On a perfect day, beware the vortex

By Edmund Tadros and Deborah Smith
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Forget the noise and the vibrations. If you live on a Sydney Airport flight path, it's a perfectly still day that should cause concern.

That's because it is only on such a calm day that a swirling mass of air trailing behind a plane, or vortex, might have the power to damage a home - like the one that ripped about 100 tiles off the roof of a Sydenham house on Saturday.

Many assumed this to be an unusual event, but it turns out to be a phenomenon.

Airservices Australia, the national air traffic control organisation, revealed yesterday that it receives three to four complaints every year about damage caused to homes by the air turbulence of aircraft taking off and landing in Sydney. It has agreed to pay for the damage to the roof of Max and Cassandra Baron's home in Unwins Bridge Road, which a builder has put at $10,000 to $15,000.

Planes can travel as close to 250 metres from rooftops near the airport. "It is like a zipper effect," says Richard Dudley, spokesman for Airservices Australia, explaining how the tiles might have been sucked from the house.

Peter Gibbens, an aeronautical engineer at the University of Sydney, said the strongest vortices were produced when large planes travelled very slowly.

Once off the ground, all aircraft produce air turbulence in their wake. Lower pressure above the wings and higher pressure below them cause the air behind to swirl in a vortex. The vortices from large planes sink at about 100 metres a minute. Winds will destroy the vortices, but on a very still day they may keep sinking to 60 metres above ground, at which point they move horizontally at about four kilometres an hour, retaining the same force. In this case, it seems, enough force to wreck the Barons' roof.

Dr Gibbens said the greatest risk of damage to any houses below was likely to be on descent, when a plane was coming in slowly at a low angle, rather than during a steep takeoff.

"But the weather would have to be incredibly calm for it to happen," he said.

Vortices weakened as they sank to the ground. "And a little bit of wind will destroy them."

The characteristic pattern of tile damage from aircraft wake turbulence could be due to something as simple as builders tending to nail down every second row of tiles, instead of every row, he said.

If a gust from a plane lifted one house tile up there would tend to be a "domino effect" with overlapping tiles also lifted.

Mr Dudley said he was unaware of any complaints about people being hurt by flying tiles.

"Of course we're concerned," he said. "But unfortunately we have little control over being able to predict when these events will occur or how serious they are likely to be."

The Barons said neighbours reported seeing a low-flying plane and hearing a mighty gust of wind about 2pm on Saturday. Then the tiles came crashing down from the roof into a neighbour's lane.

The roof was inspected yesterday by their insurance company and an investigator of Airservices Australia.

Mr Dudley said the case was one of the more severe the investigator had seen.

"The average payout is probably around $1000," he said. Other houses near the Barons' have also suffered damage.

"At around the location of Mr Baron's house, the plane would be around 800 to 1000 feet above the house, depending on the type of aircraft and how heavily laden it is," Mr Dudley said.

The power of vortices can be dangerous to aircraft, too. Pilots are taught to avoid taking off too soon after other planes, in case they are caught in a vortex.

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