

An 18-month study of damaged motorway tyres and tyre fragments by Bridgestone and Highways England has estimated that tyre punctures, underinflation and maintenance problems were the most significant causes of tyre failure



Reading the debris

Taken across the UK as a whole, tyres are a significant component of road safety. In total, 32 people were killed or seriously injured in motorway road traffic accidents in 2016 due to 'illegal, defective or underinflated tyres', according to Highways England's Casualty Report Appendix 2016.

During a recovery project that ran from 2016 to mid-2017, Highways England staff at four depots across the West Midlands supplied 1,035 pieces of tyre debris collected from the M1, M6, M40, M5 and M42 motorways. The samples, which were mostly tread strips and fragments, were analysed by a technical engineering team from tyre manufacturer Bridgestone. That team classified them into six types of damage.

Following punctures, which were the most common type of damage, about a quarter of failures were from causes "easily avoided with proper tyre husbandry", the authors note. One such example is over-deflection, a failure mode caused by poor pressure maintenance, and tyres being run flat.

Where experts could not determine the primary cause of tyre failure, they erred on the side of caution, marking the damage as indeterminate; that category therefore is the third largest of all.

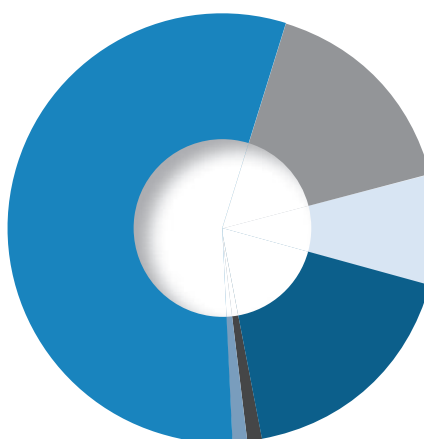
The study also found that 57% of the samples collected were from new tyres, and 35% retreads (although 7.8% could not be distinguished). As this roughly matches the 65:35 new/retread split of European tyre sales, the authors conclude that retreads were no more likely to fail than new tyres. They rebutted the common assumption that tyre debris lying on the road is rubber

that has sloughed off of retreaded tyres.

The authors also advised in favour of fitment of tyre pressure monitoring systems (TPMS), which they argue would help detect penetrations and deflations (see pp15-16).

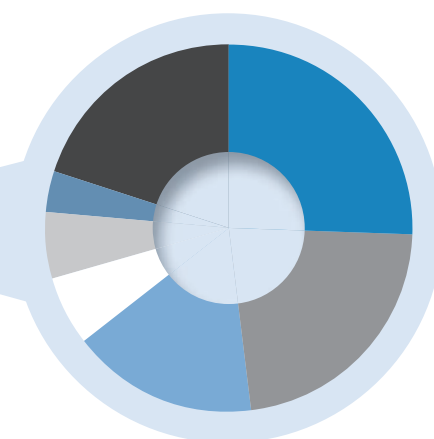
Bridgestone is participating in the IRTE Skills Challenge this month, which helps foster good maintenance practices among bus and coach technicians. [TE](#)

REASON FOR FAILURE



■ Road hazard	55.7%
■ Over-deflection	17.9%
■ Indeterminate	16.1%
■ Maintenance	8.1%
■ Heat	1.1%
■ Manufacturing defect	1.1%

MAINTENANCE PROBLEMS



■ Worn through shoulder	25%
■ Poor repair	22.6%
■ Over-age	16.7%
□ Brakeflat	6%
■ String repair	6%
■ Broken wheel	3.6%
■ Others	20.1%