operated when opposing or preceding vehicles are present.

Frequently drivers operate the dipped beam earlier than necessary

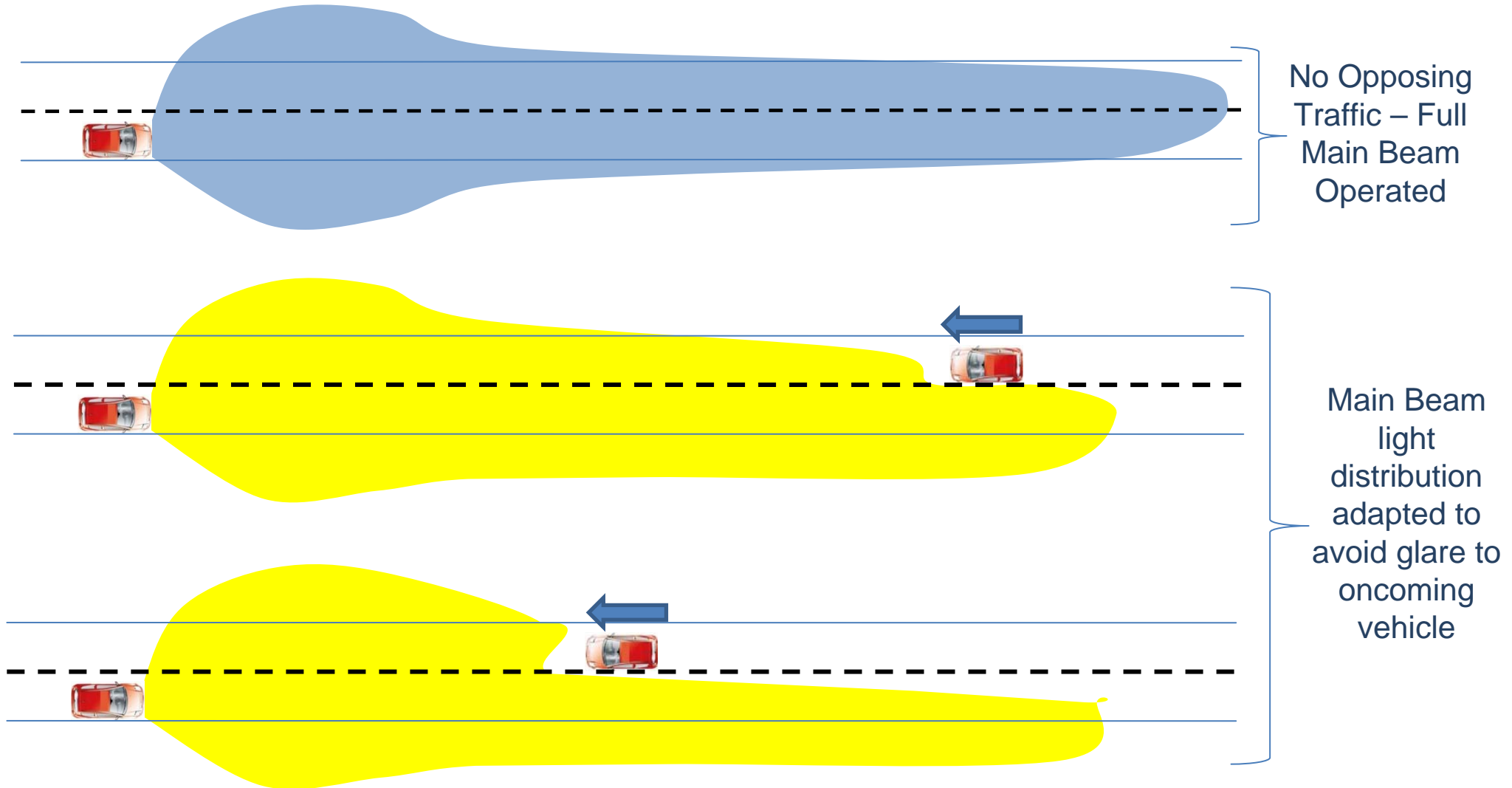
The Adaptive Driving Beam

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.

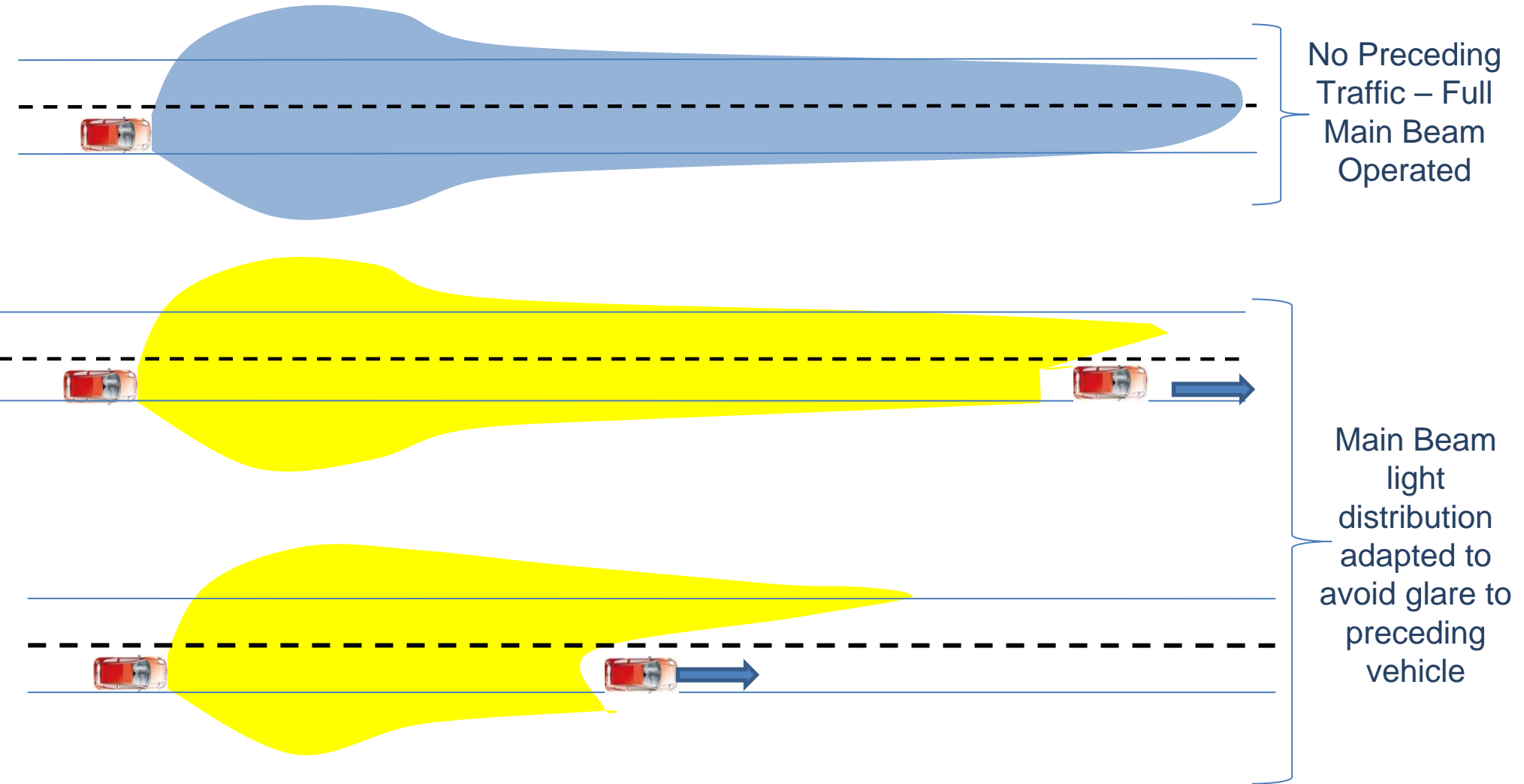
The Solution

Opposing Traffic



The Solution

Preceding Traffic



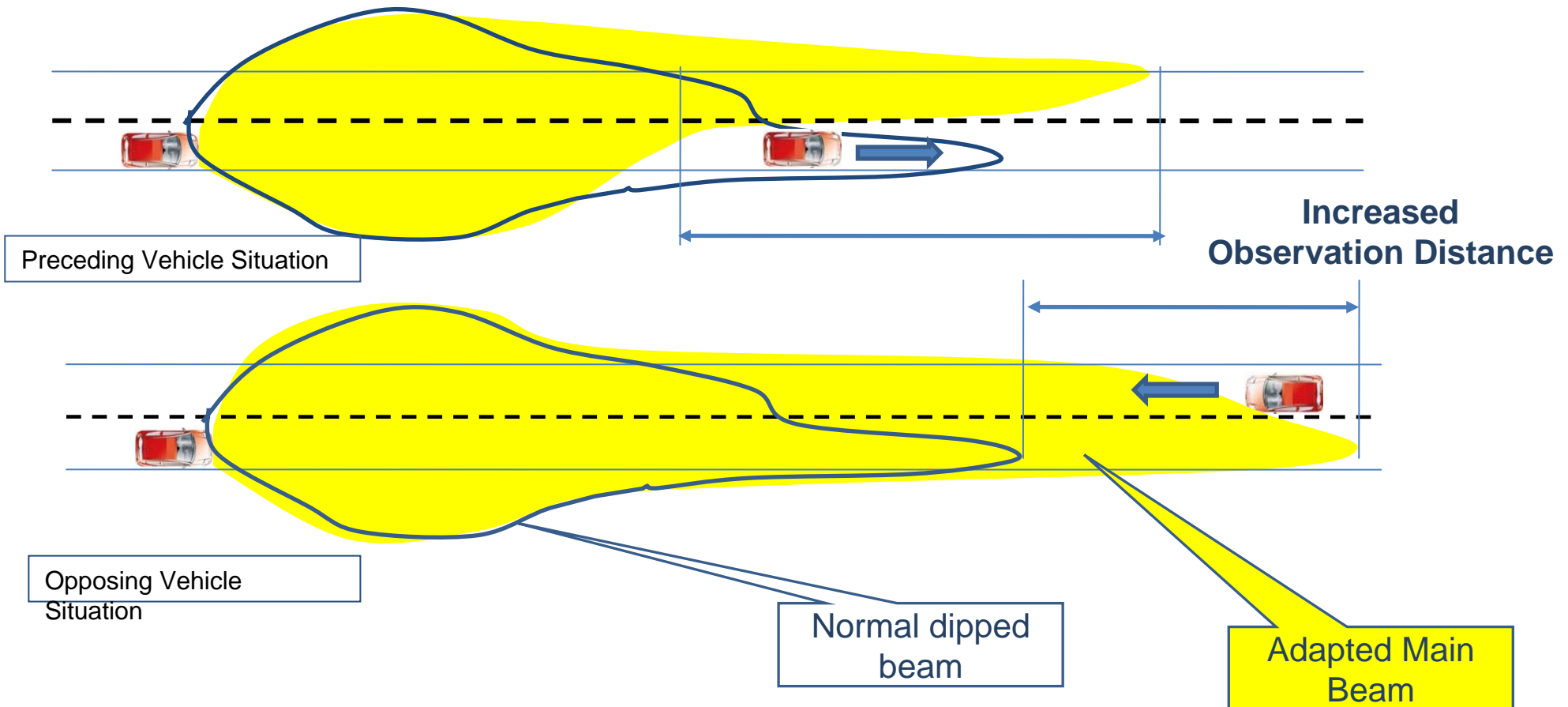
VIDEO 1

VIDEO 2



The Solution

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

Introduction Programme

GTB taskforce established

Prototype systems demonstrated to GRE in October 2008

Feedback from GRE experts

Proposals for amendments to ECE R48 and R123 expected to be approved by GTB in May 2009

Proposals expected to be introduced to GRE in October 2009

Thank you for your attention

*Your comments
will be greatly appreciated*