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# Airport Congestion: When Theory Meets Reality

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## Airport Congestion: When Theory Meets Reality

Michael E. Levine<sup>†</sup>

*Some airports experience significant congestion at least some of the time, where “congestion” means that use of the airport by one aircraft delays or prevents use of the airport in that time slot by another. Another way to say this is that airport access can be scarce. Virtually all economists agree that when a resource is scarce, it can be allocated most efficiently through the use of a mechanism that prices it to reflect its value to all other potential users. Theoretically, however, efficient prices can only be assured when both supply and demand are competitive, markets are complete (they allow purchases in any amount at any time), and the participants maximize utility by maximizing profit.*

*Analysts have used this theory to argue that airport congestion should be managed through the price mechanism, either by raising prices at peak times or by auctioning off permission to operate at peak times (“slots”) to the highest bidder. Recently, the federal government has tried to put this theory into practice by instituting slot auctions at the major New York airports. But in practice these airports are owned by a monopolist (as in most cities), the auction market proposal adopted by the Federal Aviation Administration (FAA) leaves markets incomplete by excluding many users, and the airport monopolist, here as elsewhere, is a political entity whose goals often conflict with economic efficiency. In addition, the mechanism adopted by the FAA effects a large wealth transfer from airlines to the FAA. Though this result may in principle have no effect on efficiency, it nonetheless creates both an enormous resistance on the part of airlines to the price mechanism and a substantial incentive to use the money for inefficient but politically expedient purposes.*

*This Article takes account of these economic and political realities by proposing an auction market that reduces the influence of monopolies, is relatively complete, doesn’t involve a wealth transfer, and still preserves choice at the margin that takes into account the value placed by other users on the slot. The proposal establishes a blind auction in which slots are chosen at random and made available to all bidders (including the previous owners),*

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*with the proceeds going to the previous owner and the amount of both the winning and second-highest bid (but not the identity of the second-highest bidder) being made public. This forces the slot owner to explicitly consider the value it places on a slot and to compare it to an actual cash offer that has been revealed by the auction. The airport has no monetary incentive to create scarcity. Wealth transfers are voluntary.*

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## Introduction

In 2007-08, as airlines scheduled more and more flights into airports whose capacity had not expanded, congestion and delay became a major public issue.<sup>1</sup> Delays at New York airports became particularly severe, with takeoff

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<sup>1</sup> See, e.g., *It's 9 a.m. The Weather's Fine. So Why's the Runway Clogged?*, USA TODAY, Sept. 26, 2007, at A10; Scott McCartney, *The Middle Seat: Flying Was Supposed To Be Better This*

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queues several hours long during bad weather and very substantial delays even in good weather. Landing delays became similarly severe and costly, with aircraft bound for Kennedy, LaGuardia, and Newark held on the ground at departure airports or forced to fly circuitous routes in the air in order to be sequenced for landing.<sup>2</sup> The situation was exacerbated by the temporary removal of caps on scheduled aircraft movements at the New York airports, but even the reimposition of movement limits didn't cure the problem, and the allocation of the restricted movement slots to airlines that wanted to use them became very controversial.<sup>3</sup>

In principle, congestion at airports shouldn't be much of a problem. It has become a commonplace among economists that the best policy tool to deal with increasing airport congestion is some form of pricing system that reflects capacity scarcity back onto users, preferably through a congestion charge or a slot auction or, as an inferior solution, tradeable rights in airport landing and takeoff slots.<sup>4</sup> The justification for this is the commitment to marginal-cost economics that is part of every economist's intellectual armorarium.

But these institutional preferences and their ordering are built on a model of the world which does not always, or even often, resemble reality. The market-pricing model depends on profit-maximizing parties acting in complete and competitive markets on both the buying and selling sides. In this model, parties absorb and act on the information provided by marginal-cost prices as signals about whether to buy or to invest to produce more of a good.

For economists, congestion pricing or slot auctions simply represent the application to airport congestion of the standard competitive supply-and-demand model, and the results of these mechanisms are meant to conform to the standard means of ensuring efficiency. For economists, this means pricing scarce resources at marginal cost, taking into account the loss of their

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*Summer*, WALL ST. J., July 8, 2008, at D1; Del Quentin Wilber, *Regulators Urged To Steer Airlines Toward Better Customer Service*, WASH. POST, Sept. 26, 2007, at A8; Kelly Yamanouchi, *Delta Takes a Hit at JFK: Long Ground Delay Followed by Canceled Flight Stirs Up Critics*, ATLANTA J.-CONST., July 29, 2008, at C1.

<sup>2</sup> Hereinafter, in addition to using their full names, this Article will refer to John F. Kennedy International Airport as JFK or Kennedy; LaGuardia Airport as LGA or LaGuardia; and Newark Liberty International Airport as EWR or Newark.

<sup>3</sup> Of course, the historical effect of business cycles and oil prices on severe congestion suggests that for the U.S. domestic market, congestion peaked in the summer of 2008, following which U.S. airlines substantially reduced their scheduled flights. For airports like JFK in New York, where a very substantial part of peak demand is dictated by time windows dominated by transatlantic flights, foreign airline schedules have been reduced less than those for U.S. airlines and, especially, U.S. domestic flights. But unless oil prices stay high enough to cause a permanent reduction in demand for air transport, the problem will emerge again until the institutions regulating access to airports are significantly overhauled. This Article is meant to provoke and guide institutional overhaul that takes account of real-world political institutions and constraints.

<sup>4</sup> See, e.g., IAN JONES ET AL., NAT'L ECON. RES. ASS'N (NERA), *STUDY TO ASSESS THE EFFECTS OF DIFFERENT SLOT ALLOCATION SCHEMES* (2004); George L. Donohue & Karla Hoffman, *Evidence That Airport Pricing Works 2*, (Reason Found. Policy Brief No. 67, 2007), available at [http://www.reason.org/pb67\\_airportdelays.pdf](http://www.reason.org/pb67_airportdelays.pdf); Eric Pels & Erik T. Verhoef, *The Economics of Airport Congestion Pricing* (Tinbergen Inst. Discussion Paper No. 03-083/3, 2003).

availability for others to use them (“opportunity costs”).<sup>5</sup> But real-world markets for airport capacity are incomplete and less than fully competitive. Airport capacity varies across weather conditions and runway use configurations more rapidly than can be practically reflected in markets. Participants, particularly public airport owners, are often monopoly owners of the airline-served airport or airports serving a city and in addition often maximize some dimension other than economic profit as they create and allocate capacity. And there are institutional, political, and legal constraints on airport capacity investment and allocation that are outside any proposed price system. In these circumstances, one cannot easily assert that instituting any form of market system will produce efficient outcomes.

A clear example of the tension between the marginal-cost economics embraced by scholars and the constraints that institutional and political reality can place upon its application can be found in the form and fate of various Federal Aviation Administration (FAA) proposals to alleviate New York airport congestion. Recently, for at least the third time in the history of the airline industry, the FAA has generated a “solution” to airport congestion, and politicians and interested parties have responded.<sup>6</sup> The proposed solution and the responses demonstrate that what airport congestion presents in the real world is a classic “second-best” problem.<sup>7</sup> The question presented to policymakers is not “Could aircraft operations at airports in principle be accommodated and allocated by markets?” It is rather, “In a real world in which institutions prevent markets from reaching an optimum, what policies should we follow to salvage as much social welfare as we can from a given situation?”

Alfred E. Kahn’s treatise is a good and widely used example of classical economic thinking on problems of access to congested facilities. It is commonly accepted as a comprehensive distillation of economists’ views on the design and analysis of publicly influenced pricing systems, although the literature well predates this treatise and has continued to develop since.<sup>8</sup> Kahn embraces marginal-cost pricing in general for the following reasons: (1) prices set at marginal cost allow society to get the most value from limited resources by presenting economic actors with proper incentives; and (2) marginal-cost prices give proper incentives to users by reflecting the value placed on the

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<sup>5</sup> ALFRED E. KAHN, *THE ECONOMICS OF REGULATION: PRINCIPLES AND INSTITUTIONS* 65-70 (1988); HAL R. VARIAN, *MICROECONOMICS: A MODERN APPROACH* 406-08 (6th ed. 2003).

<sup>6</sup> ROSS D. ECKERT, *AIRPORTS AND CONGESTION: A PROBLEM OF MISPLACED SUBSIDIES* (1972); Michael E. Levine, *Landing Fees and the Airport Congestion Problem*, 12 *J.L. & ECON.* 79 (1969); Daniel R. Polsby, *Airport Pricing of Aircraft Takeoff and Landing Slots: An Economic Critique of Federal Regulatory Policy*, 89 *CAL. L. REV.* 779 (2001).

<sup>7</sup> R.G. Lipsey & Kelvin Lancaster, *The General Theory of Second Best*, 24 *REV. ECON. STUD.* 11 (1956).

<sup>8</sup> KAHN, *supra* note 5, at 65 (“The central policy prescription of microeconomics is the equation of price and marginal cost.”). On congestion pricing, see *id.* at 87-109. For a summary and analysis of the earlier literature, see R.H. Coase, *The Marginal Cost Controversy*, 13 *ECONOMICA* 169 (1946), and references cited therein.

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resources in question by other users in society. In a sense, the resources required to service the next unit of demand are offered at the value that others would bid for them if given the opportunity. These bids, in turn, reflect the value of the use to which the bidders would put them. At the same time, marginal-cost prices give suppliers proper incentives by presenting them with an opportunity to make additional profits by committing resources to expanding capacity. These positions are generally uncontroversial among economists, although people differ in their application of the principle to particular circumstances.<sup>9</sup>

This much is catechism. Any conflict among economists regarding the use of marginal cost for prices generally occurs when considering whether to give primacy to short-run use or long-term supply, but the importance of the marginal-cost principle is uncontroversial.<sup>10</sup> Airport congestion and its attendant inefficiencies seem to virtually all economists to present a clear case for applying one version or another of marginal-cost pricing.

This Article on airport congestion is intended to confront accepted economic theory with the political and institutional realities of airport access, finance, and air traffic control; and to examine the likely possibilities, problems, and choices involved in applying theory to practice. In doing so, I suggest that in addressing airport congestion, we face a choice among several imperfect solutions and that a naive application of accepted theory may well leave us in a worse situation than the one we are in now. I conclude with an imperfect solution that salvages as much as possible from the collision between theory and reality.

### I. Airport Congestion and the “Congestion Problem”

Some, but not most, airports are “congested.”<sup>11</sup> Of those airports that are periodically congested, many are congested by one airline operating a hub.<sup>12</sup> The congestion from the hub airline delays mainly its own flights, inconveniencing only a few of the flights of other airlines, so that the costs of delay from accommodating simultaneous demand are largely internalized to that hub airline. When it considers whether to schedule an additional flight to its hub during a peak period, the hub airline considers the effect of that flight on its other flights along with the other revenues and expenses associated with the flight. The airline’s marginal incentives are approximately correct, and

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9 See KAHN, *supra* note 5; VARIAN, *supra* note 5.

10 R.H. COASE, *THE FIRM, THE MARKET, AND THE LAW* (1988); Coase, *supra* note 8.

11 See U.S. DEPARTMENT OF TRANSP. AIR TRAVEL CONSUMER REP., Nov. 2008, at 3, 16-19, <http://airconsumer.ost.dot.gov/reports/2008/November/200811ATCR.pdf>. It is also important to distinguish congestion from the “congestion problem.” Some congestion is not inefficient in that it is internalized, because it would cost airlines more than it is worth to eliminate the congestion.

12 Congestion is loosely defined as imposing for reasons of excess demand more than a few minutes delay on arriving or departing flights, whether through queuing or through circuitous airborne approach or departure routings. A hub is a complex of arriving and departing flights scheduled to facilitate connections.

presumably the airline optimizes in response to them so that the resource is used efficiently.

Virtually all economists would agree that if providing capacity has costs associated with it, the optimal amount of delay experienced by flights is probably not zero. The costs of delay need to be compared both with the value of the marginal flight and the cost of alleviating the delay. Evidence from airports dominated by a single airline that both experiences much of the delay and can be expected to pay through landing fees for the cost of facilities to accommodate it suggests that the optimal amount of delay at peak times is not trivial.<sup>13</sup>

Uncongested airports or airports at which only one airline both creates and experiences delay do not present much of an economic problem. Either there is no scarcity—the principal problem that economics purports to address—or the impact of scarcity on themselves and others can be taken into account by those whose activities occasion it. These airports do not need access limitations or imposed priorities, either administrative or market-based. If there is little or no marginal cost imposed on others' flights by the flights of the decision-making airline, no economic purpose is served by imposing access charges beyond those necessary for facilities cost recovery. The facilities cost-recovery charges ought to be imposed in a way that least distorts airport use by the hub airline. Marginal-cost purists may object that the cost of accessing the airport in those circumstances ought to be zero, but I am of the now-dominant school that says that recovering the cost of the airfield is the best way to tell if the historic investment in capacity was efficient and whether further capacity-maintaining or capacity-enhancing investment would be wasteful.<sup>14</sup> In the single-carrier hub-dominant situation, the airline usually can be counted on to estimate whether capacity expansion would be economically worthwhile and in those situations the politics of expansion, while never negligible, should be relatively simple.<sup>15</sup> Of course, where expansion might create opportunity for new competitors, even a dominant hub airline may object to otherwise efficient expansion.

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13 See MAJORITY STAFF OF JOINT ECON. COMM., 110TH CONG., *YOUR FLIGHT HAS BEEN DELAYED AGAIN* 9, fig.7 (Comm. Print 2008). Note delay figures for Charlotte, NC; Cincinnati, OH; Memphis, TN; and Minneapolis, MN. These are all airports where a single passenger airline schedules and operates the vast preponderance of flights. What is significant here is not the particular measure of delay (passenger-minutes) used by the Committee, but rather the degree of delay that persists when delay is under a single airline's control and the costs are not externalized to other airlines.

14 See ABBA P. LERNER, *THE ECONOMICS OF CONTROL* (1944); Harold Hotelling, *The General Welfare in Relation to Problems of Taxation and of Railway and Utility Rates*, 6 *ECONOMETRICA* 242 (1938); see also Coase, *supra* note 8.

15 There can be situations in which a dominant hub airline resists proposed efficient capacity expansion to discourage or prevent competition (especially where the prospective entrant is a low-cost carrier or another would-be hub airline). These strategies are usually not effective over the medium term, as a variety of mechanisms exist to overcome resistance by the dominant airline. Of course, there has been at least one case in which airlines have colluded with local and federal politicians to exclude would-be competitors by legislation. See, e.g., Sudeep Reddy, *Congress repeals Wright*, DALLAS MORNING NEWS, Sept. 30, 2006, at A1.

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The “congestion problem” is presented principally by very busy airports where there are substantial levels of simultaneous flight activity that are undertaken by more than one airline. These airports can include airports with one hub airline, as long as the airport is attractive enough that a substantial number of flights by other operators are delayed at congested periods. At those airports, scheduling costs by one airline are externalized onto the others so that each incremental operation experiences only a fraction of the total delay it causes.<sup>16</sup> Where two airlines hub, as at O’Hare,<sup>17</sup> substantial cost internalization may be achieved by allowing the two airlines to negotiate schedule adjustments, although the possibility of joint restraint of trade needs to be taken into account and there are still many other flights that are delayed by the two dominant airlines.<sup>18</sup>

As long as there is excess demand at an airport not dominated by a single operator, delay imposed by one operator is externalized onto others, and any restraint by one simply provides an opportunity for another, whether or not the airport is used as a hub by one or more airlines. The degree to which congestion costs of a scheduling decision are externalized can be substantial.<sup>19</sup> At the same time, it is clear that congestion costs are better internalized by dominant hub airlines so that externalized congestion costs clearly decline as the dominant airline approaches one hundred percent of operations at congested periods and, given the benefits of simultaneous scheduling to customers of the hub airlines, the resulting congestion costs do not necessarily represent a social welfare loss.<sup>20</sup>

In the same way, highway congestion or inner-city traffic congestion is a product of the fact that individual decisions affect others in ways that are not taken fully into account by those making the decision. Someone contemplating driving into the center of London or into midtown Manhattan contemplates the time it will take her but doesn’t take into account the delay she will impose on other drivers by adding her vehicle to the traffic mix. Similarly, someone deciding to commute on a busy highway delays other users while experiencing only her own transit time. But, as will be addressed below, these situations differ from airports in ways that are important to the choice of public measures to deal with them.

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<sup>16</sup> See, e.g., Alan Levin & Marilyn Adams, *Peak Flights Capped at 2 NYC-Area Airports To Cut Delays*, USA TODAY, Dec. 20, 2007, at 1A (discussing voluntary caps on the number of peak-hour flights at JFK and Newark Liberty International to alleviate chronic delays).

<sup>17</sup> Hereinafter, in addition to using its full name, this Article will refer to Chicago O’Hare International Airport as O’Hare.

<sup>18</sup> See, e.g., Sara Kehaulani Goo, *Airlines Agree to Cuts at O’Hare*, WASH. POST, Aug. 18, 2004, at E1 (discussing agreements among airlines operating at Chicago’s O’Hare International Airport to cut flights to reduce delays).

<sup>19</sup> Steven A. Morrison & Clifford Winston, *Another Look at Airport Congestion Pricing*, 97 AMER. ECON. REV. 1970 (2007). Whether these costs represent a social welfare loss is not addressed.

<sup>20</sup> David Starkie, *The Dilemma of Slot Concentration at Network Hubs*, in AIRPORT SLOTS: INTERNATIONAL EXPERIENCES AND OPTIONS FOR REFORM 193, 197, and references cited therein (Achim Czerny et al. eds. 2007).

There is little question that extracting the maximum social welfare from existing capacity at existing demand levels would be greatly facilitated by adopting a system of congestion prices or slot auctions that creates the correct marginal incentives for current users. There are some concerns and controversy as to exactly what kind of pricing scheme would be optimal and whether such a scheme should price-discriminate in a way that recognizes the partial internalization that occurs when an aircraft operator's schedules impact many of its own flights as well as the flights of others. There seems to be little doubt, however, that most of the schemes proposed would enhance efficiency.<sup>21</sup> In addition, it is important to recognize that while congestion pricing would directly affect congestion and allow relatively easy readjustment as demand and capacity waxed and waned, auctions of slots whose quantity was determined administratively would not. To affect congestion in an auction regime, a further mechanism would be needed to determine how much capacity should be available for auction and how that capacity could be adjusted over time, especially if reductions were necessary. That effort would need an entity independent of users to compare the marginal cost of creating capacity to the marginal benefits assigned to the slots by users, albeit the process would be greatly facilitated by the value information provided by auction pricing.

In a static world, that should probably end the discussion. But the aviation world is not static. Demand levels fluctuate, technology changes, and both of these dynamic variations are affected by incentives. Accommodating and taking advantage of these changes requires a scheme that preserves correct incentives at the margin for both inventing and adopting new capacity-enhancing investments. Unfortunately, as is explained below, under the current institutional arrangements for airport ownership and operation, the adoption of congestion charges or slot auctions whose proceeds would go to the airport operator would present incorrect and even perverse incentives for maximizing social welfare from airport capacity.

## II. Safety and Operations

Aircraft have to be separated for safety, both in the air and on the ground. Airport capacity is determined by the physical layout of the runways, taxiways, ramps and terminals; the weather; the mix of aircraft using the airport; and air traffic control (ATC) limits, if any.<sup>22</sup> ATC organizes the airspace used in

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21 For a summary and references to the economic literature addressing the degree to which congestion entails an externality at airports with different degrees of single-operator domination and whether differences in impact imply that congestion charges should be assessed on a discriminatory basis, see Jan K. Brueckner & Kurt Van Dender, *Atomistic Congestion Tolls at Concentrated Airports? Seeking a Unified View in the Internalization Debate*, 64 J. URB. ECON. 288 (2008) (suggesting that congestion charges should vary inversely with the degree of domination of the hub by the operating airline). This literature ignores entirely the effects of the institutional setting and incentives that this paper adds to the analysis.

22 See, e.g., High Density Traffic Airports, 14 C.F.R. § 93.123 (2008) (regulating capacity at densely trafficked airports).

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conjunction with the airport, the routings and spacing of the aircraft that use that airspace, and the rate and sequencing of aircraft for landing and takeoff. The length and strength of runways determine which kinds of aircraft can use them, while the runway layout determines whether takeoffs and landings can be conducted simultaneously and at what rate. Taxiways determine whether and how aircraft of different kinds queue for takeoff and how rapidly landing aircraft can clear the runway for another operation. Ramps and gates determine which kinds of aircraft can use which facilities, and facilitate or obstruct the flow of aircraft into and out of the immediate terminal area. Terminals determine how many aircraft can be loaded and unloaded simultaneously. As discussed below, any fixed measure of capacity also has to take into account stochastic variation due to weather, aircraft mix, and aircraft frequency, as well as the maximum, median, and average delay that the airport and airline operators are willing to tolerate.

While these factors also affect highway use or inner-city congestion, the range of variation is narrower, less stochastic, and less dependent on facilities. Much of it can be captured by considering vehicle size without taking other factors into consideration.

### III. Congestion: The Institutional Setting

In the United States, virtually all ATC facilities are operated and many are owned by the FAA.<sup>23</sup> ATC owns and operates the airspace contiguous to airports, as well as the vast territories in between. For the traffic relevant to the use of congested airports, ATC issues clearances (operating permission and instructions), dictates routes and altitudes, and directs aircraft moving to and from each airport.<sup>24</sup> ATC affects an airport's capacity by putting limits on the number of aircraft per hour that can approach or depart that airport without creating a hazardous conflict with other air traffic. It does this by structuring the use of the airspace to locate and sequence aircraft that are landing or taking off to provide safe separation among them. The particular way in which it does this for each airport or terminal area depends on geography, system technology, politics (related mostly to noise and visual annoyance from overflights), and conflicts with other airports in the area. Competition for use of this airspace occurs among aircraft of different types, different kinds of owners, and users of different airports.

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<sup>23</sup> An ATC facility is a manned or unmanned means of monitoring, guiding, and sequencing aircraft as they move throughout their journey. Facilities include navigational aids, radar traffic control centers for en route and terminal-area traffic, airport control towers, ground surveillance, and movement control systems.

<sup>24</sup> See generally Federal Aviation Administration, 49 U.S.C. § 106 (2000); General Operating Flight Rules, 14 C.F.R. pt. 91 (2008). For air traffic control procedures, see FED. AVIATION ADMIN., AIR TRAFFIC CONTROL ORDER JO 7110.65S (2008), available at [http://www.faa.gov/airports\\_airtraffic/air\\_traffic/publications/at\\_orders/media/ATC.pdf](http://www.faa.gov/airports_airtraffic/air_traffic/publications/at_orders/media/ATC.pdf).

Virtually all airline-served airports in the United States are publicly owned (by a city, county, state or public authority, or corporation)<sup>25</sup> and most are uncongested most of the time. Most are monopolies or are owned and operated as part of a multi-airport system that has market power.<sup>26</sup> The market power comes from a lack of effective substitutes for these airports that can accommodate airline service for a significant number of travelers. Exercise of this market power is constrained financially by requiring on-airport use of monies collected by the operator and by the so-called “residual fee” system.<sup>27</sup> As discussed below, however, this constraint doesn’t produce efficient pricing and is in any event absent at some of the most important airports in the U.S.

Airports are publicly owned because generally only publicly-owned airports are eligible for the approximately three billion dollars in federal subsidies dispensed each year by the FAA in the Airport Improvement Program (AIP).<sup>28</sup> They are also the source of significant political patronage and leverage. Airports can be operated by private contractors for a fee, and a few are. Much more common is private operation of terminal and service facilities on long-term ground leases or in built-to-suit facilities financed on the basis of long-term leases.<sup>29</sup> The operators can be airlines or third-party terminal companies operated for profit.

Typically, there is only one airport in a metropolitan area capable of sustaining airline operations and it is not congested because demand is well within capacity most of the time. For those delays that do occur, the cost of eliminating delay would be greater than the costs the delays impose. These airports do not present an opportunity for spending to alleviate congestion,

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25 Robert W. Poole, Jr., *Guidelines for Airport Privatization* (Reason Found. How-To Guide No. 18, 1994), available at <http://www.reason.org/htg13.pdf>.

26 Judge Easterbrook elegantly defined market power. See *Ball Mem'l Hosp., Inc. v. Mut. Hosp. Ins., Inc.*, 784 F.2d 1325, 1335 (7th Cir. 1986) (Easterbrook, J.) (“Market power comes from the ability to cut back the market’s total output and so raise price; consumers bid more in competing against one another to obtain the smaller quantity available.”).

27 In residual fee systems, all airport revenues, including fees from ground concessions, are put into a single till and applied to the total cost of running the airport, with landing fees assessed according to aircraft weight applied to each airline operation to make up any shortfall. Levine, *supra* note 6, at 89.

28 Airport Improvement Act of 1982, 49 U.S.C. §§ 47101-47134 (2000). There is a recent Airport Privatization Pilot Program that allows the FAA to designate one privatized large airline hub airport (in this case, Chicago’s Midway Airport) to remain eligible for AIP funds. 49 U.S.C. § 47134 (2000). If expanded, this program has the potential to create competition at cities with more than one airline airport, but expansion to include more large airline hubs would require further legislation. The program will also allow selection of up to three medium or small hub airports. Austin and New Orleans are reported to be considering applying for inclusion in the program. See Bruce Egger, *New Orleans City Council Backs Privatization Application for Armstrong International Airport*, TIMES-PICAYUNE (New Orleans), Nov. 21, 2008, available at [http://www.nola.com/news/index.ssf/2008/11/new\\_orleans\\_city\\_council\\_backs.html](http://www.nola.com/news/index.ssf/2008/11/new_orleans_city_council_backs.html); Kate Harrington, *Could ABIA Be Privatized? Australian Powerhouse Mulls the Option*, AUSTIN BUS. J., May 2, 2008, available at <http://austin.bizjournals.com/austin/stories/2008/05/05/story2.html>.

29 See, e.g., LOS ANGELES WORLD AIRPORTS, ANNUAL FINANCIAL REPORT: FOR THE YEARS ENDED JUNE 30, 2007 AND 2006, at 52 (2008), available at <http://www.lawa.org/docs/LAWA%20Annual%20Financial%20Report%202007.pdf> (describing long-term capital leases made with various airlines).

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although congressional politics mean that they absorb much of the AIP budget.<sup>30</sup> They are also not typical of the situation at the largest airline airports.

In the largest metropolitan areas, there is frequently more than one airport capable of sustaining airline operations, but these airports are most often operated (and usually owned) by a single public entity or coordinated by law to promote regional planning.<sup>31</sup> In very few important metropolitan areas, more than one airport with more than one operator (all public entities of various kinds) can support comprehensive airline operations. The prime example is the San Francisco Bay Area (San Francisco, Oakland, and San Jose airports, all of which can accommodate intercontinental flying). Miami-Fort Lauderdale is another. There are in addition a number of cities—Los Angeles and Seattle are examples—where there is more than one airport operator, but various physical and political constraints mean that only one airport operator can service virtually all kinds of airline operations.<sup>32</sup> It is important to note that, with almost no exceptions, a high degree of congestion is a problem only at airports

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30 For an example of how AIP funds are distributed among states and airports, see Fed. Aviation Admin., Grants Awarded by Fiscal Year: FY 2007, [http://www.faa.gov/airports\\_airtraffic/airports/aip/grantapportion\\_data](http://www.faa.gov/airports_airtraffic/airports/aip/grantapportion_data) (last visited Dec. 1, 2008).

31 Examples are the Port Authority of New York and New Jersey (hereinafter referred to as PANYNJ or Port Authority), which operates LaGuardia, JFK, Newark, Stewart International Airport in Newburgh, NY (hereinafter referred to as Stewart), and Teterboro, a New Jersey general aviation airport near Manhattan (hereinafter referred to as Teterboro); the City of Chicago, which operates Chicago O'Hare International Airport (hereinafter referred to as O'Hare) and Chicago Midway International Airport (hereinafter referred to as Midway); the Houston Airport System, which operates George Bush Intercontinental/Houston Airport and William P. Hobby Airport (hereinafter referred to as Bush International and Hobby, respectively); The Massachusetts Port Authority (hereinafter referred to as Massport), which operates General Edward Lawrence Logan International Airport (hereinafter referred to as Logan), Laurence G. Hanscom Field Airport (hereinafter referred to as Hanscom Field), and Worcester Regional Airport (hereinafter referred to as Worcester); the Philadelphia Airport System, which operates Philadelphia International Airport and Northeast Philadelphia Airport; and the Metropolitan Washington Airports Authority, which operates Washington, D.C.'s Ronald Reagan Washington National Airport (hereinafter referred to as Reagan National or National) and Washington Dulles International Airport (hereinafter referred to as Dulles).

A third airport serving the northern parts of the Washington, D.C. metropolitan area is Baltimore/Washington International Thurgood Marshall Airport (hereinafter referred to as BWI), originally conceived as a regional airport midway between Washington and Baltimore, but then built by the City of Baltimore much closer to itself. Today BWI is owned and operated by the Maryland Aviation Administration, which is also the owner and operator of Martin State Airport, a general aviation airport near Baltimore. For some travelers, especially those that are price rather than convenience sensitive, this airport is a competitor to Reagan and Dulles, but for the majority of both short-haul and long-haul Washington travelers it is not.

32 While the City of Los Angeles owns and operates Los Angeles International Airport (hereinafter referred to as LAX or Los Angeles International) and Ontario International Airport (hereinafter referred to as Ontario) as the main airports capable of long-haul operations (it also operates Van Nuys Airport, the nation's largest general aviation airport), there are airports at Burbank (Bob Hope Airport, hereinafter referred to as Bob Hope or Burbank) and Santa Ana (John Wayne Airport-Orange County, hereinafter referred to as John Wayne or Santa Ana) that have extensive airline operations. These are both runway-constrained and serve mostly shorter-haul flights with a few longer-haul exceptions at each one. Long Beach (Daugherty Field) Airport (hereinafter referred to as Long Beach Municipal) would be capable of full intercontinental airline service if it were developed, but political constraints limit flights and terminal construction there. It will be interesting to see how the privatization of Midway Airport affects the operator's behavior and the amount of capacity at O'Hare.

controlled by a local or regional monopoly, and where it does occur elsewhere, much of that congestion occurs as a “cascade” from congested monopoly airports.<sup>33</sup> Another effect of competition is to hold down airport costs and charges.<sup>34</sup>

At present, the extraction of financial rents from the public monopolies that control air-carrier airports in many of the most important metropolitan markets in the country is purportedly constrained by legislation and regulations that limit charges and the uses to which airport revenues can be put. These limitations usually find expression through so-called “single-till, residual fee” pricing structures.<sup>35</sup> While these regulations act as a ceiling on the collection of monopoly fees designed to transfer revenues from non-resident travelers to local residents and hold down landing fees paid by airlines, they are also a source of the congestion problem because they operate as an impediment to charges that reflect marginal cost (including the costs of delays). Given the monopoly status of the airports to which they apply, the regulations leave in place incentives for inefficiencies—elaborate public works projects such as monumental terminals, excess employment, etc.—whose existence provides political advantages to the public owners and whose costs can be recovered in the absence of competition. The regulations also are not universal in application. A generous handful of the most important of these monopolies—including the Port Authority of New York and New Jersey, along with Boston, Chicago, Seattle, San Francisco, Oakland, and others—have “grandfathered” exemptions from rules limiting the amount and use of revenues obtained at the airport.<sup>36</sup> Airport revenues are used to fund mass transit, seaport projects, and other politically popular projects that don’t pay for themselves.

In such environments, the effective limits on airport fees are political and come from local interests who benefit from the existence of air service. In this system, there is no guarantee that any congestion fee revenues will be used to expand capacity, nor is there incentive for such use. In most cases, these exemptions have not been used to control congestion or to expand capacity, but rather to transfer funds from airports to support such unrelated activities as rapid transit and other public works. Influential non-aviation interests put considerable political pressure on the public entities that own the airports to inhibit or prevent airport expansion. In any event, neither at exempted nor at non-exempted airports do prices serve their economic function of signaling and financing the need for additional investment in capacity and allocating existing capacity to the users that value it most.

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33 John Wayne Airport in Santa Ana, where expansion is constrained by very expensive adjoining real estate, is the main congested airport that is not part of a monopoly system. It is also relatively distant from any convenient alternative that is not itself restricted like Long Beach Municipal.

34 See, e.g., Andrew Compart, *Allegiant Cites Costs in Move from San Francisco to Oakland*, AVIATION DAILY, Nov. 5, 2008, at 2.

35 See *supra* note 27 and accompanying text.

36 Airport Improvement Program, 49 U.S.C. §§ 47107(b), 47133(b) (2000) (recognizing the rights of “grandfathered” airport operators to use airport revenues for local purposes).

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Accordingly, non-market rules and practices are used both to control investment and to allocate capacity. Decisions to invest at congested airports are partly subsidized but mostly result from a combination of political and commercial forces. Among those who exert pressure are incumbent airlines (who may or may not want more capacity, depending on whether they wish to expand their own output or defend against the expansion of others); airlines that want to offer new service; local business interests (who generally do want expansion to facilitate their own travel or to benefit from the travel of others); local residents (who oppose expansion if it will mean more noise or visual impact on them); local construction interests (who generally favor public works); local politicians (who either represent the interests that favor expansion or those that oppose it or who themselves juggle the conflicting pressures); political representatives of metropolitan areas connected by air to the congested airports (usually smaller ones, since larger ones “automatically” get service); and general aviation (business and private aircraft) users who try to ensure that they continue to receive access on preferential terms. All these interests have in common goals that impose costs on others; none are interested in paying those marginal costs. They all try to find non-market solutions that will favor their interests.

Examples of such solutions include landing fee structures that favor smaller planes and general aviation; political restrictions on runway use and growth designed to limit total operations or operations over certain areas; direct limits on total aircraft movements; limits on the number of passengers who can be accommodated each year; rules limiting the distance that can be flown nonstop by flights using the airport; and the creation of “slots” allowing the use of the airport and then the subcategorization of those slots to favor certain users, sizes of aircraft, or origins or destinations of flights. Each of these devices represents the outcome of a political process, often a political battle, whose resulting political equilibrium rarely can be changed quickly or easily. These exceptions to a set of access and charging rules that apply uniformly to all users, designed to mitigate the impact of the limits on certain constituencies and concentrate the impact on others, have created economically inefficient and indeed sometimes perverse incentives for airport operators and users.

Exemptions to non-monetary congestion-limiting measures such as slot controls have been created for politically potent special interests such as powerfully represented cities, states, and regions, as well as classes of users that consist of private and corporate aviation, regional airlines, and new entrants. Encouraged by pressures from foreign airlines and the State Department, the FAA has historically interpreted the United States’ obligations under international bilateral aviation agreements as requiring the FAA to exempt foreign carriers from congestion-relieving airport measures that might impede foreign carrier exercise of their bilateral rights at particular airports,

even if the regulations apply non-discriminatorily to U.S. carriers.<sup>37</sup> The FAA in its rule has nominally eliminated this preference for the New York airports, but its protected threshold of twenty operations per day per airport will avoid any impact on virtually all operations by international carriers, with the possible exception of British Airways at JFK.<sup>38</sup>

Since an airport does not have only one capacity, any measure of capacity has to take into account stochastic variation due to weather, aircraft mix and frequency, and the maximum, median, and average delay that the airport and airline operators are willing to tolerate.<sup>39</sup> The tolerable delay depends in turn on how valuable flights are and the degree to which customers will tolerate delay. Political factors (mostly noise-related) also affect and sometimes determine how many runways can be built, which ones can be used for what, and whether airport capacity can be increased either by better technology or by building or modifying a runway.

As noted, capacity is also a function of airspace management. While airport facilities in general are owned and operated by local public entities, ATC facilities are operated and in many cases owned by the Federal Aviation Administration, a branch of the U.S. Department of Transportation (DOT). In many other countries, this activity has been corporatized.<sup>40</sup> Almost always, the new structure is a kind of non-profit user-dominated cooperative or a government corporation.<sup>41</sup> In a few cases, however, the result is a regulated private corporation. ATC remains a purely governmental function here and affects an airport's capacity by putting limits on the number of aircraft per hour that can approach or depart the airport without conflicting with other air traffic. The exact limit depends on geography, system technology, politics (mostly, but not entirely, related to overflights), and conflicts with other airports in the area.

Of course, traffic that uses highways, bridges, and inner-city streets is catered to by publicly owned entities with monopoly power. Congestion charges in these fields are actively under consideration and have been implemented in some cases.<sup>42</sup> But a crucial difference from airports is that both

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37 See Congestion and Delay Reduction at Chicago O'Hare International Airport, 70 Fed. Reg. 15,520, 15,527 (proposed Mar. 25, 2005) (to be codified at 14 C.F.R. pt. 93) ("[F]oreign airline services to the United States (and U.S. airline services to foreign countries) are subject to intergovernmental air services agreements imposing obligations on the United States and the foreign government.").

38 Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, 73 Fed. Reg. 60,544, 60,554 (Oct. 10, 2008) (to be codified at 14 C.F.R. pt. 93) (claiming that "the Department is acting in a non-discriminatory manner" by preserving up to twenty slots for each carrier, whether domestic or foreign).

39 See Claus Ulrich, *How the Present (IATA) Slot Allocation Works*, in AIRPORT SLOTS, *supra* note 20, at 10-12.

40 Ellis J. Juan, *Privatizing Airports Options and Case Studies*, PUB. POL'Y FOR THE PRIVATE SECTOR, June 1996, at 1, available at <http://rru.worldbank.org/documents/publicpolicyjournal/082juan.pdf>.

41 Robert W. Poole, Jr., *The Urgent Need to Reform the FAA's Air Traffic Control System* (Reason Found. Pol'y Study No. 358, 2007), available at <http://www.reason.org/ps358.pdf>.

42 See Donohue & Hoffman, *supra* note 4 (citing examples of congestion pricing in road traffic).

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highway capacity and fees are subject to voter control by users sufficiently concentrated and situated to influence price levels and the uses of the revenues they raise.<sup>43</sup> The ownership and decision-making authority involved is not perfectly correlated to use by any means, but the users can make sure that fees promote development where necessary either through additional capacity or through alternative investments, like mass transit, that satisfy excess user demand. While the political demands of these constituencies have been seen as a source of the problem because they have by and large resulted in free use or toll use not related to congestion, the external impacts of traffic congestion have recently produced a significant movement by users toward accepting the financing of new commuting capacity through user charges related to congestion.<sup>44</sup> While airlines certainly can influence the pricing behavior of airports, their ability to do so is limited at monopoly-owned airports in cities they must serve.

### IV. Airport Access and Finance—Current Rules

Most airports in the United States are accessed entirely on a first-come, first-served basis.<sup>45</sup> Aircraft file flight plans (or in the case of certain light plane Visual Flight Rules operations,<sup>46</sup> just show up), are accommodated in the ATC system as they appear, are sequenced for landing or takeoff in the way that seems most efficient to the air traffic controllers at the moment, and neither have nor are required to have any formal entitlement (or “slot”) to use the airport. Legislation requires that airports receiving federal funds (virtually all air carrier airports) be available for use without discrimination and that charges for use of the airport be reasonable and cost-related.<sup>47</sup> Airports may not make a profit from accommodating takeoffs, landings, or access to terminals, but may do so from ancillary activities like concession fees for food, ground transportation, and ground rents for terminal and other airport buildings.<sup>48</sup>

Most airline airports in the United States have a “residual” fee system for airline users.<sup>49</sup> In this system, the profits from ancillary activities are applied

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<sup>43</sup> Sewell Chan, *How East River Bridges Stayed Toll-Free*, N.Y. TIMES CITY ROOM, Nov. 11, 2008, <http://cityroom.blogs.nytimes.com/2008/11/11/how-east-river-bridges-have-stayed-toll-free/>.

<sup>44</sup> *Id.*

<sup>45</sup> Peter Forsyth & Hans-Martin Niemeier, *Setting the Slot Limits at Congested Airports*, in AIRPORT SLOTS, *supra* note 20, at 64; *see also* David Z. Plavin, *Using the Revenues from Airport Pricing* 2, (Reason Found. Policy Brief No. 68, 2007), *available at* [http://www.reason.org/pb68\\_airportpricing.pdf](http://www.reason.org/pb68_airportpricing.pdf).

<sup>46</sup> Light aircraft are permitted to fly in high visibility conditions outside controlled airspace using the pilot’s visual vigilance to maintain separation from other aircraft and terrain. *See* 14 C.F.R. §§ 91.151-91.159 (2008). Airliners, turbine-powered aircraft, and aircraft weighing more than 12,500 pounds fully loaded must fly under the supervision of ground controllers using Instrument Flight Rules.

<sup>47</sup> Section 511 of the Airport and Airway Improvement Act of 1982, 49 U.S.C. § 47107 (2000), requires that all airports receiving a federal airport grant, whether public or private, be “available for public use on reasonable conditions and without unjust discrimination.”

<sup>48</sup> Plavin, *supra* note 45 (noting that airport charges may not be “unjustly discriminatory”).

<sup>49</sup> Polsby, *supra* note 6, at 789-91.

toward the cost of running the airport and the residual is charged to airline users through takeoff or landing charges assessed against aircraft according to their maximum permitted takeoff weight, which is a proxy for aircraft size and range. General aviation users (corporate or recreational) may be charged a “movement fee” (takeoff or landing fee), but are most often assessed a surcharge on the fuel they purchase at the airport. Airports are also permitted to impose a Passenger Facility Charge (PFC) on airline passengers using the airport. The PFC is generally authorized by Congress, specifically approved by the FAA, collected by the airline, and included in the price of the ticket.<sup>50</sup> None of these fee systems take into account congestion or delays imposed on others and most have the perverse effect of charging the smallest aircraft with the fewest passengers the least, even though they take up as much approach and departure capacity as bigger aircraft.

The ancillary revenues come from charges on users other than aircraft operators. Many of the non-airline charges reflect monopoly rents stemming from the fact that most airports are monopolies or part of a monopoly system, and most non-airline users (such as passengers and their companions acting as diners, gift-shop buyers, car-parkers, and rental car customers) are part of a captive customer base. Federal subsidies are also applied to facilities construction and to airport-related ATC activities. The airport operator maximizes revenues from those sources and then recovers the “residual” costs from aircraft operators as described above.

This system provides neither users nor operators with proper incentives. As discussed above, users don’t have to take into account the costs they impose on other users or unrelated taxpayers. Federal subsidy for airports, like many other federal expenditures, reflects the Constitutional Compromise of 1787 (protecting the interests of less populous states)<sup>51</sup> much more clearly than any economic definition of need. Each state has two U.S. senators who are in a position to influence the expenditure of airport funds either directly or through logrolling, which means that AIP money is distributed more widely geographically than would be justified by operational needs. Operators do not connect expenditures for capacity with the value that users attach to its use. Since users are accommodated on a first-come, first-served basis and charged in a way largely unrelated to the particulars of their use, they show up, land, and take off unaffected in any way by the costs they impose on others and only in the most diffuse way possible by some share of the costs of constructing and operating the facilities they use.<sup>52</sup>

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<sup>50</sup> See FED. AVIATION ADMIN., PASSENGER FACILITY CHARGE ORDER 5500.1 (2001), available at [http://www.faa.gov/airports\\_airtraffic/airports/resources/publications/orders/media/PFC\\_55001.pdf](http://www.faa.gov/airports_airtraffic/airports/resources/publications/orders/media/PFC_55001.pdf).

<sup>51</sup> See JACK N. RAKOVE, ORIGINAL MEANINGS: POLITICS AND IDEAS IN THE MAKING OF THE CONSTITUTION 58-70 (1996).

<sup>52</sup> An important exception is in charges for the use of terminal facilities, which at the largest airports are often designed by and constructed for individual airlines or terminal operating companies, using their rental payments as a revenue stream to pay for construction bonds and operation.

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At the busiest times at some airports (or at the busiest airports much of the time), this system produces congestion and delay. Airlines schedule flights without regard to the costs they impose on others. As long as the incremental revenue exceeds the airline's share of the incremental cost, including delay costs to other airlines, the flight will be scheduled, even if the total incremental delay cost exceeds the total new benefits created (as reflected in passenger willingness to pay). The delays can be enormous.

The most dramatic examples occur in New York, whose airports have been estimated to cause, directly or indirectly, three quarters of the total congestion delay experienced in the U.S. system.<sup>53</sup> It is the three major New York airports that have been the subject of the most intense efforts by the FAA to implement a market-based system and that have served as the front line in the political and legal wars over market-based airport congestion remedies. At JFK, where flights to Europe all need to leave in a fairly narrow time band because of time zone differences and arrive in an only slightly wider band, departure delays at peak times at peak season can be as long as two to three hours and even worse when the weather is particularly bad.<sup>54</sup> Although half-hourly movement quotas have been imposed and "slots" assigned, if an airline has a flight scheduled using a slot within the quota, it is accommodated on a first-come, first-served basis. In this system, an aircraft's place in the queue is established when it pushes away from the gate and calls in "ready to taxi."<sup>55</sup> Aircraft sit full of passengers, trapped unproductively, and crews on the time clock, with at least one engine turning and burning fuel and emitting pollutants, inching forward in line until it is their turn to take off. Aircraft coming in to land have priority over takeoffs, but often they are so numerous that they are put in holding patterns or given circuitous routings to space them for landing. A business jet with a crew of three and two passengers gets to delay a 747 with 400 passengers just by filing a flight plan (first-come, first-served within the general aviation quota) and "showing up" for departure or arrival.<sup>56</sup>

In the same way that they schedule flights without regard to others, airlines impose facilities costs on others. An airline pays only a fraction (computed as a function of "landed weight" or some other average measure) of the cost of any new facilities required to accommodate aggregate traffic or new

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<sup>53</sup> Press Release, The White House, Fact Sheet: Taking Administrative Action To Address Air Traffic Delays (Nov. 15, 2007), <http://www.whitehouse.gov/news/releases/2007/11/20071115-3.html>.

<sup>54</sup> See Notice of Airport Level Designation for John F. Kennedy International Airport for the Summer 2008 Scheduling Season, 72 Fed. Reg. 60,710 (Oct. 25, 2007).

<sup>55</sup> See FED. AVIATION ADMIN., *supra* note 24.

<sup>56</sup> Size of aircraft and local market are not necessarily a good proxy for social welfare, however dramatic some of the examples often cited may appear. The much-cited example of a fifty-seat aircraft delaying a wide-body aircraft with three hundred passengers aboard may be very misleading if the smaller aircraft is full of travelers paying premium fares to get to a business meeting on time or to make convenient connections to places ranging from Tokyo to Dubai and the larger one is full of leisure travelers whose preference to use a particular flight to Miami at a particular time can be measured in single-digit fare differences over their next preferred substitute.

aircraft.<sup>57</sup> If an airline buys a giant A380 aircraft, runways may have to be widened and strengthened or taxiways reconfigured or rerouted. The airline only pays its aircraft-weight share of the airport improvement; other users bear the rest of the cost. Airports are not required to make improvements for new aircraft, but very few airports turn away the latest and greatest, since they know they will be reimbursed for their total costs.

#### V. Congestion—Comparative Institutions

In other parts of the world, congestion is managed administratively. Airlines get “slots” to use for takeoffs and landings. These slots are usually dispensed by scheduling committees using some variant of the rules of the International Air Transport Association (IATA), the main trade association of the world’s airlines.<sup>58</sup> These rules create a committee chaired either by the dominant airline at the airport or, in more competition-conscious countries, by a neutral governmental or quasi-governmental official, to assign landing and takeoff slots at congested times to airlines requesting them. A slot is defined by a time (in one-hour or less-than-one-hour intervals) and usually as a departure or arrival slot. Previous users are grandfathered in, but there is political pressure to minimally accommodate new entrants (either new airlines or airlines new to the airport, depending on which country’s politics are being accommodated).<sup>59</sup>

The European Union (EU) has approved rules governing this process that are designed to balance the need for stability of expectations with the need to accommodate new competition.<sup>60</sup> The EU rules provide that slots shall be allocated at each congested airport by an independent coordinator, who shall act in accordance with the regulations in a neutral, non-discriminatory, and transparent way. The regulations provide that:

[A] carrier using a time slot that has been cleared by the coordinator is entitled to claim the same slot in the next scheduling period. In a situation where all slot requests cannot be accommodated to the satisfaction of the air carriers

<sup>57</sup> Landed weight is the maximum allowable gross takeoff weight (or sometimes maximum allowable gross landing weight) of the aircraft. In the system most commonly in use, the weight for each aircraft operation using the airport is compared with the aggregate over time and then applied as a fraction to the total residual costs to calculate the fee for each operation in the period. Plavin, *supra* note 45, at 1-2.

<sup>58</sup> See INT’L AIR TRANSP. ASS’N, ENSURING AN EFFECTIVE AND GLOBALLY COMPATIBLE SLOT ALLOCATION SYSTEM (2003) *available at* [http://www.iata.org/NR/ContentConnector/CS2000/Siteinterface/sites/mgr/file/IACSlotsfinal2\\_English.pdf](http://www.iata.org/NR/ContentConnector/CS2000/Siteinterface/sites/mgr/file/IACSlotsfinal2_English.pdf); *see also* Int’l Air Trans. Ass’n Scheduling Process, <http://www.iata.org/whatwedo/passenger/scheduling/process.htm> (last visited Nov. 22, 2008) (detailing the mechanics of the IATA system).

<sup>59</sup> See David Gillen & William G. Morrison, *Slots and Competition Policy: Theory and International Practice*, in AIRPORT SLOTS, *supra* note 20, at 173, 179.

<sup>60</sup> Council Regulation 95/93, Common Rules for the Allocation of Slots at Community Airports, 1993 O.J. (L 14) (EEC).

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concerned, preference is given to commercial air services and in particular to scheduled services and programmed non-scheduled air services.<sup>61</sup>

The coordinator also takes into account additional priority rules established by the air carrier industry and, if possible, the additional guidelines recommended by the coordination committee allowing for local conditions.

If a requested slot cannot be accommodated, the coordinator informs the requesting air carrier of the reasons for this mismatch and indicates the nearest alternative slot. Slots may be freely exchanged between air carriers or transferred by an air carrier from one route or type of service to another.<sup>62</sup> Technically, it is ambiguous whether slots can be sold for cash, but since slot transactions can be combined with other transactions, this is not a practical issue. The most likely source of scarce slots is from alliance partners who may also derive system revenue benefits from the transfers. This means that true new entrants are very unlikely to get slots, since ninety-seven percent of the slots are grandfathered and the other three percent are unsuited to transatlantic service. However, it has recently been reported that some “naked” slots have been transferred in arm’s-length transactions for cash. In London, prime Heathrow slots are said to be worth millions of pounds.<sup>63</sup>

Where the slots can be monetized, the impact of these rules is that users have at least implicit incentives to consider the value of the slots they use, because by using them they are giving up the monies they could receive by transferring them. The holding costs, however, are implicit and not explicit, since users are not charged anything out of pocket. This approach reduces the accounting and perhaps behavioral impact of hoarding slots or using them in a less than optimal way. In this system, “congestion” is hidden and implicit in the inability of airlines, especially airlines without slots at the same airports to trade elsewhere, to easily acquire access to the airport for high-value flights. The queue is virtual and implicit (or perhaps made explicit as a list of requests to the slot coordinator for slots if and when they become available), rather than physical and observable. In another blow to economic efficiency, the EU rules also provide for exceptions for flights that have lower economic value but serve smaller cities: “A Member State may reserve certain slots for domestic scheduled services . . . .”<sup>64</sup>

In most of the applications of the IATA rules, the slots cannot be monetized in a transparent way. Not only does this approach mean that slot holding costs are implicit instead of explicit, it also facilitates slot hoarding, makes entry

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61 European Union, Summary of Legislation, SCADPlus: Allocation of Time Slots (Sept. 4, 2008), <http://europa.eu/scadplus/leg/en/lvb/l24085.htm>; *see also id.* art. 8.

62 Council Regulation 95/93, Common Rules for the Allocation of Slots at Community Airports, 1993 O.J. (L 14) (EEC).

63 Dominic O’Connell, *Delta Scoops Slots at Heathrow*, SUNDAY TIMES (London), Apr. 15, 2007, at Bus. 3; *Heathrow Airport Slots Sold for Record-Breaking Price*, AIRPORT NEWS, Jan. 3, 2008; *see also Continental To Pay \$93 Million for Heathrow Slots This Year*, AVIATION DAILY, Feb. 25, 2008, at 1.

64 Council Regulation 95/93, Common Rules for the Allocation of Slots at Community Airports, art. 9, 1993 O.J. (L 14) (EEC).

difficult for new competitors, and ensures that no dramatic changes in the competitive landscape occur. It is widely regarded as anticompetitive.<sup>65</sup> It is this system that PANYNJ and the trade associations representing airlines have endorsed for New York airports.

#### VI. Congestion—U.S. History

In the United States, there are no scheduling committees. Airport congestion tends to ebb and flow with business cycles and, of course, with changes in the relationship of airport capacity to growth. As a point of fact, while O'Hare is finally engaged in an expansion plan that will relieve but not eliminate congestion, almost no physical capacity has been added in the last fifty years at LaGuardia, JFK, and Reagan National, three of the four airports at which congestion first appeared, although allowable operations have been increased at LGA. Since then, Newark has become relatively congested as a result of Continental's hub operations and of international movements avoiding JFK. Congestion appears at peak times at some other airports as well. Some of those airports (Hartsfield-Jackson Atlanta International most dramatically) have added capacity to accommodate demand, but in general, airport capacity is not keeping up with demand growth in the United States.<sup>66</sup>

When airport congestion first appeared as a problem in the late 1960s, I suggested congestion pricing (as well as, less importantly, more rational runway wear-and-tear pricing) in an academic article.<sup>67</sup> This article had almost no real-world impact at the time, although it was much cited and used in Economics 101 courses. Instead, the FAA embarked on a series of administrative remedies instituted over the years, with urgency peaking in periods of economic boom and airline growth, then subsiding as the next recession reduced demand. The principal administrative device used was slot control, announced in 1968 through a High Density Rule applying to O'Hare, LaGuardia, JFK, and Reagan National.<sup>68</sup> At each of those airports, the number of operations per hour was fixed by reference to the FAA's technical criteria, implicitly accepting a certain amount of delay by fixing a number above the capacity of the airport in worst-case runway use configurations and weather. At Ronald Reagan Washington National, the capacity was further limited by reserving a significant number of slots for general (mostly corporate) aviation.<sup>69</sup> Operational demand was further limited at National and LaGuardia by imposing "perimeter rules" prohibiting departures of flights over a certain

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<sup>65</sup> See e.g., Keith G. Debbage, *Airport Runway Slots: Limits to Growth*, 29 ANNALS OF TOURISM RESEARCH 933, 938 (2002) ("[T]here is little doubt that as demand has increased at the key gateway airports across the North Atlantic, the IATA-based system of administrative rationing has become increasingly anti-competitive.").

<sup>66</sup> William Spitz, *Flight and Slot Valuations Under Alternative Market Arrangements*, in AIRPORT SLOTS, *supra* note 20, at 235.

<sup>67</sup> Levine, *supra* note 6.

<sup>68</sup> High Density Traffic Airports, 14 C.F.R. § 93.123 (2008).

<sup>69</sup> *Id.*

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distance (originally 1200 miles at National and 1800 miles at LaGuardia, but later modified, as I will observe below).<sup>70</sup>

As time went on, issues emerged and were dealt with by ad hoc modifications of the High Density Rule.<sup>71</sup> Originally, the slots could not be bought and sold but could be swapped. This meant that airlines with small portfolios had much less flexibility, and new entry was very difficult. Standards of use (the so-called “use it or lose it” rule) were applied and intensified as it became apparent that airlines “parked” slots by using them less than daily.<sup>72</sup> As the rules were tightened, incumbent airlines got more ingenious. They rotated slots and flights among several destinations, preserving regular service while conforming to the eighty percent “use it or lose it” standard. For example, they could occupy six daily slots (which could accommodate forty-two flights per week) with only five flights daily (a total of thirty-five flights per week) by using each identified slot only six times per week (which might require using some slots for service to different destinations on different days of the week). The more slots they had, the easier it was to use this stratagem while scheduling flights when and to where they wanted. Quotas and exceptions were made for politically sensitive operations, such as flights to small cities with strong congressional representation.

The problems intensified with airline deregulation. Airlines were free to schedule many more flights at any of these airports but couldn’t get slots. This was especially constricting for new entrant domestic airlines. Airline hubs were established in cities like Salt Lake City, Phoenix, and Kansas City, which were outside the perimeter rules (restricting the length of scheduled flights, imposed to reduce demand) at LaGuardia and Washington National airports.<sup>73</sup> These exceptions often had political origins.<sup>74</sup> As international airline regulation relaxed, foreign airlines scheduled more flights to Chicago and JFK, claiming the right to slots because international agreements authorized them to serve the cities in question.<sup>75</sup> The business grew rapidly with the large reductions in fares caused by deregulation.

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70 Ronald Reagan Washington National Airport Traffic Rules, 14 C.F.R. § 93.253 (2008) (perimeter rule for Ronald Reagan Washington National); *Long Distance at LaGuardia*, N.Y. SUN, Aug. 4, 2005, at 12.

71 A useful summary can be found in David Gillen, *Airport Slots: A Primer*, in AIRPORT SLOTS, *supra* note 20, at 41, 57-58, tbl. 4.4 (2007).

72 *See id.* at 45; *see also* Allocation of Commuter and Air Carrier IFR Operations at High Density Traffic Airports, 14 C.F.R. § 93.227 (2008).

73 *See generally* Michael E. Levine, *Airline Competition in Deregulated Markets: Theory, Firm Strategy, and Public Policy*, 4 YALE J. ON REG. 393, 464-71 (1987).

74 For example, Senator John McCain strongly supported the exception to the perimeter rule at Washington to allow his constituent, America West Airlines (now U.S. Airways) to serve his home city, Phoenix.

75 *See, e.g.*, Kevin Done, *BA Takes OpenSkies to Amsterdam*, FIN. TIMES, July 28, 2008, at 17 (announcing launch of second route from Europe to JFK after the enactment of the EU-US open skies agreement).

Further modifications were made to the rules, including, in 1985, the right to buy and sell slots.<sup>76</sup> This made it possible, in principle, for a new entrant to serve an airport and also in principle created economic efficiency by forcing an incumbent to confront the opportunity cost of holding on to a slot that had significant value. But in real-world circumstances, the fact that the identity of the prospective buyer was known to the prospective seller meant that the seller compared the revenue from selling a slot to the loss in revenue that might come from the addition of a new, often low-cost, competitor.<sup>77</sup> This produced an inefficient marginal calculation that included an anticompetitive component. Further, new entrant airlines complained that it unfairly forced them to pay for slots that incumbents had gotten free under grandfather rules.<sup>78</sup> The first concern was a problem in economic principle as well as in practice. In economic terms, the second was “merely” a wealth distribution issue and not an efficiency problem that needed to be addressed, but it could be used politically to manipulate the system. The manipulation usually consisted of creating new slots with the initial distribution restricted to new entrants, but the new entrants often ended up selling the slots to incumbents after an unsuccessful attempt to compete.

In consequence, the right to buy and sell slots didn’t solve the problem of politically favored services that weren’t valuable enough to justify slot purchases, or the restrictions of the perimeter rules, or the fact that the cost of selling to a new entrant included the impact of its fares on the remaining services of the historically incumbent airlines, or even to result in the sustained presence of new entrant competition. On the whole, the right to buy and sell eased a few problems by enhancing flexibility but it by no means eliminated them. More and more exceptions and ancillary rules were grafted onto the system. By the late 1990s, it started to become an administrative and political swamp.<sup>79</sup>

In 2000, out of concern over the collateral effects of the slot rules at LaGuardia on airport access and competition, Congress included a provision in the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR-21)<sup>80</sup> that terminated the slot rules for all but Reagan National as of January 1, 2007. The 2000-2002 recession masked some of the effects of these changes, but by 2007 congestion had increased dramatically at all three airports. Economic growth over the years and airline consumer demand for more convenient scheduling—more flights to more places—both contributed to

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<sup>76</sup> In December 1985, the FAA began allowing airlines to buy and sell slots. *See* Federal Aviation Administration, High Density Traffic Airports: Slot Allocation and Transfer Methods, 14 C.F.R. § 93.221 (2008).

<sup>77</sup> Levine, *supra* note 73, at 417.

<sup>78</sup> High Density Traffic Airports; Slot Allocation and Transfer Methods, 50 Fed. Reg. 52,180, 52,184 (Dec. 20, 1985) (discussing comments of opponents to grandfathering the existing slot allocation).

<sup>79</sup> Levine, *supra* note 73.

<sup>80</sup> Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR21), 49 U.S.C. § 41715(a) (2000).

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increased congestion. Fragmentation of demand meant smaller aircraft. The average number of airline aircraft seats per departure declined substantially. At LaGuardia, for example, the average number of seats per departure declined from 143 to 94 between the first quarter of 1998 and the first quarter of 2007. At O'Hare, the number declined from 124 to 98 over the same period.<sup>81</sup> Much of this trend was driven by increases in premium coach fares that made it profitable to fly smaller jets with relatively few business travelers attracted by more frequent schedules.

Various administrative band-aids were applied. At JFK, airlines like American, Delta, and JetBlue, all heavy users, were requested to show "restraint" in scheduling. Nevertheless, foreign airlines continued to increase flights and Delta and JetBlue intensified their operations, so delays continued to increase dramatically through the summer of 2007. LaGuardia experienced very large increases in delays. At JFK, forty-three percent of arrivals were late in July, while at LaGuardia forty percent were late.<sup>82</sup> In 2008, things did not improve.<sup>83</sup> These statistics substantially understate the degree of delay because they don't take into account the considerable padding airlines put into schedules (many peak-hour LaGuardia-Reagan National flights using jets are now scheduled for the same duration as the piston-engined propeller planes of 1953) and the very large departure delays at peak hours that show up as delays elsewhere. Newark airport has also become very congested at peak hours: the FAA ultimately announced movement quotas there, as well as at JFK and LaGuardia.<sup>84</sup>

## VII. Congestion—Improving Existing Policy

Airline deregulation is one of the most successful policy changes in the last fifty years. It transformed flying from a luxury to an accessible necessity, bringing families and the country together, fostering economic growth, and giving ordinary people access to a wealth of experiences previously reserved for the upper-middle class. In fact, one can say that in some ways it has been too successful because it has presented the federal and local governments with challenges that they so far have failed to meet. Congestion, caused by demand far in excess of airport capacity and the constraints of a straitjacket air traffic control system, has put a heavy tax on the convenience and utility of air travel. Late planes, long waits for takeoff, in-air holds for landing, and long taxi-in delays have made air travel an ordeal for many and wasted huge sums of

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81 See TOM WHALEN ET AL., PROPOSAL FOR A MARKET-BASED SOLUTION TO AIRPORT DELAYS (2007), <http://www.usdoj.gov/atr/public/eag/227380.pdf>.

82 See Congestion and Delay Reduction at Chicago O'Hare International Airport, 71 Fed. Reg. 51,382 (Aug. 29, 2006); Matthew L. Wald, *For Now, U.S. Won't Cap Flights Per Hour at J.F.K.*, N.Y. TIMES, Dec. 19, 2007, at B1; Matthew L. Wald, *Washington Taking a Look at Air-Traffic Problems*, N.Y. TIMES, Sept. 27, 2007, at C4.

83 Andrew Compart, *At New York Area Airports in July, There's No Cap on Flight Delays*, AVIATION DAILY, Sept. 4, 2008, at 1.

84 *Newark Flights Limited to 83 for Peak Hours*, WALL ST. J., Mar. 11, 2008, at D3.

money for airlines. In the United States, airlines schedule flights largely without constraint, imposing costs on other users that are not taken into consideration.

As discussed above, nowhere have the problems been worse than in New York, where congestion has reached alarming and prodigiously wasteful levels at Kennedy, LaGuardia, and Newark. The situation at those airports, and at others around the country where problems have been developing, has created public demand that something be done. If the past is any guide, these pressures may ease somewhat as the economic cycle slows air travel growth, but they can be expected to persist at some level and to recur with new vigor when the economic cycle turns up again.

In general, there are really only two classes of institutions available to force aircraft operators to consider the marginal costs they impose by their use of congested airports. Both involve the creation of some form of salable or leaseable property rights to airport use at congested hours.

The first is some form of congestion pricing in which airport operators are in effect given a property right in the use of their facility, access to which they then offer to users in return for premium payments proportionate to congestion.<sup>85</sup> The second is a slot system. A slot system could involve either auctions of the rights to use slots for a term or “permanently,” or some variant of the IATA/former FAA slot system, with a coordinating institution awarding tradable or saleable slots to airlines through historic use or new grant.<sup>86</sup> To provide incentives to consider competing uses, the slots might be “perpetual” or for a designated term, after which they would be reallocated by the coordinating institution.<sup>87</sup>

Many variations on these systems, especially the slot system, are possible. The variations addressing competition involve the number of years included in the property right, whether there is forced confiscation and re-auction of some portion of the slot portfolios of some or all airlines, and whether to restrict repurchase at auction of slots by airlines that have been forced to give them up. Variations pursuing non-efficiency goals have included devices intended to reserve slots for new entrants; devices that privilege slot access for flights serving smaller cities, minimum access for flights operated by users with relatively small total demand at a particular airport, and flights operated by non-U.S. airlines (often by excluding all of these from auctions entirely); and caps on operations designed to affect impact on politically important constituencies.

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<sup>85</sup> Achim I. Czerny, *Managing Congested Airports Under Uncertainty*, in AIRPORT SLOTS, *supra* note 20, at 111.

<sup>86</sup> See, e.g., Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, 73 Fed. Reg. 29,626 (proposed May 21, 2008) (to be codified at 14 C.F.R. pt. 93); see also Czerny, *supra* note 85.

<sup>87</sup> Daniel M. Kasper, *Slots, Property Rights, and Secondary Markets: Efficiency and Slot Allocation at US Airports*, in AIRPORT SLOTS, *supra* note 20, at 271.

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Airlines can be and have been given de facto property rights in their use of airports at congested times and allowed to buy or sell them, but the auction variations described above have not yet been tried and some only recently were proposed again by the FAA. The FAA in 2007 and 2008 imposed movement caps at New York's Kennedy, LaGuardia, and Newark Airports as a temporary measure, pending the adoption of a congestion management rule.<sup>88</sup> It then issued a proposal to allocate the movements through congestion charges at LaGuardia and annual confiscation and auction (in two different variants) of a fraction of airline movement slots at Kennedy and Newark. It also proposed to allow within certain limitations the sale from one airline to another of slots possessed by airlines.<sup>89</sup> It then published two versions of a slot auction rule for JFK and Newark airports as a notice of proposed rulemaking (NPRM) and solicited comments. After receiving numerous comments, it has adopted as a rule one of its proposed variants and applied it to all three New York airline airports.<sup>90</sup>

Historically, the FAA had claimed that the airlines do not have a property interest in the slots they fly. However, the airlines had been granted more and more rights to utilize, lease, and even sell slots under the law, at which point the distinction between "property" and "permission" became a largely metaphysical one. The buy-sell rule was implicitly abolished by Congress when it repealed the High Density Rule, under which the buy-sell rule was adopted. The FAA declined to restore buy-sell rights at the New York airports when it proposed its new rules, although it continued to allow trades and leases.<sup>91</sup> This curious, retrograde, and largely unexplained inhibition on efficient use of slots may have been adopted to defend the FAA from allegations by the airlines that slots are "property" which its rule would "take," although the preservation of other incidents of ownership, apparently to preserve efficiency in allocation, does not seem to be consistent with this position.

In pure principle and in competitive markets, slots that could be auctioned or exchanged and congestion charges would all be equally efficient in allocating available capacity among users, no matter who kept the proceeds, since they all would represent defined property rights differing only by who was the initial owner.<sup>92</sup> Takeoffs and landings at congested times would be

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<sup>88</sup> Congestion Management Rule for LaGuardia Airport, 73 Fed. Reg. 20,846 (proposed Apr. 17, 2008); Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, 73 Fed. Reg. 29,626 (proposed May 21, 2008).

<sup>89</sup> Congestion Management Rule for LaGuardia Airport, 73 Fed. Reg. 20,846 (proposed Apr. 17, 2008) (to be codified at 14 C.F.R. pt. 93); Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, 73 Fed. Reg. at 29,626.

<sup>90</sup> Congestion Management Rule for LaGuardia Airport, 73 Fed. Reg. 60,574, 60,577 (proposed Oct. 10, 2008) (to be codified at 14 C.F.R. pt. 93); Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, 73 Fed. Reg. 60,544, 60,546 (proposed Oct. 10, 2008) (to be codified at 14 C.F.R. pt. 93).

<sup>91</sup> Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, 73 Fed. Reg. at 60,546-47, 60,556-57.

<sup>92</sup> Ronald Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960); see Kasper, *supra* note 87.

performed by those aircraft operators who valued them most, with any scarcity rents going either to the original airline slot owners or to the airport operators. As noted, to optimize delay, auctions would require the additional step of predetermining the efficient level of capacity, while congestion charges would allow rolling readjustments of prices as delay increased or decreased. The choice between the two systems, as well as variations in the implementation of each system (for example mandatory surrender and re-auctioning, with proceeds going either to the original owner, the airport, or the hypothetically non-political FAA), would all have important wealth effects, but choices at the margin would be efficient and identical. Airport expansion could be financed by the sale of the right to use the new capacity to airlines either as auctioned new slots or as additional landing fees, which would be paid willingly by marginal users who valued their operations more than the cost of the new capacity.

This is not that world. Under airport institutional conditions as presented in the real world, life gets much more complicated and tradeoffs among impediments and imperfections are essential. Even before wealth effects and their political consequences are taken into account, the systems have in common substantial problems in defining the property right in question. How much delay risk is implicit in the unit of use definition? How should the system accommodate stochastic variations based on weather? Should there be surcharges in bad weather, discounts in good weather, or uniform prices based on the average prediction? What should be the impact of aircraft mix on charges? Are smaller planes “normal” and larger planes to be surcharged because they require more separation from smaller planes, or vice versa? Does the “intrusion” of a large aircraft on the smooth flow of a smaller one merit the surcharge?<sup>93</sup> How should the charging system deal with variations in capacity associated with runway configurations changed by weather, construction, aircraft performance limitations, or local politics?<sup>94</sup> Airline schedules are defined months in advance. Should the basic unit of use be one operation on one day or the right to operate a daily (or weekly, or some other configuration) service for an extended period? Should there be a spot market for airline or non-airline users? If so, how are the “spots” to be defined as the other conditions vary?

Looking beyond these technical problems of slot definition, the two basic approaches and their variants differ considerably not only in their wealth effects but in their imperfections and vulnerabilities once one departs from purely competitive conditions and profit motivation for airlines and airports.

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93 In current practice, this is done very crudely. *See supra* note 13. Airports have maximum capacity when used by aircraft of similar weight and speed. Size and speed variation among users reduces airport capacity as safe separation margins are maintained.

94 Amsterdam’s Schipol Airport uses six runways to accommodate the amount of traffic handled by two runways at London’s Heathrow so as to spread out and rotate the impact of aircraft operations on those on the ground.

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The wealth effects are dramatically different depending on the starting point and the system used. In the IATA system, because there is no charge for the grandfathered slots, the great bulk of the economic rents generated by limiting operations to reduce congestion goes to the airlines whose slot portfolios are grandfathered. In principle, these airlines could sell or trade the slots and so face opportunity cost at the margin, but airlines with large grandfathered portfolios have a substantial financial incentive to keep slots scarce. This incentive to maximize the value of their existing portfolio is reinforced by the fact that adding capacity degrades revenue on their existing flights by giving consumers more alternatives and introducing new competitors with lower costs and different business models.

Consider the effects on airports. In the IATA system, additional slots are allocated cost-free to airlines on the basis of priority rules.<sup>95</sup> No additional revenue other than weight-based landing fees supports capacity expansion. For the airport operator, whatever political pressures limit capacity expansion are not mitigated by monetary incentives at the margin. If they are limited to residual cost recovery, there is no monetary incentive to the operator either to expand or reduce capacity. Political pressures certainly do, however, affect decisions, forcing the airport operators to choose between the following two options: one, generating additional revenues to “consume” in uneconomic but politically valuable projects like the dedicated rail system connecting the Long Island Railroad to JFK, or subsidizing off-airport uses at grandfathered airports (such as buses, rapid transit, or civic facilities);<sup>96</sup> or two, limiting operations to reduce noise or distraction impacts on politically influential residential areas, some of them quite distant from the airport.<sup>97</sup> If airport operators are exempted from rules limiting them to residual cost recovery, increasing aircraft and passenger throughput increases the ancillary revenues available for off-airport diversion but increases their political exposure.

On the other hand, if one awards revenues from the right to use the airport to airport operators through congestion charges or slot auctions, airlines face correct marginal incentives but airport operators with market power<sup>98</sup> (the most common situation at congested airports) have substantial incentives to maintain or even increase scarcity, either as profit maximizers or as political entities. As monopoly profit maximizers, they can reap substantial financial benefits from the congestion charges, especially if they are available for off-airport uses. As political entities, they can reap very large political benefits from limiting overflight impact on politically vocal constituencies and at the same time generate revenues that can be used as patronage or to support politically

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95 Ulrich, *supra* note 39.

96 See Dick Netzer, *Reinventing the Port Authority*, CITY J., Summer 1996, [http://www.city-journal.org/html/6\\_3\\_reinventing.html](http://www.city-journal.org/html/6_3_reinventing.html).

97 See, for example, the objections of residents of New Canaan, Connecticut, and exurban northern New Jersey to the FAA's East Coast Plan, *infra* notes 122-126 and accompanying text.

98 See ECKERT, *supra* note 6.

popular but economically unsustainable projects, on- or off-airport.<sup>99</sup> So the airport operator's incentives are doubly impaired where it has both market power and congestion: it has a new source of revenue, much of which is provided by people who don't vote locally, and it gets the political benefits both of additional public revenue to spend and of pleasing politically sensitive communities by limiting airport use.

As we have seen, congestion charges or slot auctions with proceeds going to the airport operator can maximize static efficiency (where capacity is permanently fixed) through correct prices, although efficient congestion pricing may present serious political problems if price discrimination is necessary for efficiency.<sup>100</sup> Letting a monopoly airport operator keep the revenues from prices or auctions, however, reduces the incentive for a monopoly public airport operator to invest in new capacity and capacity-enhancing techniques, impairing dynamic efficiency.<sup>101</sup>

In principle, determining whether the static improvement in allocating existing capacity creates more social welfare than is lost through suppression of dynamic efficiency is an empirical problem of comparing the net present value of two sets of cash flows. But the dynamic efficiency component is necessarily highly speculative and dependent on unverifiable assumptions, rendering such comparisons entirely dependent on the assumptions made about future demand for, invention of, and adoption of new capacity enhancements, not to mention the controversy surrounding the correct form of current congestion pricing.<sup>102</sup> Given the volatile and dynamic history of commercial aviation and the pending availability of capacity-enhancing technology such as precision navigation that would permit the simultaneous use of existing runways or the construction of new runways that fit within the existing boundaries of airports but violate current separation rules, the bias ought to be in favor of dynamic efficiency, both to optimize future capacity and its creation and to preserve incentives for innovation.

In short, both classes of remedies to congestion do not provide the airport operator with correct incentives at the margin under real-world conditions. How should we choose between these flawed realities? Can we modify them to improve the incentives they present? Where to start?

The Department of Transportation, spurred on by recent congestion, the prospect of the problem spreading beyond airports where it occurs now, and the demand that the Department "do something" about these problems, has adopted a rule designed to introduce marginal-cost pricing through slot auctions at New

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99 Some idea of the magnitude of the sums involved can be inferred from the fact that a study from Deloitte & Touche has been reported as estimating that peak-hour slots at London's Heathrow Airport are worth from \$48.7 million to \$68.3 million per pair. Benet Wilson, *Deloitte: UK Carriers May Add Airport Slots to Bottom Line*, AVIATION DAILY, June 5, 2008, at 6.

100 See KAHN, *supra* note 5.

101 See, e.g., Viggo Butler, *Increasing Airport Capacity Without Increasing Airport Size*, (Reason Found. Policy Study No. 368, 2008), available at <http://www.reason.org/ps368.pdf>.

102 See ECKERT, *supra* note 6.

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York's Kennedy, LaGuardia, and Newark airports. The auction design and capacity rules vary slightly, depending on which airport they apply to. The matter is complicated legally because landing fees are collected by airports and are limited by law to reimbursing the costs of running the airport, and because the FAA's authority to collect ATC charges is unclear.<sup>103</sup>

Originally, the FAA had proposed for LGA a two-part landing fee structure, with the underlying part based as it is now on landed weight subject to various constraints and a second, congestion-based "operations charge."<sup>104</sup> As the FAA has described it:

The three specific proposals do not alter one of the fundamental principles of the 1996 Rates and Charges Policy: that reasonable fees must be based on the capital and operating costs of the facilities for which the fees are assessed. Rather, two of the proposals would modify costs that may be reasonably included in the cost base of landing fees at a congested airport. The third would clarify the ability of airports to adopt a "dual-element" landing fee with both a per-operation and weight-based component. This authority exists today for airports with or without congestion. While the presence or absence of congestion may affect how an airport may reasonably implement a dual element-landing fee, as discussed below, the 1996 Rates and Charges Policy is silent on this point. None of the proposed amendments is intended to permit an airport to generate revenues in excess of the allowable costs of providing airfield facilities and services at the congested airport, as defined in accordance with the 1996 Rates and Charges Policy.<sup>105</sup>

For Kennedy and Newark the FAA had proposed to reclaim and reauction each year a portion of the slots being used by existing operators, according to a complicated formula, captured in the chart published with the rule.<sup>106</sup> First, ownership of slots would be limited in time for periods from five to ten years (after ten years the rule sunsets, with the subsequent regime and ownership undefined) depending on which category the slot was in.<sup>107</sup> The assignment of slots at JFK and Newark would be conducted through a uniform mechanism. All operators, foreign and domestic, would be guaranteed a base level of operations of twenty movements (in effect, ten frequencies) per day. This effectively exempts most foreign operators from the rule. Above this level, slots would be subject to surrender to the FAA and made available to other airlines through auctions. Base level slots, slots subject to surrender, and slots

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<sup>103</sup> See Policy Regarding Airport Rates and Charges, 73 Fed. Reg. 40,430 (notice of amendment July 14, 2008); Policy Regarding Airport Rates and Charges, 61 Fed. Reg. 31,994 (June 21, 1996); Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, 73 Fed. Reg. 60,544, 60,553 (Oct. 10, 2008) (to be codified at 14 C.F.R. pt. 93); Congestion Management Rule for LaGuardia Airport, 73 Fed. Reg. 60,574, 60,581-82 (proposed Oct. 10, 2008) (to be codified at 14 C.F.R. pt. 93). *But see* Madhu Unnikrishnan, *Lawmakers Ask DOT IG To Examine Slot Auction Rule*, AVIATION DAILY, Oct. 16, 2008, at 2.

<sup>104</sup> Policy Regarding Airport Rates and Changes, 73 Fed. Reg. 3310 (Jan. 17, 2008).

<sup>105</sup> *Id.* at 3313.

<sup>106</sup> *Infra* Appendix.

<sup>107</sup> See, e.g., Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, 73 Fed. Reg. 29,626, 29,631 (proposed May 21, 2008) (to be codified at 14 C.F.R. pt. 93).

purchased at auction could be sold in a secondary market. Once a slot had been auctioned and transferred it would change category (if necessary) to last for the duration of the rule (ten years or less, depending on the year in which the auction occurred) and would be freely transferable in the secondary market.<sup>108</sup>

A variant of the rule based on the FAA's first alternative for JFK and Newark has been adopted for all three New York Airports.<sup>109</sup> At LaGuardia, the intention is to "retire" a significant number of existing slots (to be chosen by lottery from a pool composed of those having the largest portfolios). It would then force airlines to surrender others and auction them off, as at Newark and JFK. At Newark and JFK, the FAA would use the proceeds to mitigate congestion and delay in the New York City area. Simultaneously with the adoption of the rule, the Secretary of Transportation announced an eighty-nine-million-dollar program to expand capacity at JFK, starting in 2009 and to be completed in 2013. Where new slots were created or unused slots returned to the pool, the FAA would give priority to new entrants and year-round service before auctioning them off. Non-scheduled operations would be excluded from this entire system. An elaborate reservation system would be made available to non-scheduled operators, including charter airlines and general aviation users.<sup>110</sup>

When the FAA originally proposed the rule, it offered a second alternative for JFK, where the auction proceeds would go to the carrier holding the slot rather than to the FAA, but the original holder could not bid on the slot in the primary auction.<sup>111</sup> The auction would have been blind, so that the carriers would not know who is bidding, and no reserve price could have been set. Both of these restrictions were intended to limit incumbents' ability to protect themselves from new competition that might pose a particular entry or pricing threat. Both alternatives and the adopted rule also contain provisions for minimum usage, capping unscheduled operations, and withdrawal for operational need.<sup>112</sup> The rule will sunset in ten years.<sup>113</sup>

The effect of the rule will be to increase the costs of landing at the covered airports during periods of congestion (which might last through much of the day) for those using slots that were surrendered and auctioned. By raising the costs to use congested facilities, the FAA's rule will provide an incentive for current or potential active users to (1) adjust schedules to operate at less

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108 Press Release, U.S. Department of Transportation, U.S. Transportation Secretary Mary E. Peters Announces \$89 Million Commitment to Capacity Improvements at JFK International Airport, Releases Final Rules to Improve Service, Keep Fares Competitive at New York's 3 Capped Airports (Oct. 9, 2008), available at <http://www.dot.gov/affairs/dot15008.htm>.

109 See *infra* Appendix.

110 See *infra* Appendix.

111 Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, 73 Fed. Reg. 29,626, 29,629 (proposed May 21, 2008) (to be codified at 14 C.F.R. pt. 93).

112 *Id.*; see *infra* Appendix.

113 Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, 73 Fed. Reg. 60,544, 60,562 (Oct. 10, 2008) (codified at 14 C.F.R. pt. 93).

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congested times (if they exist); (2) use less congested secondary or reliever airports to meet regional air service needs; or (3) use the congested airport more efficiently by up-gauging aircraft.<sup>114</sup> Note that those operating slots grandfathered by the rule (existing operations under twenty per day) and not subject to auction, would continue to be able to use the airports free of marginal-cost constraints.<sup>115</sup>

As stated, revenue from the sale of the slots is intended to go to the FAA for projects related to capacity in New York. It is important to note that this reduces, but does not eliminate, incentives to resist adding capacity. Projects related to expanding capacity in the New York area would be subject to local political constraints, because the project implemented by the airport operator would require an application to be funded and because projects to be undertaken by the FAA (such as ATC projects) must go through a congressional appropriations process that is subject to substantial interference by local congressional delegations, as described more fully below.

For the original congestion charge alternative, the FAA maintained that “the operator of a congested airport may consider the presence of airfield congestion when determining the portion of allowable airfield costs to be allocated to the per operation charge during periods of congestion” and may use the proceeds to increase capacity at the airport or to develop alternate facilities at reliever airports elsewhere.<sup>116</sup> It maintained that the fact that the charges are limited to the costs of facilities and congestion allows them to comply with statutory restrictions.<sup>117</sup> This view was challenged but is now moot, since the FAA has adopted the slot auction alternative and is planning to retain and expend the proceeds.

The authority of the FAA to auction slots, as well as its authority to retain the proceeds, was challenged, along with other FAA alternatives, in a federal court, which recently granted a stay. The stay means that the matter will be decided in a Democratic administration that will be influenced by the strong opposition of prominent congressional Democrats from the New York area to the auctions. Given this opposition and the reduced urgency of the matter stemming from airline schedule reductions that the economic recession of 2008

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114 Press Release, United States Department of Transportation, *supra* note 108.

115 The State Department has consistently urged the FAA to exempt foreign airlines from access restrictions, despite the fact that there is arguably no legal requirement to do so. But in any event, whatever legal limits exist on capping access by foreign airlines do not logically apply to open access on nondiscriminatory terms just because there is a price associated with the access, whether that price is paid as a congestion charge to the airport or to another airline through a nondiscriminatory compulsory auction. See e.g., Robert W. Poole, Jr. & Benjamin Dachis, *Congestion Pricing for the New York Airports: Reducing Delays while Promoting Growth and Competition* 42-46 (Reason Found. Policy Paper No. 366), available at <http://www.reason.org/ps366.pdf>.

116 Policy Regarding Airport Rates and Changes 73 Fed. Reg. 3310 (Jan. 17, 2008); Policy Regarding Airport Rates and Charges, 61 Fed. Reg. 31,994 (June 21, 1996).

117 Policy Regarding Airport Rates and Changes, 73 Fed. Reg. at 3313.

has induced, it is likely that the FAA's slot auction proposal will die, and another mechanism, yet to be determined, will take its place.<sup>118</sup>

As objections to the proposed rule emerged and legislative and judicial challenges multiplied, but before the rule was adopted, the FAA decided to implement at Newark a pilot project much more limited in scope and somewhat simpler. Immediately after EOS, a British airline, ceased operations, vacating its few arrival and departure slots, the FAA proposed to auction these slots off to other airlines, effective September 3, 2008, using a variant of its procedures under the proposed rule. The agency intended to retain the revenues for itself and issued a "request for contract bids" to airlines that might wish to bid for them. After the various legal challenges described here, the FAA halted the planned auction to review the legality of its authority to auction these slots.<sup>119</sup>

This strategy brought the issue to a head. The original proposals faced serious political problems besides their enormous complexity. Incumbent airlines vigorously opposed paying for what they already receive for "free." Various users who might be priced out, including small-to-medium communities that fear loss of air service to these airports and general aviation users who at present pay even smaller fees than airlines, also objected strenuously and enlisted the help of Congress in opposing the changes.<sup>120</sup> In addition, expenditures to relieve congestion are subject to local political pressures exerted either on local airport operators or on the FAA through congressional delegations.

The political and judicial processes surrounding these proposals were very active, made urgent by the proposed auction of the EOS slots and the adoption of the rule. Key members of Congress and the White House were lobbied intensely. Even the Mayor of New York was enlisted by proponents to support slot auctions,<sup>121</sup> despite the fact that they were opposed by the New York and

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118 Petitions for Review, *Air Transp. Ass'n of Am. v. FAA*, Case No. 08-1333 (D.C. Cir. Oct. 14, 2008) (seeking review of the Congestion Management Rules for LaGuardia and for JFK and Newark); see Matthew L. Wald, *Court Order Delays Auction of Landing Slots at Airports*, N.Y. TIMES, Dec. 9, 2008, at A32. Perhaps recognizing that only the slot-retirement feature of its La Guardia rule will actually reduce congestion (the auction will promote allocative efficiency, but not change the number of permitted operations), see *infra* text accompanying note 127, the FAA moved in December 2008 to reduce the permitted number of operations per hour for the summer of 2009 independently of the fate of the rule. See, e.g., *Agency Seeks To Reduce La Guardia Flights*, ASSOC. PRESS, Dec. 22, 2008, available at <http://www.nytimes.com/2008/12/23/business/23air.html>.

119 Press Release, Department of Transportation, FAA to Auction Slots at Newark Liberty Airport, Aug. 5, 2008, available at <http://www.dot.gov/affairs/dot11008.htm>; *FAA Stops EWR Slot Auction, Opens PANYNJ Investigation*, REGIONAL AVIATION NEWS (Sept. 8, 2008).

120 See, e.g., *Air Travelers Association Opposes Airport Slot Restrictions, Slot Auctions, and Congestion Pricing Proposals, as the New York Aviation Rulemaking Committee Concludes its Proceedings*, BUS. WIRE, Dec. 11, 2007 (indicating opposition from Air Travelers Association when auctions were first announced); Raju Chebium, *N.J. Congressmen Oppose Slot Auction Plan*, GANNETT NEWS SERVICE, Oct. 9, 2008 (including statements from several New Jersey congressmen opposing auctions); Letter from New Jersey House Delegation to Secretary Mary Peters, Department of Transportation (Aug. 8, 2008) (stating New Jersey congressmen's opposition to slot auctions).

121 See Matthew L. Wald, *Bloomberg Backs Plan for Auctions at Airports*, N.Y. TIMES, Aug. 11, 2008, at B3.

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New Jersey congressional delegations, the Port Authority of New York and New Jersey, which owns the airport, and others.<sup>122</sup> Senators Schumer and Clinton placed a hold on both hearings to confirm a new FAA Administrator, threatened a hold on the Department of Transportation appropriations bill, and introduced legislation to make slot auctions illegal, but the EOS slot auction created a need for immediate action. Since the activity surrounding the 2008 presidential elections guaranteed that the appropriations bill would not come to a vote, a continuing resolution became necessary to keep the Department of Transportation in business. New York and New Jersey senators offered amendments supported by the PANYNJ and the Air Transport Association of America (the trade association for most but not all U.S. airlines) that would effectively make the continuing operation of the DOT contingent on cancelling the auction.<sup>123</sup> The amendment failed, but Senator Schumer continued to seek a legislative prohibition of the auction, even as the Department proceeded.<sup>124</sup>

The Airports Council International, a trade association for airport operators, had supported congestion pricing as long as each airport could keep the revenues it generated.<sup>125</sup> The Council's support of only market-based congestion measures that leave all revenues in airports' hands but not those whose revenues go elsewhere suggests that airport operators may be less focused on reducing congestion than preserving revenue streams. This intensifies concerns developed below that leaving the airport operators in a position to benefit financially from scarcity may well create inefficient incentives for them. They opposed the proposed EOS auction.

Although the funds that could be generated through congestion charges or slot auctions could be substantial, the Port Authority of New York and New Jersey, the airport operator most impacted, has so far opposed congestion charges in general, presumably because it is less concerned about congestion management than about preserving its discretion in managing capacity. Perhaps more importantly, the Port Authority reaps major political benefits from transfers of funds from airports to other uses and may well be concerned that allowing modifications in the charging system may mean that more constraints will be put on its use of funds.<sup>126</sup>

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<sup>122</sup> See, e.g., Sewell Chan, *In Dispute over Plan To Auction Off Airport Slots, U.S. Threatens To Cut Aid*, N.Y. TIMES, Aug. 27, 2008, at B5; Raju Chebium, *Unpopular Airline Slot Auctions To Proceed at NY, NJ Airports*, GANNETT NEWS SERVICE, Oct. 16, 2008 (indicating that the New York and New Jersey senators, and all thirteen New Jersey congressmen, have opposed the FAA's plan to auction slots); Erika Lovley, *Airlines Moving to the Grown-Up Table*, POLITICO.COM, June 18, 2008, <http://www.politico.com/news/stories/0608/11167.html>.

<sup>123</sup> Lisa Caruso, *Pushback on Air Auctions*, NAT'L J., May 9, 2008, [http://www.nationaljournal.com/njmagazine/ad\\_20080503\\_1717.php](http://www.nationaljournal.com/njmagazine/ad_20080503_1717.php) (describing Senator Schumer's intention to place an amendment on the FAA spending bill).

<sup>124</sup> Matthew L. Wald & Ken Belson, *Despite Protests, U.S. Is To Auction Landing Slots at J.F.K., LaGuardia, and Newark*, N.Y. TIMES, Dec. 5, 2008, at A32.

<sup>125</sup> Benet Wilson, *FAA, Airlines Panel Continues Debate on NYC Slots, Auctions*, AVIATION DAILY, Sept. 24, 2008, at 4.

<sup>126</sup> The Port Authority is currently statutorily exempt from federal limitations on off-airport use of airport-earned revenues and use of money earned at the airports to support transit and various

In economic principle, both of the FAA's proposals are a great idea. As noted, it was recognized as far back as 1969 that the right remedy for airport congestion was to abandon the idea of airport landing fees based on aircraft weight and to impose charges based on true measures of wear and tear and the economic cost of imposing delays on other airport users. Allowing airport charges that reflect the scarcity of the chosen landing or takeoff time would force all operators, airline and general aviation alike, to consider whether they value use of the runway at that time enough to pay for the costs they impose on others. The principle should be the same for air traffic control. Congestion in the terminal airspace calls for a system of charges that makes the aircraft operator ask, "How much do I value this trip at this time? Would saving money by rescheduling it make sense? Is this trip necessary?"

Collecting congestion charges would assign use of existing capacity to those who value it most and provide information as to the value of additional capacity. Depending on who keeps the revenue, these proposals might help fund additional capacity as well. Charges could be set to accommodate whatever level of congestion is optimal and changed as conditions change.

Auctioning slots in principle creates the same incentives for use. An airline that wanted to use an auctioned slot would have to face the question of whether the operation was worth its cost. Standard economic models would say that this would be true even when a carrier loses the slots, keeps the proceeds, and then repurchases them in the secondary market, because venturing back into the secondary market to recover the slot would force the operator to confront the question of whether it would prefer to keep the cash or spend it recovering the slot. FAA restrictions on bidding are an attempt to prevent airlines from using a market power premium to maintain a dominant position, but there is some question as to how effective such restrictions would be if all airlines have access to the secondary market.

Auctioning slots would not in itself address the level of congestion. That would be determined by the number of slots made available for auction, a number that could be set by combining airport engineering criteria, air traffic control criteria, and whatever political considerations affected the number of slots auctioned and who was eligible to bid on them.<sup>127</sup>

As noted at the beginning of this Article, virtually all economists who have studied congestion, whether in the air or on the ground, believe in the

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non-airport capital projects. The Port Authority obviously cites different concerns, claiming the new FAA proposals will "lead to litigation between the airlines and operators 'have [no] significant impact on airport congestion [and] result in a substantial financial burden for carriers whose fleets are predominantly small and medium sized aircraft.'" Comments of the Port Authority of New York and New Jersey, Policy Regarding Airport Rates and Charges, 61 Fed. Reg. 31,994 (Apr. 3, 2008).

<sup>127</sup> For example, at Ronald Reagan Washington National Airport, the total number of operations per hour is limited for political and environmental reasons, and specific accommodation is made for general aviation, regional commuter aircraft, and larger aircraft. Special Air Traffic Rules and Airport Traffic Patterns, High Density Traffic Airports, 14 C.F.R. § 93.123 (2008). In addition, certain larger aircraft types are excluded, and a passenger throughput cap serves to limit the number of larger aircraft operations among those permitted.

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general principle embedded in these proposals. And the principles are widely applied in markets comprised of competitive private sellers. Theatres, movie exhibitors, hoteliers, restaurants, parking lots, and many other businesses implement peak/off-peak pricing (a form of congestion charges) every day. Much opposition to a regime of congestion charges at airports comes from people who don't understand the economics or who have decided that they are prepared to accept some delay for their flights while imposing large amounts of delay on the totality of other users. Objections to auctions are further grounded in the scheduling disruption that confiscation would cause, even though the FAA has attempted, through a variety of complexities not described here, to design its process to minimize this kind of disruption.<sup>128</sup>

As a very early and continuing proponent of congestion pricing at airports, I might have been expected to enthusiastically support the FAA's rules. But political and institutional constraints and the resulting real-world marginal incentives should make us wary of adopting congestion pricing in the current institutional setting. While the FAA's rules would assist in making sure that users of the largest bundles of slots use them in a way that maximizes their value, the rules will reserve many operations for those users who would not value the slots enough to pay the market price. The rules are not likely to correctly adjust capacity to demand, they already reflect political manipulation, and they will be vulnerable to further political exceptions and consequent distortions. The JFK and Newark auctions as proposed, with the number of slots held at a level that preserves wasteful congestion and revenues going to the FAA, are also fatally flawed politically and will do nothing in and of itself to optimize either congestion or capacity.

As things stand now in New York, there are reasons to be very concerned that the proposed project will not just fail and do economic damage, but will develop a political constituency that would make unintended or perverse consequences very hard to undo. The reasons for thinking so are the institutions and legislation already in place that don't make sense economically but, in concert with the proposal, will create even more perverse incentives. These incentives could make the congestion problem worse, not better. In the process, the concept of airport congestion pricing could be discredited as a way to promote economic efficiency. Instead, such prices would become just another tax on aviation—an inefficient source of politically useful funds. The politically inspired exceptions to the broad auction rules mean that even if the rules operate as intended, the incentive to operate at congested times will remain for a significant fraction of peak operations, frustrating the very purpose of the rule.

Before we implement congestion charges, we need to fix the impediments to successful congestion charges that exist at important airports around the

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<sup>128</sup> Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, 73 Fed. Reg. 60,544, 60,557-59 (proposed Oct. 10, 2008) (to be codified at 14 C.F.R. pt. 93).

country and particularly at airports with extensive aircraft operations by foreign airlines and general aviation. If we can do so successfully, no one will cheer more loudly than I. But I am worried that we won't, and will go ahead with pricing anyway. If we cannot fix the institutional features that will negate the possibility of success with a congestion-charge regime, we need to search for alternatives that will produce some of the desired effects without introducing new problems.

The questions raised by the FAA's proposal and, more broadly, by attempts to introduce marginal-cost pricing in the use of airports can be summarized as follows:

1. Is there an administrative solution to the congestion problem that is both more efficient than the current system and politically acceptable?
2. Is a market-based scheme practical as a matter of design, given existing defects in market structure and rules?
3. Is there a politically acceptable market-based scheme that would reduce waste and environmental impact and improve economic efficiency?

In short, is it possible to fashion remedies, perhaps "impure," that if adopted will produce a result better than the current situation?

The political problems that present challenges to successful implementation of an efficient system of capacity provision and allocation are illustrated dramatically in the process already under way in New York in connection with the so-called East Coast Plan airspace revisions, which are designed to increase capacity but are generating political opposition.<sup>129</sup> The airspace around New York is currently configured very inefficiently and is itself a source of delays and congestion. The FAA, after endless hearings and much consultation, has designed a new configuration of this airspace to increase capacity and reduce delays by approximately twenty percent.<sup>130</sup> In the

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129 See 153 CONG. REC. H10,311 (daily ed. Sept. 7, 2007) (statement of Rep. Engel); John M. Doyle, *N.J. Senators Seek Regional Answer to New York Airport Congestion*, AVIATION DAILY, Dec. 19, 2007, at 2 (discussing legislation submitted by New Jersey's two U.S. senators to force the FAA to take a regional approach to congestion problems in New York); Alexandra Marks, *Gridlock over Easing Gridlock*, CHRISTIAN SCI. MONITOR, Oct. 29, 2007, at 3 (discussing airline criticisms of the FAA and congestion pricing); Ron Marsico, *FAA May Cap Newark Flights To Cut Delays: Plan Also Seeks Limits at JFK*, STAR-LEDGER (Newark, N.J.), Dec. 19, 2007, at 1 (discussing FAA proposal to cap peak-hour flights at both Newark and JFK); James Ott, *Tool or Weapon? Airports Support Landing Fee Proposal, but Some Airlines See Problems Looming*, AVIATION WEEK & SPACE TECH., Jan. 21, 2008, at 39 (discussing feud between airlines and airports over congestion pricing); *US Airlines Under Fire for Delays, Meet on JFK Congestion*, AIR TRANS. WORLD, Nov. 2007, at 9 (describing meetings between airlines and the FAA and DOT to reduce congestion and delays at JFK); Press Release, Sen. Charles E. Schumer, *Schumer Grills DOT over Airspace Redesign Plan—Demands Sufficient Answers to Westchester and Rockland Concerns* (Sept. 4, 2007) available at [http://www.senate.gov/~schumer/SchumerWebsite/schumer\\_around\\_ny/record.cfm?id=281511](http://www.senate.gov/~schumer/SchumerWebsite/schumer_around_ny/record.cfm?id=281511).

130 FED. AVIATION ADMIN., RECORD OF DECISION, NEW YORK/NEW JERSEY/PHILADELPHIA METROPOLITAN AREA AIRSPACE REDESIGN 1 (Sept. 28, 2007, corrected version), [http://www.faa.gov/airports\\_airtraffic/air\\_traffic/nas\\_redesign/regional\\_guidance/eastern\\_reg/ny/njphl\\_redesign/media/Corrected\\_ROD\\_071005.pdf](http://www.faa.gov/airports_airtraffic/air_traffic/nas_redesign/regional_guidance/eastern_reg/ny/njphl_redesign/media/Corrected_ROD_071005.pdf).

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course of the reconfiguration, some areas of Connecticut and New Jersey will receive more overflights than they get now, while relatively fewer areas would receive fewer overflights, since the total amount of operations accommodated will rise. With modern noise regulation and jet aircraft and given the altitude at which overflights will take place, the amount of actual noise increase involved will be slight,<sup>131</sup> although any observer on the ground in the areas affected will see more aircraft than she is used to seeing now.

Implementation of this proposal, which is clearly efficient by any cost-benefit standard, has engendered intense and fierce opposition. Both New Jersey senators oppose it and one New York senator has objected, as have many members of Congress.<sup>132</sup> All have used whatever legislative leverage is available in an effort to prevent this change from taking effect, going so far as to lump it with allowing airline overscheduling and failing to enforce airline maintenance rules as an FAA policy failure.<sup>133</sup> This response is all for a proposal that requires very little or no incremental expenditure beyond the airspace planning that has already been done and that will result in benefits in traveler time, hydrocarbons consumed, pollution costs incurred, and aircraft operating expenditures without significantly increasing noise levels on the ground.

Now combine this political antipathy to capacity expansion with the political attractions of a revenue source that can be used to pursue other political goals. The basic problem is simple: the congestion charges retained by the airport operator will provide revenue that political pressures will discourage from being used to enhance capacity. Instead, the money can be used to build non-aviation facilities or to subsidize commuters. Worse, the greater the demand for use of the airport, the higher the charge will be, leading to more money being available for popular expenditures, more vehement political opposition to airport expansion, and more political credit being available for opposing expansion and using the money elsewhere. If congestion charges are retained by the FAA, they will be subject to local and congressional pressure that is likely to inhibit their efficient use for expansion.

One might object that this problem is substantially mitigated in auction proposals like that for JFK and Newark, where the FAA keeps the proceeds and earmarks them for capacity expansion in New York. It is certainly true that keeping the revenue out of the hands of a local operator not constrained to spend it on airport capacity projects is an improvement on proposals that would allow a monopoly operator to keep congestion revenue. But, as noted above,

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131 *Id.* at 10, 25-27.

132 See Tom Davis, *NJ Senators Act To Ease Flight Woes*, RECORD (Hackensack, N.J.), Sept. 13, 2007, at A11; Press Release, Rep. Scott Garrett, Garrett and Shays Fight FAA Redesign Plan (Sept. 20, 2007), <http://garrett.house.gov/News/DocumentSingle.aspx?DocumentID=74939>.

133 Madhu Unnikrishnan, *N.J. Senators Reaffirm Hold on Sturgell Nomination*, AVIATION DAILY, Apr. 9, 2008, at 4; see also *FAA Flight Plan Faces Political Fight*, USA TODAY, Jan. 12, 2008, [http://www.usatoday.com/news/nation/2008-01-10-FAAplan-me\\_N.htm](http://www.usatoday.com/news/nation/2008-01-10-FAAplan-me_N.htm); Woody Hochswender, *The Roar Above: Remapping the Skies*, N.Y. TIMES, Feb. 11, 2007, at 14NJ.

airport capacity expansion requires the airport operator to apply for the federal funds that might be made available, and it is difficult to imagine an application for funds to implement a project that will not meet substantial local political opposition. Consider, for example, the controversy surrounding the East Coast Plan. The knowledge that funds could not be spent anywhere else would encourage the concoction of very inefficient projects that absorbed expansion funds to maximum effect in promoting local employment or rewarded local contractors while providing little or no impact from increased flying. Characterizing projects as “safety improvements designed to lay the groundwork for possible expansion in the future” might, for example, do the job.

Recall also that, as a reflection of political reality, the FAA’s rule includes efficiency-reducing preferences in the allocation of new capacity and protects inefficient use of existing capacity through its exemptions from the confiscation-and-auction process. It only applies to slots being used by an operator that has more than twenty movements per day at the airport. This exempts almost all foreign airlines from the proposal, including those insufficiently profitable to justify purchasing slots or even those operating at an economic loss for prestige purposes. It effectively exempts operations by smaller airlines or airlines with limited service to New York. This does not make economic sense, but does reflect political realities.

If flights from smaller cities or with smaller aircraft represent valuable connections to a hub system, they will be worth paying for. If they are low-value flights by fringe operators, they should not be privileged. The rule opens the door to exemptions for service to politically influential smaller communities. Each of these privileged operators has a political sponsor. In the case of foreign airlines, the sponsor is our own U.S. Department of State, whose task in negotiating air service agreements with other countries is made vastly easier by being able to hold out free access to congested New York airports and which has made certain that these airlines are guaranteed access under the prevailing administrative system. The politics that remain will get worse when they reflect rent-seeking competition for a pool of auction proceeds. Raising the financial stakes in these political policies will only contribute toward permanently distorting markets for airport access.

When theory collides with reality, either or both must be fixed. In the end, we need to compare possible variations on the existing inefficient system with what is achievable. We should first consider whether we can fix the institutional impediments to successful congestion charges that exist at important airports around the country, and particularly at airports with extensive aircraft operations by foreign airlines and general aviation, before we implement congestion charges. If we can create an achievable congestion charge scheme that is more successful than achievable improvements in administrative schemes, we should adopt it.

The yardstick is obvious from economic theory and is grounded in the effects of any system on incentives and behavior at the margin, for both the

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airport owner/operator and the aircraft that use the airport: aircraft operators should only use scarce slots that they value more than do alternative users. But to achieve this, the necessary changes are likely to be statutory and the legislative impediments to those changes would be formidable. With respect to administrative schemes, grandfathered users have an enormous amount of wealth at stake in their grandfathered status. In the case of congestion charges, attempts to change the statutory environment that distorts incentives would collide with the financial and political bonanza that congestion charges, and indeed the existing equilibrium, offer in the current institutional environment. The biggest public policy risk is not that congestion charges won't be imposed, but rather that they will be imposed in the present institutional setting and operate to take all financial constraints off the present system, making congestion worse.

Does this mean that airport congestion pricing is a bad idea? Not at all. In principle, congestion pricing is an idea just as excellent as economists think it is. But in reality it is not the cure-all that economic theory suggests. To make congestion pricing work in a way that promotes rather than impedes economic efficiency, several key problems must first be addressed. In general, we need to improve marginal incentives for three groups: aircraft operators, airport operators, and politicians. The last group may be the hardest to affect, but we should at least avoid creating perverse new monetary incentives or worsening political disincentives. Here is where theory runs into reality, and where we need to be very careful to avoid a train wreck in consequence.

### VIII. Criteria for a New Congestion Pricing Solution

#### A. *The Number of Slots Made Available at the Prices Charged Must Be Reduced to a Level That Eliminates Inefficient Congestion*

A congestion pricing system that preserves an inefficient amount of waste and delay does not contribute to efficiency; it simply taxes airlines. If possible, ways should be found to allow optional or interruptible service during times when weather conditions or runway configurations are particularly favorable or unfavorable, as has been suggested by at least one commentator,<sup>134</sup> but they are

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<sup>134</sup> See Kevin Neels, *Pricing-Based Solutions to the Problem of Weather-Related Airport and Airway System Delay*, 10 AIR TRAFFIC CONTROL Q. 261 (2002). Some method would have to be devised for pricing this priority and a determination would have to be made as to who owned the priority right and could sell it. The fact that weather variations are stochastic and beyond the control of the airport operator or the FAA would reduce the impact of some of the problems highlighted in this Article, but it would create others. Since weather-related reductions in capacity would be conditional and episodic, the ability to impose them should have relatively little political impact or appeal, so we should be less concerned about political incentives to restrict output.

Airlines might argue that the need to complete flights so that aircraft will be in position to operate the next flight to which they have been assigned will make airline adaptation to substantial numbers of cancellations difficult. But there is no reason to believe that the total number of operations cancelled would change. What would change is the degree of airline control over priority, so that they could avoid

likely to be controversial among airlines. In general, the variability of airport capacity coupled with the relative inflexibility on short notice of airline operations will limit how close any allocation scheme can get to theoretically optimal efficiency. "Spot market" proposals should be viewed with great skepticism.

*B. There Must Be No Exemptions*

Exemptions for non-scheduled operations, for foreign carriers to accommodate bilateral concerns, for current users of less than twenty slots a day, for general aviation aircraft, for new entrants, or for service to small communities are both inefficient and discriminatory. There is no reason to believe that the exempted operations value the use of the runway more than those who are charged. Exempting them defeats the case for using market mechanisms to enforce economic efficiency in choices at the margin, because the marginal use will be unpriced. Unless rigid and universally applicable access controls are in place, exempted users will be free to increase aircraft operations, maintaining congestion and eliminating the efficiency gains. If the controls are in place, but favored users are allowed free access, low-value operations will be substituted for higher-value ones. This would create a vicious cycle until the final degenerate equilibrium is reached when U.S. airline operations, most of which are at least as valuable if not more valuable than those exempted, have been minimized, not optimized, and replaced by less valuable uses.

If some operations are exempted from charges, this result could only be prevented by rigidly grandfathering and capping those operations, further impeding efficiency by discouraging substitution of more valuable exempted operations for less valuable ones. Finally, in addition to being a waste of scarce and valuable airport capacity, the de facto discrimination against U.S. airlines created by giving access free of charge to foreign competitors would be obvious and should be politically unacceptable.

*C. Airport Monopolies Must Be Addressed*

Like New York, most metropolitan areas have only one operator for all of their air-carrier airports, thus creating a monopoly even if there is more than

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delay on the most valuable or system-critical flights. The marginal value of flights could be directly reflected in the priority assigned to them. As Neels points out, a non-priced version of this exists today under the so-called Collaborative Decision Making system (CDM), in which Air Traffic Control allows an airline to substitute one flight for another (presumably less valuable or system-critical) in the delay queue. CDM does not, however, offer much adaptive flexibility to an airline with a few very valuable flights at an airport experiencing delays. A pricing system would be more efficient in that it would allow the airline to buy priority for these flights. On the other hand, airlines with significant hub operations would clearly be worse off than under the present system and could be expected to object strenuously, since now under CDM they can minimize the cost effects of delay by deciding which flights should get priority while avoiding the wealth transfer that a pricing system would entail.

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one such airport in the area. The most conspicuous exception is San Francisco-Oakland-San Jose, where inter-airport competition has contributed greatly to cost control and efficiency.<sup>135</sup> Where there is an airport monopoly and the monopolist benefits financially from congestion charges, there is a financial incentive to maintain congestion, especially if runway capacity expansion is politically unpopular.

Ideally, before instituting a congestion-charge regime in New York or elsewhere, one would break up those monopolies in metropolitan areas with more than one airport. The British have been engaged in a major battle over a divestiture plan for London airports; Britain's Competition Commission has now proposed a major divestiture program designed to separate the ownership of the three main London and two most important Scottish airports.<sup>136</sup>

In the United States, a federal system in which airports are owned by public entities, such a divestiture regime is almost inconceivable politically. Every airport has at least two senators and since metropolitan areas often cross state boundaries, often more than two senators are interested. Since congestion occurs only in large metropolitan areas, those areas are well represented in the House of Representatives as well. The public airport authorities are famously a source of political patronage, vehicles for statements of public grandeur, recipients of Airport Improvement Program<sup>137</sup> pork, and, where exempted, extractors of monopoly rents from airlines. Perhaps the financial pressures on municipalities that have made airport privatization more attractive could allow an expansion of the privatization program to be a politically acceptable vehicle for breaking up monopolies, if privatization were made subject to antitrust provisions.

Since the monopolies have proved virtually impossible to regulate from the outside from both a political and monitoring standpoint, to avoid having congestion charges become a mechanism for creating, not relieving, congestion, a way must be found to link funds raised from congestion charges to expanding runway capacity or to providing substitutes that some identified users will choose. Ideally, proceeds from auctions should also be available for this purpose but, as we will discuss below, this ideal may be at odds with the need to recruit airline acceptance of the program. It might be objected that, even if the charges collected aren't used to expand capacity, they will at least encourage airport use by those who value it most. But this requires both adherence to the no-exceptions principle and a mechanism that discourages *reducing* capacity both to enhance revenue for non-airport purposes and to

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135 As a result of Midway's privatization, Chicago airports are no longer a monopoly, but Midway cannot serve intercontinental flights because its runways are too short.

136 U.K. COMPETITION COMMISSION, BAA AIRPORTS MARKET INVESTIGATION: PROVISIONAL FINDINGS REPORT (2008).

137 The Airport Improvement Program was first established under the Airport and Airway Improvement Act of 1982, Pub. L. No. 97-248, 96 Stat. 671 (codified in scattered sections of 49 U.S.C.). The funds for this program now come from the Airport and Airway Trust Fund, 26 U.S.C. § 9502(d) (2000).

pander to political constituencies who themselves externalize the costs of their political behavior on others. It cannot be emphasized enough that without such a mechanism, the incentives for most airport operators are all wrong, including incentives to encourage environmental objections, restrict output, and create scarcity, thereby gaining revenue, enhancing political popularity, and reducing airport expenditures at the expense of the traveling public and the economy. This brings us to a fourth requirement.

D. *If Extra Charges Are To Be Levied on the Use of Congested Facilities, They Should Not Be Available for Purposes Other Than Capacity Expansion*

This fourth requirement is designed to reduce or eliminate the economic incentives to restrict capacity (as opposed to political incentives, which will remain). To ensure that the result of congestion pricing is to expand, not restrict, capacity where capacity expansion is economically justifiable, it will be necessary to create a congestion charge fund that can be used only to relieve airport congestion by expanding operational capacity and the revenues of which would be available on a competitive basis to any airport operator collecting congestion charges. Off-airport expenditures that make capacity expansion possible, such as soundproofing homes or even supporting schools and playgrounds, would be permissible, but any off-airport expenditures would have to be linked directly to increased aircraft acceptance rates at airports where charges were being collected.

The same principles apply to slot auctions, with an important exception (to be discussed below) intended to reduce political opposition to measures designed to implement marginal-cost economics by limiting wealth transfer from existing slot holders. To the FAA's credit, the slot auction rule that it has adopted collects the proceeds into an FAA fund to be used for capacity expansion in New York. Whether this is politically feasible in a regime where many capacity-enhancing measures will be politically unpopular and most will require the airport monopolist to propose and execute projects using the federal money remains to be seen. But since the political benefits of spending money will only be available to the operator if it accepts the political penalties for expansion, the incentives for the airport operator will be more efficient than they would be if the operator collected the proceeds and was not obligated to expand capacity or could substitute these funds for other uses that are politically more attractive.

As long as the only airports at which these charges are collected are in New York and as long as the New York airports are a monopoly, even this approach may well be of very limited value, because political pressures against expansion will continue and the airports will have political incentives to propose minimum expansion for maximum expenditure. But if New York airports were forced to compete with one another or if charges were being collected at other airports in other cities and put into a common fund for

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capacity expansion accessible to airports outside New York, this would in principle enhance the incentives for the use of proceeds from market mechanisms to allocate airport capacity.

Restricting the use of these proceeds to expanding operational capacity would reduce the opportunities for airport operators to use the proceeds for new rental car complexes, airport rail systems, terminal amenities that are on-airport but don't increase aircraft acceptance rates, and airport access projects that are off-airport, as well as non-airport rapid transit projects that are currently permitted uses of airport-generated funds at grandfathered airports like Kennedy and LaGuardia. The availability of capacity-enhancing funding to all metropolitan areas where congestion charges were imposed would maximize the likelihood that applications to enhance capacity would materialize, by creating competition for other people's money.<sup>138</sup> The problem that this money might be substituted for other capacity-expansion projects as long as *some* projects were acceptable would remain.

It might be objected that reserving congestion charge or auction revenues for capacity expansion could lead to funding expansion that wasn't worth what it cost. That outcome would be made less likely by the application of cost-benefit standards to competing capacity-expanding projects, but any remaining effort presents us with a choice between that problem and creating incentives to restrict capacity or to refuse to expand it so as to preserve rents and pander to political pressures against efficient expansion.<sup>139</sup> In my opinion, the risk of flawed cost-benefit analysis is the correct choice. Expansion is difficult enough from a political perspective as it is, with externalities imposed on travelers, airlines, and local economies by parochial local interests. The danger of overexpansion is slight. The danger of underexpansion or capacity contraction is great.<sup>140</sup>

The problem is that these intricately-wrought conditions are far removed from reality. New York airports are likely to remain a monopoly for the foreseeable future, as are most airports at which the marginal costs of congestion would make market mechanisms valuable. No congestion charges or auctions have yet been proposed for any airport other than New York. The next most likely candidate, Chicago's O'Hare, is currently part of a monopoly

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<sup>138</sup> Applications competing for limited funds could be evaluated on a cost-benefit basis, using the information gained from levels of congestion charges required to reach equilibrium at congested airports and the costs of the proposed projects.

<sup>139</sup> This doesn't necessarily involve creating new or larger airports. See Butler, *supra* note 101.

<sup>140</sup> Some economists might object that even if capacity can't be expanded, congestion charges will direct valuable and limited capacity to its highest-valued use and improve social welfare. In an ideal world, this would be true. Under real-world political and economic conditions, it is much less so. Incentive problems stemming from monopolization of airports, as well as the exemption from pricing of low-volume users like most foreign carriers, general aviation, and services to small communities, are so serious that it is virtually certain that a pricing system with such exemptions would not in fact even approximately maximize the economic value of airport use. These incentive problems must be eliminated or minimized for congestion charges to perform efficiently.

system but is actively expanding, perhaps because the monopoly is being dismantled. The principle of grandfathered exemptions is so politically valuable that any inroads into it are likely to be opposed by grandfathered operators. As long as funds from auctions or congestion charges can be used as rents to benefit quasi-government entities or can become a target for funding FAA AIP grants to uncongested airports in states with influential congressional delegations, they will become pork. One reason for the virulent opposition to the FAA's proposal that funds from auction go to the FAA is precisely this concern, magnified by the fact that other competition for federal funds will make transfers of this money into FAA appropriations very attractive to a Congress searching for ways to bring the federal budget into better balance without cutting more popular programs. Such legislation would be unpopular even though it is necessary to avoid turning airport congestion into a cash cow for cities, public authorities, and the federal government.

If we can't address these key points, in my view the rest of the economic policy arguments for the congestion pricing alternative become moot (as they have been made for the moment by the FAA's choice of the slot auction alternative). We shouldn't, and it appears that we won't, proceed that way for now, because incentives will not be correct at the margin. But airports are much more amenable to imposing congestion charges that they control than they are to other capacity-management alternatives.<sup>141</sup> The idea may not go away, because they may ultimately choose to press for their version of these charges as a substitute for auctions yielding revenues they don't control. If runway congestion revenues can be generated by politically imposed scarcity, collected in economically discriminatory ways, and used for other "worthwhile" and politically popular public expenditures unrelated to relieving the limitations that generate them, then they are not user charges, don't reflect congestion costs, and don't promote economic efficiency. Congestion charges would just become another economically inefficient output-distorting excise tax of a kind that economists universally deplore.

What should we do if we don't implement congestion charges? If we retain some version of an IATA-like slot-based system, we need to greatly intensify current pressures at the margin to consider the opportunity costs of slots currently held by airlines. In principle, the refusal to sell a slot at those airports where the slots can be bought and sold imposes an opportunity cost on the airline that it takes into account at the margin. And, in practice, slots are bought and sold.<sup>142</sup> But the process of considering and accepting or rejecting bids is not transparent, and the holder knows the identity of the buyer and can take into account the competitive impact of the sale. To make this process more economically efficient, we need to transparently force slot holders to consider

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141 Plavin, *supra* note 45.

142 E.g., *Flag Carrier Finalized Sale of Four Heathrow Slots*, NOVINITE SOFIA NEWS AGENCY, Feb. 25, 2002, [http://www.novinite.com/view\\_news.php?id=7336](http://www.novinite.com/view_news.php?id=7336); Dominic O'Connell, *BA Strikes Secret Heathrow Slots Deal with BMI*, TIMES ONLINE, Mar. 30, 2007, [http://business.timesonline.co.uk/tol/business/industry\\_sectors/transport/article1591309.ece](http://business.timesonline.co.uk/tol/business/industry_sectors/transport/article1591309.ece).

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the current monetary value of the marginal slots they hold. We also need to break up equilibria in which currently dominant airlines hold onto slots that would be more valuable in the hands of others and take into account the effects on their own pricing of the entry or expansion of competitors.

We can do this by implementing a simplified variant of the FAA's auction rule in which the airlines keep the money raised in a slot auction designed to address these concerns. The proposal has its flaws, but it will force an existing user to consider in very concrete and public terms what the slot is worth to other users when deciding whether to keep it or sell it. Keeping the money may reduce airline objections, but it will not eliminate them, so even this modification will face political challenges.

For efficiency purposes, the most important goal is to affect slot use decisions at the margin. The second most important goal is to generate information that could be used to determine whether capacity expansion is economically worthwhile. At the kinds of airports where congestion will be an issue, funding expansion is the least vulnerable goal, because it is one that can be easily accomplished by borrowing supported by the revenue-generating ability of the airport and one that is unaffected by how efficient or inefficient the system of cost-recovery from airlines is, as long as that system supports the capital expenditures required. The important goal is to preserve efficient decisions at the margin.

The most powerful way to preserve efficient marginal incentives for use is simply to make all slots susceptible to monetization and at the same time to create a slot pool whose marginal value is established in auctions on a regular basis. Rather than micromanage the system by creating multiple classes of slots and multiple rules for selling and keeping them, periodically the FAA should simply force airlines to decide whether to repurchase the slots they use during congested periods and subject their behavior to ordinary antitrust rules. To preserve efficient marginal incentives in a way that would not affect airports, local politics, federal budget politics, or any presently entrenched interest other than those of inefficient users, the FAA should take the following three steps.

First, determine an efficient level of capacity. An efficient level would optimize delay by first making a safety-based engineering analysis of capacity and then adjusting it to reflect stochastic variation caused by weather and prevailing runway configuration. This capacity level would reflect estimated costs of delay, but would be subject to further adjustment as auction prices produced information that reflected the costs of delay and the value at the margin of an additional operation. We would never reach an economic optimum, but could produce a workable approximation that would represent a rational baseline from which to run the rest of this proposed system. This estimate would not be free of politics, but it would at least confine the politics to a transparent process.<sup>143</sup>

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<sup>143</sup> For example, at Reagan National Airport, this estimate exceeds currently permissible levels of operation for political reasons. Reagan National presents the special problem that the airport is

Second, this approach would involve withdrawing at the New York airports the number of slots necessary to reach economically reasonable levels of congestion each hour, as the FAA has now proposed for LaGuardia. This could be done by first determining the degree to which the cap would have to be lowered (further lowered at LGA) in each congested hour, then holding a lottery, with all slots in the affected hours vulnerable. The problem is that the total value of the economic pie would be increased, but the cost of this withdrawal would be borne only by those whose slots were taken away. This is complicated further by the fact that the value of the slots after congestion would be higher than at present, so one couldn't use subsequent auction prices to value the confiscated slots. Some proxy for present value would have to be created, perhaps from potentially unreliable data on recent transactions. The current value of the mandatorily surrendered slots would be paid to the carriers that lost them and could then be treated as a one-time sunk cost of the airport and recovered through the airport's cost recovery system.

Third, we could adopt a radically simplified version of the FAA's auction rule, but with significant differences: An arbitrary but significant portion (perhaps five percent or ten percent?) of the remaining defined slot pool would be made available in every defined slot period (year, quarter, schedule season; whatever is adopted) for purchase in a blind auction, much as the FAA rule proposes to do, but without its complexities and exceptions. Rather than being subject to complex rules regarding expiration and duration, the slots would have indefinite duration, subject to being chosen again in another lottery. The quantity of slots to be auctioned would be made up of the sum of any new slots created by capacity redefinition or physical expansion and if necessary a group of existing slots, selected randomly with no preference or penalty to existing holders, foreign airlines, new entrants, or operators with specific claims like service to small communities.<sup>144</sup>

An auction would take place in which the identity of the bidders would be withheld. The winning and second-highest prices for each slot and the identity of the winning bidder would be made public after the conclusion of the auction. The blind aspect of the auction would be designed to force the bidding airlines, including the previous owners, to value the slots independently of knowledge of the competitive impact of the transfer.

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politically managed de facto by the U.S. Congress, most of whose members are heavy users, with special deference paid to key members of relevant committees, who in turn engage in reciprocal negotiations with members of Congress representing locally affected districts. Reagan National has movement caps below the airport's capacity, an annual passenger throughput cap, a proportion of its slots reserved for general aviation users, a rule limiting the nonstop destinations that can be served from the airport, and a board of directors that is heavily political in its makeup.

<sup>144</sup> In its published rule, the FAA has itself argued that there is no legal impediment to including the slots used by foreign carriers. *See* Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, 73 Fed. Reg. 60,552 (Oct. 10, 2008) (to be codified at 14 C.F.R. pt. 93). The additional question presented is whether international law requires that they have access to some minimum number of slots. The behavior of the British at Heathrow or the Japanese at Narita strongly suggests that it does not.

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Money from the forced auction sale would then be transferred to the previous owner, including the airport authority if the slots were new. This would include a refund in the amount of its winning bid if the previous owner retained the slot. This provision obviates any claims of confiscation and provides assurance that the previous owner would receive fair market value for any slots it loses. This will reduce but certainly not eliminate opposition by dominant incumbents to capacity expansion. It substantially undercuts the political value of their objections to the “forced surrender” of the slots for auction. While it will generate objections by less intensive users, those users would face the choice of changing their operation or monetizing the value they put on use at congested times, with the overall financial burden on them to preserve their operations reduced by the fact that they only needed a few slots. In sum, the process would avoid the taints both of discrimination and of uncompensated confiscation.

Any revenue collected by airports for new slots could be applied inframarginally to reduce total cost recovered through traditional charging systems or applied to pay off the capital costs of the capacity expansion. Limiting the number of slots auctioned reduces the likelihood of a large surplus, and applying the surplus inframarginally would heighten the contrast between cost of off-peak and peak use. As long as the revenue captured by the airport is less than total cost, there will be no financial incentive for the airport operator to reduce or limit capacity, and the airport would attract a greater number of off-peak airlines. And if the revenue was generated by capacity expansion, the system would be fulfilling its function.

It might be objected that this is much ado about nothing, a pointless exercise, since any airline could keep a jeopardized slot by bidding a price that will preempt other bids and returning the money to its own pocket. But the system should greatly improve marginal valuation. First of all, the ultimate transparency of the system will reveal to shareholders, competitors, and policymakers both the amount of money that the slot-retaining winner was forced to bid to keep the slot *and* the amount of money it walked away from. Opportunity cost would be revealed and might be used both to guide capacity investment and to open the winning management to second-guessing about whether it was worth keeping the slot. It would function much as a hostile tender offer does in forcing management to face the economic implications of its assertion of control over the resource.

Second, it would convert an opportunity cost to an out-of-pocket cost. While classical theory suggests that economic decisions should be the same in the face of either, both modern behavioral economic literature (which admittedly, is generally applied to individuals and not firms) and casual observation at least open the possibility that a management facing public observation of a large out-of-pocket expenditure will behave differently from a management that turns down an purchase offer made confidentially or

deniably.<sup>145</sup> In sum, forcing valuation and reducing certainty of possession at the margin is more likely to make slot holders consider the value to others of the slots they hold and prompt them to sell those that they don't value as highly as others might bid for them. Allowing new capacity to count against the quota will give airlines the incentive to press for new capacity and create political pressure on airports to accommodate them.

It might be argued that the principal inefficiency of this system, other than its transaction costs, is the artificial uncertainty of possession injected into the system, reducing the value of slots to all holders. But uncertainty cost from potential planning disruption, and loss of firm-specific value from, for example, the value of network traffic feed, can be managed, first by running the auctions far enough in advance to allow rescheduling and second, by the incumbent bidding what a slot is worth to it, or even adding a premium that will virtually guarantee that it keeps the slot. Presumably there is *some* price at which it is indifferent as to whether it keeps the slot or loses it. This of course reveals publicly that the slot is very valuable to the airline (which may or may not reduce attempts to game the system), and the size of the second highest bid serves both as a measure of the opportunity foregone and as a reality check on the valuation placed on it by the winning bidder.

If the slot has served as security for a loan, it should not be sold encumbered. Its forced auction could be treated as an acceleration event that requires repayment of the loan from the funds realized for its sale. If the incumbent bids enough to keep it, the contract could treat the event as nullified, or it could provide for refinancing. There may be circumstances in which a loan was initially granted on terms that would not be available to the borrower again, but these circumstances presumably could be anticipated, at least in the abstract, and provided for. Although the economic circumstances of early 2009 may make this suggestion suspect, as a matter of efficiency there should also be the possibility of securing an insurance contract (whether written as a collateral default obligation or in some other form) in which a counterparty participating in what one hopes will be a reformed and regulated system takes on the risk of having the slot auctioned off under circumstances where the airline and creditor can't reach an *ex ante* agreement on an acceptable renegotiation of the credit.

On the other hand, that uncertainty exists in the FAA's rule as well, exacerbated by the fact that the airline can't bid on its own slot, and exacerbated further by the artificial deadline on commercial planning imposed by the ten-year duration of the rule. In the proposed system's favor, it confronts both the political and efficiency problems created by jeopardizing slot-specific investments. It is probably more acceptable politically and more efficient to erode gradually the wealth endowment of holders and to do so without

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145 Richard Thaler, *Mental Accounting and Consumer Choice*, 4 *MARKETING SCI.* 199 (1985). *But see* Jennifer Arlen, Matthew Spitzer, & Eric Talley, *Endowment Effects Within Corporate Agency Relationships*, 31 *J. LEGAL STUD.* 1 (2002); Charles R. Plott & Kathryn Zeiler, *Exchange Asymmetries Incorrectly Interpreted As Evidence of Endowment Effect Theory and Prospect Theory?*, 97 *AMER. ECON. REV.* 1449 (2007).

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discrimination than, for example, to attempt either to put everything up for grabs every year or to create an opportunity for gaming a complicated system that rivals the opportunity presented by the Internal Revenue Code.

This system would define the primary slot market. Slots could also be bought and sold at nontransparent prices in a secondary market. Unlike in the FAA's proposal, these slots would be subject to being selected again for a forced auction, just as they were before transfer. It would be useful, but perhaps of limited practical effectiveness, to emphasize antitrust enforcement against collusion by slot holders in withholding slots from the secondary market. The reason why this would be of limited effectiveness is that it is pretty easy for slot holders with dominant positions to figure out unilaterally that encouraging entry isn't good for them. To the extent that congestion exists at enough airports to create symmetric recognition of the value of reciprocal withholding of slots from the market or from availability to new entrants among airlines dominant at different congested airports, there will also be a collusion problem. On the other hand, the recent fact of slot availability to new entrants at London Heathrow despite the presence of at least two substantial portfolio holders—with some of the slots coming from alliance partners but others from low-value users—is encouraging in this regard.<sup>146</sup>

Ultimately, in economic terms, this paper is an argument for “second-best” economics.<sup>147</sup> It accepts that a fully efficient system of marginal-cost pricing is simply impossible in the real world. The real-world danger that must be avoided is adopting a congestion-charge system or auction regime that diverts revenues generated by congestion to airport operators or the federal government and creates further incentives to distort or constrain airport use for political reasons. Congestion pricing would create a pile of money that airport operators can swell by increasing scarcity. It would create vested interests in maintaining congestion in order to fund projects that have better organized constituencies and that cannot politically survive direct and transparent requests for funding. There are many reasons to be concerned that the FAA's rule will do just that. These interests will make it almost impossible to reverse the policy if it proves to be a mistake.

From an economist's perspective, perhaps the greatest concern of all is that imposing congestion pricing or the FAA's auctions at Kennedy, LaGuardia, and Newark without addressing the concerns addressed in this Article will create perverse incentives that will perpetuate inefficiency. These perverse incentives, and the economically and politically distorted results that will flow from them, will discredit the concept of congestion pricing in aviation and in many other valuable uses. This effect would be magnified if such a regime is extended to similarly situated airports in Chicago, Washington, and

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146 See, e.g., Nick Goodway, *BMI Snapped up by Lufthansa in £600m takeover*, EVENING STANDARD (London), May 23, 2008, <http://www.thisislondon.co.uk/standard/article-23579540-details/BMI+snapped+up+by+Lufthansa+in+£600m+takeover/article.do>; Kevin Done, *Kingfisher Stretches Its Wings*, FIN. TIMES, Aug. 25, 2008, at 15.

147 Cf. Lipsey & Lancaster, *supra* note 7.

elsewhere without taking prophylactic measures. Market incentives will have been tried and will have failed, a purported fact that will be thrown in proponents' faces whenever and wherever market incentives are proposed under conditions that are more propitious. Worse, distorted market incentives may become so attractive to political actors that market incentives of a perverse type will be entrenched as a norm. Taxation disguised as "user charges" discredits both user charges and taxation.

Markets are not "natural." They are created and affected by institutional design. Like any economic tools, market incentives work best when the institutions within which they operate allow their virtues to prevail in comparison with feasible alternatives. In the case of airports, these institutions must promote the efficient use of a scarce resource—peak capacity—through transparent and equitable pricing, avoid discouraging capacity expansion where it is efficient, and discourage the inefficient use of the funds generated. Until this can be assured, congestion pricing and auctions will be ineffective as a congestion relief measure and are likely to do harm. If a simplified auction variant of the FAA slot system that minimizes wealth transfers<sup>148</sup> is more feasible politically, it may achieve better real-world results. Meanwhile, the delays aren't getting any shorter for American air travelers.

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148 I do not mean by the use of the term "wealth transfers" to endorse the legal view that forced removal of slots would be a "taking." A virtue of the system that I propose here is that it reduces considerably the stakes of that dispute. The hope, perhaps forlorn, is that the efficiency gains for all users, especially dominant users, from adopting such a system would make it more attractive than the present one.

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## Appendix: Proposed Regulation for JFK and Newark

Feature	Newark	JFK	
		Option 1	Option 2
<b>Base Schedule</b>	Seasonal schedule, as approved by the FAA, for summer 2008 and winter 2008/2009.	Seasonal schedule, as approved by the FAA, for summer 2008 and winter 2008/2009.	Same as Option 1.
<b>Slot</b>	Defined as the right to land or depart (not both) in a 30-minute time window.	Defined as the right to land or depart (not both) in a 30-minute time window.	Same as Option 1.
<b>Number of Slots</b>	81/hour + 1 to 2 unscheduled	81/hour + 1 to 2 [unscheduled]	Same as Option 1.
<b>Slots Definition</b>	Common Slots: The Baseline (up to 20 slots per carrier) plus 90% of slots above 20 have 10 year leases; Limited Slots: 10% would have shorter leases and be auctioned over five years (2% each) (after which they convert to Unrestricted Slots).	Common Slots: [T]he Baseline (up to 20 slots per carrier) plus 90% of slots above 20 have 10 year leases; Limited Slots: 10% would have shorter leases and be auctioned over five years (2% each) (after which they convert to Unrestricted Slots).	Common Slots: The Baseline (up to 20 slots per carrier) plus 80% of slots above 20 would have 10 year leases; Limited Slots[:] 20% would have shorter leases and then be reallocated via auction over five years (4%/yr).
<b>Slot Time of Day</b>	6:00 a.m. through 10:59 p.m., every day; no more than 81 in any one hour or 44 in any half-hour.	6:00 a.m. through 11:59 p.m., every day; no more than 81 in any one hour or 44 in ay[sic] half-hour	Same as Option 1.
<b>Mechanics</b>	“Fair” initial distribution with half of slots with less than 10 years[sic] life selected by carriers; the other half selected by FAA according to specified rules.	“Fair” initial distribution with half of slots with less than 10 years[sic] life selected by carriers; the other half selected by FAA according to specified rules.	Same as Option 1.
<b>Auction</b>	Limited Slots would be auctioned among carriers.	Limited Slots would be auctioned among carriers.	Same as Option 1.
<b>Auction Proceeds</b>	Auction funds to FAA to defray costs of auction, then to NY capacity/projects	Auction funds to FAA to defray costs of auction, then to NY capacity/projects.	Auction funds (net of auction costs) to incumbent holder; incumbent cannot bid on own slots.
<b>Use/Lose</b>	Only on grandfathered slots as consideration for slots.	Only on grandfathered slots as consideration for slots.	[Same] as Option 1.

Feature	Newark	JFK	
		Option 1	Option 2
<b>Term</b>	Program is through March 2019; slot lives are whatever proportion of 10 years remain upon reallocation.	Program is through March 2019; slot lives are whatever proportion of 10 years remain upon reallocation.	[Same] as Option 1.
<b>Bidders</b>	Airlines	Airlines	[Same] as Option 1.
<b>Holders</b>	Holders of record (not marketing carrier).	Holders of record (not marketing carrier).	[Same] as Option 1.
<b>New or [R]eturned [C]apacity</b>	IATA WSG	IATA WSG	[Same] as Option 1.
<b>Secondary [M]arket</b>	Transparent not blind: carrier notifies FAA of intent to sublease; FAA makes slot availability known; bilateral negotiations; final terms disclosed to OST for monitoring.	Transparent not blind: carrier notifies FAA of intent to sublease; FAA makes slot availability known; bilateral negotiations; final terms disclosed to OST for monitoring.	Same.
<b>Logistical [S]waps of [S]lots</b>	Permitted	Permitted	Same.

Congestion Management Rule for John F. Kennedy International Airport and Newark Liberty International Airport, 73 Fed. Reg. 29,626, 29,629 (proposed May 21, 2008) (to be codified at 14 C.F.R. pt. 93).