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THE MINNESOTA AIRPORT ZONING ACT

GUNNAR C. ISBERG*

I. INTRODUCTION

An increasing percentage of the population in the United States now live in metropolitan areas. Latest population estimates indicate that nearly two-thirds of the population live in Standard Metropolitan Statistical Areas, and a majority of these metropolitan residents live in suburban areas.¹ For example, in the Twin Cities metropolitan area² the population increased by 22.9 per cent during the decade of 1960-1970, well above the national average of 14.2 per cent. This population growth was exclusively in the suburbs, with the most rapid population growth in second and third tier suburbs where most of the buildable land is available.³

This population growth has increased the demand for air travel. Many major airports have been unable to meet this demand. In the Twin Cities metropolitan area, the number of annual air passengers increased from 1,918,000 in 1962 to 5,854,000 in 1970; and the number of annual air carrier movements increased from 76,895 in 1962 to 145,000 in 1970.⁴ Projections indicate that the present major airport

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1. U.S. DEPT OF HOUSING AND URBAN DEVELOPMENT, AIRPORT ENVIRONS: LAND USE CONTROLS 1 (1970).

2. The Twin Cities metropolitan area is the seven-county area surrounding the central cities of St. Paul and Minneapolis and is larger than the Standard Metropolitan Statistical Area (SMSA). It corresponds to the jurisdiction of the Metropolitan Council and is slightly less than the jurisdiction of the Minneapolis-St. Paul Metropolitan Airports Commission.

3. METROPOLITAN COUNCIL, DATA-LOG No. 6, 1970 CENSUS FINAL POPULATION FIGURES 1 (1971).

4. R. DIXON SPEAS AND ASSOCIATES, STATE OF MINNESOTA AVIATION SYSTEM PLAN 12-1—12-44 (1970) [hereinafter cited as R. DIXON SPEAS AND ASSOCIATES].

(Wold Chamberlain Field) will reach capacity during the end of this decade, and attempts are presently being made to find a location for a new major airport.

The increased air traffic, and the introduction of large jets, have increased noise pollution around major airports of the country. One author defined the problem as follows:

The aircraft noise problem is the result of flying airplanes with engines having ten times the power of a railroad passenger train locomotive into and out of airports surrounded by residential areas. Railroads are known to be noisy and so are airplanes. People who are concerned about noise don't usually buy houses within a few hundred feet of a railroad track. With airplanes it is different. First, there aren't any metal tracks. Second, the airplanes don't always use the same runway. Third, people concerned about noise do buy houses within a few hundred feet of aircraft take-off and landing flight paths near airports. Fourth, airplanes can start using a flight path near a house that was there first.⁵

How to plan properly for and control development around the major airports to minimize the impact of noise represents a major challenge to planners, other urban specialists, and local officials. Previously, the major concern over urban development around major airports was related to safety hazards, *i.e.*, potential aircraft crashes near approach zones. Thus, the traditional zoning approach to controlling development around airports imposed height restrictions or limited urban development in a relatively narrow area extending out from major runways.⁶ The increase of noise has shifted the emphasis from safety hazards to alleviation of noise, what one author described as a distinction between vertical and horizontal zoning,⁷ and was necessitated by increased complaints and class lawsuits brought against airport operators by citizens living near the airports.⁸

II. AIRCRAFT MOVEMENT PROJECTIONS

Projections of aircraft movements at the major air hubs of the United States indicate that noise pollution is likely to become more

5. John M. Tyler, A NEW LOOK AT THE AIRCRAFT NOISE PROBLEM 1 (National Aeronautic and Space Engineering and Manufacturing Meeting, October 5-9, 1964).

6. *See, e.g.*, MINN. STAT. ANN. § 360.063(1) (1969).

7. Fenerty, *Legal Aspects of Airport Zoning*, 9 AF JAG L. REV. 40 (1967) [hereinafter cited as Fenerty].

8. McGrath, *Implementing National Policies: Bigger Carrots, Bigger Sticks*, in LAND USE POLICIES (Virginia Curtis ed. 1970).

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severe unless drastic steps are taken to control development around airports or major breakthroughs are forthcoming in technology to make aircraft engines less noisy. The following tables indicate the projected increases in aircraft movements for the Twin Cities metropolitan area:⁹

AIR CARRIER PASSENGERS

<i>Year</i>	<i>Originations</i>	<i>Connections</i>	<i>Total Enplanements</i>	<i>Total Passengers*</i>
1970	2,076,000	851,000	2,927,000	5,854,000
1980	5,400,000	2,200,000	7,600,000	15,200,000
1990	11,700,000	4,800,000	16,500,000	33,000,000
2000	20,600,000	8,400,000	29,000,000	58,000,000

* Total Enplaned/Deplaned Passengers (Enplanements times 2).

AIR CARGO

(Air Freight, Express & Mail)

<i>Year</i>	<i>Total Enplaned/Deplaned Cargo (Tons)</i>
1970	116,400
1980	386,000
1990	1,152,000
2000	3,035,000

AIR CARRIER AIRCRAFT MOVEMENTS

<i>Year</i>	<i>Scheduled Passenger Aircraft Movements</i>	<i>Other Movements</i>	<i>Total Air Carrier Movements</i>
1970	133,700	11,300	145,000
1980	243,000	22,000	265,000
1990	393,000	35,000	428,000
2000	513,000	46,000	559,000

TOTAL ANNUAL AIRCRAFT MOVEMENTS (In Thousands)

<i>Year</i>	<i>Air Carrier</i>	<i>Military</i>	<i>General Aviation</i>	<i>Total</i>
1970	145	35	1,480	1,660
1980	265	35	2,800	3,100
1990	428	35	5,110	5,573
2000	559	35	10,070	10,664

These projections indicate a startling increase from the present annual aircraft movements of 1,625,000 to over ten million movements by the year 2000. While most of this increase is in the general aviation category with smaller aircraft,¹⁰ the tables also indicate a substantial increase in the number of air carrier movements from 145,000 to 559,000.

9. R. DIXON SPEAS AND ASSOCIATES.

10. Although most noise studies have focused on major airports with larger jets, there is also a potential noise problem at smaller general aviation airports with increased use of business jets.

III. ALTERNATIVE METHODS FOR ALLEVIATING NOISE PROBLEMS AROUND AIRPORTS

There are three major approaches for alleviating noise problems around the major airports: (1) suppress engine noise, (2) change or modify flight patterns, (3) control development around the airports including soundproofing buildings.

The Federal Aviation Administration (FAA) and the National Aeronautics and Space Administration (NASA) are presently engaged in research dealing with modifications to aircraft engines to suppress noise. In a study dealing with the treatment and redesign of the engine nacelles of the Pratt and Whitney JT3B, it was found that the noise could be reduced by 15 EPNdB¹¹ on Boeing planes at a cost of \$1 million for retrofitting each plane and by 10.5 EPNdB on McDonnell-Douglas planes at a cost of \$655,000 per DC-8.¹² The total cost to the airlines of retrofitting the existing fleet is estimated at \$2 billion.¹³ However, the FAA admits that even with the suggested modifications "a large amount of aircraft noise will remain."¹⁴ This is substantiated by others who maintain that there is presently no indication of a major breakthrough in making aircraft engines less noisy.¹⁵ The aircraft noise abatement regulations enacted in the latter part of 1969 by the FAA will have little effect on noise reduction for some time since they are not applicable to the existing fleet, including the Boeing 747A.¹⁶

In changing flight patterns, it is possible to cut back on power and level off over urbanized areas after the aircraft has reached a certain altitude and to continue the climb after the aircraft has reached rural areas. On approaches it may be possible to increase the glide angle to a steeper descent from the present glide angle of 2.5 to 3 degrees. In the Twin Cities area, the Metropolitan Aircraft Sound Abatement

11. See note 38 *infra*.

12. Larson, *Improving the Airport Environment: Effect of the 1969 FAA Regulations on Noises*, 55 IOWA L. REV. 808, 812 (1970) [hereinafter cited as Larson].

13. *Id.* at 820.

14. 1967 U.S. DEP'T OF TRANSPORTATION ANN. REP. pt. II, at 55-56.

15. From the writer's discussions with Lloyd Hinton, Executive Director of the Metropolitan Aircraft Sound Abatement Council. Mr. Hinton is the former Executive Director of the National Aircraft Noise Abatement Council and is intimately aware of the current noise reduction technology.

16. Larson at 820.

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Council (MASAC)¹⁷ recently was successful in getting the airlines to increase the glide slope¹⁸ and is currently working with the major airlines on other changes in flight patterns in order to reduce noise.

While some of these efforts have reduced noise over urbanized areas, pilots' associations have resisted many of the proposed changes. They feel that reducing power on take-offs and increasing the glide angle on approaches may endanger aircraft and passengers.¹⁹ Attempts by local governments to enact zoning ordinances to limit or prohibit flights over certain areas have been overturned by the courts on the federal preemption doctrine.²⁰

To control development around the airport is probably the most effective approach, yet the one which has been used the least in the United States.²¹ The Airport Zoning Act passed by the Minnesota Legislature in 1969 is an attempt to control effectively development around the proposed new airport to reduce noise impact and to minimize the harmful effect on natural resources.²²

IV. TRADITIONAL APPROACHES FOR REGULATING DEVELOPMENT AROUND AIRPORTS

The three major approaches used in the past to control development around airports are zoning, the purchase of avigation easements, and the purchase of fee simple interest.

A. Airport Zoning

To date, airport zoning has not been effective in controlling development around airports or in preventing residential encroachments

17. The Metropolitan Aircraft Sound Abatement Council is a private, non-profit organization formed in 1969 to institute noise control programs in the Twin Cities metropolitan area, but primarily at Wold Chamberlain Field, the major air carrier airport in the St. Paul-Minneapolis area. It has a membership of 24; 12 members represent the aircraft industry—airlines, airline pilots, general aviation, and airport management—and 12 members represent the public—primarily the municipalities surrounding the airport. The organization also uses advisors from the FAA, U. S. Navy, Air National Guard, U. S. Air Force, and Air Transport Association.

18. DONALD V. HARPER, *THE MINNEAPOLIS-ST. PAUL METROPOLITAN AIRPORTS COMMISSION AND THE AIRCRAFT NOISE PROBLEM* 34-35 (1970).

19. Larson at 826.

20. See Seago, *The Airport Noise Problem and Airport Zoning*, 28 MD. L. REV. 120 (1968).

21. JOINT COMM. OF THE FAA AND AIRPORT OPERATIONS COUNCIL INT'L, *PLANNING THE METROPOLITAN AIRPORT SYSTEM* 60 (1970).

22. MINN. STAT. ANN. §§ 360.74-360.80 (1969).

in noise zones for several reasons. First, some of the residential development adjacent to airports took place before the introduction of large jets, and since zoning ordinances are not retroactive, they had no effect on this pre-existing development. Second, the authority to adopt and enforce zoning ordinances has traditionally been lodged with local governmental units. Typically, these units are located adjacent to large airports, with the consequent lack of overall coordination in adoption and enforcement of zoning ordinances. Third, there is usually a great deal of development pressure in the area adjacent to the airports, and local units of government have often been unable to withstand this pressure. Actually, most local units of government actively compete for a tax base because they depend heavily on property taxes to finance local services. Therefore, it would be unusual for the local governments to turn away a high tax-producing land use, even if it were to result in potential noise problems. Fourth, noise standards are new, very technical, and not easily understood. Furthermore, noise standards developed to date have been so general that they are subject to a wide degree of interpretation.

To overcome some of these problems, several authorities on land use control have recommended that the power to zone be shifted to a higher level of government such as a county, special district, or state. However, there are few precedents for shifting to a higher level of government the authority to adopt and enforce zoning ordinances²³ because local governments have been reluctant to give up these powers. The Minnesota approach, which represents the middle ground between these two extremes, will be described below.

B. *Avigation Easements*

An approach used by some jurisdictions is to purchase partial rights in property, called avigation easements. Basically, these easements establish the right to fly over property.

However, there are certain problems involved in the use of avigation easements. While the purchase of the easement establishes the right of passage by the aircraft, it also creates a possible liability for a second "taking" under the *Gausby* doctrine of interference with use.²⁴

23. The State of Hawaii has adopted state zoning (using four broad classifications) which has been in effect a number of years. Marion County, Indiana, prior to the formation of UNIGOV, had authority to zone in the Indianapolis-Marion County area.

24. Munroe, *Aircraft Noise as a Taking of Property*, 13 N.Y.L.F. 476, 488 (1967).

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Furthermore, the scope of the easement might be so broad that the landowner might demand fee simple value of his land.²⁵ If this is the case, it would be better for the airport operator to purchase the fee interest.

C. Acquisition of Fee Simple Interest

The most positive way of controlling land development around airports is for the airport operator to acquire fee simple interest in the land through purchase or condemnation. However, there are several drawbacks to this approach. First, the amount of land to be purchased may be substantial, especially if it is to include all the residential land likely to experience excessive noise. Second, once an airport site decision has been announced land values may rise substantially because of speculation. Since most airport operators make airports self-sustaining by financing construction and operation through user fees, major airline users are likely to resist high outlays for purchase of property, since many are currently operating in the red. The alternative is to finance construction through levy of a local property tax, which may be difficult to accomplish politically. A vast increase of federal funds to finance airport construction is the only way to insure that this approach will succeed. Alternatively, two devices currently being used in open space acquisition—purchase and lease back, or resale subject to conditions—may be useful in controlling development around airports and should be explored further.²⁶

V. AGENCIES RESPONSIBLE FOR AIRPORT PLANNING IN THE MINNEAPOLIS-ST. PAUL AREA

The Minneapolis-St. Paul Metropolitan Airports Commission (MAC) is a special district created in 1943.²⁷ It has nine members, four from each of the central cities of Minneapolis and St. Paul, and a chairman from outside the metropolitan area appointed by the governor. Originally, MAC had jurisdiction over a 25-mile radius from the city hall of either of the central cities; however, this jurisdiction was increased to an area within a 35-mile radius from the central cities in the Airport Zoning Act passed in 1969.²⁸

25. Bohannon, *Airport Easements*, 54 VA. L. REV. 376 (1968).

26. For a discussion of these techniques, see WILLIAM H. WHYTE, *THE LAST LANDSCAPE* 61-89 (1970).

27. MINN. STAT. ANN. § 360.101 (1969) (originally enacted in 1943, C. 500, § 1).

28. *Id.* § 360.80 (Supp. 1971).

MAC was created for the express purpose of planning, constructing, and operating airports within the area of its jurisdiction. It has the authority to acquire land by purchase or condemnation, to issue bonds for a total amount of \$125,000,000 for financing the construction and operation of airports, to enact rules and regulations governing operation of airports, and to operate and maintain the total airport system within its jurisdiction.²⁹ MAC is currently responsible for the operation and maintenance of Wold Chamberlain Field, the major air carrier airport in the Minneapolis-St. Paul metropolitan area.

A second agency involved in airport site selection for the metropolitan area is the Metropolitan Council. The Metropolitan Council, a successor to the Metropolitan Planning Commission, was created in 1967 by the Minnesota legislature and has a total of 15 members appointed by the governor.³⁰ Fourteen members are appointed from a combination of congressional districts; the 15th is chairman and appointed at large. The Metropolitan Council has jurisdiction over the seven-county metropolitan area surrounding St. Paul and Minneapolis, and is charged with the development and adoption of a Metropolitan Development Guide which will recognize and encompass the physical, social, and economic needs of the metropolitan area. It also has certain limited powers to implement the policies and programs as stated in the Metropolitan Development Guide.³¹

In relation to airport planning, the Metropolitan Council has the following authority:

- A. The Metropolitan Council is directed to develop and adopt a Metropolitan Development Guide which shall encompass the physical, social and economic needs of the metropolitan area and those future developments which have an area-wide impact, ". . . including, but not limited to, the necessity for and location of airports."³²
- B. The Metropolitan Council has referral power over comprehensive plans by special districts. The Metropolitan Council is directed to review comprehensive plans by independent commissions, boards, and agencies to ascertain if they are in conformance with

29. *Id.* § 360.117(2-18). For a further discussion, see Harper, *The Minneapolis-St. Paul Metropolitan Airports Commission*, 55 MINN. L. REV. 373-376 (1971).

30. MINN. STAT. ANN. § 473B.03.

31. *Id.* §§ 473A-473C.

32. *Id.* § 473B.06(5).

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the Metropolitan Development Guide. If the proposed plans are not in conformance with the Metropolitan Development Guide, the Council has the authority to suspend the plans indefinitely.

- C. The Metropolitan Council, through the Airport Zoning Act, has authority to develop standards related to development around the new major airport.³³

VI. PASSAGE OF THE AIRPORT ZONING ACT

During 1968, MAC held a series of public hearings on its "Proposed Airport System Plan, 1970-1980." This plan included recommendations for the construction of a second major airport at a site located north of the central cities and popularly referred to as the Ham Lake site.

In the early part of 1969, the MAC submitted its Findings, Conclusions, and Order³⁴ to the Metropolitan Council for review. On April 24, 1969, the Council completed its review and rejected the proposed plan as inconsistent with the Metropolitan Development Guide, using the following criteria in evaluating the plan: system role and site capacity, air space, airport and affected land development, accessibility to users, natural resources, site engineering and fiscal factors, and support services. In rejecting the proposed Ham Lake site, the Metropolitan Council indicated that it had a number of unresolved questions about potential noise problems and potential adverse effects on natural resources. Furthermore, the members of the Council indicated that they had some concern over the need for two major airports in the Twin Cities area. MAC recommended that the proposed new airport serve as a reliever for the existing air carrier airport, while the Metropolitan Council wanted all the air carrier operations shifted to the new airport, to alleviate noise problems around the existing airport, and to avoid scheduling problems associated with the operation of two airports.

At the time the Metropolitan Council rejected the proposed site, a member of the Council recommended that the MAC join with it in sponsoring appropriate legislation to assure proper zoning and development controls around the proposed new airport to protect the natural resources and the quality of living environment for residents

33. *Id.*

34. MINNEAPOLIS-ST. PAUL METROPOLITAN AIRPORTS COMM'N FINDINGS, CONCLUSION, AND ORDER 44 (February 24, 1969).

near the airport.³⁵ The staff and several members of the Metropolitan Council expressed concern that the existing Airport Zoning Act, which gave MAC or the municipalities zoning authority over the aircraft hazard areas, would not prevent noise problems from occurring around the new airport. As a result of this recommendation, the staffs of the Metropolitan Council, the MAC, the major airlines, and the Metropolitan Section of the League of Minnesota Municipalities met several times to discuss the need for and possible content of an airport zoning act. A bill was drafted, introduced, and passed during the last few days of the 1969 legislative session. The Airport Zoning Act represents the combined efforts of the two regional agencies involved in the airport site selection decision, and representatives of the local communities located at the proposed airport sites.

VII. ANALYSIS OF THE AIRPORT ZONING ACT

The Airport Zoning Act³⁶ is applicable only to the proposed new airport in the Twin Cities area and becomes operative only when new site selection hearings are opened by the MAC. Since hearings have not been held to date, the Act has not yet become operative. However, the Metropolitan Council has already undertaken a substantial amount of work on the development of noise and natural resource standards. Much of the information contained here comes from these studies and from a legal seminar held at the Metropolitan Council offices in July 1970 to discuss the legal implications of the Act.³⁷

A. Time Sequence

The timing sequence of the operation of the Act is complex:

1. After MAC has called a public hearing on the selection of a new airport site and until it has decided not to use such site, each local governmental unit within the airport development area

35. Letter from James Hetland, Chairman of the Metropolitan Council, to Lawrence Hall, Chairman of MAC, April 25, 1969.

36. MINN. STAT. ANN. §§ 360.74-360.80 (Supp. 1971).

37. Enviromedia, Inc., the Metropolitan Council's consultants on the natural resource standards, held a legal seminar at the Metropolitan Council offices in July 1970 to discuss legal implications of the Airport Zoning Act. Professor Daniel Mandelker of Washington University School of Law and Fred Bosselman of Ross, Hardies, O'Keefe, Babcock & Parsons (law firm, Chicago, Ill.) were the primary consultants. Others at this seminar were Thomas Hay, legal consultant to the Metropolitan Council, Gordon Shepard, attorney for the Metropolitan Airports Commission, Paul Dow from the League of Minnesota Municipalities, and staff members from Enviromedia, Inc., the MAC, and the Metropolitan Council.

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(which is defined as that area located within a five-mile radius of the airport proper) must submit its land use and development controls to the Metropolitan Council for review. The Council has a total of 60 days to make any comments on the land use controls. In addition, no governmental unit is allowed to construct any public buildings in the airport development area during this period.

2. After MAC has selected a site for a new major airport, it must submit the proposed site plan to the Metropolitan Council for review. The Metropolitan Council must determine whether or not the proposed site plan is in conformance with the goals, policies, and programs set forth in the Metropolitan Development Guide and must make this determination within 60 days.
3. After MAC has selected the site and the Metropolitan Council has approved the site, the following events take place:
 - a. All land use in the airport development area is frozen to its existing use. All lands previously unzoned within this area are automatically zoned agricultural except for prior nonconforming uses.
 - b. No permits for building or construction may be issued by any local government unit within the airport development area until they have been submitted to and approved by the Metropolitan Council.
 - c. The Metropolitan Council must develop criteria and standards for development in the airport development area related to noise abatement and protection of natural resources within 120 days of the date of the approval of the proposed site by MAC and the Metropolitan Council.
4. After the Metropolitan Council has adopted the criteria and standards as part of the Metropolitan Development Guide, it must submit these to all local units of government within the airport development area. Within 120 days after receipt of the standards and criteria, local governmental units must submit any proposed changes in the local existing land use and development controls to make them consistent with the standards to the Metropolitan Council for review.
5. The Metropolitan Council must approve these proposed changes in the development controls by the local units of governments with such changes as it deems necessary within 120 days after

receipt of the recommended changes from the local units of government.

6. After the proposed changes in the development control have been submitted to the local units of government by the Metropolitan Council, the local units have 60 days in which to start enforcing local development controls.

One potential problem in this timing sequence is what may happen in the area adjacent to the airport site after hearings are opened by MAC. The potential time lag between the opening of the hearings and approval of site leaves the area open to speculation and undesirable development after the 60-day time limit for review and comment by the Metropolitan Council. This could be a real problem if hearings drag on for any length of time. The only saving feature is that no public facilities (sewer, water, etc.) can be built in the area during this time.

A second potential problem with the timing sequence is the length of time that land use may be frozen in the airport development area. After the site selection has been approved by the Metropolitan Council, the land use in the area is frozen and could remain so for up to 400 days! However, this time period can be shortened by prompt actions of the various governmental agencies. The Council has already undertaken a substantial amount of work on the standards to enable it to issue them immediately after a site decision has been made. Also, to shorten the time period it is likely local governments will attempt quickly to incorporate the standards in their ordinances.

B. Standards and Criteria Applicable in the Airport Development Area

The Metropolitan Council is directed to develop criteria and guidelines protecting the inhabitants of the airport development area from aircraft noise and preserving natural underground water reservoirs and other natural resources. These guidelines must be adopted and enforced by local government units with jurisdiction in the airport development area.

In relation to noise standards, the Act is explicit in directing the Metropolitan Council to establish aircraft noise zones and acceptable levels of perceived noise decibels (EPNdB) for each land use, using the composite noise rating (CNR) method or the noise exposure forecasts (NEF) method.³⁸

38. The technical aspects of measuring noise are too complex to discuss in this paper. These brief definitions may aid in determining the difference between composite noise rating and noise exposure forecasts:

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Few studies have established explicit standards for land use related to noise abatement. However, the Department of Housing and Urban Development recently issued a report which discusses the relationship between land use planning and noise; the report rates different land uses according to noise sensitivity on a very general basis.³⁹ This report also discusses four major studies currently being undertaken under the auspices of the Land Use/Airport Panel of the U. S. Interagency Aircraft Noise Abatement Program at Kennedy International Airport in New York, O'Hare Airport in Chicago, Bradley International Airport in Hartford, and Cape Kennedy Regional Airport in Middleburg, Florida. Other studies have also been made of the general relationship between land use and noise;⁴⁰ however, these have not dealt adequately with the full range of implementation devices currently used in urban planning.

The Metropolitan Council, in conjunction with the MASAC and six of the communities adjacent to Wold Chamberlain Field, recently contracted for a comprehensive land use/noise study around that airport; it is likely that the methodology developed in this study will also be applied to the proposed new airport. The consultant proposes to develop noise contours based on projected aircraft movements, analyze existing and projected land uses in the area around the airport, and recommend standards to be incorporated in different types of land use controls to alleviate noise problems. Six noise exposure contours will be developed for the years 1970, 1975, and 1980 using

dB—unit of sound level related to a particular frequency band.

PNL (Perceived Noise Level)—measure of human response to sound; value calculated from testing subjective response to humans as to noisiness of different sounds in each of the octave bands.

PNdB—units of PNL.

EPNL (Effective Perceived Noise Level)—same as PNL with addition of corrections for pure tone content and duration of sound.

EPNdB—units of EPNL.

CNR (Composite Noise Rating)—calculations based on PNdB of aircraft, plus corrections for number of operations, time of day, airborne to ground run-up, and mix of aircraft.

NEF (Noise Exposure Forecasts)—calculations based on EPNdB and same factors as in CNR.

115 CNR = 40 NEF

100 CNR = 30 NEF

39. U.S. DEP'T OF HOUSING AND URBAN DEVELOPMENT, AIRPORT ENVIRONS: LAND USE CONTROLS, 33-35 (1970).

40. BOLT, BERONEK, AND NEWMAN INC., ANALYSIS OF COMMUNITY AND AIRPORT RELATIONSHIPS/NOISE ABATEMENT, SRDS REPORT NO. R.D.-64-14811, 29 (1964).

such factors as time of day, season of year, and land use. Based on this information, existing and projected land use by the Metropolitan Council and local governmental units will be analyzed; standards will be developed; and land use controls and practices (zoning, subdivision regulations, purchase and resale at discount price, purchase and lease at discount price, and redevelopment) will be recommended to minimize noise problems. In addition, the study will recommend improved flight patterns as a means to alleviate noise.⁴¹

In relation to natural resource standards, the Act was not explicit, but only generally directed the Metropolitan Council to develop and adopt standards to protect the natural resources of the area. Perhaps the major reason is that very few studies, if any, have been undertaken to develop specific standards which can be incorporated in development controls to protect natural resources of an area from potential adverse effects of airport and related development.⁴² For this reason and because the Metropolitan Council had to develop standards quickly, a consultant was hired to undertake a major study of natural resource standards. This study, completed in November 1970, included both proposed airport sites and all of the area within a five-mile radius of the sites (approximately 300 square miles at both sites.)⁴³ The methodology was complex and unique. It was an extension and refinement of an ecology study completed in June 1969 for the Metropolitan Council by another consultant.⁴⁴ The study area was divided into "cells" of approximately 25 acres in a grid-coordinate overlay. The processing of the information for each of the cells was computerized. A data bank of 49 variables consisting of data on natural resources, existing development, and present services was used. Some of the variables were topography, physiography, bedrock geology, soils, hydrology, and existing vegetation. A total of 20 natural resource systems were then developed to predict the potential impact

41. *URBANOMICS, PROPOSAL FOR AN AIRCRAFT NOISE ABATEMENT STUDY AT MINNEAPOLIS-ST. PAUL INTERNATIONAL AIRPORT FOR MASAC (1970)*. The name of the consultant has changed to Market Facts, Inc.

42. The Airport and Airway Development Act of 1970, 49 U.S.C. § 1701 (1970), passed May 21, 1970, may spur additional natural resource studies. It declares that airport development projects authorized pursuant to the Act shall provide for the protection and enhancement of natural resources and the quality of the environment of the nation.

43. *ENVIROMEDIA, INC., AND STEINITZ ROGERS ASSOCIATES, NATURAL RESOURCE PROTECTION STUDY (1970)*.

44. *WALLACE, McHARG, ROBERTS, AND TODD, AN ECOLOGICAL STUDY OF THE TWIN CITIES METROPOLITAN AREA (1969)*.

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of different land uses on the natural resources. Some of the natural resource systems developed were ground water pollution, soil erosion, scenic resources, air pollution, vegetation, and water table fluctuation. A total of eight categories of land use intensity were developed to characterize levels of resource demand from various activities and construction types. Analysis of the natural resource systems and land use intensity resulted in the development of different zones of sensitivity or vulnerability of the natural resources. Recommendations were then made to protect the natural resources.

The following illustration may clarify the methodology used in this study. The susceptibility of ground water (natural resource) quality to pollution is a function of permeability of the soil, the slope of the surface, and the depth of the water table. During winters, salt is applied to highways (urban use) which washes to the side of the highway and enters the surface drainage system. Minerals and salts in the ground water system represent a mild health hazard (impact on natural resources). Corrective action to minimize this impact includes either collecting and treating the surface drainage from highways or reducing the application of salt to the highways.

The result of this study was to indicate areas with different degrees of sensitivity to land uses and to suggest corrective actions to be taken if the land uses were to protect or minimize the damage to natural resources.

The complex standards may lead to potential problems in incorporation into local ordinances. First, the standards may be so rigid that they prevent development altogether, or severely restrict it; this may amount to a "taking" of property. Second, the local officials may have problems in comprehending and enforcing technical and complex standards. Third, developers may have problems in determining what is required of them. For these reasons, the staff of the Metropolitan Council has recommended that three task forces be appointed to aid the Council in evaluating and further refining the natural resource standards. These task forces would consist of private builders, public works officials, municipal administration personnel, and environmental specialists.⁴⁵

45. See Memorandum from Robert T. Jorvig to Metropolitan Council (November 9, 1970).

C. Local Governmental Units Affected by the Act

The Airport Zoning Act directs the Metropolitan Council to adopt criteria and guidelines for the regulation, use, and development of the property in the metropolitan area extending three miles from the proposed boundaries of the airport site or five miles from boundaries in any direction the Council determines is necessary to protect the natural resources of the metropolitan area.⁴⁶ In effect, the Act provides that the criteria and standards which are developed shall themselves establish the boundaries of the airport development area.

The site (Ham Lake) that has been seriously considered and proposed by MAC and has been reviewed and rejected twice by the Metropolitan Council is approximately 23,000 acres in size. A second site (Rosemount-Farmington), which has been used as an alternative in the more recent airport studies, is approximately 18,000 acres. The major reason for these relatively large sites is to provide sufficient facilities to handle projected demand beyond the year 2000. Six parallel runways, approximately 12,000 feet in length, and substantial terminal and maintenance facilities have been provided for in the plan. If the airport development area is drawn as a five-mile radius around the proposed airport site, it will include almost 300 square miles.

At the present time, there are 195 local governmental units in the seven-county metropolitan area, all varying in size and population. Fifteen to twenty units of government will be included either wholly or partially in the airport development area at either site.

The large number of local governmental units affected by and involved with the Act represents one of its most difficult and challenging parts. It will be difficult to achieve the necessary coordination in the adoption, enforcement, and monitoring of the standards, especially if they severely restrict development. The success of the implementation of this Act will be determined by the degree of coordination which can be achieved between the Metropolitan Council and the local municipalities.

D. Tax Sharing Provision

Once the airport site decision is announced, each local governmental unit adjacent to the area may attempt to take all necessary steps to attract development because of competition for tax base. This could

46. MINN. STAT. ANN. § 360.74 (Supp. 1971).

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seriously weaken or adversely affect the enforcement and working of the Airport Zoning Act.

In order to minimize the competition for tax base, the Act specifically provides that all local governmental units affected by the Act shall jointly study and decide upon a plan for the sharing of property tax revenues from property located in the airport development area. If 80 per cent of the local governmental units agree upon the plan, it shall be put into effect but shall not impair existing contracts.⁴⁷

The main problem with this section is the requirement that 80 per cent of the local governmental units must agree to the plan before it can be put into effect. In view of the competition for the tax base, it is very unlikely that such a plan can be agreed upon by such a large majority.

VIII. INNOVATIVE PARTS OF THE AIRPORT ZONING ACT

The Airport Zoning Act is unique in comparison with other airport zoning acts. The innovative features may not only aid in controlling noise and in minimizing impact of airport development on natural resources, but may also serve as a model approach to be used in other functional areas. The following are some of the Act's unique features.

A. The Standards and Criteria Are Applicable to All Types of Land Use Controls

The Act is applicable not only to zoning ordinances but also to all other types of land use controls such as subdivision regulations, the official map, and housing and building codes. This tends to insure a coordinated, comprehensive approach for regulating development in the airport development area since some of the standards may be better used in housing and building codes or subdivision regulations than in zoning ordinances. This approach may also allow for more flexibility in development. For example, rather than exclude residential development entirely in areas subject to noise through zoning ordinances, it may be possible to allow certain residential development if it is soundproofed according to certain standards incorporated in a building code.

B. The Standards and Criteria Are Unique

The standards which eventually will be recommended by the Metropolitan Council and adopted by the local units of governments are

⁴⁷ *Id.* § 360.78.

unique. The areas designated for excessive noise are likely to be irregular and elliptical; they may cross many local boundaries and may include only portions of a local community. Furthermore, the devices used to measure and monitor the noise will be relatively technical and complex.

The same is true of the natural resource standards. Again, the actual monitoring and measurement of the effect of certain land uses on natural resources may involve some relatively technical and complex procedures.

This uniqueness in the standards may be subject to legal challenges for going beyond the bounds of the police power. There is little precedent for using natural resource standards in land use controls as involving the "public health and welfare."

Most local officials, administrative personnel, and potential developers may be unfamiliar with the measurement and application of the standards. However, part of this problem may be solved through the establishment of advisory committees made up of local officials, developers, and technical experts to refine the standards and make them "workable." The standards must be acceptable from both legal and political points of view or local governments will have to refer them back to the Metropolitan Council for appropriate changes, a rather awkward procedure.

C. The Act Provides for Shared Authority in Development and Implementation of Standards

This Act provides for shared authority in the development and enforcement of the standards between metropolitan agencies and local units of government. Previously, this authority has rested exclusively either with local governmental units or higher units of government.

For political reasons, the latter approach has not met with any real success in the United States. The Airport Zoning Act represents a middle ground between these two extremes; the standards and criteria are developed by a regional agency and adopted and enforced by local units of government. The success of this approach will depend upon the degree of coordination between the Metropolitan Council and the local units of government.

D. The Act Has No Provisions for Issuance of Variances

The Airport Zoning Act has no provisions for zoning amendments or variances, the "safety valve" found in traditional zoning ordinances.

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Instead of variances or zoning amendments the Act explicitly states that, if any of the standards or criteria as adopted and enforced amounts to a taking of property and exceeds the bounds of the police power, MAC must acquire the land. This removes one of the traditional administrative weaknesses of the zoning ordinance whereby an inordinate amount of variances or amendments are issued by those who administer the ordinances. However, the methodology for land acquisition seems awkward and could result in problems for MAC in determining its annual budget.

E. Tax Sharing

Another unique part of this Act is that it provides for a method of tax sharing between the local units of government located in the airport development area to minimize competition by local units of government for high tax-producing land uses.

IX. RECOMMENDATIONS

The following amendments should be made:

- A. Amend the provision whereby the Metropolitan Council establishes the standards and the MAC must acquire the property if the standards are unenforceable. Both powers should reside in one agency.
- B. Amend the provision which requires an 80 per cent majority by the local municipalities to adopt a tax sharing plan. This should be changed to a simple majority.
- C. Amend some of the time periods in the Act. A time limit should be placed on the length of time that MAC holds its hearings on a proposed site to minimize the development pressure and potential development in the airport development area. Also, the length of time established for the development of the standards by the Metropolitan Council (120 days) appears to be too short.

