

Trains to be 'bomb proofed' as study identifies simple design changes that could lessen impact of terrorist attack

Scientists have devised a set of key changes to train coaches that could contain an explosive blast and reduce the amount of flying debris in a carriage

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Train carriages could soon be built to give passengers better protection against bomb explosions following a three-year study that identified simple design changes to lessen the impact of a terrorist attack.

Scientists have devised a set of key changes to train coaches that could contain an explosive blast and reduce the amount of flying debris in a carriage, which can injure passengers as well as hinder the emergency services.

After a three-year EU-funded study into the problem, which included test explosions on a decommissioned metro carriage, researchers have produced a check-list of safety improvements that could be incorporated into new passenger trains within the next decade, they said.

The research was commissioned in the aftermath of the Madrid bombings in 2005 and the 7/7 London Underground bombings a year later. The results will be passed on to train manufacturers and could be integrated into national and European safety standards, said Conor O'Neil of Newcastle University.

Changing the features of existing carriages and incorporating new technology and materials rather than a total re-design could make relatively simple and cost-effective improvements to passenger safety in the event of an explosion, Dr O'Neil said.

"Preventing flying objects is the key. Tethering ceiling panels reduced the risk of fatalities and injury from flying shrapnel and also meant the gangways were kept relatively clear of debris, allowing emergency staff quick access to the injured," Dr O'Neil said.

"The window coating we developed was also incredibly effective. Without it the windows are blown outwards, putting anyone outside, such as those standing on a platform, at risk from flying glass," he said.

"A bomb on a train is always going to be devastating but what we are trying to do is find a way in which the vehicle itself can help to mitigate the impact of an attack. These are all low-cost, simple solutions that can be put on existing trains which could not only save lives but also reduce the attractiveness of our railways for potential terrorist attacks," he added.