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**Working Party No. 2 on Competition and Regulation**

**ROUNDTABLE DISCUSSION ON COMPETITION ISSUES IN THE ALLOCATION  
OF AIRPORT TAKE-OFF, LANDING SLOTS AND GROUND HANDLING  
SERVICES**

-- United States --

*This note is submitted by the United States to the Working Party No. 2 FOR DISCUSSION at its next meeting on 19 June 1997.*

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AIRPORT TAKE-OFF, LANDING SLOTS AND GROUND HANDLING SERVICES**

**Note by the United States**

**I. The Market for Airport Slots in the US**

1. In the United States, the issue of airport slot allocation is predominantly a domestic policy issue handled by the federal government, and the policy approach and the rules governing international slot allocation differ from the domestic regime. Two of the four most congested US airports subject to federal slot allocation procedures (La Guardia in New York and National in Washington, DC) have virtually no international operations. This situation is very different from Europe where international operations predominate, and where governmental bodies other than the national government have much more to say about slot allocation procedures. Accordingly, the discussion that follows deals primarily with US domestic policy. Although foreign carrier operations are an important element of service at US airports, their relatively small share of overall operations means that international service did not drive the making of past or current slot allocation policy. Instead, the US slot policy was primarily driven by concern regarding domestic operations.

2. The High Density Traffic Airports Rule (HDR) was originally adopted in 1968 as a solution to the problems of congestion at five (now four) of the busiest airports in the country. Airport congestion can result from a common-property resource problem, where no well-defined property rights exist for a resource that is available in a fixed supply. In the absence of property rights for the fixed resource, competing users seek to overuse it. Here, the resource that is available in fixed supply is the capacity of the airport. Physical and technological constraints, such as the number of runways and terminals and the capability of the air traffic control system, limit the density and frequency of operations. Overuse of the scarce resource manifests itself in congestion and delay as the number of airplanes attempting to land or take off during the same period exceeds the airport's physical capacity.

3. The 1968 HDR required carriers wishing to land or take off during restricted periods to obtain the privilege to do so. These landing and take off privileges are commonly referred to as "slots." The 1968 HDR set the total number of slot operations-takeoffs and landings-allowed during certain restricted time periods at the high density traffic airports (HDTAs) and distributed this quota of operating privileges to incumbent carriers. The number of operations allowed under the HDR is based on the estimated capacity of each airport.

4. Until 1985, the incumbent airlines at each high density traffic airport decided how slots would be allocated, with any reallocation requiring their unanimous approval. The incumbent airlines could trade slots among themselves, one for one. But increasing competition in the post- 1977 deregulation era strained this method severely and in many cases, the allocation system broke down completely, freezing the previous allocation in place and denying slots to new entrants. An economically efficient solution to a common-property resource problem would limit the use of the resource and allocate rights of use to those who value them highest. Starting in April 1986, the HDR, as amended in the FAA 1985 Final Rule, largely accomplished this by encouraging the development of a market-based slot transfer system for domestic slots at HDTAs.

5. The HDR currently affects operations at four airports: Kennedy (New York City), La Guardia (New York City), O'Hare (Chicago), and National (Washington). Present regulations allow slot holders to sell, trade or lease their domestic slots, after a prescribed minimum period of usage, and permit slots to be held by any party meeting certain FAA qualifications. The FAA retains the right to repossess slots, which the HDR describes as operating privileges, not property rights. Slots may be withdrawn for such reasons as making necessary allocations for international flights and implementing competition goals. Slots also will be recalled for reallocation if used less than 80 percent of the time over a two-month period. The FAA rules provide for lotteries to distribute the slots that have been recalled for nonuse, voluntarily transferred back to it, or are otherwise not currently allocated when a sufficient number of slots become available. The last lottery was held in 1989. Both incumbent and new entrant carriers may enter these lotteries, in which the order of choice is determined by random drawing. During the first lottery sequence, 25 percent of the slots (but no fewer than two) are set aside for new entrant carriers.

## II. Criticisms of the Use of "Slots" to Allocate Airport Capacity in the US

6. The HDR has been criticized for setting, by its mere implementation, artificial constraints on airport operations. Critics also have contended that the HDR, by limiting entry, fosters the exercise of market power by incumbent carriers. The level of concentration at the HDTAs also has been a source of concern. Based on slot holdings, each of the HDTAs considered alone is either moderately or highly concentrated, according to the standards of the Merger Guidelines. As evidence of the anticompetitive effects of the HDR, critics have pointed to the higher concentration and higher ticket prices at HDTAs relative to other airports. Some critics have also addressed distributional issues, observing that incumbent carriers received a valuable (and salable) right for free.

7. Several observations are relevant to these criticisms. First, as long as the slot quotas reflect each airport's capacity, the slots are not "artificial" constraints on airport operations. In the US, the binding constraint on net increases in operations has been the HDTAs' physical capacity, not the use of the "slot" system. If the slot system were eliminated tomorrow, the constraint on operations would remain, and probably would be manifest in additional delays.

8. Second, the existence of higher prices for air travel at slot controlled airports does not necessarily imply the existence of anticompetitive behavior. Even if markets were perfectly competitive, fares at capacity-constrained airports would be higher, all other things equal, than at airports without capacity constraints. Equilibrium competitive prices for air travel at capacity-constrained airports would reflect the "scarcity rents" associated with the constraint on capacity. Indeed, the absence of higher airfares at slot constrained airports would imply (again, all other things equal) that landing rights at HDTAs were not a valuable resource, and slots would not trade at positive prices.

9. Using slot usage data supplied by the US Federal Aviation Administration (FAA), the FTC Bureau of Economics Staff in 1991 and 1993 tested several hypotheses about anticompetitive behavior in slot markets.<sup>1</sup> The first hypothesis flows from the standard analysis of market power, which implies that dominant firms have a greater incentive to reduce output than do fringe firms, and predicts that smaller fringe firms will increase output in response to a contraction of output by the dominant firm. This reasoning suggests that larger carriers would attempt to restrict output by reducing the number of days on which a slot was used, and implies that larger carriers would use their slots less intensively than would the smaller fringe carriers.

10. A second anticompetitive hypothesis was that dominant carriers would be unwilling to sell slots to potential new entrants at competitive rates, but instead would lease their slots to selected other carriers, with the purpose of deterring entry by carriers likely to increase overall slot use. In this scenario, dominant airlines would choose their competitors by leasing slots to them. In this way, the dominant firm(s) could both ensure that less efficient firms would be competing with them for the same passengers and simultaneously deter the entry of more efficient firms. This hypothesis implies (1) that the dominant air carriers will be net lessors of slots; and (2) that these leased slots will be used relatively less intensively than slots held and operated by the dominant carriers.

11. The empirical results obtained by the FTC staff were largely inconsistent with these two anticompetitive theories. Slot usage for all carriers at the four HDTAs tended to be very high -- typically above 90 percent -- and the data indicated no relationship between market share and slot usage. That is, the negative relationship between market share and slot usage predicted by the anticompetitive hypothesis did not emerge from actual slot usage data. Further, rather than being net lessors of slots, the largest firms at each of the four HDTAs were consistently net lessees of slots. This result, together with the high degree of slot usage, is inconsistent with the implications of these anticompetitive theories.<sup>2</sup>

12. Even if the allocation of slots is efficient, it might have been better for the Federal treasury had the original recipients of slots paid for them, rather than receiving them for free.<sup>3</sup> But economic theory implies that in the absence of transactions costs, the initial allocation of these rights will not affect the allocative efficiency of the ultimate market allocation.<sup>4</sup> That is, the fact that incumbent airlines in 1968 received a windfall does not mean that today slots are not efficiently allocated to their highest-valued use.

13. Several new entrant carriers, however, have recently complained that despite long searches they are unable to obtain slots at HDTAs, which calls into question whether the secondary market is functioning as efficiently as possible. One possible explanation of these complaints is that the existing slot allocation is relatively efficient and the new entrants are simply unwilling to pay the required price to re-allocate the slots.

14. An alternative explanation is that transactions costs for acquiring a critical mass of slots are relatively high, and that new entrants have been unable to use the secondary market to acquire efficiently slots for entry. In particular, successful entry on some routes may require a frequent pattern of service between the new entrant's hub and one of the HDTAs. To establish a profitable US domestic service, carriers often find that they must offer frequent service throughout the day to appeal to the business traveller. Since business travellers are willing to pay a premium for convenient service, airlines without a reasonably frequent service will be unable to attract premium passengers who are usually essential for establishing a profitable service between two cities. Although new entrants often find that one or two slots may be available at odd times of day, putting together a package is apparently much more difficult. Unless one carrier happens to be downsizing its service and is willing simultaneously to sell off a large group of slots, a new entrant would have to acquire slots from several sellers simultaneously, and arranging a workable package might be difficult.

15. Distinguishing between a market with low transactions costs and efficient allocations and a market with high transactions costs and inefficient allocations can be difficult. Entry could be difficult in both circumstances, and relatively few transactions would be expected in either case. In the case of hub airports (like Chicago O'Hare), the marginal value of additional flights to the incumbent hub carriers is probably very high since each flight expands the reach of their entire network. A new entrant with a much smaller network might not generate enough revenue to justify paying the price necessary for entry at such a hub even if there is no anticompetitive "hub" premium. For other airports like New York's La

Guardia where there are many more point to point operations, the inability of entrants to obtain slots is harder to explain if transactions costs are low. With lower costs than many incumbent carriers, entrants should be able to pay the scarcity premium and still be profitable if the secondary market is functioning effectively.

16. There continues to be some concern that the new entrant's problem may be exacerbated when the proposed service is one in direct competition with an existing incumbent with market power. Many nonstop airline routes have relatively little competition, and entry on such routes often lowers fares dramatically. Most incumbents would be unwilling to sell slots at a price reflecting only the airport's scarcity premium when those slots are going to be used in direct competition with its service. With low transactions costs, an entrant could approach other airlines, but even if they have a useable package of slots available, the incumbent may be able to outbid the entrant for those slots. Given the existing structure of slot transactions, the seller knows who is bidding on the slots. The knowledge of who is bidding on the slots makes it possible to predict how the slots would be used. With that knowledge, a seller receiving a bid from an entrant should logically seek out the incumbent and solicit a counter bid, since prices tend to fall dramatically upon entry of new, direct competitors on airline routes. Notwithstanding the FTC study (*see* above), it is possible that incumbents would find it in their interest to make a higher bid than the entrant could afford even if they had no particular plan for how to use the slots.

17. Although an incumbent would have to find a use for such slots or risk losing them under existing use or lose rules, not all uses are equally efficient. In particular, at least one US airport subject to HDR rules has some incumbents operating or leasing "jet" slots for use by commuter aircraft.<sup>5</sup> Since commuter aircraft operate at much smaller passenger volumes and significantly higher per passenger costs than jet aircraft, the use of these highly valued jet slots for commuter planes suggests that the market for slots is working imperfectly.

### **III. Possible Changes in Slot Allocation Mechanisms**

#### ***A. Prohibit the sale of slots***

18. Practices regarding whether slots can be purchased vary in different countries. Although the buy/sell rule is well established in the US for domestic slots<sup>6</sup>, under at least one interpretation of current EC slot rules, the buying and selling of slots is illegal. Instead, "excess" slots must be returned to the slot co-ordinator for redistribution. Not surprisingly, very few slots representing capacity at useable times are returned, and entrants have a particularly hard time acquiring slots. Rules that prohibit the sale of slots are likely to be inefficient. Creating a market for slots assists airlines in adjusting their holdings at an airport over time to reflect changing conditions in the demand for air travel among different airlines. Absent some market mechanism, the system of simply trading one slot for another is inefficient if the user with the highest value has nothing of similar value to trade. In particular, new entrants that were not in existence when the initial allocation was established would be shut out of the market. Although slot rules attempt to compensate for this problem by according new entrants a higher priority when new slots become available through capacity expansion, the small number of extra slots made available in this fashion can make effective entry impossible for new carriers at tightly controlled airports. In practice, in countries where there is no officially sanctioned market for slots, there is an active "grey market" for slots whereby some unequal trades are accompanied by cash or other considerations to make a bartering system workable.

***B. Permit secondary sales of slots***

19. By permitting the active buying and selling of slots as the US does, airlines can adjust their slot holdings over time to accommodate shifts in demand. Carriers that decide to downsize their presence at a particular airport can sell to carriers with a demand for more access. In addition, while many carriers may be able profitably to use a slot at a HDTA, some carriers may value service on particular routes they serve more highly than other carriers, leading to readjustments of slot holdings. Regardless of how the initial allocation is made (typically through grandfathering existing carriers), an active secondary market for slots will produce an efficient outcome if transactions costs for arranging sales are relatively low. Over time, if one carrier acquired enough slots to exercise market power in the pricing of slots, the slot authority or an antitrust agency might have to intervene to restore a more competitive market, but the general assumption is that short of acquiring or enhancing market power, most transactions would be presumed legal. Although an entrant may have to pay a higher price than it prefers for slots, entry should still be practical for carriers with relatively low costs and adequate financing. Internationally, non-market factors may interfere with the smooth functioning of a secondary market if (for example) subsidies insulate some carriers from market forces. In addition, if some carriers "must" serve certain routes regardless of profitability because national prestige requires a flag airline to provide some service, then a secondary slot market will not function efficiently in all cases.

***C. Conduct periodic auctions of slots***

20. If transactions costs for acquiring packages of slots suitable for entry are relatively high, however, then the existence of a secondary market may be insufficient to promote efficient usage of scarce capacity even in the absence of incumbent market power. The primary advantage of a periodic auction involving a percentage of the capacity at an airport throughout the day is that it will restore some liquidity to markets where the transaction costs of finding the right package to launch new service are very high. Even existing incumbents could benefit from such an auction if they wanted to set up new service on a point to point basis for lucrative business routes.

21. Concerns by new entrants that incumbents with market power may buy up slots suitable for entry may also be reduced with a periodic auction. As the deregulated domestic airline industry has developed in the US, many incumbent airlines face relatively little competition on routes between some HDTAs and their hub because the network advantages of the existing hub carrier (such as feed from connecting flights) can make point to point entry unprofitable even for an airline with lower per mile seat costs.<sup>7</sup> When a low cost carrier attempts to establish a competing hub operation, however, the prospect of entry on a competing city pair between the entrant's hub and the HDTA becomes much more likely, and the corresponding advantages of expenditures on entry deterrence by the incumbent increase.

22. When an incumbent has market power on a particular route, a periodic auction would affect the cost the incumbent would have to pay to pursue an anticompetitive strategy by outbidding potential entrants. Under the current system, an incumbent interested in protecting certain routes does not have to buy up all surplus slots that come on the market. Small numbers of slots do not present a threat to traffic on lucrative business routes because without adequate frequency, an entrant will generally be unsuccessful in competing with an incumbent. Similarly, slots traded or sold between existing incumbents at an airport often do not represent a threat of new entry because with their hub and spoke structures, many incumbents do not compete on nonstop routings to the same HDTA. With a periodic auction, however, all slots would become available over time, and a strategy of buying up slots for less valuable uses in order to preclude entry would become much more expensive.

23. The existing system whereby the seller knows who is bidding on the slots also makes entry deterrence by incumbents more likely than under a periodic auction where the identity (and even the number) of potential buyers could be concealed. As noted above, knowing the identity of a bidder is often the equivalent of knowing the likely use of a particular set of slots. Thus, sellers of slots can use the identity of a potential entrant to solicit a counter offer from an incumbent that would be threatened by entry. In contrast, if the incumbent is uncertain about who is bidding on a set of slots, there will be less incentive to bid up the slots for anticompetitive reasons. Although blind bidding in periodic auctions can increase the cost of entry deterrence, periodic auctions cannot eliminate the possibility that an incumbent will use slot purchases to acquire market power or prevent entry. If entry deterrence is sufficiently profitable, then an incumbent may still be willing to buy up spare slots over time in a periodic auction in the same way that an incumbent could buy up slots in the secondary market today.

24. Periodic auctions could discourage needed investments if slot holding were leased for too short a period of time. Consequently, periodic auctions must be designed carefully to balance the availability of slots with a reasonably long period of time during which an airline could establish service at an airport. There are sunk costs associated with entry on airline routes, and airport authorities also may have difficulty making the necessary adjustments to accommodate excessive turnover at any one time. Nevertheless, if (for example) 10% of an airport's capacity became available each year under a 10 year lease, the vast majority of all flights at any airport would be unaffected, especially since existing users of the slots being put up to bid might well reacquire some of the slots if they offer the most efficient service.

#### **IV. Conclusion**

25. Permitting the buying and selling of airport capacity (with or without a periodic auction) will not solve all problems at capacity constrained airports. Depending upon an airport's rules, for example, a new entrant may find that obtaining space at gates is difficult unless the airport authority possesses either extra capacity or the ability to order airlines to move to promote efficient use of its facilities. A buy/sell rule also is not a substitute for antitrust enforcement. If a carrier acquires market power at an airport, then market mechanisms will not correct such situations automatically. In setting up any buy/sell rule, however, governments may want to consider whether they can establish some firm rules regarding limits on how many slots one airline can acquire. Those rules might vary depending upon how the airport is used, and the expected likelihood of anticompetitive problems. In the long run, however, both airlines and consumers will benefit from having an effective and efficient slot allocation system that permits entry and competition between airlines.

NOTES

- 1 These studies were conducted in response to an invitation by the Federal Aviation Administration to participate in its proceedings that proposed changes or expansion of the HDR. The FTC staff comments submitted to the FAA in November, 1991 ("1991 FTC Staff Comments") and November, 1994 ("1994 FTC Staff Comments") will be made available as room documents at the June 19, 1997 meeting of WP2.
- 2 The FTC staff also used multiple regression analysis to test the anticompetitive hypotheses. The results did not generally support the two anticompetitive hypotheses examined.
- 3 Carriers that acquire slots in the secondary market do pay for them.
- 4 See Ronald Coase, "The Problem of Social Cost," 3 *J. Law & Econ.* 1 (1960).
- 5 At US airports subject to HDR, the available capacity has been further subdivided into two categories: slots for jet aircraft and slots for commuter aircraft. Commuter aircraft can be flown in jet slots but jet aircraft cannot use commuter slots without permission from the FAA. The policy of subdividing types of slots was designed to preserve some service from smaller, relatively nearby communities to major airports that would not justify operation of jet aircraft. Since commuter aircraft are smaller than jet aircraft, special commuter slots do not maximize passenger capacity at the airport.
- 6 International slots in the U.S. are outside the buy/sell process so that the government can assure that route rights granted to foreign carriers under bilateral agreements are exercisable.
- 7 These advantages are not necessarily related to possession by an airline of a large number of slots at any one HDTA. If an incumbent airline initially possessed only enough slots to serve the route between its hub and the HDTA, it would not have enough slots to trigger antitrust scrutiny. Such a carrier would have the same incentive as any other carrier to attempt to preclude entry on such a route.