

Dear [REDACTED]

Thank you for writing to TRL and enclosing a copy of the Regulation 28 report by Lorraine Harris, Area Coroner, East Riding of Yorkshire and City of Kingston Upon Hull. The report detailed the investigation into the death of Donald Frederick Hooker, which was concluded at the end of the inquest on 20th December 2022.

Please accept my sincere apologies that we are replying two days after the deadline – I would be most grateful if you could acknowledge receipt of this email .

Regarding the matters of concern, namely:

- (1) This is the second matter that has been referred to my jurisdiction in recent months where a motorcyclist has lost his helmet during a collision. During evidence it was adduced that, although it is not a common occurrence, it is certainly not unusual for a motorcyclist's helmet to come off or to rotate during a collision.
- (2) The Forensic Collision Investigator was unable to explain the reason for Dr Hooker's crash helmet coming off. The chin strap was in place.
- (3) The Forensic Collision Investigator indicated that she had been unable to find any research or scientific data on why such incidents occur.
- (4) It was adduced in evidence that a kite safety mark may be checked by an instructor during motor cycle courses/tests but there did not appear to be a known check for ensuring a person has the correct size motorcycle helmet.
- (5) It was acknowledged that many people may now purchase motorcycle helmets over the internet and the sizing and fitting may not be appropriate.
- (6) I am concerned that without knowledge of why such incidents are occurring, or appropriate education of the riders, that more deaths may occur.

TRL has been instrumental in supporting the Department for Transport to establish SHARP (<https://sharp.dft.gov.uk/>). SHARP is the UK government's ratings scheme for motorcycle helmets and provides consumers with objective information on their safety performance.

TRL has undertaken research on attitudes and motivations of motorcyclists towards helmets and protective equipment (<https://www.trl.co.uk/publications/ppr442>). In summary, "Passion, performance, practicality: motorcyclists' motivations and attitudes to safety - motorcycle safety research project", found that based on self-reported decisions, with respect to choice of bike, helmet, safety gear and avoiding fatigue, there was a wide variety of risk perception. Motorcyclists are not a homogeneous group and different safety interventions are required to influence their behaviour.

In 2018, TRL has conducted our own research into helmet loss, or more specifically our "Helmet Retention Report" (<https://www.trl.co.uk/publications/helmet-retention-report>). This self-funded study had two specific aims. The first

was to see whether the existing test requirements in ECE Reg 22.05 relating to dynamic helmet retention (the roll test) are realistically based and how well existing helmet designs comply with these tests when new and used. The second was to identify the mechanism of helmet loss and to quantify the importance of relevant factors such as inertia effects, head geometry and flesh compliance and misuse.

Key extracts from this report are:

- Statistical data suggested that helmet loss occurs in about 5% of reported collisions involving injury.
- The current form of statutory roll off testing involves the helmet being drawn forwards on an arc that causes the helmet chin bar to hook beneath the user's chin in a manner that would not be possible in a collision, and is therefore not representative of real world collisions.
- Equally the tests include the retention straps being tightened below the test headform to a level of tightness that a user survey has suggested is inappropriate to real world conditions. A more representative level of tightness allows roll off at lower loads.
- Many users are wearing helmets that are reportedly the wrong size for their heads
- The mechanisms for helmet loss are still not fully understood. The involvement of the sternum and rotation of the neck are believed to be significant factors, which could be tested in the future.

To my knowledge this is the latest research on the subject. In my opinion more work should now be done, especially as we see a changing demographic of motorcycle users, for example with increasing numbers of fast-food and other delivery rider services, potentially increasing the likelihood for future incidents involving helmet loss.

I have spoken with colleagues from the Institute of Traffic Accident Investigators (ITAI) and colleagues at TRL, who raised the following questions with respect the case:

- What type of helmet was involved in the incident (make and model)?
- Is there an indication of how tightly the strap was fastened? A helmet should feel comfortable but fit snugly. A loose-fitting helmet may come off during an accident, however how, after an accident, do you determine if it was fitting snugly
- How old was the helmet?
- Where was the helmet purchased? Normally when purchased at a reputable dealer, the seller would provide fitting advice and ensure it fits correctly, however this does not apply when purchased at other establishments or via the internet.
- Chin strap maintenance could be an issue. Was there evidence of wear, had it stretched? These issues can only be determined during a forensic examination. This could mean that more awareness training for the attending police traffic officers and forensic examiners is required.
- This issue is likely to become more widespread with the introduction of electric bikes and e-scooters or even pedal cycles.

If you have further questions, or would like to arrange a call to discuss this further, please don't hesitate to contact me.

Kind regards,

[REDACTED]

[REDACTED]

Director, TRL Academy

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