



## Enhancing the Visibility of Emergency Vehicles at Intersections

Establishment of a new, regulation-compliant lighting system architecture based on directional warning lights (ECE R65).

**Customer/Partner:** Bavarian Red Cross, Ambulanz Mobile GmbH

**Industry:** Emergency services, automotive systems engineering, ECE R65

### Task:

Emergency personnel repeatedly reported critical visibility deficits when entering intersections, particularly when other road users were approaching from the side. Existing solutions were unable to adequately address the issue, as directional warning lights are not permitted by regulation to operate laterally on the vehicle.

### My Contribution:

- Identification of a systematic safety issue arising from real operational use.
- Development and implementation of a regulation-compliant system solution based on existing components.

### The challenge was to:

- Improve lateral visibility while complying with regulatory requirements (ECE R65).
- Use exclusively approved standard products.
- Generate the light intensity values and beam angles required by the standard.



### My contribution to the solution and its success:

- Systematic interpretation of regulatory requirements (ECE R65)
- Derivation of light characteristics of a "half beacon" (270° overall effect).
- Coordination and control between the user (emergency services), body manufacturer, and technical implementation.
- Geometric integration while maintaining defined emission angles, through the development of customised installation solutions for the optimal alignment of the light modules.
- Independent prototype implementation (CAD & 3D printing), design and manufacture of shell components with defined installation angles for integration into the vehicle contour without safety-critical edges.



### Result / Impact:

- Significantly improved visibility of emergency vehicles at intersections.
- Regulation-compliant implementation without additional lighting classes.
- The concept was implemented in numerous emergency vehicles and further adopted across the market.
- Established as state of the art within the North Rhine-Westphalia police forces.
- Transfer of the concept into emergency vehicle engineering and sustainable market penetration.

