Is the FAA Missing the Mark to Reduce Airplane Near-Misses?

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American Airlines' flight attendants say they're prepared to strike the airline without a new labor contract. Joe Raedle/Getty Images

The Federal Aviation Administration (FAA) needs to reduce the risk of aircraft near-collisions (or "close calls") on runways at airports around the country. They recently announced awards totaling over $121 million at eight airports, following an announcement back in May 2023 of over $100 million invested at 12 airports. The FAA is holding runway safety meetings at 90 airports around the country to get more eyeballs on the situation at each location. A U.S. government watchdog is in place to further scrutinize all the FAA's efforts in this area.

The goal of reducing airport runway risks is a good one. The problem is that the FAA may be missing the mark on what needs to be done to make air travel safer moving forward.

Commercial air travel has been remarkably safe over the past decade. In spite of this, there have been several "close calls" this year that suggest that an airplane collision on a runway is not only possible but may occur at some point in the foreseeable future.

The FAA is in a no-win situation: It is understaffed, with antiquated computer systems to track airplanes and keep air travel safe. At the same time, air travel volume is approaching an all-time high, as evidenced by the number of passengers flying. This creates an environment of increased risk that is displaying itself by near-misses on runways.

The FAA defines "runway incursions" as incidents in which an airplane is incorrectly positioned, which could lead to a collision. The good news is that most runway incursions are benign. However, a few could lead to catastrophic accidents. The number of runway incursions in fiscal year 2022 was 1,730, just under five per day. Fiscal year 2023 looks like it will have a similar number.

For example, in January 2023, a Delta flight had to abort its takeoff when an American flight crossed onto its runway. Only the quick action of air traffic controllers prevented a collision, with the airplanes getting within one-third of a mile of each other. To put this into perspective, for an airplane traveling at 90 miles per hour, this distance would be traversed in around 13 seconds.

The good thing about the new runway investments is that they are designed to make ground travel around runways at these airports safer, focusing on simplifying their movement pathways.

However, the summary of the FAA Aviation Safety Summit, which brought 200 safety leaders together last March in Washington, D.C., made no mention of a redesign of how air traffic is managed at and around airports. More importantly, artificial intelligence (AI) was not mentioned as a tool to remake air traffic control with the goal of enhancing runway and air control safety.

AI is most effective when it has data to learn from and can provide input based on such learning. A review of some of the most serious runway incursions over the past year shows that they typically involved airplanes crossing active runways or airplanes scheduled for takeoff and landing on the same runway at the same time.

Such incursions were likely due to human error, either on the part of flight crews or air traffic control. AI could reduce such errors with early warning alerts, or

better yet, ensure that conflicting instructions are impossible to be relayed. Much like how autonomous vehicles provide drivers with early warning of an impending crash, similar mechanisms could be deployed as part of air traffic control communication systems so that impending incursions could be avoided.

The good news is that with tens of thousands of flights each day handled by air traffic controllers, there are less than five runway incursions each day. This is an impressive record of safety that is largely due to the diligence and skill of air traffic controllers, who get far less credit than they deserve. Yet, the fact that any incursions continue means that over a long enough period of time, a bad outcome is likely to occur, and an avoidable accident will likely happen.

The current air traffic system has been pushed to its limits. Some critics would argue that it is already beyond what it can safely handle, with runway incursions evidence of this state of affairs. Instead of incrementally adjusting to the current path, AI provides an avenue to remake and rework operations so that runway incursions can be reduced, with the goal of zero runway incursion. More realistically, even reducing such incursions by 20% would mean that over 300 fewer airplanes, and thousands of passengers, would not be put at risk this year.

Waiting for the next runway incursion to become the next airplane accident is bad policy. The FAA understands this, based on their Safety Call to Action. That is why AI may provide a pathway to make air travel safer for all.

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