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AN ECONOMIC APPROACH TO AIRPORT NOISE

BY PAUL K. DYGERT†

I. INTRODUCTION

THE decision of the United States Supreme Court in the case of *Griggs v. County of Allegheny*,¹ delivered on March 5, 1962, raises more questions than it answers with respect to the locus of responsibility for airport noise. Although the facts in the *Griggs* case are too limited for the decision to indicate a general approach to the noise problem, the conflict between the opinion of the Court and the dissenting opinion raises questions, the answers to which provide an economic approach.

The limited question which the Court answered in the *Griggs* case was "whether respondent has taken an air easement over petitioner's property for which it must pay just compensation as required by the Fourteenth Amendment."² The opinion of the Court, delivered by Mr. Justice Douglas, argued that "respondent, which was the promoter, owner, and lessor of the airport, was in these circumstances the one who took the air easement in the constitutional sense."³ The responsibility for providing the airspace easement was that of the County of Allegheny, for there was "no difference between its responsibility for the air easements necessary for operation of the airport and its responsibility for the land on which the runways were built."⁴ The Court concluded that the County had to acquire some private property to provide the airport, but in failing to also provide an airspace easement over the *Griggs* property "by constitutional standards it did not acquire enough."⁵

On the other hand, in his dissenting opinion, Mr. Justice Black argued that (1) the responsibility for airport development lay with the federal government, (2) the County of Allegheny was only induced by federal funds "to assist in setting up a national and international air transportation system,"⁶ and (3) by Section 101 (24) of the Federal Aviation Act of 1958,⁷ "Congress . . . provided the low altitude airspace essential for . . . planes to approach and take off from airports."⁸ Since the United States had acquired these easements, it follows that it was not necessary for Allegheny County also to acquire them. If compensation is due for the acquisition, it is the United States which owes that compensation, not Allegheny County.

Regardless of whether the federal government or the airport sponsor is responsible for acquiring airspace easements to provide airport approach/departure paths, the general problem of responsibility for airport noise remains unresolved. Section 101(24) of the Federal Aviation Act extends the definition of navigable airspace to include the approach/departure

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¹ 369 U.S. 84 (1962).

² *Id.* at 84-85.

³ *Id.* at 89.

⁴ *Ibid.*

⁵ *Id.* at 90.

⁶ *Id.* at 94.

⁷ 72 Stat. 731, 49 U.S.C. § 1301 note (1958).

⁸ 369 U.S. 84, 92.

paths "needed to insure safety in take-off and landing of aircraft." For purposes of safety, these paths are defined by Federal Aviation Agency Technical Standard Order-N18, "Criteria for Determining Obstructions to Air Navigation." Acquisition of airspace easements for the approach/departure path, in accordance with TSO-N18, will not adequately compensate property owners below that path for the "taking" of property inflicted by aircraft noise for two reasons. First, within the vicinity of the airport, turbo-jet aircraft substantially above the minimum approach/departure path will normally generate a noise level in excess of the one hundred "perceived noise decibels" (PNdb) considered the acceptable limit for residential areas.⁹ Secondly, aircraft-generated noise encompasses the entire area surrounding the airport. While the approach/departure paths tend to be the most critical, they are by no means the only areas of concern. Recent studies of jet aircraft noise patterns, utilizing the latest aircraft and power plants, indicate that the one hundred PNdb area extends approximately 4,000 feet to each side of the runway centerline. Although that width diminishes beyond the end of the runway, the "noise-affected" area exceeds the width of the approach/departure path for several miles.¹⁰

Therefore, the question of responsibility for providing approach/departure paths and paying compensation therefor when required is essentially irrelevant to the noise problem. The two relevant questions implied by the Court are: (1) Who has the primary responsibility for airport development; and (2) to what extent does that responsibility also imply responsibility for compensating property owners for the costs of aircraft-generated noise around airports?

II. RESPONSIBILITY FOR AIRPORT DEVELOPMENT

A. Congressional Intent

The Congress has historically indicated its intent to leave the responsibility for ownership and development of airports with local governmental units. The first federal legislation concerned with airport development was the Air Commerce Act of 1926¹¹ which provided in part:

The airways under the jurisdiction and control of the Postmaster General, together with all emergency landing fields and other air navigation facilities (except airports and terminal landing fields) . . . shall be transferred to the jurisdiction and control of the Secretary of Commerce, and the established airports and terminal landing fields may be transferred to the jurisdiction and control of the municipalities concerned. . . .¹²

⁹ For example, a turbojet aircraft with takeoff power at an altitude of 1,000 feet will generate a noise level of approximately 118 PNdb on the ground directly below it. Assuming that the aircraft has taken off from a 9,800 foot runway and has traveled 15,000 feet from the beginning of takeoff roll, the approach/departure path, at that point, defined by TSO-N18 will be 100 feet above the ground (assuming level terrain) for an instrument runway and 125 feet for a non-instrument runway. Although the aircraft will be some 875 to 900 feet above the minimum approach/departure path, its noise level on the ground along the departure path will be substantially in excess of that acceptable for residential development. Based on FAA, TSO-N18; and Bolt, Beranek, and Newman, Inc., Planning Guide for Aircraft Noise in Residential Areas, Figures A2 and A6 and Table 6, their Report No. 821 (December 1962).

¹⁰ Bolt, Beranek, and Newman, *op. cit. supra* note 9, Contour Set 1. Data are averages and will tend to vary as among specific airports.

¹¹ 44 Stat. 568 (1926), 49 U.S.C. § 171 (1958).

¹² 44 Stat. 570, 49 U.S.C. § 174 (1958).

The policy of Congress restricting the federal government from airport ownership, as expressed in the Air Commerce Act, was continued with the Civil Aeronautics Act of 1938.¹³ Section 302(a) of that act provided that "the Administrator [of Civil Aeronautics] shall not acquire any airport by purchase or condemnation." However, the act clearly spelled out the interests of the federal government in the establishment of a national system of airports. Section 302(c) directed the Administrator to conduct a survey of the existing system of airports and report to the Congress "(1) as to whether the Federal Government should participate in the construction, improvement, development, operation or maintenance of a national system of airports, and (2) if Federal participation is recommended, the extent to which, and the manner in which, the Federal Government shall so participate." Pursuant to the congressional directive, a report was submitted to the Congress by the Civil Aeronautics Authority on March 23, 1939, which recommended a federal aid airport program. That report was accompanied by a "national airport plan indicating by location and type of work the airport development recommended by the Civil Aeronautics Authority."¹⁴ Congressional consideration of a national system of civil airports was, however, delayed until the end of World War II. In 1944, in response to a House Resolution, the Administrator submitted to the Congress a revision of the 1939 plan. Recognizing the need for a national system of airports rather than just a scatter of landing fields, legislation for a federal aid airport program was introduced into both houses of Congress in 1945, and the Federal Airport Act was approved on May 13, 1946.

The act basically (1) authorizes and directs the Administrator to formulate and annually revise a National Airport Plan, which is to "specify in terms of general location and type of development, the projects considered by the Administrator to be necessary to provide a system of public airports adequate to anticipate and meet the needs of civil aeronautics, which projects shall include all types of airport development eligible for Federal Aid under this Act . . .";¹⁵ and (2) authorizes him to make grants of funds to public agencies (sponsors) for airport development "to bring about, in conformity with the national plan . . . the establishment of a Nationwide system of public airports adequate to meet the present and future needs of civil aeronautics. . . ."¹⁶ The report from the Committee on Interstate and Foreign Commerce accompanying the House version of the Federal Aid Airport Act stated, "The basic need for the advancement of aviation at this time is a national system of airports *independently located and planned* for the integrated use of the nation."¹⁷

In August 1958, the Civil Aeronautics Act was replaced by the Federal Aviation Act and administration of the federal aid airport program was placed within the newly created Federal Aviation Agency. Under the 1958 act, the Administrator is given the power, among others, to "make long range plans for and formulate policy with respect to the orderly development and use of the navigable airspace, and the orderly development and

¹³ 52 Stat. 973 (1938).

¹⁴ U.S. Cong., House, II Legislative History of the Federal Airport Act 579 (1948).

¹⁵ 60 Stat. 171 (1946), 49 U.S.C. § 1102 (1958).

¹⁶ 60 Stat. 171 (1946), 49 U.S.C. § 1103 (1958).

¹⁷ U.S. Cong., House, *op. cit. supra* at 576. (Emphasis added.)

location of landing areas. . . ."¹⁸ However, while the Administrator is given direct power by the act to assign and regulate the use of navigable airspace,¹⁹ his power to affect airport development is limited to control of federal aid grants. In cases where federal funds are not involved in airport construction, the Administrator only has the power to "advise as to the effects of such construction on the use of airspace by aircraft."²⁰

While it is clear that, as Mr. Justice Black states, "Congress has over the years adopted a comprehensive plan for national and international air commerce . . ."; it is certainly less evident that Congress intended that comprehensive plan to "[regulate] in minute detail virtually every aspect of air transit—from construction and planning of ground facilities to safety and methods of flight operations"²¹—at least insofar as airports are concerned.

B. Local Governmental Responsibility

Economic airport development requires coordinated planning, financing, construction, and operation of a number of distinct, but related, operational elements in order to achieve a maximum return on total airport investment. These elements may be conveniently classified in the following categories:

(1) The airfield complex, including the runways and their approaches, taxiways, and public aircraft parking apron.

(2) The common-use building complex, which typically includes an airline passenger terminal, air cargo terminal for common use of the air carriers and, possibly, special terminal facilities for general aviation. Also normally included in this complex are public parking facilities, roadway systems, and other similar facilities for common public use.

(3) The exclusive-use building complex, which normally includes improved lease plots, available to private enterprise for the conduct of specific aviation and non-aviation activities related to the airport operation, the convenience of airport patrons, and the integration of the airport into related economic activities of the local community. The types of functions for which lease plots are provided vary as among airports, but typically include:

(a) airline maintenance and service,

(b) exclusive-use air cargo buildings,

(c) commercial aviation services, for the sale and servicing of general aviation aircraft,

(d) noncommercial aviation facilities, for the operation and maintenance of large corporate aircraft or fleets of aircraft,

(e) aviation industrial sites, for manufacturers requiring the use of an airport for some phase of their manufacturing or testing activities, and

(f) nonaviation industrial and commercial facilities which make no direct or immediate use of the airport, but which find some particular advantage in locating on the airport.

(4) Land required to mitigate the impact of aircraft noise in the vicinity of the airport, but which may have no other functional relationship to the airport.

¹⁸ 72 Stat. 752, 49 U.S.C. § 1353 (1958).

¹⁹ 72 Stat. 749, 49 U.S.C. § 1348 (1958).

²⁰ 72 Stat. 751, 49 U.S.C. § 1350 (1958); also 14 C.F.R. 157.9.

²¹ 369 U.S. at 90-91.

Responsibility for the coordinated development of all elements rests with the sponsor. That development is conceived by the sponsor in accordance with community goals, policies, and requirements and is articulated in the form of a long-range master plan. Implementation of the plan in terms of investment timing, financing, engineering, and construction is the responsibility of the sponsor, subject only to certain planning standards and design criteria published by the Federal Aviation Agency. The economic development of the airport requires the sponsor to analyze the net public return to be expected from investment in any of the diverse elements of the airport, as well as public facilities unrelated to the airport, and invest public resources in those expected to provide the greatest return.

C. Federal Impact On Airport Development

The primary impact of the federal government on airport development is effectuated through the grant of funds under the Federal Aid Airport Program. Federal influence is exercised in two ways: (1) through the specification of eligible and noneligible items for matching federal grants, and (2) through establishing certain standards of airport planning, design, and construction which must be met by the sponsor before it is eligible for federal aid.

1. *Eligibility of Projects* The Federal Airport Act clearly specifies that the purpose of the Federal Aid Airport Program is to implement the National Airport Plan. The act indicates, in general terms only, the types of airport development projects which may be eligible for federal funds:

“Airport development” means (A) any work involved in constructing, improving, or repairing a public airport or portion thereof, including . . . passenger or freight terminal buildings and other airport administrative buildings . . . and (B) any acquisition of land or of any interest therein or any easement through or other interest in air space, which is necessary to permit any such work or to remove or mitigate or prevent or limit the establishment of, airport hazards. . . .²²

Under the administration of the act, however, the scope of airport development projects which the Administrator will consider as eligible for federal funds is much more limited. At the present time, the emphasis of the Agency is on safety.²³ Since the National Airport Plan encompasses only those airport projects which are eligible for federal funds under current policy, the document is not a comprehensive program for the development of a national system of airports. Rather, the purpose of the Plan is to “include . . . the basic elements upon which the public agencies concerned can prepare plans of development for the individual airports in question.”²⁴ These “basic elements” eligible for federal aid funds are, with minor exceptions, confined to the “airfield complex” (category 1, *supra*). All other elements of the airport are developed at the discretion of the sponsor with little or no federal influence exerted, except as the availability of federal funds for the “basic elements” tends to distort local airport investment in favor of those items and away from noneligible items.

²² 69 Stat. 441 (1955), 49 U.S.C. § 1101 (1958).

²³ U.S. Federal Aviation Agency, Federal-Aid Airport Program: Policies and Programming Standards 4 (1962).

²⁴ U.S. Federal Aviation Agency, *National Airport Plan: Requirements for Fiscal Years 1963-1967* iii (1962).

2. *Conformance to Standards of Planning, Design, and Construction* In addition to establishing standards of project eligibility, the federal government has an influence on airport development through its administrative authority to prescribe criteria for long-term master planning of airports. In order to receive federal funds for an eligible project, a sponsor must provide certain written assurances to the Administrator, including one providing, "The Sponsor will maintain a master plan layout for the Airport having the current approval of the Administrator. . . . The Sponsor will conform to such master plan layout in making any future improvements or changes at the Airport which, if made contrary to the master plan layout might adversely affect the safety, utility, or efficiency of the Airport."²⁵

In order to obtain the required approval, the master plan must be prepared in accordance with FAA technical standards and specifications. Nonetheless, the FAA maintains that "it is still the responsibility of the community to develop, operate, and maintain its airport," and the FAA will only provide "services in the form of financial and technical aid."²⁶ These technical standards and specifications, even though set forth as "technical aids" strongly affect the airport sponsor's planning and design discretion in certain areas. They thus tend to become minimum design criteria for the elements to which they apply. On the other hand, FAA master planning criteria have their primary impact on the airfield complex. The planning and development of the other major elements of the airport—those in which no federal money is involved—is substantially at the discretion of the local sponsor, as long as the development does not adversely impinge on the "safety, utility, or efficiency" of those elements upon which federal funds have been expended. Moreover, the master plan required by the FAA relates primarily to the project under consideration, rather than to the comprehensive development of the airport. As a matter of practice these plans tend to encompass a shorter period of time than required to effectively guide long-range airport development. In effect, the sponsor often finds it necessary to operate with two separate, but related, master plans. The first, a relatively detailed, short-term plan with a high probability of execution meeting FAA criteria for federal-aid project applications; and another, longer-range plan with a correspondingly lower probability of detailed execution defining the long-term developmental possibilities of the airport.

To summarize, the Congress has clearly demonstrated its intent to leave the responsibility for airport development with local units of government. In the Civil Aeronautics Act of 1938, Congress directed the Administrator of Civil Aeronautics to undertake a study to determine the role of the federal government "in the construction, improvement, development, operation or maintenance of a national system of airports." The result of that inquiry was the Federal Airport Act of 1946, which authorizes and directs the Administrator to formulate and annually revise a National Airport Plan specifying, in general terms, the type of development which the Administrator considers necessary to provide a national system of public airports and authorizes him to implement that plan

²⁵ U.S. Federal Aviation Agency, *Project Application*, Form ACA-1624, Part III—"Sponsor's Assurances", p. 6.

²⁶ U.S. Federal Aviation Agency, *National Airport Plan: Requirements for Fiscal Years 1963-1967*, 1963 Supplement (Washington: GPO, 1963), p. iii.

through grants of funds to public agencies for airport development. Although the act outlines a broad range of airport development projects which may be eligible for federal funds, grants are administratively restricted to projects "essential to the safety of aircraft operations at the airports." As a result, specific federal interest in airport development is essentially limited to the "airfield complex," with little or no impact on the many other operational elements. Development of the "airfield complex" is subject to a relatively high degree of federal control through planning, design, and construction specifications and standards when federal funds are involved. However, an airport sponsor's development standards or practices for other elements of the airport are relatively independent of federal control as long as the proposed development does not adversely affect the "safety, utility, or efficiency" of those portions of the airport in which federal funds have been expended. On balance, the responsibility for airport development resides with the local sponsor, despite substantial federal regulation of specific aspects.

III. RESPONSIBILITY FOR AIRPORT NOISE

Having established that the local community is not only the legal airport owner, but is responsible for total airport investment planning and development, within a rather complex framework of federal criteria, the foundation is laid for reaching an economic conclusion with respect to the locus of responsibility for the constitutional "taking" of property rights by airport noise.

A. Airports As Public Enterprise

One of the primary economic functions of government in a competitive capitalistic economy is the satisfaction of public wants which are not adequately provided for through the private market sector of the economy. In the competitive economic model, prices function to allocate scarce resources. By following the incentive of maximum profit, the individual entrepreneur allocates resources among alternative uses in a manner such that no change in allocation could increase his profit. As long as certain formal conditions of competition exist, the entrepreneur's profit-maximizing behavior also maximizes the economic welfare of the community. Although the formal conditions of the theory are a fiction, over a broad range of economic activities, the approximation to those conditions is sufficiently close that economic order is achieved. Where the conditions do not exist, government regulation of the private economy or government production of certain goods and services may be required to approach optimum economic welfare.

The price system in a competitive capitalist economy has been characterized as a "signaling system" which guides the economy toward the welfare-optimizing allocation of resources.²⁷ The signaling system breaks down when price signals (1) do not exist, (2) are not received by the relevant decision-making agent, or (3) are distorted in some particular way. When the signal system becomes distorted or malfunctions, discrepancies arise between profit-maximizing and welfare-maximizing behavior of the entrepreneur or decision-maker; and the free market system fails, in greater or lesser degree, to approach a welfare-maximizing allocation.

²⁷ Ciriacy-Wantrup, *Philosophy and Objectives of Watershed Development*, 25 *Land Economics* 215 (1959).

tion of resources. Government intervention is required to secure welfare-maximizing rather than profit-maximizing behavior.

Price system malfunctions of all three types tend to occur in the production of airport services, but the particular concern here is with the second type. When price signals are not received by the relevant decision-making agent, but are received by some other economic (broadly conceived) activity, they may be denoted as "external values." In more formal terms, an external economic value (cost or benefit) occurs when an output of one economic activity appears in the production function of another or in the utility function of an individual as a consequence of its production and not through a voluntary exchange of values.

In the context of the *Griggs* case, an external cost occurred when a by-product of the air transportation industry—airport noise—appeared, without an exchange of values (compensation), as an element in the utility functions of the members of the Griggs family: "The plaintiff and the members of his household . . . were frequently unable to sleep even with ear plugs and sleeping pills; they would frequently be awakened by the flight and the noise of the planes. . . ."²⁸ In a somewhat different sense, the product "airport noise" appeared as a negative factor in the production function of the Griggs property—where the product of that function was the satisfaction derived by the Griggs family from the use of the property. In this second sense the economic expression of the constitutional taking in the *Griggs* case is roughly parallel to that of *United States v. Causby*,²⁹ although the diminished productivity of the property is more readily definable in the latter instance.

As owner and operator of the airport, Allegheny County had the public responsibility to maximize economic welfare either through elimination of the perception of noise as a cost or through internalization of that cost (payment of compensation). To date it has not been possible to eliminate aircraft noise at its source. Gains have been made in this direction through the use of noise suppressors on engines, noise suppressing foliage and other objects around airports, and the use of more powerful engines allowing steeper aircraft climb-outs and thus mitigating noise along departure paths. A significant reduction of aircraft noise at the source does not appear feasible in the foreseeable future. At the present stage of technology, the only way to eliminate aircraft noise at its source is to eliminate the aircraft producing it—clearly an unacceptable alternative. With only limited ability to mitigate aircraft noise at its source, the airport sponsor has only two realistic alternatives available to it to fulfill its public responsibility: eliminate perception of the noise or compensate property owners for the "taking" effected by the noise.

The approach of eliminating noise perception is generally feasible only for new airports or airports in as yet relatively undeveloped areas. This approach calls essentially for the manipulation of land uses through planning and zoning in such a manner as to minimize the perception of airport noise as a cost. The corollary proposition of manipulating land uses around an airport so as to maximize the positive external values is equally important, but is not germane to the present argument. The planning and zoning of airport-adjacent land areas to minimize the cost of

²⁸ 369 U.S. 84, 87.

²⁹ 328 U.S. 256 (1945). The low flight of aircraft over Causby's chicken farm killed a large number of birds from fright and greatly impaired the productivity of the property.

airport noise is probably the least costly and most desirable approach on both economic and noneconomic grounds.

If external airport noise costs cannot be substantially mitigated or eliminated, public policy based upon economic welfare-maximizing criteria requires that the "taking" be compensated. In the *Griggs* case the question was not whether a constitutional "taking" had occurred; but, rather, who was responsible. Clearly, in an economic sense, it is the airport sponsor, in its role of public entrepreneur, who effects the taking. The cost of the taking cannot properly rest upon those who happen to own the property any more than the cost of the concrete required to build the airport runways can properly rest upon those who own concrete plants. In this sense the costs of compensating affected land owners adjacent to the airport for a constitutional taking of property rights is economically parallel to the costs of compensating the suppliers of all other factors involved in the production of airport services. Optimum economic welfare requires that all relevant costs be made internal to the enterprise and be allocated equitably among the various users. If the enterprise fails to internalize all relevant costs, it defaults in an important aspect of its public responsibility.³⁰

B. *Redefinition Of Navigable Airspace*

To reiterate, the conclusion that the local airport sponsor has the economic responsibility to either eliminate or compensate for external costs of airport noise is based on the premises that (1) the extended definition of navigable airspace by the Federal Aviation Act of 1958 to include the approach/departure paths "needed to insure safety in take-off and landing of aircraft" is essentially irrelevant to the noise problem and, (2) as owner, developer and operator of the airport, the airport sponsor has the responsibility of the public entrepreneur to internalize the external costs of airport noise through the best available method, including the payment of compensation if necessary.

If the Congress were to redefine navigable airspace to include that airspace in which the sound pressure on the ground underlying exceeds one hundred PNdb as a consequence of normal operations of an airport, including the landing and take-off of aircraft, it probably would be possible to successfully urge that the United States had acquired the necessary airspace easements which the local sponsor need not then also acquire. Having taken the easement, the United States would owe compensation where the courts determined a constitutional taking had occurred. In taking this new position, the United States would be accepting a major element of the airport sponsor's entrepreneurial responsibility: that of effectively eliminating or paying compensation for external noise costs. To economically fulfill that responsibility, the federal government would have to exercise dominant control over the location, planning, and design of all airports and possess planning and zoning control of the entire noise-affected area. It would, in effect, become the airport entrepreneur with the local sponsor having little responsibility other than that of routine administration.

The redefinition of navigable airspace would not change the conclusions herein as to the public responsibilities of the airport entrepreneur.

³⁰ Kuhn, *Public Enterprise Economics and Transport Problems* 16-17 (1962).

It would, however, compel the conclusion that the federal government, and not the local airport sponsor, is the true airport entrepreneur.

C. Allocation Of Airport Costs

While this article is not the place to develop a theory of airport cost allocation, Mr. Justice Black's comments on the implications of the Court's decision on future airport development require consideration within the framework of currently accepted airport financial practices.

The effect of the court decision imposing liability for aircraft noise on the airport sponsor will, Mr. Justice Black contends, so increase the local financial burden of providing airport facilities as to defeat the congressional plan for a national and international air transportation system. He held, therefore, that the federal government should be responsible for the compensation of aircraft noise costs around airports, since the advantage of a reliable transportation system to the nation as a whole is so immense "it would be unfair to make Allegheny County [the airport sponsor] bear expenses wholly out of proportion to the advantage it can receive from the national transportation system."⁸¹ It is important to distinguish here between the problem of equitable cost allocation and that of the locus of entrepreneurial responsibility.

Under generally accepted financial policies, an average cost method is utilized for the allocation of airport costs among the principle users. The airport sponsor, as entrepreneur, is financially responsible for providing, operating, and maintaining the airport, (with the exception of certain federally owned and operated navigation and air traffic control facilities and services). The federal government and some state governments pay a portion of the total costs through participation in the financing of certain capital improvements and the payment of some maintenance and operating expenses of facilities used. The sponsor negotiates with the various tenants and users for rentals and fees for the facilities occupied or used. But the airport sponsor stands in the entrepreneur's residual position. That portion of total cost which is not paid by federal or state government grants, or by the specific airport users, must be paid by the sponsor.

The public enterprise nature of airport ownership and operation logically implies a responsibility on the part of the airport sponsor to assume the external costs of aircraft noise in the airport environs through the purchase of property rights and payment of compensation awarded by the courts. Although the initial incidence of aircraft noise thus falls on the airport sponsor, the ultimate burden depends upon the ability of the sponsor to shift the initial cost to others through user fees, grants-in-aid and other fiscal devices. The cost of property rights purchased and compensation awards paid by the airport sponsor should be capitalized as an element of airport fixed costs. If after such capitalization the private users and the federal government are paying a disproportionately small share of total airport costs and the sponsor a disproportionately large share, an adjustment in cost shares is indicated. Higher user charges and larger federal appropriations are possibilities. In this manner the noise cost problem is capable of resolution through techniques of cost allocation rather than through a fragmentation of the sponsor's entrepreneurial responsibility among several levels of government.

⁸¹ 369 U.S. 84, 94.

However, such a scheme immediately suggests two financial problems for the airport sponsor: first, it may not be possible for the sponsor to obtain sufficient capital funds to initially purchase the required property rights and pay compensation costs awarded by the courts; and secondly, the sponsor may be unable to negotiate higher user charges or obtain larger federal appropriations in order to eliminate its entrepreneurial loss or reduce that loss to an acceptable level. Even when such losses are less than the "external benefits" realized by the community and, therefore, presumably economically justifiable, it may not be financially feasible for the sponsor to carry them over an extended period of time since the external benefits normally cannot be converted into a governmental revenue flow. If the sponsor's entrepreneurial position is economically or financially untenable after all possible cost and revenue adjustments have been accomplished, the enterprise must either be discontinued or modifications in the entrepreneurial position effectuated.

D. A Role For State Governments

In cases where local governmental units are unable to meet their entrepreneurial obligations, logic demands that state governments assume at least a portion of the responsibility. The entrepreneurial authority of a local government to own, develop, and operate an airport derives from the state. With that delegation of authority, state governments have generally avoided substantial involvement in airport matters. Although all states have offices dealing with various phases of aviation problems within the state, direct influence of these offices on airport development has remained relatively small, with such development proceeding on an almost exclusively federal-local governmental pattern. There are notable exceptions in such states as Alabama, Alaska, Hawaii, Michigan, Wisconsin, and some others; but in total the effort of state governments in civil aviation and particularly in airport development has been relatively limited. Moreover, the history of airport development to date has suggested little or no necessity for state involvement.

To the extent states have historically participated in airport development, their role has been conceived predominantly in terms of direct financial assistance or control of airport development within the state through the channeling of federal-aid project applications and grants through state offices. Current hearings on the possible future role of the State in airport development and operation being conducted by the California Senate Fact Finding Committee on Transportation and Public Utilities carry distinct overtones of perpetuating the historical trend. It is submitted that the aircraft noise problem around airports presents a new and significant challenge to state governments and demands a revision in the traditional thinking as regards the state's proper role.

The fundamental contemporary role of state government in airport development is to fill the vacuum which currently exists between federal powers and the capabilities of local government. Planning and zoning authority is delegated by the state to local units of government. In virtually every instance, that local governmental unit—city, township, or county—finds itself too restricted legally, politically, financially, or in other respects to deal with the problem of airport noise on a comprehensive and effective basis. In many instances enabling legislation encouraging and compelling adequate land use planning and zoning around airports

with provisions for enforcement, as well as general revision of archaic planning and zoning laws, would allow local communities to solve much of their noise problems on their own initiative. Reforms in arbitrary debt and tax limitations currently impairing the financial capacities of many local governments would also provide those communities with means for solving their own problems. Finally, a limited state program of direct financial aid might be desirable in some instances.

E. *The Federal Position*

There is evidence that the federal government is becoming increasingly aware of the need for state or local action dealing with the problem of aircraft noise around airports. The Administrator of the Federal Aviation Agency, in a letter to the Chairman of the Aviation Subcommittee of the Senate Committee on Commerce dated April 26, 1963, asked, "Congress give fair notice that appropriate action is required by the States or their political subdivisions to assure that airports receiving Federal funds are placed in an environment which will permit them freely to operate to fulfill the purpose for which Federal funds are expended."³² To provide a means for implementing that request, the Federal Aviation Agency recommended that Section 11 of the Federal Airport Act of 1946 be amended to add the following sponsor's assurance: "Appropriate action, including the adoption of zoning laws, has been or will be taken, to the extent feasible, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations including landing and takeoff of aircraft."³³ In response the Committee on Commerce acknowledged, "[T]he growing seriousness of the aircraft noise problem cannot be ignored or dismissed [T]he single most important means [to alleviate noise] is to insure adequate zoning."³⁴ The proposed amendment was included in the Senate bill to amend the act, as reported by the Committee.

Implementation of the addition to the sponsor's assurances will require the establishment of at least a minimum set of criteria for judging whether "appropriate action" is being taken by the airport sponsor, inasmuch as the amendment fails to define precise standards. The Senate Commerce Committee clearly indicates that it will be the responsibility of the local communities to develop the required standards, pointing out "the policy underlying [the amendment] is to encourage and, equally important, assist the local communities in their efforts to achieve effective zoning and land use. . . . Primary initiative should rest with the local governments and the Federal Government's approach should be one of cooperation and assistance and not one of preemption or dictation."³⁵

A portion of the machinery required to "encourage" and "assist" local communities already exists in Section 701 of the Federal Housing Act of 1954.³⁶ Under that act, funds are currently available through the Housing and Home Finance Agency for comprehensive planning of communities, including airport planning. In addition, the Federal Aviation Agency proposed and Congress enacted an amendment to the Federal Airport Act

³² S. Rep. No. 446, 88th Cong., 1st Sess. 22 (1963).

³³ *Hearings on S. 1153 Before the Subcommittee on Aviation of the Senate Committee on Commerce*, 88th Cong., 1st Sess. 6 (1963).

³⁴ S. Rep. No. 446, *supra* note 32 at 22.

³⁵ *Id.* at 23.

³⁶ 68 Stat. 640 (1954), 40 U.S.C. § 461 (1958).

which provides the FAA with authority to make advanced planning grants of up to two-thirds of the estimated total planning cost for the development of plans for airport layout and construction projects.

The provision of federal grants-in-aid for advanced airport planning specifically oriented to the problems of aircraft noise and land use compatibility could provide a needed stimulus to the local community to undertake the required comprehensive planning program and to implement that program, where possible, through changes in zoning. However, planning and zoning will fall short of solving the total problem of aircraft noise around airports. In many communities, the problem has proceeded to a point where the purchase of property rights and the payment of compensation for rights "taken" constitutes the only effective solution. Recognizing that a national as well as a local interest exists in airports, a congressional policy is called for providing federal funds to communities which have explicit plans for the compatible development of the airport and its environs. Where local communities are prepared to take "appropriate action," federal funds should be available to match local funds in such proportion as the Congress may determine to aid in the purchase of property rights necessary to implement the plan and to pay a portion of compensation costs awarded by the courts.

A federal program developed along these lines, supplementing individual state programs to strengthen local planning and zoning laws and practices and to increase local financial capabilities, could provide an effective solution to the problem of aircraft noise in the vicinity of airports. Such a multiphase program would leave primary airport development and community planning authority at the local level where it has traditionally resided, but would relieve the local community of costs which are "out of proportion to the advantage it can receive from the national transportation system."

IV. SUMMARY

The normative economic approach to the problem of airport noise provides the thread of logic required to establish sound public policy. The initial responsibility for minimizing airport noise costs is that of the local sponsor. Despite extensive federal influence on some aspects of airport planning and development, initiative and ultimate responsibility for total development rests with the sponsor. Moreover, land use planning and zoning authority required to implement sound airport planning exists only at the local level, often with the same governmental unit as sponsors the airport.

As the entrepreneur producing airport services and offering them to the public for established fees and charges, the airport sponsor has the obligation to provide these services on a welfare-optimizing basis. In general, this means all costs of production must be made internal to the enterprise and airport services must be made available at fees and charges equal to the (long-run marginal) costs of production. When the local community is unable to eliminate aircraft noise problems in the airport environs through appropriate land use controls, it is the responsibility of the sponsor to purchase such property rights and pay such compensation for constitutional "taking" as may be required. Although initially financed by the airport sponsor, these costs should be capitalized and added to the

total fixed costs of the airport. That portion of total airport costs which is not paid by federal or state grants-in-aid should be charged to the airport users. The residual of costs which cannot be passed on through user charges must be borne by the sponsor. If the sponsor's estimated benefits do not equal the subsidy required, the enterprise should be abandoned.

Even when the benefits are estimated to exceed the subsidy costs, operation of the airport on the welfare-maximizing basis described may not be feasible by virtue of the sponsor's limited planning and zoning authority and financial capacity. Since the sponsor derives its planning, zoning, and financial powers from the state, inability of the sponsor to deal effectively with the problem of aircraft noise around airports due to restrictions on these powers implies an obligation for state assistance. Such assistance may take the form of legislation rationalizing local financial capabilities, enabling legislation encouraging and obligating local communities to undertake such planning and zoning as may be feasible to obtain compatible land use in the airport environs, general modifications in planning and zoning laws, and a limited program of direct financial aid in some instances.

The federal government has shown increasing awareness of the necessity for local or state action dealing with the airport noise problem. Congress has enacted amendments to the Federal Airport Act requiring "appropriate action" on the part of airport sponsors to restrict the use of land in the vicinity of airports to activities and purposes compatible with normal airport operations; and providing advanced planning grants to airport sponsors. In addition, advanced planning money is available from the Housing and Home Finance Agency for airport planning directed toward integrating the airport into the comprehensive land use plan of the community.

Advanced planning alone will not solve the total airport noise problem. In many communities, property rights will have to be purchased and compensation awarded by the courts will have to be paid. Federal aid should be available to communities for a portion of these costs. Solution of the airport noise problem calls for a coordinated federal-state-local effort. Initial responsibility for developing a solution rests with the local sponsor. In many cases, however, the sponsor lacks the authority or ability to deal with the problem on a comprehensive and effective basis. The state's role is one of providing the local sponsor with the authority and powers required, and possibly to provide some direct financial assistance. Since a national as well as local interest exists in a sound system of airports, some federal assistance would also appear desirable. Such assistance could take the form of additional grants-in-aid for advanced planning, as well as for matching a portion of the local sponsor's costs of acquiring property rights and paying compensation for property rights "taken." A combined federal-state-local program of the type proposed could solve the airport noise problem on a comprehensive basis without imposing additional costs on the local airport sponsor beyond its economic and financial capacities.