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Office of Aviation Policy and Plans
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FINAL REGULATORY EVALUATION

CONGESTION MANAGEMENT RULE FOR JOHN F. KENNEDY INTERATIONAL AIRPORT AND NEWARK LIBERTY INTERNATIONAL AIRPORT

Office of Aviation Policy and Plans
Aircraft Regulatory Analysis Branch

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EXECUTIVE SUMMARY

This final regulatory evaluation examines the benefits and costs from implementing the final rule which addresses congestion at John F. Kennedy International Airport (JFK) in New York, NY, and Newark Liberty International Airport (EWR or Newark) in Newark, NJ. The rule assigns the majority of operations at each airport to current users and will stimulate a secondary market by annually auctioning off a limited number of slots at each airport; the FAA plans to use the proceeds from the auctions to mitigate congestion and delay in the New York City area. The hourly cap on scheduled operations will be 81 per hour at each airport during the regulated hours. This rule also addresses use-or-lose, unscheduled operations, and withdrawal for operational need. The rule will sunset in ten years.

The estimated present value of net benefits of improved slot allocation by auctions is $238 million at JFK and $205 million at EWR from 2009 to 2019. These net benefits are additive to those attributable to the establishment of ten-year caps at 81 scheduled operations per hour at each airport.

This final regulatory evaluation assumes as a baseline that in the absence of this rulemaking, the FAA would not otherwise extend the temporary caps on aircraft operations at JFK and EWR (due to expire on October 24, 2009). Therefore, the FAA estimates that, during the ten-year implementation of a cap on aircraft operations, this proposed rule would result in about a 25 percent reduction in the average delay per operation at JFK relative to a situation with no cap. After allowing for the lost consumer and producer surplus due to a reduction in air service caused by the cap, the net value of the savings in average delay attributable to the cap (as distinct from the auction) at JFK generates a present value net benefit attributable to the caps of about $1,629 million from 2009 to 2019. At EWR, this proposed rule would result in about a 23

percent reduction in the average delay per operation at EWR relative to a situation with no cap, generating a present value net benefit (after deducting lost producer and consumer surplus from reductions in air service) of about $634 million from 2009-2019.

In total, net benefits from both the auctions and the caps as implemented by this rule would be $1,867 million for JFK and $839 million for EWR.

Who Is Potentially Affected By This Rulemaking

- Operators of scheduled and non-scheduled, domestic and international flights, and new entrants who do not yet operate at JFK or EWR.
- All communities, including small communities with air service to JFK or EWR.
- Passengers of scheduled flights to JFK or EWR.
- The Port Authority of New York and New Jersey, who operates the airports.
- Passengers on scheduled and unscheduled flights in New York airspace.

Key Assumptions

- Baseline JFK: No operating authorizations or caps (the rule will generate approximately $1,867 billion in net benefits compared to this case, of which approximately $238 million is due to reallocation benefits associated with the auctions and the balance due to the caps)

- Baseline EWR: No operating authorizations or caps (the rule will generate approximately $839 billion in net benefits compared to this case, of which approximately $205 million is due to reallocation benefits associated with the auctions and the balance due to the caps)

- A cap on operations from 81 scheduled operations plus one to two unscheduled operations per hour at each airport, which features:
  - 100 percent of slots[1] held by carriers with fewer than 21 slots at each airport will be reassigned to the carrier with 10 years of life;
  - For holders with 21 or more slots, 90 percent of slots above the baseline of 20 slots will be reassigned to the carrier with leases of 10 years and ten percent of slots above the baseline will be assigned to the carrier shorter leases and then auctioned over five years.

- For the purposes of this evaluation, the effective date is (11/1/08).

[1] A "slot" is defined as the right to land or depart (not both) in IFR conditions in a 30-minute time window.

Other Important Assumptions

- Discount Rates – 7%
- Period of Analysis – 2009 through 2019 (The rule will sunset in ten years)
- Assumes 2008 Constant Year Dollars
- Passenger Value of Travel Time -- $30.02 per hour[2]

Alternatives We Have Considered

- **No caps**: The FAA expects that without regulatory caps, operators would expand operations at both airports above current levels, and hence further worsen airport delays.

- **Caps without auctions**: This alternative would impose caps at 81 scheduled operations plus one to two unscheduled operations per hour; it would implicitly assign operations to current holders of operating authorizations at the airports.

- **Caps with auctions**: This alternative would permanently impose caps at 81 scheduled operations plus one to two unscheduled operations per hour; it would assign the large majority of operations to current holders of operating authorizations at the airport; and would auction a small but consistent number of slots for the first five years of the rule.

[2] GRA, Incorporated "Economic Values for FAA Investment and Regulatory Decisions, A Guide", prepared for FAA Office of Aviation Policy and Plans, (October 3, 2007). The passenger value of time reflects a mix of business and leisure travel developed for the New York area.

BACKGROUND AND NEED FOR THE REGULATION

JFK and EWR are two of the most congested airports in the United States. Given their proximity to New York City and the northern New Jersey area, they experience heavy flows of flight arrivals and departures throughout the day, but particularly in the mornings and evenings. These flows of traffic, when unconstrained, create unacceptable, inefficient levels of congestion and delay that affect the entire National Airspace System (NAS).

The need for this regulation is to mitigate negative externalities at the two airports associated with scheduling practices, thereby enabling the market for air services at JFK and EWR to function more efficiently. A "negative externality" arises when producers are able to avoid some of the costs of production attributable to their actions while continuing to capture the full benefits of their activities. In the case of JFK and EWR, a carrier can over-schedule its operations in a manner that creates delays for other airport users, but incurs costs only for delays to its own flights. The costs to society in aggregate of such practices exceed the total of the benefits to individual carriers. The existence of externalities often requires some type of governmental intervention to prevent overuse and enable markets to efficiently allocate resources.

At the same time, the establishment of operations caps creates a barrier to new access and competition at JFK and EWR, which could lead to less competition and higher prices. Accordingly, this rule also establishes an auction process through which carriers can bid on a small number of slot leases on an annual basis for five years. These auctions, and a permitted secondary market for slots, will provide the opportunity for carriers to enter or expand operations at the airports. In addition, the auctions will provide important price information to carriers

participating in the secondary market. By imposing caps and auctions for slot allocation, this regulation will prevent excessive congestion and, at the same time, facilitate the direction of scarce slots to their highest value uses, as would occur in an efficient market.

Need for Delay Mitigation at JFK

The developments that have led to the need for this rule are well documented in the rule's preamble. In brief, due to severe congestion prior to 1969, JFK was subject to the High Density Rule (HDR) from 1969 through 2006. Under the HDR, aircraft operations at JFK were limited during the five hours of peak transatlantic demand—3 p.m. through 7:59 p.m., Eastern Time. In 2000, Congress passed the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR-21) which directed the U.S. Department of Transportation to phase out the HDR at JFK, effective January 1, 2007. In addition to phasing out the HDR, AIR-21 directed the Secretary of Transportation to grant exemptions at JFK from the HDR's flight restrictions for flights operated by new entrant carriers or flights serving small-hub and non-hub airports, as long as the aircraft had less than 71 seats.

The phase out of HDR slots at JFK permitted increased operations at the airport during the afternoon hours. In addition, since the spring of 2006, U.S. carriers significantly increased their scheduled domestic operations for all hours of the day, causing JFK to evolve from its predominantly international role to a more mixed-use airport. The introduction of more domestic service has created new arrival and departure traffic patterns that impede the efficient use of JFK's four runways.

The increase in scheduled operations and changes in traffic patterns at JFK has contributed to delays experienced by travelers there and elsewhere in the NAS. During fiscal year 2007, the average daily operations at JFK increased 21 percent over those in FY 2006. The

on-time performance at JFK, which is defined as the arrival at the gate within 15 minutes of the scheduled time, declined from 68.5 percent in fiscal year 2006 to 62.19 percent in fiscal year 2007. On-time arrivals during the peak travel months of June, July and August declined from 63.37 percent in 2006 to 58.89 percent in 2007, while on-time departures declined from 67.49 percent to 59.89 percent. For the entire fiscal year, the average daily arrival delays exceeding one hour increased by 87 percent over fiscal year 2006 levels. Airlines nonetheless announced new flights during peak and off-peak hours.

The FAA and the Office of the Secretary have undertaken several actions to respond to the unacceptable congestion and delay at JFK:

- On September 24, 2007 the FAA re-designated JFK and EWR as Level 2 Schedules Facilitated Airports for the summer 2008 scheduling season in accordance with the IATA Worldwide Scheduling Guidelines (WSG). In designating the JFK and EWR as IATA Level 2 Schedules Facilitated Airports, the FAA required all U.S. and foreign carriers to report to the FAA their proposed summer 2008 scheduled operations at the airport during designated hours.
- On September 25, 2007 the Acting FAA Administrator established an Aviation Rulemaking Committee (ARC) to explore various options, including market-based mechanisms, for addressing airspace congestion in the New York area.
- On October 12, 2007, based on the summer 2008 schedules submitted by the carriers in response to the FAA's designation of JFK and EWR as Level 2 airports, the FAA determined that a Scheduling Reduction Meeting for JFK was necessary to meet a serious transportation need or to achieve an important public benefit. The FAA declared that JFK was a Level 3 IATA airport at this time.

- As a result of the agreements reached at the JFK Scheduling Reduction Meeting, the FAA issued a temporary order on January 18, 2008 (the "2008 JFK order"). The 2008 JFK order assigned scheduled operations at JFK, effective 6 a.m., Eastern Time, March 30, 2008, through 11:59 p.m., Eastern Time, October 24, 2009, to U.S. and foreign carriers serving the airport and capped scheduled operations at 81 per hour (except as specified in the Appendix to the Order).
- The FAA proposed a temporary order limiting unscheduled operations at JFK and EWR on July 17, 2008 (the "2008 JFK-EWR order"). The 2008 JFK-EWR order would assign (26 and 24) unscheduled operations respectively at JFK and EWR between the hours of 6:00 a.m. and 10:59 p.m. until the order sunsets on October 24, 2009.

The 2008 JFK Order and proposed JFK-EWR Order respond to a persistent number of flights above capacity at JFK during peak operating hours and are intended to relieve the substantial inconvenience to the traveling public caused by excessive congestion-related flight delays at the airport (which ripple through the NAS), reduce the average length of delays and provide for a more efficient use of airspace. Once the orders sunset in October 2009, however, the FAA expects that the delay conditions at JFK will return and deteriorate further from levels experienced in Summer 2007 unless new and longer-term action, such as that proposed in this rule, is taken at JFK.

Need for Delay Mitigation at EWR

Although Newark was initially subject to the HDR, the FAA suspended the application of the HDR at EWR in 1970 due to sufficient airport capacity to meet demand. Even so, EWR has historically experienced a significant number of delays relative to other airports. Ranked according to the proportion of delayed operations, EWR has frequently been the most delayed

airport in the system. Current and anticipated demand during peak hours approaches or exceeds the average runway capacity, particularly during peak hours, resulting in volume-related delays. These delays are aggravated by weather or other adverse operating conditions.

Comparing FY 2007 to FY 2000 activity, average daily operations at EWR decreased about three percent (1,253 vs. 1,219 daily operations) but performance suffered. The percent of on-time gate arrivals decreased from 70.66 percent to 61.71 percent over this same period; arrival delays greater than one hour increased from 54 to 93 per day on average. In FY 2007, for example, Newark's on-time arrival performance was 61.8 percent, the second worst among the top 35 airports. The airport's performance metrics and imbalance between air traffic control (ATC) capacity and demand is expected to continue in the near term. Newark is particularly susceptible to increased delays during periods of reduced visibility, which reduces capacity on its two closely-spaced parallel runways.

Several of the FAA actions described above for JFK (e.g., implementing short-term initiatives developed through the ARC, the proposed order on limiting unscheduled operations at JFK and EWR) also apply to EWR and other airports in the New York area. As already noted, the FAA announced on September 24, 2007 that Newark was designated a Level 2 IATA Schedules Facilitated Airport for the summer 2008 scheduling season. The FAA required all U.S. and foreign carriers to report to the FAA their proposed summer 2008 scheduled operations at the airport during designated hours. The FAA and the carriers at EWR also discussed the carriers' future schedule plans at Newark. In December 2007, the FAA determined through modeling that the anticipated summer 2008 demand would further overtax Newark's capacity, warranting an IATA Level 3 Coordinated Airport designation. The designation of EWR as a Level 3 airport was officially made in the Federal Register on December 27, 2007, "Notice of

Airport Level Designation for Newark Liberty International Airport for the Summer 2008 Scheduling Season."

The carriers had planned about 100 new flights at Newark during the afternoon and early evening hours for summer 2008. For several consecutive hours, demand for arrivals or departures would number in the upper 80s to the mid-90s of operations. These operations would significantly exceed the 83 operations (scheduled and unscheduled) that the airport handled or was capable of handling in FY 2006. The FAA's modeling showed that, with these operations, passengers would suffer average arrival delays of 35 minutes (a 38 percent increase of the summer of 2007); a 50 percent increase of the average number of arrival delays of at least one hour; and, by 7 p.m., a mean arrival delay at almost 80 minutes.

On May 21, 2008, the FAA published an Order to impose a temporary cap on scheduled operations at Newark (the "2008 EWR order"). The cap took effect on June 20, 2008 and will expire at 11:59 p.m. Eastern Time, October 24, 2009. The cap limits peak hour scheduled operations to an average of 81 per hour. As with JFK, the FAA anticipates that that once the 2008 EWR Order sunsets, delay conditions at EWR would significantly exceed the unacceptable conditions of summer 2007 unless new action, such as that specified in this rule, is taken at EWR.

Need for Action at Three Major New York Area Airports

The FAA believes it is necessary to address congestion and delays at LGA, JFK, and EWR in a systematic manner and therefore is issuing a cap and auction rule at LaGuardia Airport (LGA) in a sister rulemaking to this one for JFK and EWR. Congestion and delays at each of the three airports affect the other two airports as well as the NAS. The airports are all located relatively close to each other and consistently have been among the nation's most delay-prone

airports. Moreover, excluding any one of the three major New York-area airports would very likely shift the over-scheduling problem to the non-slot controlled airport as it would become attractive to carriers wanting to start or add service in the New York market. The result would be an overburdening of that airport and the system.

In addition to capping operations at these airports, the FAA is enabling the efficient allocation of slot capacity at these airports by introducing an auction mechanism that relies on competitive market forces. The auctions will help to ensure that the scarce airport and airspace resources go to carriers who can put the resources to the highest value use, as evidenced by the carriers' willingness to pay more for the slots than would other carriers. By conducting primary auctions of a known number of slots on an annual basis, new entrants and other carriers will be assured the opportunity to acquire new or expanded access to the New York area, while at the same time such auctions will provide important price information to the secondary slot lease market. Additionally, over the course of the 10-year life of the rules for the three airports, the FAA will monitor the need to maintain the caps and may relax the limitations on scheduled operations to respond to technological, operational, or capacity plans or improvements or to other factors that may warrant such action.

RULE SUMMARY

This Final Rule will replace the temporary orders governing airspace access at JFK and EWR. The FAA intends to address congestion at JFK and EWR by replacing the temporary Operating Authorizations with slot leases. The rule imposes a cap on scheduled operations of 81 per hour from 6:00 a.m. to 10:59 p.m., effective October 25, 2009—re-establishing the caps

established by the temporary Orders for scheduled operations at JFK and EWR that expire on October 24, 2009.

Unscheduled operations continue to be capped at the levels established under the unscheduled operations order that FAA proposed in the Federal Register on July 17, 2008. Under the terms of this order, which extend through October 24, 2009, the number of reservations at JFK for unscheduled operations would be limited (unless otherwise authorized) to two per hour from 6 a.m. through 1:59 p.m.; one per hour from 2 p.m. through 9:59 p.m.; and two per hour from 10 p.m. through 10:59 p.m. At EWR, the number of reservations for unscheduled operations would be limited (unless otherwise authorized) to two per hour from 6 a.m. through 11:59 a.m.; one per hour from 12 p.m. through 9:59 p.m.; and two per hour from 10 p.m. to 10:59 p.m.

The initial allocation of scheduled slots would be made to each slot holder at JFK and EWR based on carrier approved operations under the FAA orders. Where an operating carrier conducts flights solely under the control of another carrier, the carrier that "holds" the slot would receive it.

With regard to a carrier's initial slot assignment, the "baseline" would consist of up to 20 slots that would have leases of 10 years; 90 percent of its remaining holdings above the 20-slot baseline would also have 10-year leases. These slots would be designated as Common Slots and would not be subject to reallocation during the term of the rule (10 years). Ten percent of the slots above the carrier's baseline of 20 slots would be termed Limited Slots. The 10 percent of Limited Slots would be evenly divided into five portions. The first portion of one-fifth the total would be auctioned immediately and the remaining four portions would have leases of from one to four years. These short-lived Limited Slots would be auctioned to the highest bidder after the

expiry of their initial lives in four subsequent annual auctions, with the proceeds going to the FAA to offset the cost of the auctions and to provide incremental funding for New York capacity programs, including the early implementation of NextGen technologies. The first auction would be held in January 2009; the last auction would be held in January 2013. Upon their reallocation, these slots would be termed Unrestricted Slots and have whatever life is left until the rule expires – up to 10 years.

All slots may be transferred via a secondary market. While carriers may engage in direct negotiations with each other, all opportunities to sub-lease a slot must be advertised publicly and the Department will monitor transactions for anti-competitive behavior.

SUMMARY OF ECONOMIC RELATED COMMENTS

We requested comment on the proposal and our evaluation from interested parties during the NPRM comment period. This final rule integrates our initial estimates with the new estimates and additional data that we have obtained since our previous evaluation. Technical and legal comments can be found in the preamble of the final rule. Below, we address those economic related comments not already addressed in the preamble.

Base Case

Comment: The ATA and other commenters questioned the choice of the baseline used as the base case in the Initial Regulatory Evaluation (IRE). ATA states that the "uncapped" base case used in the IRE is "completely unreasonable" as it represents a baseline that the FAA would never adopt. Instead, the commenters argued that a capped base case, reflecting existing conditions under the temporary orders, is more appropriate.

FAA: The temporary orders that currently cap operations at JFK and EWR will sunset on October 24, 2009. Unless an action, such as in this rule, is undertaken to re-establish caps, there would not be a cap in place by October 25, 2009. Therefore, the "uncapped" base case used in the IRE is appropriate for dates following October 25, 2009. The FAA has, however, adjusted its net benefits to exclude both capping and auction benefits for the period in 2009 prior to October 25.

Benefit Analysis

The ATA, Regional Airline Association (RAA), and other commenters argued that the benefits of the rule are overstated because the FAA did not sufficiently distinguish the benefits of the slot caps from the benefits of the slot lease auctions. At the same time, the ATA stated that the benefits of the caps are actually understated because the FAA's calculation of benefits does not factor in the downstream costs of delay savings caused by implementing the slots.

FAA: The FAA made every effort in the IRE to distinguish between the benefits and costs attributable to slot caps and those attributable to the auctioning of slot leases. Similarly, in all discussions of the rule's benefits and costs in this final regulatory evaluation, the benefit and cost components linked to each action are clearly presented. It should be noted that there cannot be slot lease auctions without slots, however, which is one reason for including both actions in this rule.

With regard to the possible understatement of benefits associated with the slot caps, the FAA acknowledges that downstream benefits are likely to exist. These downstream benefits are, however, difficult to quantify. Given that there is agreement between the FAA and commenters that such downstream benefits will be positive, and the more-than-ample net

benefits associated with caps in the New York area, further quantification of such benefits would only add to the positive economic justification for slots in this rule.

In response to the ATA comments, however, the FAA reviewed its assessment of the JFK and EWR estimates of benefits and costs of the caps and uncovered a calculation error made in the NPRM. This error, attributable to an incorrect cell reference, caused benefits of the JFK cap to be significantly understated in the NPRM. A smaller, downward adjustment was also made in the estimated net benefits of the Newark cap. The new cap benefit levels for JFK and Newark are reported in this final regulatory evaluation. The new, higher benefit level for JFK is reported in the final regulatory evaluation.

Auction Participation Costs

Comment: Several commenters questioned the format of the auction and the estimated participation costs in the auction. Specifically ATA points out that at the time of publication the FAA had not determined the type of auction it would hold, nor the vendor who would design and provide auction services, or the cost of such services. Accordingly, ATA states that the cost estimates provided in the IRE for participating in the auction are conjectural and underestimated. Other commenters challenged the ability of the FAA to develop and conduct auctions in the timeframe required by the rule.

FAA: Since publishing the NPRM, the FAA has issued an order for supplies/services to develop and implement an auction program including the services, materials and software. Details were specified in that statement of work, and a contract has been awarded. As such, in our final regulatory evaluation, we estimate the costs of these known procedures. Much more detail on this issue is provided later in this regulatory evaluation (see "Auction Process and Costs" below) and in the final rule itself.

Cost of Slots

Comment: The ATA, United, American and other commenters state that the NPRM also does not take fair and proper account of the cost to carriers of purchasing slots at auction. The FAA's cost-benefit analysis should include the cost to all carriers of paying for all slots. The commenters state that the cost is not theoretical and should be included in the FAA's cost-benefit analysis. The ATA notes that "absent the confiscation of a slot and mandatory auction, there would be no carrier auction costs."

FAA: The final rule facilitates the reallocation of slots among users. Payments for slot leases represent transfer payments in an economic sense, in that the monies paid by air carriers for slot leases (net of auction costs) will go to the flying public in the form of increased investment in the New York airport and airways system. Thus, for the society as a whole, there are no economic gains or losses from these transfer payments from the air carriers to the FAA.

With regard to the ATA assertion that slots are being confiscated, the preamble to the final rule explains why the FAA's action is not a taking of an asset from the air carriers. Any pre-existing "ownership" of slots at JFK that might be held to stem from the HDR was eliminated by the phase-out implemented by Congress under AIR-21. The slots that were temporarily re-established at JFK in 2008 by the JFK Order and the slots temporarily established in 2008 by the EWR Order are clearly stated in the orders to sunset as of October 24, 2009. The possibility that some carriers may have used HDR or current slots for collateral, even without property rights to the slots or approval by the FAA to do so, does not constrain or bind the FAA's actions to assure the most efficient allocation of slots using market mechanisms.

Other Costs

Comment: ATA, RAA, United, and others commented that the regulatory evaluation failed to consider the following costs:

Costs associated with changing ground facility demands

Loss of jobs due to service reductions

Reduced or loss of utilization of airport assets

Longer turn times for airplanes

Network disruptions due to schedule changes, including disruptions to international routes which are often inflexible to schedule changes

Loss of passengers due to dissatisfaction with schedule changes, and accompanying reductions in revenue and profit

Inability to meet volume targets in commercial agreements

Other cost items

Similarly, the Port Authority stated that the annual reallocation of slots through the auction system will create administrative and other expenses for the itself, carriers, and the traveling budget.

FAA: The amount that a carrier is willing to bid for a slot lease will reflect the full consideration of potential revenues and costs associated with use of the slot lease. As such, it will include the factors described above in its bid price, which as just noted, represents a transfer payment and not an economic cost to society.

As the slot leases will be sold to the carriers with the highest value uses for the slots, the public will benefit as the net value of air service (reflecting social benefits and costs, ultimately expressed in quality of service and fares) improves. It would also be expected that any job losses

that occur when a carrier loses a slot would be offset by job gains when a carrier gains a slot. As a result of our actions, we expect turn times to be shorter than they would have been in the absence of a permanent cap because there will be less stress on airport facilities. Further, carriers will have access to the secondary market and may swap slots for logistical reasons, which should insure smoother operations at both airports. Ultimately the higher valued slot reflects passenger desires. Later in this analysis we provide an auction net benefit resulting from a larger airplane replacing a smaller airplane.

The FAA notes that the Port Authority has always had to accommodate carriers under the HDR by accommodating airlines that leased, purchased, or traded slots under the HDR; that received slots through FAA-run lotteries; or that were granted slot exemptions under 49 U.S.C. §§ 47174 and 41716. Furthermore, the Port Authority is obliged to file competitive access reports to the Secretary if it denies access to a requesting carrier at JFK and Newark. With respect to Newark, the FAA must ensure that the Port Authority successfully implements its competition plan to enhance opportunities for airline competition and accommodate requesting airlines there. Accordingly, the Port Authority may not claim that the fact that a slot is acquired through an auction presents any unusual accommodation issues that it has not routinely dealt with in the past.

Reduced Value of Slots Due to 10 Year Lease Terms

The ATA states that the "short term" (10 year) nature of the rule and the Government's inclination to change historic processes could create a lack of confidence by financial institutions in slots as collateral and reduce or eliminate a carrier's ability to fully collateralize the asset. The ATA argues that this action will remove another mechanism that some airlines use to obtain financing.

FAA: The FAA notes that the current operating authorities used at JFK and EWR extend only until October 24, 2009 and that prior operating authorities at JFK under the HDR were ended by the AIR-21 legislation. Therefore, the 10-year timeframe provided by this rule, in which property rights are defined and protected, represents a significant extension of the time certain for the use of slots and therefore should improve the potential collateral value of slots compared to the current environment.

Auction Participation

Comment: The Port Authority of New York and New Jersey, National Air Carriers Association (NACA), and others suggested that the auction process could hurt competition as opposed to promoting it, particularly if the largest current holders of operating authorities with the most financial resources acquire unrestricted slot leases at auctions with the intent of preventing new entry or competition from non-legacy carriers. Commenters expressed concern that the Unrestricted Slots will not have use or lose requirements, raising the possibility of inefficient use of scarce airport capacity.

FAA: The auction, as designed, encourages truthful bidding, which minimizes potential gaming. Because the incentives to bid truthfully are strong, the rationale for speculation is reduced; if a speculator has to pay more than all truthful bids to win in the primary market, it is unlikely he or she would find someone willing to pay more later. If a speculator's primary rationale for holding slots won in an auction is to prevent competitive entry, the speculator would have to sacrifice the amount paid for the slots, whereas today a slot holder can avoid using up to 20 percent of its slot capacity without financial penalty under the terms of the use-or-use rule (although this action could trigger a response by the Department of Transportation).

The FAA notes that the potential for anti-competitive behavior is always a risk in markets, but as noted in the preamble to this rule, the Department of Transportation has the authority to ensure that carriers with Unrestricted Slots do not use their ability to permit such slots to remain idle to unlawfully restrict competition. The Department's mandate under 49 U.S.C. §41712 to prohibit unfair methods of competition authorizes it to stop carriers from engaging in conduct that can be characterized as anticompetitive under antitrust principles both in the primary and secondary slot lease markets. If the Department is presented with clear and convincing evidence that a carrier is hoarding slots to monopolize operations at an airport it will pursue enforcement action against the carrier.

Reallocation

Comment: One commenter representing the ATA challenged the FAA's assertion that welfare improvement due to reallocation (e.g., from small to larger aircraft) will occur, stating that mainline carriers already operate to maximize profits. The commenter asserts that the FAA is assuming that carriers are not allocating their own scarce slot resources optimally and that the enhancement will be due to reallocation of slots from legacy carriers to low cost carriers (LCCs).

FAA: Under the current slot allocation system, incumbents treat slots as semi-permanent assets. Because few slots are ever sold, and the ability to acquire new slots is uncertain, we assume that some holders prefer to fly smaller or less efficient aircraft rather than to sell the slots to other carriers for higher value uses. We note and are joined by Department of Justice in observing that some incumbents choose not to sell because they fear the competitive consequences. Because a slot is necessary for new entrants to compete or for other incumbents to increase operations, incumbents can effectively block new competitors by choosing not to sell. The auctions in the final rule will make available 10 percent of eligible capacity (slots above up-

to-20 slot per carrier base) to all competitors (current and potential). Incumbents are free to bid and indeed have the advantage of having recent information on the likely profitability of the service they will provide with the slots.

All new and expanding carriers are free to bid based upon their individual business models. Although they have less information on the likely profitability than the incumbents, they have the incentive to bid based on their potentially most profitable routes. The outcome of the auction is unknown, but clearly there are incentives for improvement in the allocation of resources because new entrants might offer service with larger or more efficient aircraft and replace incumbent services offered with smaller or less efficient aircraft. Similarly, incumbents may decide to upgrade service on existing routes in response to the need to compete with new entrants.

Slot Values

Comment: One commenter questions the reasoning why the value of slots lost is not counted as costs to incumbents even though they may have paid millions for them. If incumbents pursue legal claims these would be real economic costs to the taxpayer.

FAA: While we note the distributional consequences of the final rule in the regulatory evaluation, most of the costs to which the commenter is referring are transfer costs and not real economic costs properly counted in measures of economic efficiency. Moreover, as noted in the preamble to the final rule, the air carriers have no property rights to the operational authorities that they currently operate under. Slots purchased before January 1, 2007 were eliminated as part of AIR-21, and the authority granted by the temporary JFK and EWR rules lasts only until October 2009. In addition, there is nothing in this rule that precludes a carrier from bidding in the auctions to acquire the same or a comparable slot for the purpose of maintaining the status

quo. A regulatory evaluation estimates the direct costs and benefits of a regulation. A threatened legal action at this point is speculative, we believe without merit, and in any case not a direct cost of the rule.

Willingness to Invest

Comment: The FAA received several comments regarding carriers' willingness to invest in developing services and facilities at JFK and EWR. American Airlines stated that the provision of slot leases for only 10 years would have an immediate chilling effect on long-term carrier investment in routes and facilities.

FAA: This final rule will not have a negative effect on investment in developing facilities and services at JFK and EWR. The creation of 10-year slot leases will reduce uncertainty about the tenure of slot holdings, which has been debated for many years. Defining the life of an investment clarifies its value, and in this case, will facilitate the spreading out investments over the long term. By ensuring well-defined property rights, the leases are a form of property that may be leased or traded for consideration and used as collateral.

Ten years is a relatively long time horizon in the dynamic airline business. Any investments made at the airport in fixed assets can be amortized either by the investing carrier or by subleasing to others. Carriers tend to lease most of their fleets, and many employ operating leases that typically have five year-terms, the shortest period of time for a slot lease under the final rule. Seen in this light, there is nothing unusual and detrimental to the investment case for carriers. In fact, this rule clarifies several uncertainties about slot ownership and the potential for allocation that may have clouded the investment picture in the past.

Equipment Usage

Comment: One comment indicated that the FAA ignores public interest in different sized aircraft.

FAA: This final rule does not dictate or require carriers to fly any particular size or type of aircraft. Carriers will be able to continue to allocate equipment of any size or type as a business decision.

Market Efficiency

Comment: The Regional Airline Association (RAA) challenged the FAA's assertion that auctioning slot leases to the highest bidder would create a true primary market for slots, asserting instead that auctions provide no improvement whatever over the current secondary market for slots. The RAA asserted that one of the most important characteristics of a true "market" is the expansion of capacity and new competition from additional entrants when high demand results in supra-competitive prices. No matter how high the prices reach for slots in the New York area however, the RAA stated that capacity expansion will be entirely dependent on governmental expansion of airport and airways facilities, and no new entrants can possibly provide additional airport or airway capacity in competition with the Port Authority or the FAA. Thus, the RAA said that claims the FAA's auction proposal is "market-based" are misplaced.

FAA: Prices play a critical role in rationing scarce capacity in all sectors of the economy. Auctions will reveal the true value of airport and airway capacity in the New York region at the same time that the FAA is making investments and undertaking other actions to increase this capacity. Revenues raised in the auction will be directed toward accomplishing these capacity-adding actions, which will in the longer run benefit carriers and their passengers. Moreover, the revealed value of the slots in the primary auctions will provide important price information to participants in the secondary market and will simultaneously create incentives for carriers to

upgrade equipment and services to get the best return on valuable slots (or to lease the slots to carriers who can). In provide larger and more efficient aircraft, carriers will expand the passenger throughput, and thus capacity of the airport as measured in passengers.

Impact on Fares

The Emirates and several other commenters to the docket asserted that slot lease auctions could lead to additional costs for carriers and that, with the current financial crisis the industry is facing, it will be difficult for the carriers to bear these additional costs. The carriers would therefore be forced to pass on these costs to the passenger in form of increased ticket prices. The Governors of New York and New Jersey made similar comments in a letter received at the Department of Transportation after the docket for this rulemaking had closed.

FAA: The potential for new entry through the auction process and use of larger aircraft at the slot controlled airports will combine to keep fares lower than they would otherwise be if no auctions were in place. Slots, although necessary to mitigate delay at JFK and EWR, also impede new entry and competition unless a market mechanism that facilitates slot reallocation and competitive new entry is in place. More efficient aircraft and services offered by competitors who bid successfully for slots will put pressure on other operators to improve efficiency and reduce fares. In fact, it has already been noted that some carriers, fearing price competition caused by the auctions, might bid for some slots to prevent such competition--a practice that the Department of Transportation will monitor carefully in the primary auction and secondary markets to make sure it does not occur. Finally, to the extent a carrier might attempt to pass along its bid price to its passengers, it can only price at what the market will bear. The presence at both airports of a large amount of air service offered on un-auctioned common slots

would impede the ability of any one carrier to simply raise its price. Rather, its competitive success will depend on improving its efficiency.

Effects on Unscheduled Operators

Comment: In the comments on the NPRM, several observers expressed concern about the effect of the Final Rule on unscheduled operations at JFK and EWR. The Cargo Airline Association claims that the rule does not address the unique operational requirements of the all-cargo industry and discriminates against the unscheduled operations necessary for the all-cargo environment. Comments by FedEx, UPS, and others included concerns about accommodating additional operations normally conducted to support increased demand around the Thanksgiving and Christmas holiday periods. NACA expressed concerns about impacts on commercial charter operators. The Aircraft Owners and Pilots Association (AOPA) stated in its comments that our rule will cause an increase in the number of operations at airports elsewhere in the region, to levels beyond the capacity of those airports.

FAA: Unscheduled flights can be accommodated under the rule at JFK and EWR if operators are flexible in their arrival times. The FAA recently issued a proposed Order on "Operating Limitations for Unscheduled Operations at John F. Kennedy International Airport and Newark Liberty International Airport" and has conducted extensive analysis of the issue of meeting the demand for unscheduled operations. FAA assessed the impact on business if unscheduled flights are restricted based upon the FAA's record of actual operations in the agency's Enhanced Traffic Management System (ETMS) for the year ended May 31, 2008. In the analysis of ETMS, FAA assumes that unscheduled flights would be accommodated in visual meteorological conditions (VMC) or if there is available capacity in an adjacent hour (one hour

either side of the actual hour of operation in the data) since unscheduled operators have flexibility to adjust their flight plans slightly.

Based on the year June 1, 2007 through May 31, 2008, ETMS data show the numbers of unscheduled operations that would not have been accommodated per year had the final rule been in place (where there was insufficient capacity in the adjacent two hours to handle excess demand) was 87 at Newark and 23 unscheduled operations at JFK. Therefore, less than one flight per day would on average be affected by the rule at each airport. The results are tabulated in the table below. Thus, if an unscheduled flight changes its flight plan slightly, it will be accommodated and this operator would not incur costs. The FAA also believes that general aviation demand can be accommodated within regional capacity. Much more detail regarding unscheduled operations is provided in the Final Rule and therefore is not repeated here.

Unscheduled Operations YE May 31, 2008 vs Proposed Slots

	Number of Hours Where Unscheduled Operations Exceeded Available Slots	Number of Hours Where There Was Insufficient Capacity in Adjacent Hours to Handle Excess Demand	Unscheduled Operations Affected After Accounting for Extra Capacity in VMC Conditions
EWR	740	339	87
EWR Pct	13%	6.2%	2.2%
Avg per Day	2.0	0.9	0.2
JFK	535	188	23
JFK Pct	9.7%	3.4%	0.7%
Avg per Day	1.5	0.5	0.1

Source: ETMS and National Weather Service

DELAY AND COST CONSEQUENCES IN THE ABSENCE OF CAPS

This section describes how FAA has estimated the delay benefits of having caps at JFK and EWR versus the baseline case (prevailing after October 24, 2009) of having no caps. Two major components are measured to determine the total net benefits to caps. The first major component is the improvement to consumer and producer surplus associated with reductions in flight and passenger delay from imposition of caps at each airport. The second major component is the negative impact on consumer and producer surplus associated with the loss of flights due to the imposition of caps. Other costs are either indirect costs or transfer costs and are discussed at the end of this section.

Quantification of Delay Reduction Benefits to Carriers and Passengers

In the modeling exercises used to support the development of the recent orders that imposed temporary caps at JFK and EWR, the FAA provided estimates of expected delays if caps did not exist at these two airports. For the purposes of the analysis for this rule, which necessarily must consider a 10-year period of consumer and producer benefits and costs attributable to caps, the FAA applied airport delay and cancellations results developed by the University of Maryland (UMD). The team at the University of Maryland collected a significant sample of delay experience from the FAA's Aviation System Performance Metrics (ASPM)-analysis database. The FAA relied on actual operations and delays experienced at JFK and EWR in 2007, plus carrier-provided schedules for the summer of 2008, to model the effects of uncapped operations on the airports in the absence of this rule.

A summary of the delay and cancellation data developed from actual and projected operations at JFK and EWR is shown in Exhibit 1. The exhibit shows the average delay per operation and the percent of scheduled flights cancelled at different levels of operations. In

estimating the effects of increasing operations, FAA adjusted projected growth in operations levels to reflect a simultaneous increase in cancellations, thus mitigating to some extent the impact of increased operations on airport delay (but undercounting delay to passengers whose flights were cancelled).

Exhibit 1: Delay and Cancellation Probability by Different Operation Levels

John F. Kennedy Airport (JFK)		
Daily Operations	Average Delay Minutes	Cancellation Probability
660	11.6	0.9%
760	13.1	1.1%
880	16.4	1.4%
970	21.5	1.3%
1110	22.1	1.6%
1230	23.6	2.4%
1290	31.2	4.3%
1420	47.8	6.1%
Newark Liberty Airport (EWR)		
1030	8.3	1.3%
1090	11.9	1.6%
1130	17.9	2.1%
1180	20.1	2.5%
1230	23.2	2.7%
1240	24.8	3.7%
1270	26.8	4.5%
1360	33.2	4.7%
1430	42.8	6.1%

JFK Delays:

To estimate the delay benefits and other consequences of implementing a cap, the FAA developed a delay model from the UMD data set. The base case for the analysis was August 16, 2007. The activity on this day was approximately equal to the number of operations anticipated under a cap at JFK. To model the uncapped case, FAA added carriers intended flight additions for summer (August) 2008. In the cap case, there are 1,287 daily realized operations (net of

cancellations but including unscheduled operations) while in the uncapped case there are 1,505. Average delays in the respective cases are estimated to be 31.1 and 41.6 minutes per operation, while the probability of cancellations increases from 3.4 percent to 5.4 percent.

The FAA estimates that, were the schedules originally proposed by the carriers in October 2007 for JFK to be implemented in the summer 2008, delay hours at JFK would rise to 1,015 aircraft block hours and 117,890 passenger hours per day compared to 645 aircraft block hours and 74,476 passenger hours per day in the capped scenario. On an annualized basis, delays at JFK in 2008 without caps in place could exceed those in the capped scenario by as much as 135,000 aircraft block hours and 15.8 million passenger hours. These savings equate to $998.2 million in delay reductions attributable to the cap each year at JFK ($522.5 million in reduced block hour costs and $475.7 million in reduced passenger delay). These reductions must, however, be adjusted for lost producer and consumer surplus due to the reduced number of flights caused by the cap.

EWR Delays:

The FAA undertook a parallel analysis of the consequences of a cap at EWR using the identical methodology employed for JFK. To estimate the delay benefits and other consequences of implementing a cap at Newark, the FAA developed a delay model from the UMD data set. The base case for the analysis was August 16, 2007. The activity on this day was approximately equal to the number of operations anticipated under a cap at EWR. To model the uncapped case, FAA added carriers intended flight additions for summer (August) 2008. In the cap case, there are 1,254 daily realized operations (net of cancellations but including unscheduled operations) while in the uncapped case there are 1,371. Average delays in the respective cases are estimated

to be 25.0 and 32.7 minutes per operation, while the probability of cancellations increases from 3.7 percent to 5.1 percent.

The FAA estimates that, were the schedules originally proposed by the carriers in October 2007 to be implemented in summer 2008, delay hours would rise to 728 aircraft block hours and 67,724 passenger hours per day compared to 509 aircraft block hours and 46,613 passenger hours per day in the capped scenario. On an annualized basis, delays at EWR in 2008 without caps in place could exceed those in the capped scenario by as much as 80,000 aircraft block hours and 7.7 million passenger hours. These savings equate to $482.2 million in delay reductions attributable to the cap each year at EWR ($250.8 million in reduced block hour costs and $231.3 million in reduced passenger delay). Again, these reductions must be adjusted for lost producer and consumer surplus due to the reduced number of flights caused by the cap (see next section).

Reduction in Non-Delay Consumer and Producer Surplus Associated with Caps

Consumer surplus is defined as the difference between what consumers must pay for a given level of service and what they would be willing to pay. Reductions in delay caused by the caps (discussed above) will generate significant savings for consumers at both airports (measured under Delay Reduction Benefits above). At the same time, consumers will lose the transportation utility of those flights that must be eliminated to conform to the caps. These lost flights will mitigate to some extent the value of passenger time savings introduced by the caps.

Producer surplus is the amount producers (e.g., carriers) benefit by selling at a market price that is higher than they would be willing to sell for based on their costs of production. Producers will benefit significantly due to the implementation of caps at the two airports, in that caps reduce the costs the carriers collectively incur due to delay and cancellations of flights.

However, there is a countervailing reduction of producer surplus associated with the loss of some flights caused by the implementation of the caps. By virtue of the fact that these flights were being offered before the caps it is clear that some losses on these lost operations will be realized.

More information about consumer and producer surplus calculation is provided in Appendix A. The losses of consumer and producer surplus at JFK due to flights not flown would be $741.7 million per year ($466.1 million in consumer surplus and $275.6 million in producer surplus). When deducted from the delay savings of $998.2 million caused by the cap (see JFK Delays above), this yields a net benefit attributable to the cap at JFK of $256.5 million per year. The losses of consumer and producer surplus at EWR due to flights not flown would be $382.3 million per year ($252.3 in consumer surplus and $129.9 in producer surplus). When deducted from the delay savings of $482.2 million attributable to the cap (see EWR Delay above), this yields a net benefit at EWR of $99.9 million per year. In summary, the delay savings at each airport attributable to the cap more than offset the costs to carriers and the flying public caused by the reduction in the number of flights.

Net Change in Consumer and Producer Surplus Attributable to Caps

The net benefit in consumer and producer surplus associated with the implementation of caps (i.e., the value of delay savings attributable to the caps less the loss of non-delay consumer and producer benefits associated with the flights lost to the caps) is $256.5 million per year at JFK and $99.9 million per year at EWR, as shown in Exhibits 2 and 3. The FAA estimates that total present value of delay benefits over the 10 years of the rule, net of the value of air service lost, are about $1,628 million for JFK and $634 million for EWR. These latter values represent the net benefits of the caps at these airports without considering downstream benefits or potential

reductions in schedule delay, and without additional benefits stemming from the auctions and secondary markets for slots proposed by this rule.

Exhibit 2: Adjusted Net Benefits of a Cap at JFK

Estimated Net Benefits of a Cap at JFK ($mil)

	Annual Benefits	Discounted Benefits
2009	47.8	44.7
2010	256.5	224.0
2011	256.5	209.4
2012	256.5	195.7
2013	256.5	182.9
2014	256.5	170.9
2015	256.5	159.7
2016	256.5	149.3
2017	256.5	139.5
2018	256.5	130.4
2019	47.0	22.3
Total Discounted Value		1628.8

Exhibit 3: Adjusted Net Benefits of a Cap at EWR

Estimated Net Benefits of a Cap at EWR($mil)		
	Annual Benefits	Discounted Benefits
2009	18.6	17.4
2010	99.9	87.2
2011	99.9	81.5
2012	99.9	76.2
2013	99.9	71.2
2014	99.9	66.6
2015	99.9	62.2
2016	99.9	58.1
2017	99.9	54.3
2018	99.9	50.8
2019	18.3	8.7
Total Discounted Value		634.3

Other Factors Affecting Delay and Total Value of Caps at JFK and EWR

Note that these delay estimates for JFK and EWR are net of cancellations and also do not take account of the additional time incorporated into carrier schedule times.[3] The FAA has also excluded the downstream costs to the NAS of delay that are avoided due the cap; the FAA is in the process of revising its methodology for estimating these types of costs and prefers to exclude them pending completion of its work in this area. The FAA notes, however, that the inclusion of these downstream benefits would simply make an even stronger case for the implementation of caps at both airports.

[3] Average block times at JFK and EWR, like most U.S. airports, have increased over time as carriers "pad" schedules to better reflect actual travel times; this has the effect of lowering reported delays, which are incorporated into the scheduled block times.

LONGER TERM COSTS OF INSTITUTING A CAP

The net benefits of a cap are based on the recent and projected markets for air service at JFK and EWR. Without a cap, there would be negative consequences for society in the form of excessive delay and cancellations in air service.

There are longer-term costs of a cap unless there are provisions made to create opportunities for entry. If, as was the case under the HDR at JFK, slots are allocated on a semi-permanent basis to carriers, then adverse incentives may come into play. Incumbents tend to overvalue slots because incentives exist to hold them for competitive reasons (to prevent entry) and because they are so difficult to replace should they be needed again. New entrants tend to undervalue slots if the government grants exemptions to the cap to encourage new entrance (as was the case before and after AIR-21). In the long run, air service at a capped airport is hindered because potential entry is slowed or halted entirely, thus impeding the ability of new entrants to exert competitive pressures and lead to new service, lower fares, and innovation.

The FAA has designed this final rule to avoid at least some of these longer-term costs at JFK and EWR by instituting a periodic auction of some slots and establishing a secondary market for slots characterized by clear property rights, thereby removing some of the adverse incentives to hold slots and make at least some slot leases available periodically to interested carriers to allow for entry and changes in air service. In addition, holders of Limited Slots may find it advantageous to sublease them knowing that these assets will soon be subject to auction in any case.

SLOT AUCTIONS

Slot auctions are a market-based solution to the slot allocation problem. The notion that auctions will improve the economic efficiency of slot use is straightforward. Those carriers with the best uses for slots would be willing to pay the highest amounts for those slots and should submit winning bids during the auctions. Winning bidders would be conveyed a well-defined property right to schedule operations at JFK and EWR over the life of the lease. Note that this result, allocation by "willingness-to-pay," is consistent with the FAA's criterion for the preferred or most economically efficient resource allocation.

Air carriers and their customers, passengers and shippers, are principal stakeholders in how slots are allocated and used. During the auctions, however, only the carriers would be active participants. Accordingly, carriers would act as economic agents for consumers (i.e., the passengers) during the auctions. It is reasonable to assume that carriers' bids on slots would be motivated primarily by profit potential. Consumers, on the other hand, benefit primarily from a higher value package or level of flights serving JFK and EWR. This higher value could manifest itself in many ways: service and schedule quality, reduced travel times, lower prices, etc. So consumers will benefit from the auction if service quality improves and /or money prices fall. While the motives of carriers and their customers are not perfectly aligned, the FAA believes they coincide closely in these cases. The demand for slots is ultimately derived from the demand for air travel. The best uses of the slots are likely to be the most profitable among the set of alternative slot uses, at least in part because they are valued the most highly or are demanded by the most potential air travelers. As a result, if carriers submit bids on slots motivated by their own profits, they would serve as efficient economic agents for their customers.

The terms of this rule stipulate a finite life on all slot leases, with a maximum of 10 years. This arrangement contrasts sharply with the quasi-permanent lives of slots under the HDR. The finite slot lives under the proposed options should, over the long run, increase the ability of the market for JFK and EWR carriers' services to balance the valuations of slots among incumbents and new entrants, thus better capturing overall market dynamics. The fact that some slot leases would expire during the 10-year term of the rule (i.e., the terms of Limited Slots will last only one to four years) could make them less economically attractive to their temporary holders and lead to a greater willingness to sublease them. As a result of these factors, the secondary market should see more activity than in the past.

Carriers may still have incentives to hold slots to prevent competitive entry. However, under an auction, carriers will have to pay cash to preserve this strategy. When a slot lease expires, if a holding carrier's potential loss of network profits exceeds the willingness of the next highest bidder to pay for a slot, then the holding carrier may succeed in preserving its position. However, at a minimum, the rule should increase the opportunity cost of holding slots to prevent entry. More importantly, the measured, incremental implementation of the annual auctions proposed in this rule, limited to a small share of the airports' slots for any given auction, provides the DOT with the opportunity to monitor competition and intervene if anticompetitive actions are found to occur.

The FAA notes that the Department of Transportation has the authority under 49 U.S.C. § 41712 to investigate, prohibit, and impose penalties on a carrier for an unfair or deceptive practice or an unfair method of competition in air transportation or the sale of air transportation. The Department has consistently held that this authority empowers it to prohibit anticompetitive conduct that (1) violates the antitrust laws, (2) is not yet serious enough to violate the antitrust

laws but may do so in the future, or (3) although not a violation of the letter of the antitrust laws, is close to a violation or contrary to their spirit.

CHARACTERIZING BENEFITS FROM REALLOCATION BY AUCTION

Without detailed proprietary information on carrier costs and business and marketing plans, no one can say for sure how many slots would change hands and what the net effects would be from the auction. However, for the reasons just discussed, there would be some improvements in economic efficiency.

One likely market response to auctions would be changes in frequency and aircraft size, whether initiated by incumbent carriers or new entrants. The FAA and the OST have for the past four years contracted with the National Center of Excellence for Aviation Operations Research (NEXTOR) to conduct research on various proposals to implement congestion management. As part of the research, NEXTOR conducted a number of strategic simulations with the industry in an effort to design and assess the potential effectiveness of various allocation mechanisms, including auctions. On February 24 – 25, 2005 NEXTOR conducted a strategic simulation in which they demonstrated how an auction model could be used to allocate capacity. The simulation was structured around a mock auction for arrival and departure slots at LGA. The purpose of this simulation was to familiarize the relevant industry and government communities with auction processes and the specifics of slot auction design. The exercise also brought in views from industry and government on the overall policy of using auctions to allocate arrival and departure capacity.

Among many findings of the strategic simulation was that airline schedulers when confronted with caps and some form of pricing, including auctions, would shift some flights from smaller planes to larger planes, a process referred to as "upgauging."

One potential motivation for upgauging of aircraft at JFK and EWR is derived from their roles as major international airports. Operating profits in the domestic market are currently very modest and are projected to remain so for the foreseeable future, whereas the profitability of international flights has been relatively good. The ability of carriers to purchase slots formerly used in domestic service, where the aircraft operated are generally smaller standard jets, Regional Jets (RJs), and turboprops, and use the slots for international flights, where aircraft used are typically larger standard jets, could lead to a higher value mix of air service at the airports.

JFK Benefits from Reallocation

Exhibit 4 shows the characteristics of commercial air service at JFK during August 2007. Seventy-one percent of the passenger operations at JFK were accounted for by LCC, legacy, RJ and turboprop carriers in domestic US markets (including Canada.) JFK has a relatively large LCC presence (27 percent of operations) due primarily to the hub operated by JetBlue. The remaining 29 percent of operations are in international markets and are undertaken by both U.S. and foreign operators. Seventy-four percent of total operations are in standard jets (LCC, legacy and international).

Exhibit 4: Air Service Characterisics at JFK in August 2007

JFK Service Characteristics	LCC	LEGACY JET	PROP	RJ	INTL	TOTAL		CARGO	GRAND TOTAL
Weekday Scheduled Operations	342	226	50	261	366	1245		42	1287
Pct of Daily Schedule	27%	18%	4%	21%	29%	100%			
Total Seats Offered (roundtrip)	46,348	37,946	1,850	12,879	87,121	186,144			
Pct of Seats Offered	25%	20%	1%	7%	47%	100%			
Number of Markets	44	26	11	32	84	154			
Pct of Markets	29%	17%	7%	21%	55%	100%			
Avg Roundtrips	3.89	4.35	2.27	4.08	2.18	4.04			
Avg Passengers per Operation	107.3	135.3	20.7	36.0	180.4	115.5			
Total Passengers per Day	36,708	30,584	1,034	9,389	66,038	143,753			
Pct of Total Passengers	26%	21%	1%	7%	46%	100%			
Avg Block Time	3.11	4.70	1.51	1.84	7.57	4.38			
Avg Variable Cost per Blk Hour	$2,699	$4,465	$1,372	$1,686	$6,828	$5,035			
Avg Segment Fare	$144	$223	$41	$99	$525	$332			
Avg Load Factor	79%	81%	56%	73%	76%	77%			
Avg Seat Size	135.5	167.9	37.0	49.3	238.0	149.5			
Avg Cost per Seat Hour	$19.91	$26.59	$37.08	$34.18	$28.69	$33.68			

This service pattern is to a large degree a product of historic regulatory and administrative allocation of slots, but was also heavily influenced by the phase-out of the HDR, particularly after 2005. The service pattern is likely to change when some access rights are auctioned off. Carriers would have to pay cash for some portion of JFK capacity and make their business cases work in competition with other bidders. The auction process should encourage the most efficient use of those slots made available, resulting in an increase in societal benefits.

To give some dimension to the potential size of these benefits, Exhibit 5 shows the average net benefits (consumer and producer surplus) produced by a flight for operations at JFK in August 2007 using the methodology applied in the regulatory evaluation of the just-issued Congestion Management rule for LGA and the earlier proposal NPRM for the same airport, published August 29, 2006. These estimates are offered only as being indicative of the relative value to society of different types of air services at JFK. Any single service on any particular route may differ greatly from the average.

Details on the methodology are available in the 2006 *LGA Initial Regulatory Evaluation* document and in Appendix A below. The method accounts for average delay and cancellation

costs, cash outlays, and time expended for different service types by both consumers and operators at JFK (based on a full price of travel framework).[4] The lower portion of Exhibit 5 describes the change in consumer and producer surplus, on average, in shifting from one service to another, at JFK.

JFK Surplus Estimates by Type of Flying								
	LCC	LEGACY JET	PROP	RJ	INTL	TOTAL	CARGO	GRAND TOTAL
TOTAL SURPLUS per day	$9,044	$14,552	-$1,702	$438	$59,815	$22,734	$ 14,552	$ 22,467
Total Annual Surplus	$3,301,146	$5,311,594	-$621,184	$159,770	$21,832,426	$8,297,768	$ 5,311,594	$ 8,200,317

Exhibit 5: Indicative Average Surplus to Society Produced by a Flight at JFK

JFK Reallocation Example		
From	**To**	**Annual Surplus Change**
RJ	LCC	$3,141,376
	Legacy Jet	$5,151,824
	Int'l	$21,672,656
Turboprop	LCC	$3,922,330
	Legacy Jet	$5,932,778
	Int'l	$22,453,610
AVERAGE		$10,379,096

EWR Benefits from Reallocation

Exhibit 6 shows the characteristics of commercial air service at EWR during August 2007. Legacy carriers, especially Continental Airlines flying standard jets, dominate operations at the airport. Their code share regional partners operate in domestic markets with prop and RJ aircraft. Legacy, prop, and RJ operators offer more frequency in markets than do LCCs, which operate standard jets and have a relatively small share of scheduled operations (three percent).

[4] Please see Appendix A for a discussion of the full price of travel.

The load factors for all passenger operations at EWR in August 2007 are about equal to the national average for large hub airports.

Exhibit 6: Air Service Characterisics at EWR in August 2007

EWR Service Characteristics	LCC	LEGACY JET	PROP	RJ	INTL	TOTAL		CARGO	GRAND TOTAL
Weekday Scheduled Operations	34	527	2	462	194	1219		35	1254
Pct of Daily Schedule	3%	43%	0%	38%	16%	100%			
Total Seats Offered (roundtrip)	4,704	74,368	100	23,146	38,615	140,933			
Pct of Seats Offered	3%	53%	0%	16%	27%	100%			
Number of Markets	6	53	1	56	57	151			
Pct of Markets	4%	35%	1%	37%	38%	100%			
Avg Roundtrips	2.83	4.97	1.00	4.13	1.70	4.04			
Avg Passengers per Operation	113.7	113.2	36.1	38.0	157.4	91.6			
Total Passengers per Day	3,867	59,643	72	17,545	30,544	111,671			
Pct of Total Passengers	3%	53%	0%	16%	27%	100%			
Avg Block Time	2.69	3.42	1.50	1.97	7.62	3.52			
Avg Variable Cost per Blk Hour	$2,803	$3,462	$1,558	$1,559	$5,499	$3,744			
Avg Segment Fare	$131	$177	$90	$110	$513	$257			
Avg Load Factor	82%	80%	72%	76%	79%	79%			
Avg Seat Size	138.4	141.1	50.0	50.1	199.0	115.6			
Avg Cost per Seat Hour	$20.26	$24.53	$31.16	$31.12	$27.63	$32.39			

This service pattern is largely a product of the hub system operated by one large carrier, but has also been influenced by the HDR because of air service demand redirected from LGA and JFK to EWR because of Newark's position as the one major hub airport in the New York area not previously subject to the HDR. The impact on service patterns at EWR from flights in the future that are redirected from LGA and JFK due to the caps at those airports would be even more severe unless an operations cap is also sustained at EWR.

Looking forward, the present mix of aircraft and service at EWR will almost certainly change when some slots are auctioned off under this proposed rule after a cap is in place. In particular, in October 2007 the carriers serving EWR announced plans to add about 100 new flights during the afternoon and early evening hours of summer 2008. Under the provisions of this

proposed rule, the carriers proposing these additional flights, as well as existing flights, would compete for capped capacity at EWR. As would also be the case at JFK, carriers would have to pay cash for some portion of EWR capacity, encouraging them to make the highest and best use of the slots made available.

Exhibit 7 shows the average surplus (consumer and producer) produced by a flight for operations at EWR in August 2007, using the same methodology applied for JFK. Again, these estimates are offered only as indicative of the relative value to society of different types of air services at EWR.

Exhibit 7: Indicative Average Surplus to Society Produced by a Flight at EWR

EWR Surplus Estimates by Type of Flying								
	LCC	LEGACY JET	PROP	RJ	INTL	TOTAL	CARGO	GRAND TOTAL
TOTAL SURPLUS per Day	$9,644	$11,752	$951	$1,499	$52,774	$14,318	$ 11,752	$ 14,247
Total Annual Surplus	$3,520,039	$4,289,658	$346,957	$546,974	$19,262,639	$5,226,152	$ 4,289,658	$ 5,200,014

EWR Reallocation Example		
From	**To**	**Annual Surplus Change**
RJ	LCC	$2,973,064
	Legacy Jet	$3,742,684
	Int'l	$18,715,664
Turboprop	LCC	$3,173,082
	Legacy Jet	$3,942,701
	Int'l	$18,915,682
AVERAGE		$8,577,146

Effect of Auctions on Slot Reallocations at JFK and EWR

Exhibits 5 and 7 show average, not marginal, values, for possible reallocations from smaller to larger aircraft at JFK and EWR, respectively. Some small aircraft operations are doubtless extremely valuable, both on individual routes and as part of network services, and will

compete well for the scarce slot assets. As noted previously, the FAA would need comprehensive data on all carriers' operating costs and business and market plans to attempt an estimate of actual reallocations, route-by-route and aircraft type-by-aircraft type, caused by the auctions.

The values in Exhibits 5 and 7 do, however, give some dimension to the possible benefits of reallocation that result from higher valued flying at JFK and EWR. If only one or two slots per auction move from lower-valued to higher-valued flying at each airport (enough to enable one flight reallocation per auction per airport), the benefits to society are likely to exceed the costs of the auction (discussed below). Market forces should cause the scarce slot resources to go to the highest valued users. Users with higher value services should acquire some slots in the auction and the numerical estimates in Exhibits 5 and 7 can be used to illustrate the benefits of this process. Whether those higher valued operations would be with larger or smaller aircraft is not known.

At JFK and EWR, a carrier's slot portfolio may or may not be big enough to fully implement its best business plan; the intent of this rulemaking is to give carriers the opportunity to supplement their slot portfolios through auctions as well as the secondary market through subleases, and to allow the market to test the associated business case, thus improving the allocation of resources.

AUCTION PROCESS AND COSTS

The auction format will consist of a single-round, second-price, combinatorial auction. This type of auction imposes fewer administrative or processing costs on auction participants than other auction formats. This design significantly reduces the preparation and participation

costs for bidders when compared to alternative designs. The single-round format reduces participation costs because bidders are not required to react to published prices in an ascending auction format. This contrasts with a multiple-round auction format; the Federal Communications Commission (FCC), for example, has used a simultaneous multiple-round auction to award many spectrum licenses. The most recent of these, involving licenses in the 700 MHz band, resulted in 216 rounds of bidding that lasted for 38 bidding days, or nearly eight business weeks.

The term "second-price" auction refers to one in which the highest bidder wins, but is required to pay an amount only slightly above the highest competing bid (*i.e.*, the "second price"). A "combinatorial" auction is one in which bidders are allowed to assign and bid an amount on an all-or-nothing combination or package of items, as opposed to just individual items.

A second-price auction also dramatically simplifies a bidder's strategy, and therefore reduces participation costs, because bidders have incentives to express their true valuation for the product up for sale, without the risk of paying too much and being subject to the winner's curse.[5] This is in contrast to first-price auctions, where bidders have incentives to shield their true values to avoid paying more than they need to, making the determination of their desired bid amount a tricky process.

A combinatorial format that includes all-or-nothing packages also reduces auction participation costs because bidders may assign and bid amounts for combinations or packages that have a unique value that is different from that for the individual items. Non-combinatorial

[5] The winner's curse is a phenomenon that occurs in common value auctions with incomplete information. In short, the winner's curse says that in such an auction, the winner will tend to overpay.

methods, by contrast, create exposure risks for bidders, and require development of strategies to minimize these risks.[6]

Government Auction Costs

A contract has been awarded by the FAA to implement the auction. Based on past experience, the FAA believes there will be few if any slots returned to the FAA under the use or lose provisions of the rule at either airport; carriers will be better off subleasing slots in the secondary market. Therefore, the agency has not made provisions for reallocating returned slots in years six through ten in the cost estimates, relying instead on WSG procedures. However, even if the government costs were identical after the fifth year to those in years one through five, the rulemaking would be more than justified.

The total undiscounted cost to the government cost is $6.2 million at each airport with initial costs of $1.7 million and recurring costs of roughly $0.9 million.[7] To manage the auction process, the agency has assumed that the FAA will devote two full person-years of effort in each of the auction years, at a GS-14 rate (including overhead and benefits) for a total of $0.5 million in annual cost.

Carrier Auction Costs

In response to comments, we have re-estimated and thoroughly examined the auction participation costs to carriers. The following are the details regarding the carrier auction costs. We expect carriers to dedicate an auction team to focus their efforts and conduct their due diligence to participate most effectively in a government auction. In this case, a carrier will likely assemble a multidisciplinary team of existing staff that might consist of an auction

[6] For example, bidders in FCC SMR auctions without combinatorial bidding face an exposure risk of winning some but not all of their complementary licenses to support their business plan. Likewise, takeoff and landing slots may be worth more in combinations or bundles than the sum of the individual slots.
[7] We have included $0.2 million for the one-time "fair allocation" of slot lives.

manager, an operations research specialist, and a corporate lawyer. The assembled team resources involved in the auction would not be dedicated entirely to the auction process and could continue to work on existing projects and responsibilities. In addition to staff resources, company executives would be involved on an as-needed basis to approve bidding strategies, final bids, and secure any necessary financing.

In Exhibit 8, the auction process activities are described and the associated costs with each activity are estimated per carrier. For purposes of this analysis, a blended rate of $100/hour is used to estimate carrier costs of in-house auction preparation activities.

Exhibit 8 – Carrier Auction Costs

Activity	Description of Activity	Hours and Expenses	Labor Costs
Review Final Rules	Each team member reviews the final rules to fully understand the bidder obligations and auction procedures	24	$2,400
Determine least profitable slots to include in the auction	Operations research personnel determines least profitable existing slots at each airport using existing software tools and models	40	$4,000
Review Bidder Information Package	Each team member reviews the Bidder Information Package that includes a full set of auction procedures	24	$2,400
Submit Auction Expression of Interest	Auction Manager submits Auction Expression of Interest and certification to the FAA through web-based form. Legal reviews form for rules compliance	8	$800
Develop bidding strategy assumptions	Auction team develops strategy assumptions based on existing operations and long-range, strategic plans	120	$12,000
Obtain bidding strategy approval	Auction team coordinates with applicable executive level employees to obtain bidding strategy approval	80	$8,000
Determine values of most profitable slot combinations	Operations research personnel determine most profitable packages of auction slots and corresponding values at each airport based on carrier's existing slot portfolio and private and common value assumptions and gate	160	$16,000

	availability (if applicable) using existing software tools and models		
Obtain final approval of bids	Auction team coordinates with applicable executive level employees to obtain bid approval	40	$4,000
Secure necessary financing	Auction manager coordinates with CFO to secure any necessary financing and upfront payment deposit requirements	40	$4,000
Attend bidder seminar	Auction team travels to and attends government sponsored bidder seminar event in Washington, DC	48 +$3,000 travel expenses	$4,800 $3,000
Deposit upfront payment and lost interest	Auction manager coordinates with Finance department to deposit auction upfront payment	8	$800
Mock Auction	Auction team participates in government sponsored mock auction including creating a fictitious bid in the required format and reviewing auction system confirmation.	48	$4,800
Prepare final bid	Operations research specialist prepares final bid; Auction Manager and Legal reviews final bid to verify and validate package contents, prices and to ensure that file format is compliant	48	$4,800
Submit bid on Auction Day	Auction Manager submits file to FAA auction system, Operations Research and Legal reviews confirmation and compares it to final approved bid	24	$2,400
Post auction	Auction Manager requests refund of upfront payment or coordinates final payment of winning bid amounts	24	$2,400
	Total:	736	$76,600

In this case, the airlines will likely use existing in-house resources in their operations research departments to determine the value of each slot and the values of different combinations of slots such that they can find the most (and least) profitable slots/packages for their specific businesses. Since schedule optimization is already a core competency of the airline industry and all carriers have existing software tools and models to determine optimal schedules and the

potential revenue that can be realized by using those schedules, the slot valuation process is an inherent part of their ongoing operations.

SUMMARY OF BENEFITS AND COSTS OF THE AUCTION

Instead of an administrative procedure, this rule relies on auctions to allocate scarce operating rights at JFK and EWR. In an exchange of an arrival and departure of an airplane with another, the market will determine who most values the available slots. The slots will be sold to those carriers willing to pay the most. The receiver of the slot anticipates that its flight will have a higher profit, thus higher social value, than can the other bidders.

Exhibits 9 and 10 summarize the estimated benefits and costs of the auctions at JFK and EWR, respectively. The benefits assume that only one slot is reallocated from a smaller aircraft to a larger aircraft in each of the five auctions. The benefits and costs listed in each exhibit are explained in more detail immediately below the exhibits.

Exhibit 9—Benefits and Costs of Auction at JFK

Benefits and Costs of the JFK Auction (CY $2008 mil)

	Slot Years Reallocated Via Auction	Current Dollar Value of surplus @$10.379M	Discounted Present Value of Benefits	FAA Auction Costs	Carrier Auction Costs	Total Auction Costs	Discounted Present Value of Costs
2008				1.7	5.90	7.5982	7.60
2009(Oct)	0.19	1.9	1.8	0.9	5.51	6.4055	5.99
2010	2	20.8	18.1	0.9	5.51	6.4055	5.59
2011	3	31.1	25.4	0.9	5.51	6.4055	5.23
2012	4	41.5	31.7	0.9	5.51	6.4055	4.89
2013	5	51.9	37.0	0.9	5.51	6.4055	4.57
2014	5	51.9	34.6				
2015	5	51.9	32.3				
2016	5	51.9	30.2				
2017	5	51.9	28.2				
2018	5	51.9	26.4				
2019 (Mar)	1.25	13.0	6.2				
TOTALS	40.4	419.7	271.9	6.2	33.4	39.6	33.9

Net Benefits	238.04

Exhibit 10—Benefits and Costs of Auction at EWR

Benefits and Costs of the EWR Auction (CY $2008 mil)

	Slot Years Reallocated Via Auction	Current Dollar Value of surplus @$8.577M	Discounted Present Value of Benefits	FAA Auction Costs	Carrier Auction Costs	Total Auction Costs	Discounted Present Value of Costs
2008				1.7	2.99	4.6874	4.69
2009(Oct)	0.19	1.6	1.5	0.9	2.79	3.6885	3.45
2010	2	17.2	15.0	0.9	2.79	3.6885	3.22
2011	3	25.7	21.0	0.9	2.79	3.6885	3.01
2012	4	34.3	26.2	0.9	2.79	3.6885	2.81
2013	5	42.9	30.6	0.9	2.79	3.6885	2.63
2014	5	42.9	28.6				
2015	5	42.9	26.7				
2016	5	42.9	25.0				
2017	5	42.9	23.3				
2018	5	42.9	21.8				
2019 (Mar)	1.25	10.7	5.1				
TOTALS	40.4	346.8	224.7	6.2	16.9	23.1	19.8

Net Benefits	204.89

Auction Benefits

As discussed earlier and shown in Exhibits 5 and 7, a slot resulting in larger airplane service nets the society $10.4 million per year at JFK and $8.6 million per year at EWR. The auction benefits are based on one operation resulting in larger airplane service per year. We estimate that by 2013, five such operations will have been allocated at each airport and will remain in service until the leases expire. When expressed in present value terms (using a 7 percent rate) and summed, the total present-value benefits at JFK over a ten year period are $272 million and at EWR are $225 million.

Auction Costs

The annual total costs are based on 77 carriers participating each year for five years at JFK and 39 carriers participating at EWR. The estimated carrier administrative costs of participation in the chosen format for a given bidder is approximately $76,000 initially and $71,500 for recurring years[8].

[8] These costs are the maximum expected carrier costs from participating in the auction. We expect that the number of participating carriers will be substantially less than 77 and 39 at JFK and EWR, respectively, especially after the first

The costs of the auction (that are not transfer costs) relate to the public and private sectors costs of creating, operating, and participating in the auction. The price paid for a slot in an auction is not an economic cost of the rule, but rather is a transfer payment from the buyer. The auction itself does not create slots or provide other services. It is merely a reallocation mechanism. The rule will substitute a market mechanism for an administrative/regulatory one. The only resource costs are related to the cost of the auction itself, and the foregone surplus of the slots that are retired.[9]

Net Auction Benefits

The net benefits associated with the upgauging of one flight per year at each airport for the five years of the auctions are positive. When expressed in present value terms (using a 7 percent rate) and summed, the total present-value benefits at JFK over a ten year period are $248 million and at EWR are $201 million.

COST BENEFIT SUMMARY

The primary benefits of this rulemaking will be the delay reductions from the caps on operations and the improvement in the allocations of scarce slot resources at JFK and EWR. When we evaluate this final rule under the baselines that there would be no caps on authorizations at either airport after October 24, 2009, the net benefits (as measure in net present value) from both the auctions and the caps as implemented by this rule would be $1,877 million for JFK and between $835 million for EWR. Of these amounts, the net benefits of improved slot

year. Moreover, it is unlike that many of the small carriers will assign the level of effort indicated in Exhibit 8.

[9] There is a requirement for GA operators to acquire a reservation (beyond any flight plan they might file) at LGA; this process is already automated and should not add appreciably to either private or public sector costs. The costs to private charter operators of acquiring a reservation in advance should be little changed from today.

allocation by auctions would be $248 million at JFK and between $201 million at EWR from 2009 to 2019.

ECONOMIC EFFICIENCY AND DISTRIBUTIONAL EFFECTS

Auctions of a limited number of slot leases at JFK and EWR will likely result in some reallocations of scarce resources at the airports. The economic efficiency resulting from this reallocation is an important consideration in assessing the desirability of slot auctions. Carriers with the best uses for slots will have the highest willingness-to-pay and win the auction. Winning bidders will be conveyed a well-defined property right to schedule operations at JFK or EWR over the life of the lease. Allocation by willingness-to-pay is consistent with our earlier criterion for the preferred or most economically efficient resource allocation.

Air carriers and their customers (i.e., consumers of passenger and cargo services) are two of the principal stakeholders involved in slot use at the two airports. While increasing total welfare, a change in slot use at the airport is also likely to improve the welfare of some of these stakeholders at the expense of others. For example, the slot auctions are likely to result in some new air transport services and the termination of some existing services. As a result, consumers of the new transport services are likely to benefit from the new resource allocation, partly at the expense of consumers of terminated services. Similarly, some air carriers who acquire slot rights during the auctions are likely to benefit from the new regime, while carriers who lose slots might suffer losses.

The Port Authority, the New York area, and outlying communities are also stakeholders in slot use but will not directly participate in the auction. Their welfare may also be affected by the change in air service patterns that result from slot reallocation.

The scenario described above is typical of most public policies affecting resource use: some members of society benefit, others are made worse-off, while the total social welfare of society increases (assuming that the policy is cost-beneficial as measured through economic analysis). There is a commonly adopted standard for economic efficiency in these cases. Specifically, a change in resource allocation is said to improve economic efficiency if the beneficiaries can potentially compensate the losers for loses and still be better off.[10]

SLOT VALUES

At JFK and EWR, the FAA would collect the auction receipts to offset the cost of the auction and to pay for capacity enhancements in the New York area.

It is uncertain how much money will be paid for slot leases in the auctions. Slots have not been in tight supply at JFK until recently. Relatively aggressive expansion by JetBlue and Delta, together with faster growth in international market, have pushed JFK beyond its capacity. The FAA is unaware, however, of any large sales or subleases of slots at JFK in the recent past. Therefore, it is hard to judge what the auction prices at the airport will be. Historically, the mid to late afternoon period has been most prized because this is the prime window for operations from and to Europe. Domestic operations have also been increasing in this period. As a result, we would expect that slot leases in this period will be more valuable than at other times of the day. Similarly, JFK also sees peak activity in the morning during which there is significant domestic activity.

[10] A different, arguably stricter standard states that a reallocation of resources improves efficiency if the welfare of at least one member of society is made better-off, and no member of society is made worse-off. However, because losers are rarely compensated for losses, this strict standard would almost never be satisfied in any regulation. As a result, most policy evaluations adopt the standard of potential compensation, and then describe how benefits and costs are distributed among various members of society. We describe the distributional impacts of the slot auctions elsewhere in this report.

To provide some indicative values, we have assumed that the morning, primarily domestic slots, at JFK would command leases in the neighborhood of those at LGA ($7,500 per month) and that the mid to late afternoon/early evening peak would command a premium of $12,000 per month.

The FAA recognizes that slot lease values may be far different in an auction, and in fact expects that they will become more so over time. The purpose of the auction is to provide an opportunity for improved allocation of the scarce slot resource, not to collect funds per se. Of course, historically HDR slots were treated as quasi-permanent assets with indefinite lives whereas under the proposed rule, slots traded in the auction would be defined as FAA property leased to carriers for up to 10 years, assuming the first auction is conducted in January 2009 with the slots beginning to be used in the fall of 2009. It is unclear how this more precise definition of slot property rights would affect value of the slot in the auction, although it would lead to less arbitrary valuations. Conditions in the wider airline market would also have an important effect on slot lease prices.

Assuming the indicative values described above and using a 12 percent cost of capital (as might be used in a carrier capital investment decision) over the slot lives ranging up to 10 years provides one way to estimate potential slot values in an auction. Exhibit 11 summarizes these values and the implied auction proceeds; the latter are estimated using the average of the two values for slot leases. The FAA stresses that these are indicative values and the actual values in an auction may be different, particularly given business circumstances, tax implications, and other factors unique to particular bidders.

Exhibit 11: Indicative Slot Lease Values at JFK and Implied Auction Proceeds

Indicative Slot Lease Values and Implied Auction Proceeds at JFK

Average Monthly Value of a Slot		$ 7,500	$ 12,000		
Cost of capital		12%	12%	Annual Proceeds	
Year	Slot Life	A.M. Lease Value	P.M. Lease Value	Slots Traded	Proceeds @ Avg. Value
2009	9.19	$ 498,979	$ 798,366	18	$ 11,676,107
2010	9	$ 493,933	$ 790,293	18	$ 11,558,042
2011	8	$ 461,458	$ 738,332	18	$ 10,798,112
2012	7	$ 424,863	$ 679,781	18	$ 9,941,803
2013	6	$ 383,628	$ 613,805	18	$ 8,976,894
				Total*	$ 52,950,959

* Funds collected by FAA

Because EWR has not operated under the HDR since 1970, there are no data on actual values of slot trades at that airport. The FAA assumes that values at JFK serve as a proxy for these values, and that Exhibit 11 is indicative of the auction proceeds that would come from EWR.

One way to gauge the effect of slot-related cash outlays on carriers is to compute the slot value on a per seat-day basis (see Exhibit 12). The values in this exhibit are the amounts that carriers would have to amortize per seat offered in the marketplace. Clearly operators of larger aircraft are advantaged in this comparison.

Exhibit 12: Value of a Slot per Seat Offered per Day

Value of a Slot per Seat Offered per Day		
Average Monthly Value of a Slot	$	9,750
Seat Configuration	Value per Seat Day	
400	$	0.81
350	$	0.93
300	$	1.08
250	$	1.30
200	$	1.63
150	$	2.17
135	$	2.41
100	$	3.25
70	$	4.64
50	$	6.50
35	$	9.29
19	$	17.11

Assumes 30 day month and average of morning and afternoon slot values.

The FAA recognizes that carriers would look at the cost of a slot on a network basis, and as part of the cost of their entire service offered to and from the New York area; given the modest number of slots in the auction, the resulting costs for incumbents, who are well-positioned at JFK and EWR, are more modest than one might conclude from Exhibit 12.

APPENDIX A

A complete discussion of the methodology for estimating net benefits to society of the cap provisions of the proposed rule can be found in the earlier Initial Regulatory Evaluation for the Congestion Management rule for LaGuardia Airport dated August 29, 2006 (see docket number FAA-2006-25709). This appendix documents the application of this methodology to the alternatives evaluated for JFK and EWR in this proposed rulemaking.

Estimates of Net Benefits Due to a Cap

The analysis in this regulatory evaluation corresponds to the analysis undertaken in the 2008 LGA rulemaking. The value of the operations cap at each airport is based on airport-specific estimates of net surplus—delay savings less consumer and producer benefits from flights avoided because of the cap. This section summarizes the development of the schedules in the two relevant cases: with and without the cap at the two airports, and summarizes how average surplus values were applied to develop the value of the cap. A later section in this appendix describes the methods used to develop estimates of average surplus values.

The FAA acquired information from the carriers on their planned operations at JFK and EWR in the absence of a cap. These plans showed net increases in operations at JFK of 218 and at EWR of 117 relative to the August 2007 schedule. The plans also showed changes arrivals and departures by time of day. The carriers did not provide details on either where the new flights would be flown or with what aircraft. The FAA examined the carrier plans and made assumptions about the fleet that carriers would fly with the incremental operations. The FAA also classified the flights into five categories: domestic flights (including Canada) by legacy carriers, low cost carriers (LCC's), regional jets (RJs), turboprops, and international flights.

Because the delay consequences of carrier plans were so adverse, the FAA decided that it would need to implement a cap at both airports. For the purposes of the regulatory evaluation, the agency selected the August 2007 Official Airline Guide (OAG) as the cap case, and assumed the uncapped case would be the August 2007 OAG plus the added flights identified by the carriers themselves.

The modeling task was to estimate the incremental delays, cancellations, and surplus that would occur if the incremental flights above the cap were flown. To do this, the FAA applied the University of Maryland (UMD) delay models described earlier and the incremental surplus values estimated for JFK and EWR using the methodology described later in this appendix (see "Estimating the Value of a Cap" that follows the development of the consumer and producer surplus methodologies). The no cap scenario produces higher levels of delays and cancellations, which are costly to consumers and operators, but it also permits additional flying which consumers and producers value. The methodology explicitly handles this tradeoff.

The benefits of caps at JFK and EWR do not include the downstream costs of delay that are avoided due to the cap. The FAA is in the process of revising the methodology on these types of costs and prefers to exclude them pending completion of the work in this area.

Using the adjusted one year net benefit estimate over the 10 year time horizon of the rule, the cap provides discounted benefits of approximately $1,629 million for JFK and $634 million for EWR. These calculations are shown in Exhibits 13 and 14.

Exhibit 13: Adjusted Net Benefits of a Cap at JFK

Estimated Net Benefits of a Cap at JFK ($mil)		
	Annual Benefits	Discounted Benefits
2009	47.8	44.7
2010	256.5	224.0
2011	256.5	209.4
2012	256.5	195.7
2013	256.5	182.9
2014	256.5	170.9
2015	256.5	159.7
2016	256.5	149.3
2017	256.5	139.5
2018	256.5	130.4
2019	47.0	22.3
Total Discounted Value		1628.8

Exhibit 14: Adjusted Net Benefits of a Cap at EWR

Estimated Net Benefits of a Cap at EWR($mil)		
	Annual Benefits	Discounted Benefits
2009	18.6	17.4
2010	99.9	87.2
2011	99.9	81.5
2012	99.9	76.2
2013	99.9	71.2
2014	99.9	66.6
2015	99.9	62.2
2016	99.9	58.1
2017	99.9	54.3
2018	99.9	50.8
2019	18.3	8.7
Total Discounted Value		634.3

Estimating Illustrative Benefits and Costs of Different Types of Flying

The empirical analysis described below is based on estimating the full price of travel and social marginal costs for representative markets at JFK and EWR. Estimates are provided for domestic markets (including Canada) for services provided by legacy (standard jet), RJ, turboprop, and LCC[11] operators, and for international and cargo[12] operations. The estimates are meant to be illustrative of the consumer and producer surplus produced by an average operation over a year. Comparison of the surplus produced by the six types of markets gives some feel for the consequences for society if one type of service is traded for another as a result of an auction.

The consumer benefits related to a reallocation of slots can be estimated using the economic concept of consumer surplus, defined as the difference between what consumers must pay for a given level of service and what they would be willing to pay. In passenger transportation markets, consumer surplus is usually defined in the context of the full price of travel. The full price of travel includes the money fare that a consumer must pay and the value of his or her time in transit (including both the scheduled time and any expected delays) and the value of schedule delay (the difference between the ideal time of departure/arrival for the consumer versus the actual schedule offered weighted by the probability of being accommodated on the desired flight). The common sense interpretation of the full price of travel model is that consumers prefer to fly at a time closest to their desired departure (or arrival) time, at the lowest possible price, and in a manner that minimizes the expected time in transit, including the risk of delays and cancellations.

[11] LCC is low cost carrier.
[12] Cargo operations are assumed to produce surplus and experience delays in the same way as legacy jet operations.

Application of the full price of travel in the context of consumer surplus is straightforward. A consumer would not choose to purchase a transportation service unless it was worth more to him or her than the sum of the money price plus the value of his or her time, including airport and schedule delay. Consumer surplus is the value of air transportation to the consumer in excess of the full price of travel. Although it is not always the case, larger aircraft would tend to exhibit more consumer surplus per operation because there are more passengers on-board who tend to fly longer distances, expend more time traveling, and pay more for the service, than on a smaller aircraft. Smaller aircraft will tend to exhibit less consumer surplus per operation for the same reasons and in addition, to the extent smaller aircraft are used for shorter haul flights, their use may be less advantageous to consumers at a highly delayed airport with high cancellation rates. Consumers can more easily elect to take other forms of transportation, such as rail, in shorter haul markets if they are confronted with less reliable air service.

It is also important to account for producer surplus, or the amount carriers earn per flight in excess of marginal cost (including delay and cancellation costs at JFK and EWR). Carriers will tend to focus on their own delay costs, and not worry about the costs they impose on other operators. At JFK and EWR under operations caps, a carrier would not have an opportunity to earn producer surplus in the absence of a slot caused by the caps. A reallocation of slots might increase producer surplus for some carriers and reduce it for others.

By adding producer and consumer surplus together, the FAA derives an estimate of the benefits to society of the air service at JFK and EWR. A reallocation via auction should increase these benefits.

The analysis is carried out at the segment level, i.e., each non-stop destination from JFK and EWR is considered to be a separate market. To implement the analysis, estimates are needed for the full price of travel and social marginal costs as of August 2007.

The full price of travel (FPT) in each case is defined as:

FPT = money fare + value of scheduled time in transit + value of airport delay and cancellations + value of schedule delay

For the sample schedule day (August 16, 2007), data are available to estimate each term in the above equation:

- Money fare: Average segment fare[13] for each of the four types of service
- Average time in transit: Weighted average block time from the OAG sample day
- Expected airport delay and cancellations[14]
- Value of travel time applied to transit time, delay and cancellations: GRA, Incorporated" Economic Values for FAA Investment and Regulatory Decisions, A Guide", prepared for FAA Office of Aviation Policy and Plans, (October 3, 2007). Passenger value of time is for "all purposes," reflecting a mix of business and leisure travel in the New York area, valued at $30.02 per hour
- Schedule delay: Computed from the OAG data using a method described below
- Value of time in schedule delay: $2.70 per hour from a study by Morrison and Winston[15]

[13] Based on DB1B third quarter 2007. The calculation includes "zero fare" observations (frequent flyers) and all O-D trips with 2 or less connect points involving JFK and LGA as an endpoint or a connect point. It is important to include frequent flyers in order to avoid overestimating carrier revenues (calculated as total passengers x average fare). To derive the segment fare observations, the total itinerary fare for each DB1B record is first allocated to separate O-D trips using the DB1B trip break indicators and a weighting factor of W = exp(2.485+0.720668*ln(miles)) – this represents an approximation to ICAO formula prorates. The O-D trip fare is then further allocated to individual segments based on direct segment distance.

[14] Passenger delay costs are estimated as the product of expected delay time and the value of time. Cancellation costs are calculated the same way. In estimating expected passenger time lost due to a cancellation, the FAA assumes that a passenger is reaccommodated on the next flight out with enough available seats, where available seats are estimated as (1- load factor) x seat capacity. In some cases, passengers can be reaccommodated on the next flight out; in others, they might have to wait for the second flight.

For each segment, there are data on the level of service by the six types of aircraft operations (legacy, LCC, RJ, turboprop, international, and cargo). These data are aggregated up to the segment level to estimate an average money fare, passengers per day each way, measures of travel time, airport delay, and schedule delay. The resulting sample day full price of travel and number of passengers together represent a point on the segment FPT demand curve. The corresponding point on the money demand curve can be found by substituting the money fare for the FPT.

One additional point is required to identify the two demand curves (FPT and money) in mathematical terms. To do this, one additional roundtrip with the average load (for each type of service) on the segment is assumed. The FAA's suggested money elasticity is applied to estimate change in the money price at the increased level of service.[16] This procedure provides another point on the (assumed) linear money demand curve for the flight segment. With this information, the FAA recalculates the other components of the full price of travel and thus another point on the FPT curve. Finally the FAA calculates the intercept point for the FPT

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[15] Morrison and Winston, "Enhancing the Performance of the Deregulated Air Transportation System," *Brookings Papers on Economic Activity, Microeconomics*, 1989, p. 66, use the ratio of value of schedule delay/value of travel time applied to current estimate of travel time value. The results of this study suggest that consumers place a lower value on schedule delay than on travel time. The rationale is that while consumers will prefer to fly at precisely the time that fits their schedules, deviations from the schedule do not generally result in large losses of consumer benefits because they are able to use any deviations in other productive or leisure pursuits. For example, a business person who would prefer to leave at 4 PM but is forced to leave at 5 PM because of the schedule of available service may find ways to productively use the extra hour at work.

[16] The elasticity estimate is based on a weighted average of the recommended values from FAA's "Airport Benefit-Cost Analysis Guidance," 1999 – -2.0 for leisure travel ≤ 500 miles, -1.0 for leisure travel > 500 miles, -1.6 for business travel ≤ 500 miles, -0.8 for business travel > 500 miles.

demand curve by assuming it is linear and, with the fully identified function, estimates the total consumer surplus for the segment (the so-called welfare triangle).[17]

In order to attribute consumer surplus to the different types of flying on a segment, the FAA calculates average segment consumer surplus per passenger (that is, passengers were indifferent between the types of flying – legacy, LCC, regional jet and turboprop). Then the FAA multiplies average consumer surplus by the number of passengers per flight for each type of flying to estimate consumer surplus per flight for a segment. For each type of flying, the FAA calculates total consumer surplus on a segment by multiplying by the number of flights.

To calculate the average consumer surplus per flight across all segments for each type of flying, the FAA sums the surplus across segments and divides by the total number of daily flights. Assuming each flight is offered daily, the FAA multiplies the average per flight figure by 365 to obtain an estimate of average consumer surplus per flight for legacy, LCC, RJ, turboprop, international, and cargo operations at JFK and EWR.

Estimating Schedule Delay

One of the important differences that need to be accounted for between the cases is the effect of frequency and average seat size on consumer benefits. In general, consumers prefer more frequent flight opportunities and larger aircraft so that they can more easily accommodate their own schedules. For example, consumers value legacy carrier operations at JFK and EWR highly because legacy carriers fly relatively large aircraft with high frequency. In contrast, LCC's fly larger aircraft on average but much less frequently, perhaps in part because they have less access to facilities. Economists measure the value of frequency using a concept termed

[17] Note, the full price of travel demand curve is not linear. But the FAA assumes that it is to calculate surplus. This tends to understate consumer surplus.

"schedule delay." The idea is that consumers can reduce schedule delay when there are more frequent flights and more seats. For example, a businessperson can more precisely plan a business trip when there are more opportunities to fly to a distant city to make a meeting at a particular time. In contrast, when service is relatively infrequent, the traveler might incur wasted time or even have to stay overnight to accommodate a meeting schedule. Personal travelers also benefit from increased frequency.

For valuation purposes, schedule delay is broken into two components – frequency delay and stochastic delay. Frequency delay measures the average difference between a passenger's preferred departure time and the closest scheduled departure time. Frequency delay (FD) in minutes for a given market segment is parameterized as:

$$\text{FD} = 92F^{-0.456}$$

where F is daily flight frequency.[18]

Stochastic delay measures the expected delay due to the probability that a passenger would not be able to obtain a seat on his most preferred departure because of capacity limitations of the aircraft. Stochastic delay (SD) is parameterized as:[19]

$$\text{SD} = \frac{12010}{F} \times P^{0.5725} \times (S - P)^{-1.79}$$

where F = daily flight frequency
P = passengers per flight
S = seats per flight

[18] Douglas and Miller (1974). Economic Regulation of Domestic Air Transport: Theory and Policy, p. 105.
[19] Morrison and Winston, *op. cit.*, p. 63. This is based on a parameterization of the Douglas and Miller (*op. cit.*) schedule delay equation.

The sum of frequency delay and stochastic delay yields total schedule delay. Estimates of schedule delay from these equations for various values of *F* and *S* are shown below in Exhibit 15 below (using the observed average JFK system load factor of 68.6 percent):

Exhibit 15: Equation Estimates of Schedule Delay (minutes)

Daily Frequency	Average Seatsize				
	50	75	100	125	150
4	213	149	120	103	92
6	150	108	88	77	69
8	118	86	71	63	57
10	98	72	60	54	49

Schedule delay is valued at $2.70 per hour based on estimates developed by Morrison and Winston cited earlier.

Estimating Carrier Impacts

This analysis also includes estimated producer surplus impacts. For each type of flying (legacy, LCC, regional jet, turboprop, international, and cargo operations) carrier revenues are computed based on the estimated number of passengers served and the money fare (net of passenger taxes, segment and security fees, and Passenger Facility Charges). For present purposes, carrier costs include scheduled aircraft variable block-hour costs, airport delay costs, and cancellation costs.

Variable block-hour costs are taken from the FAA "Economic Values" study completed in 2007.[20] Estimated airport delay costs are computed as average delay minutes per operation multiplied by the average variable block-hour costs summed across all operations and cancellation costs.

[20] FAA, "Economic Values for FAA Investment and Regulatory Decisions, A Guide", op cit; Table 4-3.

Cancellation costs are difficult to measure because some portion of crew and other costs may still be incurred, and downstream operations may be affected. Ignoring downstream effects, one can estimate a ceiling on such costs based on the delays discussed above. Clearly, a carrier will cancel a flight only when the net costs of doing so are less than those that would be incurred by operating it and accepting the consequent delays. So a ceiling on (own-airport) cancellation costs can be estimated by taking the difference between (1) net operating profits with no cancellations (and therefore very high delay costs) and (2) net profits with cancellations. For this analysis, incurred cancellation costs were assumed to be 50 percent of the profit estimate difference.[21] This is likely to be a conservative estimate of cancellation costs since it does not include downstream effects.

Estimating Impacts on Non-Scheduled Operators

Delay effects on non-scheduled operations are also taken into account. The FAA assumed that non-scheduled operations remain constant at 33 per day at EWR and 26 per day at JFK (the actual average for 2007). Non-scheduled passenger delay costs are estimated assuming 2.8 passengers per flight[22] and using the same value of time as for scheduled passengers. Non-scheduled aircraft delay costs are estimated assuming an average cost of $1,108 per block hour.[23]

Illustrative Estimates of Surplus for Different Types of Operations at JFK

Exhibits 16 and 17 show the illustrative average surpluses per day and per year for operations at JFK and EWR, respectively. The FAA stresses again that these are illustrative.

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[21] In estimating carrier revenues when there are no cancellations, it was assumed that each 1-point reduction in cancellations from the current value would lead to an increase in passengers equivalent to about 0.14 load factor points.

[22] FAA, "Economic Values for FAA Investment and Regulatory Decisions, A Guide", 2007; Table 3-15, average passengers in operations involving Turboprop 1-9 seats multi-engine and Turbojet ≤12,500 lbs aircraft, the prevalent operators at LGA.

[23] FAA, *op. cit*, Table 4-10.

They are rough estimates of the relative benefits to society of alternative types of service at JFK and EWR. The relative values are of primary interest. It should not be surprising, given the economic methodology for calculating society benefits, that more frequent service with larger aircraft produces more surplus. On average, consumers as a group are willing to pay more for such service than they are for less frequent service with smaller aircraft.

Exhibit 16: Illustrative Estimates of Surplus for Different Types of Flying at JFK

	LCC	LEGACY JET	PROP	RJ	INTL	TOTAL	CARGO	GRAND TOTAL
Daily Results								
Consumer Surplus	$1,637,404	$2,188,908	$14,333	$297,222	$9,524,953	$13,662,821	$406,788	$14,069,609
Producer Surplus	$1,455,725	$1,099,914	-$99,427	-$182,975	$12,367,287	$14,640,524	$204,409	$14,844,933
Non-Scheduled Passenger Delay Costs						-$1,127		
Non-Scheduled Aircraft Delay Costs						-$14,918		
TOTAL SURPLUS	$3,093,129	$3,288,823	-$85,094	$114,247	$21,892,241	$28,287,300	$611,197	$28,898,497
Annual Results								
Consumer Surplus	$597,652,488	$798,951,551	$5,231,710	$108,485,934	$3,476,607,927	$4,986,929,610	$148,477,722	$5,135,407,332
Producer Surplus	$531,339,533	$401,468,732	-$36,290,920	-$66,785,952	$4,514,059,927	$5,343,791,319	$74,609,233	$5,418,400,553
Non-Scheduled Passenger Delay Costs						-$411,212		
Non-Scheduled Aircraft Delay Costs						-$5,445,152		
TOTAL SURPLUS	$1,128,992,021	$1,200,420,283	-$31,059,210	$41,699,982	$7,990,667,854	$10,324,864,566	$223,086,955	$10,547,951,521
Per Operation (excluding Non-Scheduled)								
Consumer Surplus	$4,788	$9,685	$287	$1,139	$26,024	$10,974	$9,685	$10,932
Producer Surplus	$4,257	$4,867	-$1,989	-$701	$33,790	$11,759	$4,867	$11,535
TOTAL SURPLUS per day	$9,044	$14,552	-$1,702	$438	$59,815	$22,734	$14,552	$22,467
Total Annual Surplus	$3,301,146	$5,311,594	-$621,184	$159,770	$21,832,426	$8,297,768	$5,311,594	$8,200,317

Exhibit 17: Illustrative Estimates of Surplus for Different Types of Flying at EWR

	LCC	LEGACY JET	PROP	RJ	INTL	TOTAL	CARGO	GRAND TOTAL
Daily Results (Capped)								
Consumer Surplus	$165,223	$3,432,796	$1,969	$644,353	$4,065,564	$8,309,906	$227,985	$8,537,891
Producer Surplus	$162,671	$2,760,765	-$68	$47,981	$6,172,660	$9,144,009	$183,353	$9,327,361
Non-Scheduled Passenger Delay Costs						-$1,152		
Non-Scheduled Aircraft Delay Costs						-$15,255		
TOTAL SURPLUS	$327,894	$6,193,561	$1,901	$692,335	$10,238,224	$17,437,508	$411,337	$17,848,845
Annual Results (Capped)								
Consumer Surplus	$60,306,480	$1,252,970,617	$718,788	$235,189,019	$1,483,930,964	$3,033,115,869	$83,214,367	$3,116,330,237
Producer Surplus	$59,374,839	$1,007,679,192	-$24,874	$17,513,127	$2,253,020,953	$3,337,563,238	$66,923,666	$3,404,486,903
Non-Scheduled Passenger Delay Costs						-$420,504		
Non-Scheduled Aircraft Delay Costs						-$5,568,192		
TOTAL SURPLUS	$119,681,320	$2,260,649,809	$693,914	$252,702,146	$3,736,951,918	$6,364,690,412	$150,138,033	$6,514,828,445
Per Operation (Capped - excluding Non-Scheduled)								
Consumer Surplus	$4,860	$6,514	$985	$1,395	$20,957	$6,817	$6,514	$6,809
Producer Surplus	$4,784	$5,239	-$34	$104	$31,818	$7,501	$5,239	$7,438
TOTAL SURPLUS per Day	$9,644	$11,752	$951	$1,499	$52,774	$14,318	$11,752	$14,247
Total Annual Surplus	$3,520,039	$4,289,658	$346,957	$546,974	$19,262,639	$5,226,152	$4,289,658	$5,200,014

Estimating the Value of a Cap

For the purposes of this regulatory evaluation, the cap case is assumed to be the OAG schedule for August 2007. The data in the immediately preceding two exhibits are valued using available information from that time period. To value the cap, the FAA assumed that the information that carriers provided on their intended summer schedules for 2008 (relative to 2007) would constitute the uncapped case. For each of the ten years of analysis, FAA assumed the same cap and uncapped cases, which ignores the potential additional growth in operations in the future, and therefore is conservative.

To estimate the delay and cancellation impacts in the uncapped case, the FAA applied the UMD model for each airport. The estimated delay and cancellation parameters for the two airports in the capped and uncapped cases are shown in Exhibit 18.

Exhibit 18: Effect of the Cap on Delays and Cancellations at EWR and JFK

	EWR		JFK	
	Capped	Uncapped	Capped	Uncapped
Total Scheduled Operations	1254	1371	1287	1505
Cancellation Rate	3.7%	5.1%	3.4%	5.7%
Realized Operations incl Unscheduled	1240	1333	1269	1445
Airport Delay per Op (min)	25.0	32.7	31.1	41.6
Airport Delay Cost per Pax	$12.53	$16.35	$15.55	$20.83

In the absence of a cap, both existing passengers and passengers on added flights would experience increases in delay and cancellation costs. Carriers would also experience higher delay and cancellation expenses.

On the other hand, consumers on-board the added flights in the uncapped case would enjoy additional consumer surplus (net of delay and cancellation costs), and airlines would also

benefit from adding flights. To model these incremental operations, FAA assumed that the additional flights would be less productive (for consumers and producers) than most of the existing flights at the two airports. The rationale for this is, but for this rulemaking, both JFK and EWR would be uncapped (following the sunset of the temporary JFK and EWR orders). Therefore, the higher value flights would be incorporated into the schedules.

The carriers provided information to allow us to characterize most of the additional flying. For example, we can immediately characterize LCC and international flying by foreign operators. The FAA then made assumptions about the likely types of flying that would be taken by other domestic operators (legacy jet, RJ, turboprop, international, and cargo) based upon recent public announcements. With this information in hand, the FAA assumed that the incremental flights produced consumer and producer surplus equal to the average of the lowest rated flights already in the capped schedule. For example, at EWR, LCC's announced that they would add 14 flights per day in the uncapped case. These 14 flights were assumed to produce the average consumer and producer surplus of the 14 lowest rated flights in the capped case.

With these assumptions, the FAA was able to estimate the net cost to society of allowing operations beyond the cap. Exhibits 19 and 20 summarize the findings for JFK and EWR, respectively. In both cases, going beyond the cap produces negative results for society. The FAA has reported the benefits of the cap as the negative of the reported numbers.

Exhibit 19: Net Effect of Operations Beyond the Cap at JFK

Effect of Added Flights Beyond the Cap at JFK						
Change in Consumer Surplus	LCC	LEGACY JET	PROP	RJ	INTL	TOTAL
Added Flights	$223,910	$215,173	-$66	$21,113	$271,637	$731,767
Existing Flights	-$193,585	-$161,293	-$5,454	-$49,514	-$348,263	-$758,108
Total Change in Consumer Surplus	$30,325	$53,880	-$5,520	-$28,400	-$76,626	-$26,341
Change in Producer Surplus						
Added Flights	$87,165	-$56,411	$2,678	-$45,696	$203,683	$191,419
Existing Flights	-$162,132	-$177,265	-$12,051	-$77,327	-$439,045	-$867,820
Total Change in Producer Surplus	-$74,966	-$233,676	-$9,373	-$123,023	-$235,362	-$676,401
TOTAL CHANGE IN SURPLUS PER DAY	-$44,642	-$179,796	-$14,892	-$151,423	-$311,988	-$702,742
ANNUALIZED CHANGE IN SURPLUS	-$16,294,211	-$65,625,622	-$5,435,678	-$55,269,507	-$113,875,767	-$256,500,784

Exhibit 20: Net Effect of Operations Beyond the Cap at EWR

Effect of Added Flights Beyond the Cap at EWR						
Change in Consumer Surplus	LCC	LEGACY JET	PROP	RJ	INTL	TOTAL
Added Flights	$56,935	$323,700	$11,855	$444	$91,609	$484,542
Existing Flights	-$14,787	-$228,084	-$276	-$67,093	-$116,807	-$427,047
Total Change in Consumer Surplus	$42,148	$95,616	$11,579	-$66,650	-$25,198	$57,496
Change in Producer Surplus						
Added Flights	$55,864	$94,617	-$3,256	-$4,322	-$1,398	$141,505
Existing Flights	-$12,141	-$232,428	-$397	-$91,771	-$135,906	-$472,642
Total Change in Producer Surplus	$43,723	-$137,812	-$3,653	-$96,093	-$137,303	-$331,137
TOTAL CHANGE IN SURPLUS PER DAY	$85,871	-$42,195	$7,927	-$162,743	-$162,501	-$273,642
ANNUALIZED CHANGE IN SURPLUS	$ 31,342,969	$ (15,401,321)	$ 2,893,236	$ (59,401,124)	$ (59,312,963)	$ (99,879,203)

Sample Calculations

Exhibit 21 shows the individual calculations applied to data at the segment level for EWR. In the analysis, consumer and producer surplus estimates are developed at the segment level and then summed across segments. The segment shown is EWR – Atlanta, which was selected because it has a variety of different types of flying. The general assumptions are shown at the top of the table; the calculations for the segment then follow below.

Exhibit 21: Sample Calculations of Surplus at the Segment Level[24]

EWR INPUTS		
Unscheduled Daily Ops	33	Source: Joe Phillips ETMS FY07
Scheduled Cargo Ops	35	OAG Aug 16 2007
% Leisure traffic	60%	Source: EWR Fact sheet from www.jcdecauxna.com
Value of Travel Time per Hr	$30.02	Source: Business and leisure values from FAA critical values
Value of Schedule Delay per Hr	$2.63	Source: Morrison and Winston, "Enhancing the Performance...", Brookings 1989.
Passenger/Segment/A&H Tax Rate	8%	Source: G Helledy, FY04 scheduled domestic pax svc (airline rev % ticket rev)
PFC and Security Fee per Segment	$7.00	$4.50 PFC + $2.50 Security Fee
Money Fare Arc Elasticity	-1.372	Arc elasticity assumed to apply between current P,Q and that which would occur with 1 additional flight in the market
Downstream delay multiplier	0	
Chg in LF with 1 pt incr in completion rate	0.14	T-100 LF and completion rates, Dec. 2000 vs. Apr 2001
Cancellation cost factor	50%	
Include cancellation effects?	Y	
Avg Blkcost per Hour for GA	$1,108	Source: FAA critical values Table 4-10, avg. of Multi-Engine Turboprop 1-9 seats and Turbojet <=12,500 lbs variable operating costs
Passengers per GA flight	2.8	op. cit., Table 3-15
Annualization Factor	365.0	

[24] The first table in Exhibit 21 contains assumptions used for model calculations. The second table presents sample calculations for the EWR-Atlanta segment.

Exhibit 21: Continued

Data	LCC	LEGACY JET	PROP	RJ	INTL	Grand Total
Sum of FLTCOUNT	12	36	0	2	0	50
Sum of SEATSIZE	1404	4964	0	140	0	6508
Sum of TIME	1673	5412	0	288	0	7373
Sum of TOTCOST	79440	316437	0	8702	0	404579
Sum of pax	1154.09	3981.13	0.00	106.12	0.00	5241.34
Sum of totrev	160707	554372	0	14777	0	729856

	LCC	LEGACY JET	PROP	RJ	INTL	TOTAL
Scheduled Operations	12	36	0	2	0	50
Scheduled Roundtrips	6.0	18.0	0.0	1.0	0.0	25.0
Scheduled RT Seats	702.0	2482.0	0.0	70.0	0.0	3254.0
Avg Seatsize	117.0	137.9	0.0	70.0	0.0	130.2
Cancellation Rate	3.7%	3.7%	0.0%	3.7%	0.0%	3.7%
Realized Roundtrips	5.78	17.33	0.00	0.96	0.00	24.07
Realized RT Seats	675.91	2389.76	0.00	67.40	0.00	3133.07
Segment PDEWs	577.04	1990.56	0.00	53.06	0.00	2620.67
Pax per Operation	96.17	110.59	0.00	53.06	0.00	104.83
Avg Load Factor	82.2%	80.2%	0.0%	75.8%	0.0%	80.5%
BlkHrs/Operation	2.32	2.51	0.00	2.40	0.00	2.46
VarCost	$79,440	$316,437	$0	$8,702	$0	$404,579
VarCost/Hr	$2,849	$3,508	$0	$1,813	$0	$3,292
PASSENGERS						
Avg Segment Fare						$139.25
Money Fare Arc Elasticity						-1.372
Travel Time Cost per Pax						$73.78
Airport Delay Cost per Pax						$12.53
Avg Time between Flights (hrs)						0.72
# Flights needed to Accommodate All Cancelled Pax						3.84
Total Passenger Hours Incurred						171.06
Cancellation Cost per Pax						$1.96
Frequency Delay (min)						21.20
Stochastic Delay (min)						21.17
Schedule Delay Cost per Pax						$1.86
Avg Full Price of Travel						$229.38
With 1 Additional Scheduled Flight:						
Segment PDEWs	673.22	2101.15	0.00	106.12	0.00	2880.49
Intermediate calculation						-14.525
Avg Segment Fare						$129.98
(ignore marginal changes in airport delay and cancellation costs)						
Frequency Delay (min)						20.13
Stochastic Delay (min)						18.90
Schedule Delay Cost per Pax						$1.71
Avg Full Price of Travel						$219.96
Money slope						-0.036
Money intercept						$232.73
FPT Slope						-0.036
FPT Intercept						$324.33
Daily Consumer Surplus	$54,794	$189,017	$0	$5,038	$0	$248,849
Annual Consumer Surplus	$19,999,797	$68,991,056	$0	$1,839,009	$0	$90,829,862
CARRIERS						
Airline Revenue	$139,772	$482,154	$0	$12,852	$0	$634,778
Variable Block Costs (before delays)	$76,488	$304,677	$0	$8,379	$0	$389,543
Airport Delay Costs	$13,740	$50,757	$0	$1,457	$0	$65,955
Downstream Delay Costs (deps only)	$0	$0	$0	$0	$0	$0
Daily Airline Profit (before cancellations)	$49,544	$126,720	$0	$3,016	$0	$179,280
Cancellation Costs	-$2,842	-$10,925	$0	-$307	$0	-$14,073
Daily Airline Net Profit	$52,386	$137,645	$0	$3,323	$0	$193,353