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# The Invisible 200-Pound Man

*If airlines knew your weight, air travel would be much safer*

Most of us know that the weight of the average American is on the rise. The Centers for Disease Control made news this month when it announced obesity soon would overtake tobacco as the leading preventable cause of death.

But how many of us have looked around a crowded airline cabin and wondered whether the Federal Aviation Administration (FAA) has noticed it, too? According to a recent FAA survey, the extra pounds we weigh add up to an invisible extra “passenger” for every 10 people on board the airplane.

The FAA’s bureaucratic cousin, the National Transportation Safety Board (NTSB) has noticed. In reviewing a January 2003 US Airways accident in North Carolina that killed 21 people, the NTSB called upon the FAA to review its methods of weight and balance calculation for commercial aircraft.

Some have gone so far as to say the airlines should weigh individual passengers before they board a flight. For the sake of air safety, this is a life-saving

idea that is long overdue.

A brief lesson in flight will help explain. Safe flight depends on a number of things, among them the proper balance of the forces of lift, thrust, weight and drag. Put too much weight in the rear of the airplane and the pilot may be unable to push the nose down far enough to maintain control. Think of a teeter-totter with a football player on one side, a toddler on the other. Similarly, if you were to switch the athlete and the youngster and put too much weight on the other side of the teeter-totter, or in the front of the aircraft, and you may exceed the ability of the pilot to raise the nose.

In short, with the plane loaded improperly, the crew may be unable to maintain controlled flight. The NTSB found that this sort of loading problem was a contributing factor to that US Airways accident.

And there’s another issue, something your high school physics teacher would have called a “moment arm.” If the football player in our example sits close to the fulcrum upon that the teeter-totter balances, he exerts a different force than he might if he sits at the very end, several feet away from that point. The same is true in an airplane. If our athlete sits over the wing – near the plane’s center of gravity – he exerts one force. But if he’s

in the very last row, he exerts a completely different one.

The smaller an airplane, the more critical small differences in weight and the location of weight become. That is, each pound of weight and each inch of distance make much more difference to the balance of a 10-seat commuter plane than they would to a 300-seat jumbo jet.

Given all that, if you were flying a plane, you probably would want to know not only how much each of your passengers weighed, but also the location where each was sitting. But the FAA doesn’t require the airlines to do that. Instead, each time you board an airplane, the airline assigns you an estimated weight, which the FAA had set at 180 pounds in the summer, 185 pounds in the winter. All those heavy coats and such. The force you exert on the plane – your own moment, depending on where you sit – is something of an estimate as well.

After the Jan. 8, 2003 US Airways accident, an FAA survey of actual passengers on 10-to-19-seat commuter planes discovered they weighed, on average, 21 pounds more than the estimate. Board 10 people at that weight, and the invisible 200-pound man is aboard.

Did the FAA order the airlines to start weighing passengers? No. It merely

increased the weight estimate for every passenger to 190 pounds in the summer, and 195 in the winter. The FAA is still relying on averages. And your safety is, too.

Admittedly, improper loading has not been identified as a primary cause for a large number of fatal air carrier accidents. We can wait for such an accident, which is what the FAA tends to do before mandating safety changes. That is why it’s known as “the tombstone agency.”

Or we can take advantage of technology that would allow airlines to know the actual weights of passengers. After scanning a boarding pass with a given seat location, passengers might step across a scale that would transmit the weight – without identification or embarrassment to the passenger – to the airline for use in pre-takeoff calculations. There have always been provisions for the weighing of checked baggage to assess excess baggage fees; it makes sense that the data should be captured and used for loading purposes as well.

Mother Nature – i.e., the law of physics – knows the “invisible man” is there. The FAA needs to find him – and his baggage – before it’s too late.

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