Terminal Chaos: Why U.S. Air Travel Is Broken and How to Fix It

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Foreword

This is a very disturbing book—and it was intended to be. The crisis in U.S. aviation is far more serious than most people imagine.

Airline deregulation, enacted in 1978, was a huge success in democratizing air travel. It unleashed competition that transformed air travel from a luxury good to an everyday phenomenon for the vast majority of people. But those benefits are now at risk, as the aviation system nears catastrophic overload.

Alfred Kahn, the father of airline deregulation, was one of those who warned at the outset that simply removing obstacles to airline competition would not be enough. Unless aviation infrastructure (airports and air traffic control) were also transformed by market forces, continued growth in affordable air travel would be put at risk. For the first two decades of deregulation, there was enough slack in the system to accommodate growth. But in the last 10 years, we have started bumping up against its capacity limits, both in air traffic control and, increasingly, at major airports.

George Donohue and Russell Shaver have done a masterful job of explaining how we got into this fix, why getting out of it will be very difficult, and how much is at stake if we don't make major changes. While I don't agree with every detail of their prescription, they have framed the debate and pointed to the directions we must go.

All of aviation—airline travel, business aviation, air cargo, and private flying—depends on airports and air traffic control that can accommodate ongoing growth. The status quo model for this vital infrastructure is broken. Donohue and Shaver have given us the best prescription I've seen for fixing it.

Robert W. Poole, Jr.
Director of Transportation Studies, Reason Foundation

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Second, we would like to thank Mike Wambsganss for providing a review of an earlier version of the manuscript and a valuable description of the history of the collaborative decision-making (CDM) process that is currently used by the FAA and the airlines. Michael Kennedy, a senior economist at the RAND Corporation, also helped with the lost consumer surplus calculations in Appendix G. In addition, RAND'S Jerry Solenger made significant helpful suggestions regarding the book's organization and structure. Much of the research cited in this book was funded under multiple grants and contracts from the National Science Foundation, the National Aeronautics and Space Administration, and the FAA. The first author was granted a sabbatical leave by George Mason University (GMU) for a stay at the RAND Corporation in the spring and summer of 2007 to finish this book, and RAND also provided financial support to the second author as well as valuable advice on the ultimate organization of the text.

Finally, we would like to thank David Hinson, former administrator of the FAA (1993–1997), and Linda Hall Daschle, deputy administrator of the FAA (1993–1997), for providing the opportunity to work from 1994 through 1998 on a critical national problem. They were the best leadership team the FAA has had in over 20 years. Their support and encouragement were critical to the beginning of our campaign to improve the air transportation system for ourselves, for our children, and for our nation.

CHAPTER 1

Introduction: Frequent Flying, Frequent Frustration

When it comes to air travel today, everyone has a horror story.

In June 2007, a Federal Aviation Administration (FAA) computer malfunction in Atlanta, Georgia, led to an overload in the FAA backup computer in Salt Lake City, Utah, which disrupted many thousands of traveler's flight plans across the United States.

In March 2007, the University of California, Los Angeles (UCLA), as playing the University of Florida in the semifinals of the NCAA basketball championship tournament. Delta Airlines reportedly oversold 33 seats on one flight and 40 seats on the next flight from Los Angeles, California, to Atlanta, Georgia. In addition, a flight on the previous evening was cancelled for mechanical problems, and the passengers were rescheduled for the day of the NCAA game as well. The result? Many people who had purchased extremely expensive game tickets and hotel rooms were "bumped" with little compensation or legal recourse, and as a result they missed a critical game that they had hoped to attend for months.

In December 2006, American Airlines did a similar thing to passengers on a flight diverted to Austin, Texas, because of weather over its hub airport at Dallas. In February 2007, this happened again, at New York's Kennedy airport by Jet Blue Airlines, one of the new breed of "passenger-friendly" airlines. Several years ago, 137 passengers sat cramped on a Northwest Airlines flight at the Detroit airport for nine hours only hundreds of feet from the gate, and they were not allowed to leave the plane. With no food or drink, fresh air, or operating bathrooms, passengers literally were held hostage. And no one would tell them why.

In 2005, a flight loaded with high school students changing planes in Chicago's O'Hare airport en route to San Diego was cancelled due to bad weather, yet there was not a single raindrop within 100 miles of the plane's flight path. Twenty-five students slept in the airport and missed most of the first day of a national academic contest.

And just recently, an American Airlines gate attendant refused boarding to a passenger, claiming he was already onboard and instructing him he would have to purchase another ticket. The passenger was then accused of stealing his ticket and was almost arrested for making a scene. After a stress-filled hour and a half, and a phone call to American's corporate headquarters, the passenger learned that another traveler with the same last name (but a different first name) was on the plane that had since landed in St. Louis. To make matters worse, passengers on that flight were held onboard for 45 minutes while Transportation Safety Administration (TSA) personnel grilled the passenger with the same last name about being a possible terrorist.

And the stories go on and on. For most passengers, air travel today has become one of the most stressful and frustrating experiences of modern life. Even seasoned travelers cringe when they proceed through security to board their flights, never knowing what will happen next. They cannot be sure if their flight will depart on time, will face delays while in the air, or will even occur at all. Flying often becomes a degrading and illogical set of random events in which grown people are treated like children. The traveler is not only subjected to arbitrary rules and regulations, but no one seems interested in providing him with a straight answer. He is purposely kept in the dark about a system to which he willingly gives over his personal rights, his hard-earned money, and even his life.

Unfortunately, these horror stories, and the many like them that occur almost daily, are not isolated incidents caused by random "bad luck" for which nobody is at fault. In short, we have reached a point of terminal chaos. In 2006, 22% of flights were delayed, the highest rate since 2000 (24%), and the average aircraft load factor (LF) (the fraction of aircraft seats occupied by a paying customer) was 80%, the highest in U.S. aviation history! And the trend is heading upward: 16% flights delayed in 2003, 20% in 2004, 21% in 2005, and 22% in 2006.

Actually, flight *cancellations* produce more delay time for the passengers than flight *delays*, and high LFs make the system extremely fragile to any disruption and barely able to recover when those disruptions come (and they always come). The year 2000 was the worst year for flight cancellations (3.3%) and, some say, the worst year for bad flying experiences. However, during that year, though flight cancellations

were at 3.3%, the load factors were only at 72%. In subsequent years, the numbers show that the passenger experience has been getting increasingly worse, with yearly flight cancellations trending upward (for the most part) and with LFs surpassing the 2000 totals and reaching a historic high of 80%! Why do LFs matter in this case? Because higher LFs lessen the likelihood that the passengers from a cancelled flight will find another flight with available seats within a few hours.

Many people think that all of these delays and flight cancellations are inevitable in a modern industrialized society. If that were true, however, the same poor performance would be seen in the European air transportation system. And it is not. Table 1.1 compares the numbers of total aircraft movements and passengers and the delay averages for several major U.S. airports and comparable European airports ACI-NA, EC Performance Review 2006 and FAA ASPM. Q1

Clearly, from the delay data shown in the table, something in the U.S. system has gone terribly wrong. Although the United States and Europe use almost identical air traffic control systems and almost identical safety standards, the delays in most major U.S. airports are over **ten times larger** than those of European airports. Note also that the transportation efficiency, as measured by the number of passengers moved through the airport, is over 30% higher in Amsterdam than in Newark, New Jersey, with an order of magnitude less delay, and about the same number of operations.

Not surprisingly, the cost to the U.S. public for all of these delays is enormous. Using government estimates of $30/hour per passenger, and new passenger delay metrics under development at the Center for Air Transportation Systems Research (CATSR) at George Mason University, over **108 million hours** of passenger time, or **$3.2 billion**, was lost in 2006 as a result of delays and cancellations. And this loss in U.S. travel time productivity is only the tip of the iceberg. It has been estimated that the U.S. tourism industry lost **200,000 jobs** and **$98 billion** in revenue in 2004 and 2005 because of the poor quality of our national transportation service [*Washington Examiner* 2007]. (The authors estimate that as much a $30 billion of this may be due to our poor air transportation system.) That's right, $98 billion! Q2

On a more individual level, with all of the activities that are packed into people's busy lives today, a single airline flight should not be able to ruin a business trip or sour a vacation, but very often it does just that. And there is scarce redress. Although passengers can complain to the FAA or to the U.S. Department of Transportation (DOT), which oversees the FAA and keeps statistics of customer complaints, both organizations have kept their hands off the quality-of-service (QOS)

Table 1.1 Comparison of Major U.S. and European Airports

	Total aircraft movements		Total passengers		Average delays, minutes
Airport	**2000**	**2005**	**2000**	**2005**	**2006**
Frankfurt, Gr (FRA)	458,731	490,147	49,360,630	52,219,412	2.7
London, UK (LHR)	466,815	477,884	64,606,826	67,915,403	3
Newark (EWR)	450,187	437,402	34,188,468	33,999,990	28.8
Amsterdam, NL (AMS)	432,480	420,736	39,606,925	44,163,098	0.7
New York Laguardia (LGA)	384,554	404,853	<28,000,000	<29,000,000	23.4
Munich (MUC)	—	398,838	—	<29,000,000	1.8
New York Kennedy (JFK)	<384,000	<353,000	32,856,220	41,885,104	24.3
Madrid, Sp (MAD)	—	415,677	32,893,190	41,940,059	1.8

aspects of the system since the airline deregulation in 1978. Quite frankly, since its founding in 1958, the FAA has never considered airline service quality to be its responsibility. The FAA's only job is to make sure that the air traffic control network—which keeps planes from hitting each other in the air and on runways—is adequately operated and maintained. Despite what many people think, the FAA does not regulate airline schedules, pricing, or passenger satisfaction.

Even though the U.S. air transportation system is a vital part of the nation's economic infrastructure (tourism is the world's largest industry), it is woefully behind the times, is sometimes unsafe, and, worse yet, is largely shielded from public scrutiny. The government and industry have made it virtually impossible to understand why the public is subjected to procedures that make little sense. Even a simple query from a passenger about why a flight is being delayed or cancelled is often met with outright hostility from airline personnel. When offered, their responses are often vague and misleading. And when the going gets especially tough (and many have been in at least one airport line when this has happened), these people simply close ranks, close mouths, and close the door on the passengers—their customers.

And the government knows all about it. But despite all of the recent rhetoric and highly publicized hand waving from the executive and legislative branches, even the government seems unable to stop this almost fraudulent activity. The whole system simply seems to be caught in one big downward spiral.

By contrast, Europe, which faces a much less severe problem, has passed a Passenger's Bill of Rights (see Appendix E). Although the U.S. Congress has discussed passing a similar bill, it has not as yet followed suit. But even if it did, without fixing the underlying problems, the situation will not improve (and might even be made worse).

Sometimes it seems that no one involved in the flying experience—not the airlines, not the government, and not the overseeing agencies (the DOT, FAA, and TSA)—is willing to offer straight answers about flying. The public is simply expected to listen politely, never question, and then obey, much like sheep being led to be fleeced.

And there are no quick fixes for this chaos. The much-touted Next Generation Air Traffic Control System (NGATS), promised to appear sometime between 2015 and 2025, will not fix any of these problems (even if the FAA can actually afford or technically deliver this system). And none of the recently publicized initiatives from Congress or the White House seems likely to do it either.

But it need not be this way. There are solutions, real solutions, that can work. (In fact, there's one called the "30% solution" that the authors

believe can quickly and significantly reduce the current congestion at most major U.S. airports.) Accordingly, this book is aimed at educating the traveling public on the U.S. air travel system. Chapters 1–3 provide an insider's look at the background and true nature of the current problem. Chapters 4 and 5 then detail how the situation grew to where it is and why the airlines and others will not (and cannot) simply fix it. Chapter 6 profiles the various winners and losers (aka villains and victims) involved. And finally, Chapter 7 provides numerous recommendations for reversing the trends and putting the air travel system back on the right flight path.

The book is also aimed at those individuals in government and industry who have it within their power to help effect change. Just as the system did not arrive in terminal chaos by the actions (or inactions) of a single individual or organization, it certainly will not be able to depart from it without multiple people and organizations working together.

The basic themes that occur throughout the text include the following:

1) Commercial flying in the United States is often an abysmal experience in which there is a de facto Bill of Rights for the airlines but not for the passengers.

2) The situation is quickly getting worse.

3) The most serious problem is an overscheduling of flights by airlines at key airports, producing delays and flight cancellations that degrade the traveling experience system-wide. (The phrase "overscheduling of flights by airlines at key airports" reappears frequently in this book. To avoid any misunderstanding, note that no single airline is scheduling more planes into an airport than the airport could accommodate. Rather, it is the collective schedules of all airlines flying to that airport that yield "overscheduling." Why this is happening is a major topic of this book.)

4) The United States arrived at this chaotic situation through a series of rational decisions, including deregulation in 1978. However, because no one has overall network control responsibility, decisions are made at the system component level, which often harms overall network performance.

5) Attempts to improve the problem have been hampered by an autocratic air traffic controller's union and legacy airlines that have vested interests in the status quo.

6) For things to change, Congress and the DOT must change some important laws and regulations.

7) Failure to fix the system will have severe economic effects on the overall U.S. economy and will ultimately harm our nation's competitiveness in the world community.

In addition, for those readers who desire more detailed or technical information, appendices have been provided for several topics, including major airline/airport codes (Appendix B), airport performance measures (Appendix C), mathematical support for slot utilization (Appendix D), market-based slot allocation (Appendix E), the European Passenger's Bill of Rights (Appendix F), travel tips for frequent flyers (Appendix G), and tradeoff between passenger delay costs and lost consumer surplus (Appendix H). The interested reader with a technical background might also be interested in the many publications that are available on our Web site: http://catsr.ite.gmu.edu.

Finally, note that the authors have had much personal and professional experience with the issues discussed herein. George Donohue is the current director of the Center for Air Transportation Systems Research and a professor of systems engineering in the Volgenau School of Information Technology and Engineering at George Mason University. Previously, he served as the associate administrator of the FAA for Research and Development, as a vice president and director of the RAND Corporation's PROJECT AIR FORCE, and as a director of the Office of Aerospace and Strategic Technology at the Defense Advanced Research Projects Agency (DARPA). Russell D. Shaver, III, is a visiting research fellow at GMU. He recently retired from the RAND Corporation after more than 35 years. From 1994 to 2000 he served as the chief policy analyst at the Center for Advanced Aviation Systems Development at the MITRE Corporation.

Even more important, having been fellow "road warriors" (or rather "air warriors") throughout their careers, the authors understand and have great personal sympathy for the plight of the frequent flyer and for the deteriorating quality of his/her traveling experience. In short, they feel the flying public's pain. However, they also recognize that a collective, stoic acceptance of the current situation has gotten the U.S. system nowhere. And thus it is the goal throughout the pages that follow to shed the necessary light on the subject to awaken "the sheep" (and maybe even some shepherds) and together demand change. And who knows, before long, perhaps everyone will be able to confidently utter those all-important words when someone heads off to the airport: "Have a good flight."