GLARE FROM ROAD VEHICLE LIGHTING - FAQs

Set 1 – Relating directly to TRL's report PPR2069

Q1: Why do so many drivers complain that today's headlamps are dazzling? Are they really brighter than before, or are people just more sensitive?
A: Drivers aren't imagining it. There is evidence that modern lights are brighter. At the same time, individual factors such as increasing age of drivers and diseases of the eye do make people more sensitive, so it's likely a combination of both. What this research shows, from real driving, is that these and other factors like the geometry of the road play a role.

Q2: Your report says more than half of drivers have cut down on night-time driving because of glare (or would if they could). That sounds shocking — how serious is this as a road safety issue?
A: It's a significant issue in itself. If people avoid driving at night because they don't feel safe, it restricts their mobility and independence. And for those who do drive, glare can interfere with vision and driving reactions. While data on glare directly causing road collisions is difficult to find, it is self-evident that we should ensure drivers can see when driving.

Q3: Older drivers often say they find headlamps unbearable — is this mainly an age problem?
A: Ageing eyes are more sensitive to glare, so older drivers are certainly more affected. But our survey showed concerns across all age groups. This isn't just an issue for pensioners, it's something most drivers notice.

Q4. Do women drivers suffer more from dazzling vehicle lights?
A: Our survey showed that women are more likely to report being affected than men and there is other evidence that females are more susceptible. The practical research task didn't include this variable directly so we need to look into that in future work.

Q5: You measured glare using a special car and cameras — can you explain in simple terms what you found?
A: We drove a car fitted with specialist cameras and sensors to measure how bright lights appeared at the driver's eye level. We found that as brightness in the scene increased, glare was more likely. It was also more likely if the camera car was going uphill, or around aright hand bend. Finally some specific locations were associated with a higher chance of glare being experienced.

Q6: Is the problem worse with certain types of headlamp, such as LEDs or those bright blue-white ones?
A: The data suggest that LED and whiter headlamps may be linked to glare. Drivers told us in the survey that they find whiter light harder to cope with for example. Larger vehicles like SUVs may also make it worse because the lights are positioned

higher up. However, these findings need confirming in further work designed to test them directly.

Q7: Headlamps seem to be of many different styles and illuminate the road at odd angles. Does this play a part in glare?

A: The footprint made by headlamps should cover a minimum area so that drivers can see the road ahead. In practice, the size and shape of the footprint is likely to vary. To understand this better needs extra work.

Q8: Are larger, taller vehicles the real villains here?

A: We need to be cautious because more research is needed, but the evidence points towards vehicle size and headlamp technology (LEDs) potentially being part of the problem. SUVs and taller cars put their headlamps closer to the eye line of oncoming drivers, which may increase the likelihood of glare.

Q9: Does the design of our roads — hills, bends, speed bumps — make glare worse than it needs to be?

A: We found that glare was more likely on hills or bends, where the throw of the headlamps is more likely to catch a driver directly in the eyes. Road geometry plays a big role, but this is not something we can necessarily say is 'designed'. Many roads are just the roads we have. This information could help though with the design of roads in the future though, and we could perhaps warn drivers of the situations in which glare is more likely.

Q10: Is this something the Department for Transport should be fixing with tougher regulations?

A: Regulations today focus on measuring headlamp performance in controlled tests, but they don't always reflect what drivers experience in the real world. Our findings suggest there's a case for updating the rules, so they consider glare from the driver's perspective, not just the headlamp's technical output.

Q11: Car makers argue that new headlamps improve safety because they light the road better. Is glare the price we have to pay?

A: Brighter lights do help drivers see further, but safety must balance visibility for one driver with comfort and safety for everyone else.

Q12: What can drivers do right now if they're dazzled on the roads?

A: The best advice is to avoid looking directly at oncoming headlamps, keep windscreens clean to reduce scatter, and make sure their own headlamps are properly aligned. Regular eye tests are also important, and keeping spectacles clean, especially if glare seems to be getting worse.

Q13: Do you think we'll see new regulations or design standards in the next few years because of this research?

A: I think this study is the start of a bigger conversation. Public concern is growing, and

the evidence is now stronger in pointing to the complexity of the issue. This could help inform renewed attention on headlamp standards in the coming years.

Q14: Your report talks about 'luminance' rather than 'luminous intensity'. What's the difference — and why should drivers care?

A: Luminous intensity measures how much light is coming out of a headlamp in a particular direction — it's what manufacturers currently test against regulations. What we need to measure instead is how bright that light appears to the human eye once it reaches you. So, a headlamp can pass the current tests but still dazzle drivers in some situations. This is why it might be more useful if regulations could reflect what people actually see on the road.

Set 2 – Based on wider range of issues

Q15: Opticians say more patients have given up night driving because of dazzle. Could this become a public health issue?

A: Absolutely. If people can't drive after dark, they may be relatively cut off from work, social events, or even basic errands. That can lead to loneliness, reduced independence, and worse health.

Q16: Is it true that glare can cause headaches and migraines, not just momentary blindness?

A: There is some evidence that prolonged exposure to bright, blue-rich LED headlamps can trigger headaches and migraines in some people.

Q17: Are older drivers facing social exclusion because of headlamps?

A: Drivers of all ages in our survey said they avoid driving at night. If glare forces them to give up altogether, it risks cutting them off from family, friends, and essential services.

Q18: Why are LED headlamps worse than halogen ones?

A: LEDs are brighter, more concentrated, and often emit more blue light. The human eye struggles more with blue wavelengths at night, so these lights feel harsher.

Q19: Could LEDs damage eyesight in the long term, not just temporarily blind drivers?

A: There's no firm evidence of permanent damage from car headlamps at normal distances.

Q20: At what point does glare become a safety issue?

A: It is very challenging to design a trial that makes a distinction between the temporary discomfort caused by glare, and measurable impairment to a driver – especially on-road; it would need further investigation likely in multiple settings, involving not just measuring the impact of brightness subjectively, but through collision investigation and controlled lab tests.

Q21: How can rules from 1989 still govern headlamps when LEDs didn't even exist back then?

A: DfT would need to be consulted on this. TRL's research was focused on finding information that can help inform any changes.

Q22: Should MOT tests be tougher on poorly adjusted or aftermarket LED bulbs?

A: MOT tests are designed to ensure that all aspects of vehicles are aligned with legal requirements. Any evidence from the current work could be used to change what those legal requirements are, which would then have a knock-on impact on what MOT tests cover.

Q23: If the US says up to 15% of crashes are caused by glare, why won't the UK act?

A: The UK government relies on official statistics that don't always capture all the factors at play. People swerving, slowing down, or avoiding night driving entirely don't always show up in collision data. That doesn't mean the problem isn't real, and this research is an example of the UK government acting rationally – to try and understand the problem so that any changes are informed by evidence, not just opinions.

Q24: Are cyclists and pedestrians just as vulnerable?

A: They could be - although they are often higher in the scene meaning headlamp beams may not shine in their eye level as much.

Q25: Are SUVs the main culprits?

A: They may play a part. The headlamps sit higher up, meaning they may be more likely to dazzle. More research is needed though to understand the scale of this issue, with our data only being suggestive.

Q26: Do modern 'matrix' headlamps make things better or worse?

A: In theory, they should help by automatically dipping beams. But in practice, they don't always anticipate bends, hills or speed bumps the way a human can. That means on rural roads or country lanes, drivers can still get dazzled.

Q27: How realistic is it to expect car makers to redesign headlamps?

A: It is realistic to expect vehicle manufacturers to work to the regulations, and to what their customers feed back to them

Q28: What happens if nothing changes?

A: We might expect the level of complaints about this issue to continue. Our work suggests that there are things that can be done to improve the situation, and it is important that this evidence and that from future work feeds into decisions.