



MCA Awards 2018 Winner

Social & Environmental Value Arup with Transport for London

In 2013, collisions across Europe involving HGVs killed or seriously injured 5,123 people. Within London over the past three years, HGVs have been involved in 20% of pedestrian and over 70% of cyclist fatalities, despite only accounting for 4% of road miles. As the capital continues to grow, the trend in cycling and pedestrian casualties from HGV collisions looks set in one direction. Unless the fundamental design flaw behind many of these accidents is addressed.

Driver blindspots are known to be a contributing factor in fatal collisions involving HGVs. Attempts have been made in recent years to reduce or eliminate these blindspots with larger mirrors, cameras and retrofitted safety equipment. But there has been little or no action to address the real issue: the design of HGV cabs.

TfL specifically wanted to know more about the relationships between HGV cab design, drivers' cognitive reactions and collisions with vulnerable road users (VRUs), to discover how design changes might help reduce casualties. Arup was commissioned to undertake the research project with UoL, whose Perception-Action-Cognition Lab (PACLab) leads the field of psychological research into driver behaviour.

The research provided cast-iron evidence that traditional HGV design, where the cab is elevated from the road, is more dangerous to pedestrians and cyclists:

- Looking straight through a window and directly viewing a VRU resulted in a 0.7 second quicker reaction time
- A driver travelling at 15mph (London average 14.6mph) would need an extra 4.7m to stop when viewing a pedestrian indirectly; enough to cause a fatality
- When a cognitive load was added (simulating every day driver distractions), collisions with a VRU when in a low-entry cab, and larger window, were 40% lower.

The findings provided the scientific foundation for the world's first Direct Vision Standard (DVS) for HGVs. This proposes a star system that rates HGVs on the driver's ability to see pedestrians and cyclists through their windows, as opposed to indirectly via mirrors or cameras. Under the TfL proposal, only HGVs with a three-star rating or above will be allowed to operate in London by 2024. The European Commission also received the findings well and are currently using these to inform future regulatory changes to cab design.



MCA Awards 2018 Winner

Social & Environmental Value
Arup with Transport for London

A thorough cost-benefit analysis for mandating HGV Direct Vision requirements in the European Union was undertaken and revealed between 16,160 and 65,500 VRU casualties can be avoided by Direct Vision minimum standards improvements, between 2022 and 2048. These numbers of casualties equate to a total economic benefit to society of €1.1bn and €4bn respectively (present values, 2016).

Arup has been instrumental in delivering landmark research, assembling an expert team, building trust with the client and with stakeholders, redefining the scope of the study and ensuring the validity of the final research findings – findings that could help to bring long-term benefits for road user safety, in London, Europe and beyond.