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United States General Accounting Office

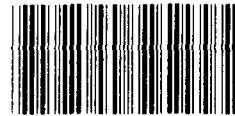
GAO

Report to the Honorable
Paul S. Sarbanes, U.S. Senate

April 1988

AIRPORT NOISE

FAA's Enforcement of Noise Rules at National Airport



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**Resources, Community, and
Economic Development Division**

B-230734

April 15, 1988

The Honorable Paul S. Sarbanes
United States Senate

Dear Senator Sarbanes:

This responds to your request that we review the Federal Aviation Administration's (FAA) monitoring for compliance with and enforcement of rules affecting the noise generated by flights at Washington's National Airport. In discussion with your office, we agreed to review FAA's enforcement of Washington National Airport flight restrictions during the period from January 1982 to June 1987—after which the Congress transferred the operating authority for National Airport from FAA to the new Metropolitan Washington Airports Authority. These flight restrictions that have the effect of minimizing the noise problem include:

- FAA's National Airport nighttime noise rule (14 CFR 159.40), the "curfew" rule, restricts operations between 10:00 p.m. and 7:00 a.m. to certain types of aircraft that have been classified by FAA as relatively quiet. Monitoring and enforcement of this rule was transferred to the Metropolitan Washington Airports Authority in June 1987.
- FAA's high density rule (14 CFR 93, Subpart K) limits the number of hourly operations for certain types of aircraft and classes of aircraft operators for each of four busy airports, including Washington National. The rule also provides for several exceptions to these limits. Although not intended to be a noise abatement rule, it does affect the overall noise generated. FAA's responsibility for this rule was unaffected by the transfer of authority in June 1987.
- FAA's National Airport noise abatement procedures for jet aircraft, in general, established the Potomac River flight path and reduced power settings for departures within 5 miles to the south or 10 miles to the north of National Airport. Responsibility for monitoring and enforcing these procedures was transferred to the Metropolitan Washington Airports Authority in June 1987.

We also agreed to obtain data on the actual number of flights from January 1982 through December 1987, to determine whether there has been a recent increase.

In summary, we found that between January 1982 and June 1987, FAA monitored all flights between 10:00 p.m. and 7:00 a.m. for compliance

with the nighttime noise rule. FAA imposed penalties for violations, but made exceptions for noncompliant operations which it determined were the result of factors beyond the control of the operator. Our analysis of National's daily activity reports indicates that the median number of nighttime flights increased slightly from 38 in 1985 to 42 in 1987.

We found that FAA relied on a nongeneralizable sample for monitoring compliance with its high density rule and, consequently, did not know how many violations actually occurred at National. National's daily activity reports indicate that flights during peak traffic hours consistently exceeded the high density rule limits by 5-13 percent during the past 6 years. The excess flights might have been (1) considered violations by FAA or (2) excused by FAA under one of its exceptions to the rule. We were unable to determine the number of violations or the rate at which FAA imposed penalties for violations because FAA does not maintain sufficient records of the results of its monitoring and enforcement of the high density rule.

We also found that FAA directly monitored compliance with the National Airport noise abatement procedures until 1985, when its special monitoring equipment—in use since 1976—broke down. After that, FAA relied on voluntary operator compliance with this rule.

Background

The airlines began jet service at National Airport in 1967, and airport noise was officially recognized as an environmental pollutant in 1969. The National Environmental Policy Act of 1969 (42 USC 4321 *et seq.*), as applied to the Federal Aviation Act of 1958 (49 USC 1301 *et seq.*), required that environmental impact assessments of proposed airport construction or improvement include aviation noise as a possible pollutant. From 1970 through 1982, a series of statutes similarly focused on land use and airport construction planning to limit the nuisance of airport noise.

A second group of statutes addressed the problem from a different direction: airport and aircraft operations. The Noise Control Act of 1972 (42 USC 4901 *et seq.*) authorized FAA to use its air traffic control authority to limit aviation noise by placing restrictions on airport and aircraft operations. The Aviation Safety and Noise Abatement Act of 1979 (49 USC 2101 *et seq.*) set target dates for reducing the number of the noisiest jet aircraft then in use.

The nuisance of airport noise tends to be concentrated along airport approach and departure paths and varies with the frequency, as well as the noise level and timing, of takeoffs and landings. Air temperature and humidity also affect the perception of noise. FAA estimated in 1985 that airport noise significantly affects about 5 million Americans—those living in areas subjected to an average day-night sound level of at least 65 decibels. FAA officials believe the problem has lessened already and will be further reduced as the noisier aircraft are retired or modified and quieter aircraft, such as the B-757 and B-767, are brought into service.

Residents of Maryland, Virginia, and Washington, D.C., who live along the Potomac River have organized to lobby for changes in National's traditional Potomac River corridor approach and departure routes. In response, in 1983, FAA tested community perception to alternative flight departure paths—known as the “scatter plan”—which distributed National's departing aircraft noise nuisance in a different pattern among the local jurisdictions. After receiving negative public comment on the test, FAA returned to the original flight departure path over the river, convinced that this route generates the least noise for most residents. Since then, organized resident groups have primarily focused their complaints on the adequacy of FAA's interpretation, monitoring, and enforcement of the nighttime noise rule, daytime high density rule, and operational noise abatement procedures for National Airport.

The Nighttime Noise Rule

National's nighttime noise rule limits the level of noise permitted by aircraft operating between 10:00 p.m. and 7:00 a.m. to 85 dBA¹ on landing, or 72 dBA on takeoff. To put these noise levels in perspective, the 65-90 dBA range includes the noise level produced by a household vacuum cleaner at 10 feet (69 dBA) or the noise perceived by the operator of a printing press in a printing plant (86 dBA).

FAA classified types of aircraft by the noise levels generated,² and FAA staff identified and logged each nighttime flight by aircraft types and models actually used. FAA airport management reviewed this nighttime flight operations log daily to identify operators of prohibited types of aircraft. From July 1982 (the effective date for enforcement of the rule)

¹“dBA”, or “A-weighted decibel,” is a unit of measurement for describing the intensity of sound as experienced by the normal human ear. It is the unit used in federal regulation of occupational noise exposure.

²As measured under standardized test conditions, aircraft types and noise levels are contained in FAA advisory Circular 36-3D, “Estimated Airplane Noise Levels in A-weighted Decibels.”

through December 1987, FAA took enforcement action in 218 of 230 cases in which operators were initially identified as using prohibited aircraft, including 137 letters of correction or warning and 81 civil penalties totaling \$37,500. On the basis of further examination, FAA presumably determined that the remaining 12 apparent violations were compliant operations.

Most often, FAA's redeterminations followed from initial misidentification of the aircraft. FAA also excused flights initially scheduled to arrive before 10:00 p.m. if they were cleared for approach before 10:30 p.m. This allowed for delays at the airport where the flight originated. FAA considered such delays—due to air traffic system congestion and/or weather problems—beyond the control of the operator.

We analyzed FAA's daily activity reports for National for the period 1982-87 to determine whether nighttime flight operations had increased in recent years, especially during weeknights and between the hours of 10:00 p.m. and midnight. Table 1 summarizes the median³ number of flights by type of operator per weeknight each year, for 1982 through November 1987, and table 2 shows the median number of flights for selected weeknight hours during the same period.

Table 1: Median Number of Weeknight Flight Operations by Type of Operator—10:00 P.M.-7:00 A.M., 1982-87

	1982	1983	1984	1985	1986	1987
All operators ^a	34	45	41	38	39	42
Air carrier only	4	4	8	14	16	15
Air carrier percent of total	12	9	20	37	41	36

^aIncludes air carriers, commuters, general aviation, military, and extra sections of flights scheduled as shuttle operations.

Table 2: Median Number of Weeknight Flight Operations by Time of Flight, 1982-87

	1982	1983	1984	1985	1986	1987
(Total: 10:00 p.m. -7:00 a.m.)	34	45	41	38	39	42
10-11:00 p.m.	13	19	19	21	21	17
Percent of total	39	43	48	55	54	40
11 p.m.-Midnight	3	4	5	6	6	8
Percent of total	9	9	12	16	15	19

Source, Tables 1 and 2: GAO Summary of Daily Activity Reports, Operations Office, Washington National Airport.

³The median number is the midpoint of the range, meaning that 50 percent of the weeknights had equal or higher flight totals, and 50 percent had equal or lower totals.

The median number of total nighttime flights has not varied greatly since 1983, although it edged up from 38 to 42 between 1985 and 1987. From 1983 to 1986, nearly half of the weeknight flights occurred between 10:00 and 11:00 p.m., and the air carrier share of these flights quadrupled. This pattern suggests that many were air carrier flights arriving after their scheduled hour, which were exempted by FAA because the flights were delayed by air traffic congestion. In 1987, the majority of nighttime flights occurred after 11:00 p.m. This parallels the airlines' acquisition of new, quieter jet aircraft that are acceptable under the nighttime noise rule. As air carriers and other operators increasingly replace their equipment with quieter aircraft, the number of nighttime operations at National will be limited only by the high density rule.

The High Density Rule

FAA's high density rule limits the number of Instrument Flight Rule (IFR) operations⁴ that may be scheduled per hour at certain high density traffic airports, including National Airport. The rule is intended to address congestion and delays around these airports, rather than noise pollution; however, it affects the degree of noise pollution by limiting the number of flights within a given time period. For National Airport, the high density rule specifies that no more than 37 air carrier, 11 commuter, and 12 general aviation IFR operations may be scheduled per hour, and FAA granted a partial exemption (FAA Docket Number 22473, April 26, 1983) that, in effect, allowed 2 additional commuter operations per hour at National. These limits on scheduled air carrier (37), commuter (13), and general aviation (12) operations combine to an overall restriction of 62 scheduled operations per hour at National Airport.

Air carrier and commuter flights are scheduled by use of a slot system, which allocates to each carrier certain hours in which it is regularly allowed a landing or takeoff operation. General aviation flight operators must obtain a departure or arrival reservation from FAA's airline reservations office (ARO). ARO distributes general aviation reservations for a specific hour and operator on a first-come, first-served basis up to the scheduled limit for each high density airport, including National. ARO also makes reservations above a given airport's hourly limit whenever the airport determines that scheduled operations will not be significantly delayed. Without a reservation an operator may not use one of National's 12 general aviation hourly slots.

⁴IFR operations are those in which the pilot relies on automatic direction-finding instruments, rather than on visual navigation.

The rule specifically exempts certain types of unscheduled operations—that is, operations that are not regularly scheduled—from the hourly limits. These exceptions include (1) charter flights, (2) extra sections—e.g., the “shuttle”—of scheduled air carrier or commuter flights that may have been overbooked, and (3) movement of empty aircraft to position them for future operations.

In addition to these formal exceptions, FAA exempts flights that are delayed from their scheduled hour into the following hour by air traffic system delays, just as it does for nighttime delays of the same origin. The problem of air traffic congestion and delayed flight operations is exacerbated by the airlines’ tendency to schedule many flights near the end of their scheduled hour. FAA officials told us its high density rule is primarily a scheduling approach to minimize congestion and delays—an objective they feel must also allow for some flexibility in meeting operational contingencies.

We analyzed FAA’s daily activity reports from 1982 through 1987 for the hours between 8:00 a.m. and 11:00 p.m. The median number of flights per hour for all operators during the midday hours between 11:00 a.m. and 2:00 p.m. was slightly below the maximum of 62 operations allowed by FAA’s high density rule. However, as indicated in table 3, the median number of actual flights during the peak traffic hours of 8-11:00 a.m. and 5-8:00 p.m. exceeded the maximum by 3-8 flights, or 5-13 percent during the period 1982-87.

Table 3: Peak Traffic Hours and the High Density Limits, 1982-87

	Median number of weekday flights/hour for selected hours					
	1982	1983	1984	1985	1986	1987
8-11:00 a.m.:						
All aircraft ^a	66	70	67	68	68	67
No. in excess of limit (62)	4	8	5	6	6	5
5-8:00 p.m.:						
All aircraft	65	70	68	66	65	66
No. in excess of limit (62)	3	8	6	4	3	4

^aIncludes air carrier, commuter, and general aviation operations.

Neither the daily activity reports nor FAA’s monitoring and enforcement records contained sufficient detail for us to determine how many of these flights FAA treated as violations and how many qualified for one of FAA’s exceptions to the rule.

FAA has two approaches to monitoring compliance with its high density rule: (1) monitoring air carrier and commuter flight scheduling and (2) monitoring actual flights at high density airports.

Bimonthly, the FAA Chief Counsel's Office compares a computerized file of hourly slots assigned to air carriers and commuter airlines for each high density airport with each carrier's published schedules (also computerized) for the previous 60 days. The comparison is made automatically through a computer analysis, which produces a printout of improperly scheduled slots.

Biweekly, FAA's Air Traffic Operations Service (ATO) monitors compliance with the high density rule by comparing the actual flights recorded by FAA's air traffic controllers at National Airport with three other computerized files:

- Lists of the one-time reservations made for general aviation operators.
- The list of hourly slots assigned to the commercial airlines.
- The airlines' published flight schedules.

An ATO staff member performs this comparison manually for a sample of total operations at the high density airports, including National. This staff member told us he uses his judgment in deciding which airports, times of day, and operators to include in each biweekly sample, using a different sample every 2 weeks. He maintains no record of these sample selections or sizes.

Because the sample FAA uses is judgmental, rather than systematic, the results cannot be generalized to all time periods, operations, or operators. As a result, FAA does not know how frequently the high density rule is violated at National, nor what proportion of violators it has identified. In addition, air carriers and other operators do not have an equal probability of being included in this nonsystematic sample; that is, they are not necessarily monitored in proportion to the number of operations they conduct, nor the hours in which they operate at National.

We could not determine the number of violations FAA identified or the rate of enforcement actions taken on these violations between January 1982 and December 1987 because FAA did not maintain a system of records on the violations initially identified and their ultimate disposition by its administrative enforcement process.

Flight Path Procedures

FAA's National Airport operational noise abatement procedures recommended the Potomac River flight path for all landings and takeoffs and the use of specific power settings for jet aircraft, to control the rate of climb on departures. FAA officials explained these procedures were designed to reduce noise levels and limit the number of flights over residential areas without compromising aircraft safety. Since these were voluntary procedures, rather than rules, FAA had no authority to enforce them. FAA officials told us they preferred not to impose limits on a pilot's ability to react to hazardous conditions that may develop suddenly during a takeoff or landing.

In 1976, FAA installed equipment that allowed it to monitor compliance with these procedures, but this equipment reached the end of its serviceable life in 1985. After 1985, therefore, FAA could not know how many operators violated its National Airport operational noise abatement procedures because it did not have the means to monitor compliance. We note that the Metropolitan Washington Airports Authority—now responsible for such procedures at National—has budgeted funds to purchase monitoring equipment.

Conclusions and Recommendations

FAA, which remains responsible for the high density rule at National and other high density airports, does not employ a systematic sample in monitoring compliance with its high density rule, nor does it maintain adequate records of its enforcement activities. Accordingly, it does not know how often the rule is violated or have any basis for evaluating its enforcement approach.

Therefore, we recommend that the Secretary of Transportation direct the Administrator, FAA, to (1) monitor all—or a systematic, generalizable sample of—operations at high density airports, including National Airport, for compliance with the high density rule and (2) maintain a system of records of the violations identified and its disposition of them in a form that will enable FAA to evaluate its overall monitoring and enforcement effort.

Scope and Methodology

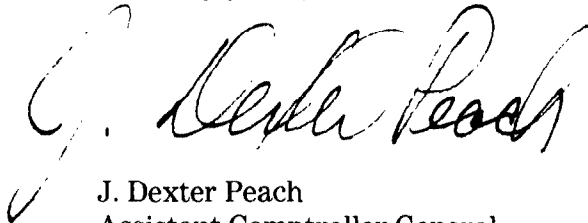
Our review of FAA's monitoring and enforcement of noise-related regulations covered the period from January 1982 through June 1987. We analyzed the federal statutes and regulations affecting noise control at Washington National Airport and reviewed technical literature on the measurement of noise and its impact on human health. Our description of FAA's monitoring and enforcement of the rules is based on interviews

with officials in FAA's Metropolitan Washington Airports office (transferred to the Metropolitan Washington Airports Authority in June 1987), Air Traffic Operations Service, and Office of Chief Counsel, and various documents provided by them. We discussed the impact of National Airport noise with officials of the Metropolitan Washington Airports Authority, the Metropolitan Washington Council of Governments, and Montgomery County, Maryland, and with various community groups. For information on trends in airport operations, we analyzed FAA's National Airport daily activity reports for the period January 1982 through December 1987. Our review followed generally accepted government auditing standards.

At your request, we did not provide a copy of this report to the Department of Transportation (DOT) for comment. We did, however, discuss our findings with DOT, FAA, and Metropolitan Washington Airports Authority officials who generally agreed with them.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time we will distribute this letter to the Secretary of Transportation; the Administrator, FAA; officials of the Metropolitan Washington Airports Authority; and other interested parties. Our work was performed under the direction of Kenneth M. Mead, Associate Director. Major contributors are listed in appendix I.

Sincerely yours,



J. Dexter Peach
Assistant Comptroller General

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