UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

March 5, 1982

COMMUNITY AND ECONOMIC
DEVELOPMENT DIVISION

B-205520

The Honorable Anthony C. Beilenson
House of Representatives

The Honorable Bobbi Fiedler
House of Representatives

The Honorable Henry A. Waxman
House of Representatives

Subject: The Burbank-Glendale-Pasadena Airport Authority's Compliance With the Noise Provision of Its Federal Grant (CED-82-49)

This report responds to your July 30, 1981, request that we review the Burbank-Glendale-Pasadena Airport Authority's compliance with the noise provision of its October 1977 grant agreement with the Federal Aviation Administration (FAA), Department of Transportation. Paragraph 18 of the grant agreement states that, to the extent feasible, the authority shall not take any actions that will increase the noise levels and/or noise exposure impact boundaries beyond those existing on August 12, 1977, when the environmental impact statement was approved. In addition, State and local restrictions require that the authority not permit or authorize any activity that would increase the noise impact area.

We found no evidence that the authority had authorized any action that would increase airport noise. On the contrary, the authority has taken and is continuing to take actions to limit noise. In our opinion, the authority is in compliance with paragraph 18 of its October 1977 grant agreement.

We agreed to confine our review to that portion of the noise provision concerning whether the authority has, to the extent feasible, not authorized any action which would increase noise levels and/or noise exposure boundaries above the base period.

We reviewed FAA grant records concerning the airport; noise reports prepared by Bolt, Beranek and Newman, Inc. (BB&N), under contract to the Burbank-Glendale-Pasadena Airport Authority; California Superior Court records concerning the authority's actions following the introduction of additional flights by an airline; airport planning documents; and related materials. We interviewed FAA officials at FAA's western region in Los Angeles,

California; authority officials; BB&N representatives; State of California officials; Los Angeles County officials; and spokespersons for homeowner groups. We did not evaluate the noise monitoring system's technical adequacy, but we did talk with the State of California officials responsible for developing the State's airport noise regulations and Los Angeles County officials responsible for enforcing the State's noise regulations. We reviewed BB&N's noise measurement reports to assess the noise trend and the authority's actions concerning airport noise. The review was performed in accordance with GAO's current "Standards for Audit of Governmental Organizations, Programs, Activities, and Functions."

We have discussed the material in this report with FAA and Burbank-Glendale-Pasadena Airport Authority officials. They said that the report is accurate.

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As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 10 days from the date of this report. At that time we will send copies of this report to the Secretary, Department of Transportation; the Administrator, Federal Aviation Administration; and the President, Burbank-Glendale-Pasadena Airport Authority. Copies will also be available to other interested parties upon request.

Henry Eschwege

Henry Eschwege
Director

ENCLOSURE I

A REVIEW OF NOISE AT THE BURBANK-GLENDALE-PASADENA AIRPORT

When the Burbank Airport opened in May 1930, it was known as United Airport. In 1940 the Lockheed Aircraft Corporation bought it and renamed it Lockheed Air Terminal. In January 1976 Lockheed announced that it intended to close the airport in June 1977. The cities of Burbank, Glendale, and Pasadena, California, formed an airport authority to preserve the airport. In June 1978 the authority purchased the airport from Lockheed for $51 million. FAA provided approximately $35.5 million in Airport Development Aid Program grant funds to assist in the purchase. The physical size and layout of the airport has remained basically the same since the early 1950's, except for major runway improvements that were made in September 1979 and July 1980. The airport is surrounded by a dense residential and commercial area.

Four major air carriers--Pacific Southwest Airlines, Alaska Airlines, Continental Airlines, and Republic Airlines--and small commuter and air taxi operators, including Aspen, Inland Empire, and Sun Aire, provide service for an estimated 2 million passengers a year. In 1980 there were 28,332 air carrier operations and 209,349 total operations. The four major carriers accounted for 95 percent of the air carrier operations.

THE BURBANK-GLENDALE-PASADENA AIRPORT'S NOISE MEASUREMENT SYSTEM MEETS CALIFORNIA STANDARDS

California mandates noise standards governing the operation of aircraft at airports operating under a permit from the Division of Aeronautics. The standards are designed to help airport proprietors, aircraft operators, local governments, pilots, and the State to work cooperatively to diminish noise. The noise standards require that

--the airports use the community noise equivalent level (CNEL) system,

--overall CNEL accuracy must be $\pm$ 1.5 decibels,

--the county approve of the airport monitoring system, and

--the county enforce the standards.

The standards state that airports designated as having a noise problem by the Board of Supervisors of the county in which

the airports are located must install a noise monitoring system that meets State requirements. The Los Angeles County Board of Supervisors designated the Burbank Airport as having a noise problem, and the appropriate noise monitoring system has been installed.

In 1976 Los Angeles County, responsible for enforcing the State requirements at the Burbank Airport, hired Hilliard and Bricken, an acoustical and energy consulting firm, to verify the reasonableness of the airport's noise monitoring data. FAA uses the noise contours produced from the CNEL noise measurements to judge the airport's compliance with the grant's noise provision.

The community noise equivalent level system

CNEL is a system used to measure the noise environment. It represents the average noise level over a 24-hour period. Because noise occurring during evening and night hours is more disturbing than noise occurring during the day, it is counted more heavily. The noise occurring during the evening (7 p.m. to 10 p.m.) is multiplied by 3, and the noise occurring during the night (10 p.m. to 7 a.m.) is multiplied by 10.

The noise standards require airports with a noise problem to determine the "noise impact area" defined by an appropriate CNEL contour. Contours can be drawn for any noise level. The area within a contour experiences noise levels equal to or greater than the noise level that contour describes. Noise monitoring determines the location of the CNEL contour line. Noise monitoring and reporting is performed for the authority by BB&N. Such monitoring was done at Burbank Airport intermittently until April 1980, when a permanent, continuous monitoring system was installed.

Monitoring occurs at various ground locations. Eleven monitoring stations are on or near the 70-decibel CNEL contour line in residential areas near the Burbank Airport. On December 18, 1978, the State approved the location of Burbank's monitoring stations. The State reviewed the technical specifications for the instrumentation plan for the noise monitoring system and found that the instrumentation was considerably more sophisticated than necessary to meet the requirements contained in the California noise standards. On December 24, 1980, after reviewing the permanent noise monitoring system performance, the State found the instrumentation functioning well within the accuracy tolerance required in the noise standards.

CNEL IS NOT AN EXACT MEASURING SYSTEM

The noise contours produced with the CNEL system and the land area within those contours should not be viewed as precise. The CNEL boundary measurement has to be accurate to only +1.5 decibels. A California Division of Aeronautics official told us that available

that a noise contour could vary within a 3-decibel "band of uncertainty." A BB&N official said that there are several sources of errors in airport noise computations. These affect the accuracy of the noise contours developed to describe airport noise. The instruments used to measure land area within the noise contour are also imprecise.

The annual CNEL contour is a four-quarter average that reflects the average noise level over the past year rather than the noise level at any specific point in time. Accordingly, the noise level for a specific quarter is really the average of the four quarters ending with the specified quarter. The Hilliard and Bricken representative told us that for this reason, the noise contour is not an accurate indicator of how changes, such as in the number of flights, affect noise levels. This averaging makes it difficult to determine when the contour actually changed and what factors caused the change.

INTERPRETING THE GRANT'S NOISE PARAGRAPH

Before addressing noise levels at Burbank Airport, it is necessary to clarify the grant agreement's noise provision. The grant agreement states that the authority cannot authorize any actions which will increase noise beyond the level on August 12, 1977, the approval date of the final environmental impact statement. BB&N's July-September 1977 "Quarterly Noise Monitoring Report" defines the noise contour as of August 12, 1977, according to a noise compliance finding FAA issued on February 15, 1980. It should be noted, however, that the authority did not take title to the airport until June 29, 1978.

The agreement further refers to noise levels and/or noise exposure impact boundaries. FAA's Chief, Airports Division, western region, Los Angeles, told us that noise level and noise exposure impact boundaries are two ways of representing noise impacts and that FAA does not consider them to be separate issues. As noise levels increase, contours of given noise levels will move away from the airport and include larger areas within their boundaries. FAA, in its February 15, 1980, noise compliance finding, stated that the "boundary" referred to in the grant agreement means the noise impact area according to the California noise law. The California noise standards define noise impact area as the land within the noise impact boundary having incompatible, i.e., primarily residential, land use. Compatible land use, which is agricultural, airport, industrial, and commercial property; property subject to a navigation easement for noise; and zoned open space, is not included in the noise impact area.

The grant noise condition states that the authority "shall not authorize any action" which will increase noise. That phrase is, in our opinion, crucial to determining whether the authority is in compliance with the grant agreement. FAA western region Airports Division personnel told us that the criteria, as taken from the grant agreement, provides that the authority take no

action which will increase the noise levels in the noise impact area. They further stated that if noise levels increase in the impact area or the impact area increases through activities outside the control of the authority, the authority could continue to be in compliance.

THE AMOUNT OF INCOMPATIBLE LAND HAS FLUCTUATED

Under the grant agreement, the baseline for measuring the airport's noise compliance is the third quarter 1977. According to FAA, the baseline contour contained 370.75 acres. Since the third quarter 1977, the amount of incompatible land within the noise impact area has fluctuated, increasing to a peak in the third quarter 1979 before beginning a decline to its present low. A decrease in air carrier operations, a shift to more daytime flights, and the recent introduction of quieter aircraft have resulted in a smaller noise impact area.

As indicated by the table on page 7, the number of acres in the noise impact area was above the baseline level in all quarters through the first quarter of 1980, except for the fourth quarter 1977 and the first and fourth quarters of 1979. The noise impact area was at its greatest in the third quarter of 1979, when it encompassed 483 acres, 112 acres more and 30 percent larger than the baseline noise impact area. This was shortly before the Subcommittee on Government Activities and Transportation, House Committee on Government Operations, held hearings on the Burbank Airport on November 9 and 10, 1979. Authority officials told us that an increase in Hughes Airwest (now Republic Airlines) flights using Boeing 727-200 aircraft, which are noisier than some other types of aircraft, resulted in a significant increase in the noise impact area. As will be discussed later, the authority took Hughes to court over the noise increase.

Beginning with the second quarter 1980 and continuing through the third quarter 1981, the latest quarter for which data is available, the noise impact area fell below the baseline area and has decreased in each successive quarter. The third quarter 1981 noise-impact area encompassed 203 acres, 168 acres, or 45 percent, less land than the baseline area.

The CNEL is not an exact measuring system; therefore, the amounts presented in the table are not precise. This means that the trend in the size of the noise impact area is more significant than the acreage measurement in any quarter. For that reason, small changes in the noise impact area, such as those appearing in the April 1981 Burbank Airport Master Plan Update showing a 3-acre increase between fiscal year 1977 and 1980, could be attributable to measuring error.

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Year and quarter		Noise impact area (acres)	Total air carrier operations for quarter
1977	3	371 (baseline)	8,560
	4	338	8,559
1978	1	407	8,053
	2	a/403	8,590
	3	398	9,033
	4	394	8,719
1979	1	366	8,472
	2	398	8,449
	3	483	8,510
	4	b/206	7,925
1980	1	412	8,200
	2	354	8,336
	3	340	7,660
	4	232	4,136
1981	1	218	5,196
	2	215	5,897
	3	203	6,207

a/Burbank-Glendale-Pasadena Airport Authority took title to the airport in June 1978.

b/A four-quarter running average was not calculated for this quarter because the north-south runway was closed for reconstruction from September to November 1979.

Air carrier operations have changed

Air carrier operations cause 90 to 95 percent of the noise at Burbank Airport. As indicated by the table, no close correlation exists between the number of flights and the size of the noise impact area. Air carrier operations, for example, totaled 9,033 in the third quarter of 1978, when the noise impact area comprised 398 acres, and 8,510 in the third quarter of 1979, when the noise impact area peaked at 483 acres. Significant declines in operations, however, have been associated with smaller noise impact areas.

According to FAA's August 14, 1981, airport noise impact review, the decline in the first quarter 1980 contour was due to Pacific Southwest Airlines' and Republic Airlines' shifting scheduled departures from the evening and night hours to daytime hours. The noise impact area reduction in the second quarter 1980 was also due in part, according to FAA, to the change in airline departure hours. Based on the data available, we calculated that the number of weighted air carrier operations, i.e., evening and night flights, decreased 19 percent from the third quarter 1978 to the third quarter 1981, from 12,574 to 10,232 operations, respectively.

In addition to the change in the number and timing of flights since 1977, there has been a significant change in the type of aircraft used at Burbank. Pacific Southwest Airlines, which in September 1981 accounted for just over half of the weekly flights of the major air carriers, introduced the DC-9-80 in January 1981. The DC-9-80 is a quieter aircraft than the Boeing 727-200 aircraft it replaced. According to a Pacific Southwest official, the DC-9-80 noise contour is only one-fifth that of the 727-200. In June 1981, 42 percent of Pacific Southwest's weekly flights at Burbank used DC-9-80 aircraft and by December 1981, 59 percent used DC-9-80 aircraft.

THE AUTHORITY HAS TAKEN A VARIETY OF ACTIONS TO CONTROL NOISE

The authority established noise abatement rules to limit noise at Burbank Airport and is developing additional rules to decrease noise levels. It has also taken one airline to court to enforce its noise abatement rules. We found no evidence that it has taken any actions to increase noise.

As previously noted, the authority would have to have authorized actions at the airport which would increase noise for it to be considered in violation of the grant. In a March 15, 1979, resolution, the authority noted that FAA had advised it that a failure to take affirmative steps to prevent noise increases may, in FAA's view, constitute an authorization of such activity and may accordingly be a violation of the grant agreement.

A noise abatement rule, enacted in March 1979, prohibits a change in the number of flights beyond the levels of March 10, 1979, without the authority's approval. Approval is granted only if the change will not increase the noise impact area. Enactment of the rule coincided with the previously discussed increase in flights by Hughes Airwest.

The authority brought suit against Hughes Airwest in August 1979 for unauthorized flight increases in March and July of 1979. According to airport officials, the flight increases and the larger, noisier Boeing 727-200's used for the increased schedule caused an increase in the noise impact area. The Superior Court denied the authority's request for an injunction against Hughes. But, in its final decision in February 1980, the court ordered Hughes to decrease its schedule within 120 days to the level effective for the week prior to March 10, 1979, or satisfactorily prove to the authority that the increase in the number of flights would not increase the contour beyond the June 30, 1978, levels. BB&N has determined that the flight increases would enlarge the 70-decibel contour; but, according to airport personnel, the air carrier has adopted other measures (increased use of the east-west runway and quieter DC-9-80 aircraft) to mitigate the effect of the flight increase and has not reduced the number of flights.

In November 1980, the authority enacted a rule restricting operations at the airport between 10 p.m. and 7 a.m. The rule

restricts the type of aircraft that can land or take off during those hours. As of November 1981, airport personnel were completing work on another rule and were just beginning to develop two additonal rules. The one recently completed, if enacted, will establish noise level limits for aircraft landing at or taking off from the airport. One of the rules being developed, as currently envisioned, will establish a so-called noise budget for each air carrier and the community. The assigned budget can be used as each carrier wishes. The allocation to the community provides for future noise reduction because the rule does not allow the community's allocation to be reallocated to the air carriers. The other rule being developed will prohibit carriers from introducing older, noisier aircraft and will require an eventual phase-out of all the noisy aircraft in use.

Other significant actions by the authority include forming the Noise Abatement Technical Advisory Group and submitting filings opposing Civil Aeronautics Board route authority authorizations. The advisory group consists of representatives from the public, the airlines, general aviation, noise consultants, FAA, and the airport staff. The group's function is to study and develop noise mitigation techniques for the airport.

CONCLUSION

We found no evidence that the authority had authorized any action that would increase airport noise. On the contrary, the authority has taken and is continuing to take actions to limit noise. In our opinion, the authority is in compliance with the noise provision of its October 1977 grant agreement.