Tarmac Delay Rule May Punish Passengers as Well as Airlines

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When the airlines are good, they are very, very good: Last year, more than five million flights transported U.S. passengers to their destinations within fifteen minutes of their scheduled arrival time. The trip that took the Pilgrims sixty-six days on the *Mayflower* in 1620 now takes less than eight hours by plane – with ice cream, on-demand movies, and your choice of complimentary cocktails. You can fly from Detroit to Ft. Lauderdale for less than the cost of the gas to drive there. And let's not take safety for granted – in 2008, over 37,000 people died in car accidents in the U.S.; there were zero fatalities for the 650 million passengers who flew that year.

But when they are bad – well, "horrid" only begins to describe it. The stories are legend. On New Year's Day in 1999, passengers landing at the Detroit airport in the middle of a blizzard were met with chaos. Several flights were trapped on the tarmac; in the worst case, passengers sat for eight hours before finally being able to de-plane. In the so-called "Valentine's Day Massacre" of 2007, passengers spent more than six hours idling on the taxiways of New York's JFK airport, their planes queued up for departure slots that would never materialize. The longest delay in that case was over ten hours. And most recently, in August of 2009, forty-seven passengers spent the night on the tarmac of the Rochester, MN airport — trapped on a cramped regional jet without food, water, or fully-functioning lavatories, in sight of the terminal that they were not permitted to enter because of confusion over security regulations.

These extreme cases are so egregious that they have motivated the U.S. Department of Transportation to pass a new ruling. Effective April 29, 2010 the ruling allows the DOT to fine an airline up to $27,000 *per passenger* for any flight that is delayed on the tarmac for more than 3 hours. A single delayed flight could accrue more than $3 million dollars in fines.

As a frequent flier, and someone who has chronic health problems that often flare up when traveling, it's hard for me to disagree with the motivation behind this ruling. Even though rationally I recognize that the odds of experiencing one of these extreme events are very small (roughly one hundredth of one percent of flights in the last year have experienced a tarmac delay of three hours or more), the thought of being trapped on a crowded plane for hours and hours without food or water, inadequate lavatory facilities, and no chance to control my environment nonetheless literally gives me nightmares.

But as someone who studies the airline industry for a living, I find the ruling frustrating. Not because I don't recognize that there's a problem. Not because I don't think the airlines should be held responsible for cases such as those mentioned above. But because I don't think it's going to make things much better for passengers. If we really want to see change, it's not enough to punish the airlines when things go wrong – we have to find a way to keep them from going wrong in the first place. And this is no small task.

When things go wrong, it is human nature to look for someone to blame, and the airlines certainly deserve that blame some of the time. But things can easily go wrong in aviation even when an airline does everything right. Weather is the most obvious reason for this. And it doesn't even have to be *your* weather. If there's fog in San Francisco that delays a flight to Detroit, your Detroit flight to Ft. Lauderdale can be delayed as a result, because you have to wait for your aircraft to arrive. And you can experience a mechanical delay when there's nothing wrong with your plane. If there's a problem on the flight from La Guardia to Detroit, your flight to Ft. Lauderdale has to wait because it's bringing your pilot.

The challenge is that these flights all interconnect in one enormous, complex system. They share aircraft, crews, gates, runways, and corridors in the sky. When something goes wrong in one part of the system—whether it's as big as a thunderstorm shutting down a hub airport for hours or as small as a flight pushing back from the gate a few minutes late because of slow boarding – the effects can ripple throughout the entire system. The delayed aircraft from San Francisco to Detroit means the Detroit flight to Ft. Lauderdale flight is delayed, which in turn means that it occupies its departure gate longer than planned. Therefore the flight from Baltimore that's just landed in Detroit has to sit on the tarmac waiting to pull into this gate. When it finally does so, one passenger misses her connection while her seatmate makes his with minutes to spare… but his bags don't.

Of course, most people don't want to think about system complexity, they just want to get from A to B, safely and on time. And they most definitely don't want to sit on the tarmac for three hours in the process. The DOT ruling seems like a simple solution to this: fine the airlines $3million per incident, and pretty quickly they'll find a way to stop these delays.

But can they?

This is no trivial task, not only because of the system-wide effects but also because different passengers want different things. Let's look at the case of a plane that has been sitting on the taxiway, awaiting departure, and is now approaching the three-hour mark. To avoid a $3million fine, the airline tells the pilot to return to the terminal to allow passengers to de-plane. [It's not guaranteed that this is even possible, by the way: Picture being on a grid-locked highway and deciding to give up on your trip and just turn around and go home. Great. Except you still have to reach an exit ramp before you can get off the highway, and no one ahead of you is moving. Well, that's exactly what can happen at an airport…] But let's assume that the aircraft can in fact easily return to the gate. For one passenger, this might be a lifesaver. Claustrophobia has set in and he will happily postpone his business meeting to another day, just to be off the plane. But for another passenger, her top priority is reaching her destination at any cost – perhaps for a wedding, a funeral, a big job interview – and her delay has just gotten worse: once the passengers who choose to do so get off, the plane heads back out, and goes to the end of the line to start waiting behind all the other flights in queue. That is, if the flight doesn't just get cancelled outright at this point, which is often the case (for example, if the crew has exceeded their duty limits). So the ruling has made the situation better for one passenger but worse for another.

More importantly, this begs the question of why the flight was sitting on the tarmac for so long in the first place. If there are already too many planes lined up for departure on the taxiway, the obvious solution is to delay passengers at the terminal instead of on the plane. They can remain inside the terminal enjoying a meal or working on their laptops, then board and push back once a departure slot is imminent. Of course, all airlines would have to agree to do this; otherwise, while one airline's

passengers are patiently waiting in the bar, another airline could be grabbing the next several spots in lines. But even if flights were only allowed to pull back from the gate when the queue was short enough to ensure a timely take-off, there would still be a problem during periods of peak congestion (the very times that lengthy tarmac delays tend to arise). If too few departure flights push back from the gate, then arrival flights will have nowhere to go – all the gates will be occupied. So the outbound passengers don't experience long tarmac delays, but now the inbound passengers do.

Ok, let's try another approach. When extreme conditions decrease the number of departures/landings that can occur at an airport (this reduced capacity is the main cause of lengthy tarmac delays), airlines can only avoid lengthy delays by cancelling flights. But at a time where airlines are flying at historically high load-factors (i.e. the percentage of empty seats is very small), passengers' ultimate delay in reaching their destination may be enormous, because it can take so long to re-accommodate them on a future flight. Here's some simple math: If flights are 95% full and you cancel one of them, it will take the next *nineteen* flights to that destination to find available seats for all of the disrupted passengers. If an airline offers three flights a day to that destination, it will be a full week before everyone can travel. So this isn't an easy fix either.

Frankly, there aren't any easy fixes. Limitations will always stress the system: weather, congestion, and the very nature of the physics of flight. Airlines need to collectively deal with the challenges of constrained resources -- the airports, the runways, and even the airspace itself – that must be shared and managed by multiple players. Things can improve, but it will take change on the part of not only the airlines, but the associated government agencies, and the flying public, as well.

First and foremost, the airlines need to take responsibility for their mistakes. They can't cry "system complexity" as an excuse to cover up the bad decisions that were made in cases such as the flights mentioned above. Airlines are charged with the safety and wellbeing of their passengers, and in these cases, they failed miserably.

The DOT ruling also requires airlines to develop contingency plans for emergencies. Passengers stuck on the plane for hours because an international flight diverted to a non-international airport? This is actually an issue under the jurisdiction of Customs and Border Protection, and CBP should be responsible for establishing guidelines; but the airlines still need to be fully informed and prepared to act on them. Bad weather? Obviously airlines can't prevent snow, thunderstorms, or high winds. But a passenger may need medical attention while a plane is delayed on the tarmac, all passengers have basic needs that must be met. The airlines should have protocols in place to deal with these situations, and these protocols should be followed.

But it's not enough to plan for what to do when these delays happen, the airlines should work to avoid them in the first place. To do so, they need to work closely with government agencies and with other airlines, dealing with the challenge of constrained resources -- the airports, the runways, and even the airspace itself – that must be shared and managed by multiple players.

One area worth exploring is new paradigms for how flights queue up for departure. In most cases, flights enter the runway queue under a strict first-come-first-served policy. And when a plane gets out of queue to de-ice, to let a passenger off, for re-fueling, etc., that plane typically returns to the end of the taxiway. This is not out of fairness (it seems quite reasonable that a plane that returns to the gate to

give passengers the option to disembark should be able to re-claim its original place in the taxi queue) but out of practicality – there's often no easy way to re-enter the line, except from the end. This is a physical characteristic of most airports, especially congested ones, and thus not trivial to change (at best, it would require enormous capital costs; in the case of land-starved airports such as Boston or La Guardia, it's a virtual impossibility). It is nonetheless worth investigating whether new policies for sequencing flight departures (when there is not enough capacity to enable all scheduled flights to depart, should we treat a once-a-day wide-body departure to Asia the same as a regional-jet flying to a small rural airport?), as well as new physical airport layouts to facilitate these policies, could lead to better outcomes.

Likewise, it is worth thinking "outside the box" about how to disembark passengers during periods of extreme congestion. In many European airports, which typically have fewer terminal gates than U.S. airports, it is standard practice to have passengers deplane on the tarmac rather than at a gate; busses then transport the passengers from the tarmac to the terminal. During periods of extreme congestion and lack of gate access, could a similar approach be employed in the U.S.to ensure that inbound passengers don't experience prolonged delays on the aircraft after they've landed? What would the cost be for this infrastructure, and what would it mean for passengers with limited mobility? How viable is it during extreme weather conditions? Alternatively, could outbound aircraft, themselves quite likely delayed, be pushed back from the gate empty to allow inbound aircraft to use the gate for deplaning, then swap the empty aircraft back for outbound boarding? This is a sizeable task that would consume time, fuel, crew resources, and aircraft space (that is, "parking lots" for the empty planes), but again is worth evaluating as a possible alternative to cases such as the Detroit 1999 debacle. The feasibility and value of such changes to our present system key can only be determined through thorough and thoughtful analysis of costs and benefits.

It is also worth finding ways to encourage and support greater collaboration across airlines during extreme conditions. The most obvious example is in re-accommodating passengers from one airline to another during periods of extensive cancellations (e.g. in January and February of this year, when thousands of flights were cancelled due to several large snowstorms), in giving fliers greater flexibility in changing their plans, and in facilitating alternative transportation modes where appropriate.

Another area where collaboration is needed to reduce delays (and where government intervention may be required) is in the more day-to-day problem of congestion in NYC. Thirty-three percent of the past year's 3+ hour delays have occurred in NYC, largely due to the very high volume of flights in this area. These delays may well be reduced with the implementation of NextGen, a major FAA initiative to completely re-vamp the air traffic control system. [Today, think of planes as following a highway system in the sky, restricted to specific corridors that move between tracking points; in the future, planes will have far greater flexibility in where they fly and how they are tracked, meaning more room for more planes.] But NextGen is still many years and many, many dollars away. It certainly won't fix the delays in NY in the short term, and it's unlikely to fully solve the problem in the long term,

Ultimately, delays in NY will always be a function of the volume of flights into and out of its popular airports. No one airline alone is likely to take a pro-active stance in reducing their schedule to decrease delays. At first glance it seems like a promising business opportunity – reduce your schedule and then charge a premium for better on-time performance. In reality, though, their competitors would see the same reduction in delays, eliminating their ability to charge higher fares. Or, more likely, their

competitors would simply start offering more flights to pick up the slack and increase their own market share. Delays are always going to exist unless passengers are willing to give up the frequency of flights into and out of New York to which they're accustomed, and only if the government steps in to impose schedule limitations.

What, then, is the role for the flying public? We need to think hard about the choices that we're faced with, and ultimately vote with our wallets. We all want perfectly reasonable things: frequent, non-stop flights that are on time and spacious, plenty of leg room and space for our carry-ons, high-quality customer service. Unfortunately, it is not reasonable is to expect these things at current airfares (today, on average, domestic fares adjusted for inflation are about fifty percent lower than they were in 1978 when the airline industry de-regulated). Everything comes down to trade-offs. For example, the cost of operating a flight is largely fixed. So the lower the fare, the more people an airline needs to pack in just to break-even. But, as we've seen, the more people that are packed onto a flight, the harder it is to recover from a cancellation. Of course, you can make recovery easier by keeping reserve aircraft available to add in extra flights once the storms have passed, but at a cost of more than $100 million a pop, this will certainly impact fares substantially. Likewise, if you were to add just fifteen extra minutes between every flight connection, you could greatly reduce the amount of propagated delay. But for an airline flying 2,000 flights a day, you'd need on the order of fifty more planes in order to fly this expanded schedule – an investment of roughly $5 Billion. Funding NextGen, building more runways, expanding airports to have extra gates, buying busses to transport passengers off the tarmac – none of these comes cheap.

So the good news is that just about everything we want from our air transportation system – more frequent flights, fewer delays, and increased reliability– all of these are possible. But just like our desire for more legroom and better airplane food, we have to answer the question: How much are you willing to pay?