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Solved: the mystery of those traffic tailbacks

OLIVIER VERGNAULT

THE mystery of how lengthy traffic jams can build up with no apparent cause has been solved, according to mathematicians.

A single tap on the brakes is enough to set off a long tailback, says a team led by a University of Exeter scientist which developed a model to show just how major delays can occur on our roads.

Many traffic jams leave drivers baffled as they finally reach the end of a tailback to find no visible cause for their delay.

According to the mathematicians, from Exeter, Bristol and Budapest, motorists who react suddenly to unexpected events by applying the brakes cause a "ripple effect" to spread through traffic, with more and more drivers braking, until traffic grinds to halt.

The team's finding on what is described as a "backward travelling wave" was published in the leading academic journal, Proceedings of the Royal Society.

The team, led by Dr Gábor Orosz of the University of Exeter, developed a model to show the impact of unexpected events such as a lorry pulling out of its lane on a dual carriageway.

The model revealed that a car slowing down below a critical speed when reacting to such an event, forces the car behind to slow down still further, and so on and so forth, until traffic finally grinds to a halt several miles behind the original slowdown.

The team's model shows the backway travelling wave of braking motorists is a typical scenario on a busy road.

Dr Orosz said: "As many of us prepare to travel long distances to see family and friends over Christmas, we're likely to experience the frustration of getting stuck in a traffic jam that seems to have no cause.

"Our model shows that overreaction of a single driver can have enormous impact on the rest of the traffic, leading to massive delays."

Drivers and policy-makers have not

previously known why jams like this occur, though many have put it down to the sheer volume of traffic.

Dr Orosz said it was important to keep the traffic flow smoothly.

He added: "When you tap your brake, the traffic may come to a full standstill several miles behind you.

"It really matters how hard you brake – a slight braking from a driver who has identified a problem early will allow the traffic flow to remain smooth.

"Heavier braking, usually caused by a driver reacting late to a problem, can affect traffic flow for many miles."

The research team plans to develop a model for cars equipped with new electronic devices, which could cut down on overbraking as a result of slow reactions.