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# Zoning--The Airport and the Land Surrounding It in the Jet Age

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## ZONING—THE AIRPORT AND THE LAND SURROUNDING IT IN THE JET AGE

Since the start of World War II there has been a tremendous growth in air transportation.<sup>1</sup> In 1940 commercial airlines carried three million passengers. By 1957 this had increased to fifty-two million passengers,<sup>2</sup> and a further increase of fifteen million passengers is expected within the next ten years. During the same period there was also a rapid expansion in the number of cities served. Only 146 cities were served in 1938, but by 1956 there was 713 cities being served by regularly scheduled commercial airplanes.<sup>3</sup>

Although it is well recognized today that airports are necessary to metropolitan areas, the rapid growth in air transportation has not taken place without many attendant problems. One of the first problems was whether the expenditure of public funds for an airport was for a "public purpose." The courts unhesitatingly decided this question in the affirmative.<sup>4</sup> In addition, many disputes arose between airports and adjoining landowners concerning flights over their land and the dust and noise created by use of the airport. In some instances the

<sup>1</sup> World War II played a major role in this phenomenal growth in many ways, with one of the most important being the number of airports constructed during the war which were later turned over to municipal control. The passage of the Federal Airport Act in 1946 was an important factor in the growth of air service. This Act allowed Congress to appropriate up to 100 million dollars a year to be expended jointly with local governmental agencies for the construction or improvement of airports. 60 Stat. 172 (1946), as amended, 49 U.S.C. § 1104 (Supp. V, 1958).

<sup>2</sup> U.S. Bureau of the Census, Statistical Abstract of the United States 575 (1958).

<sup>3</sup> 18 Air Transport Facts and Figures 4 (1957).

<sup>4</sup> Mr. Justice Cardozo, in an opinion which said that an airport was a public purpose, stated:

We think the purpose to be served is both public and municipal. A city acts for city purposes when it builds a dock or a bridge or a street or a subway. Its purpose is not different when it builds an airport. Aviation is to-day an established method of transportation. The future, even the near future, will make still more general. The city that is without the foresight to build the ports for the new traffic may soon be left behind in the race of competition. Chalcedon was called the city of the blind because its founders rejected the nobler site of Bysantium lying at their feet. The need for vision of the future in the governance of cities has not lessened with the years. The dweller within the gates, even more than the stranger from afar, will pay the price of blindness.

Hesse v. Rath, 249 N.Y. 435, 164 N.E. 342 (1928). The Missouri Supreme Court in *Dysart v. City of St. Louis*, 321 Mo. 514, 11 S.W.2d 1045, 1047 (1928) was equally convincing in stating that the construction of an airport was a public purpose. The court said, "It is unquestionably true that the airplane is not in general use as a means of travel or transportation either in the City of St. Louis or elsewhere; and it never will be unless properly equipped landing fields are established."

courts granted injunctions against an airport's operation.<sup>5</sup> However, these cases primarily concerned the small, private, dirt strip field. On the other hand, courts have refused to enjoin a municipal airport from operation when the nuisance complained of is a necessary incident to an airport's operation.<sup>6</sup> Only in severe cases will a court today deem that there has been a "taking" and require the airport operator to pay a just compensation to a surrounding landowner for a diminution in the value of his property as a result of the airport's operation.<sup>7</sup>

#### THE PROBLEM TODAY

One of the foremost problems confronting aviation today is the protection of airports from urban encroachment. A considerable number of the major air terminals of recent years have become practically worthless, since they are unable to expand in order to meet the runway demands of our modern aircraft. Many of our present airports were constructed especially to meet the war emergency and little thought was given to their post-war use and the type of airplanes they would be serving. This is true of many of the airports established by our cities in past years. Few airport planners of thirty, twenty, or even ten years ago could envisage today's jet liner, which is rapidly becoming standard equipment for commercial carriers.<sup>8</sup>

Airports which were established away from the city have often had the city grow to, and even around, them.<sup>9</sup> The problem of urban encroachment has increased to such an extent that adequate measures must be taken both to insure the successful operation of existing and future airports, and also to protect surrounding landowners and the

<sup>5</sup> *Brandes v. Mitterling*, 67 Ariz. 349, 196 P.2d 464 (1948); *Thrasher v. Atlanta*, 178 Ga. 514, 173 S.E. 817 (1934); *Gay v. Taylor*, 19 Pa. D. & C. 31 (C.P. 1932).

<sup>6</sup> See, e.g., *Delta Air Corp. v. Kersey*, 193 Ga. 862, 20 S.E.2d 245,251 (1942).

<sup>7</sup> See, e.g., *United States v. Causby*, 328 U.S. 256 (1946).

<sup>8</sup> Although conventional propeller driven aircraft will be in service for many years, jet aircraft will soon be the backbone of commercial aviation. Already forty-one airlines have placed orders for 672 jet aircraft, a number of which are already in operation. For a general discussion of the problems of the airport in the jet age, see Peterson, *Airports for Jets* (1959).

<sup>9</sup> This can be traced to the fact that airports were of necessity built on the least expensive land available. The new industries which sprang up in our cities also built on the cheapest suitable land. Workers, naturally desiring to be relatively close to their jobs, tended to build their homes in close proximity to the industry at which they were employed. It inevitably followed that soon many of our major air terminals were nothing more than a few acres of flat terrain surrounded by industries and subdivisions. The airport itself has caused some of this urban encroachment since its employees and flight personnel like to live close to their jobs. Also the establishment of an airport brings with it commercial establishments such as restaurants, souvenir shops and other businesses which spring up to serve both the airport users and the many people who just like to go to the airport to sight-see.

public from the increased hazard and other detrimental effects due to an airport's operation.

#### REQUIREMENTS OF THE AIRPORT

A careful analysis of the area surrounding the airport plus both the present and future needs of the airport must be made to insure that the approaches thereto will be adequately protected. The three basic methods by which an airport can be protected from urban encroachment which would hinder its operation or future expansion are purchase of surrounding land, zoning, and the acquisition of avigation easements. Before discussing the use of these methods for protecting the airport, it is necessary to determine which method or methods will most nearly fulfill these requirements, taking into consideration the cost involved and the advantages and disadvantages both to the surrounding landowner and the public in general.

An airport requires a rather extensive tract of relatively flat terrain which is located as close as possible to the area it is to serve. It also needs to be located in an area which is not conducive to the formation of fog, and it should not be near heavily industrialized, smoky areas. In addition, there must be no natural or manmade obstacles which would in any way tend to impair the use of the airport. An obstruction in the approach to a runway could render an entire airport worthless, resulting in the loss of the millions of dollars which a modern airport costs.

In the past, most airports were constructed with three runways which crossed each other so as to give six available directions for operations according to the direction of the wind. Due to an increase in weight and advances in design factors, such as the crosswind landing gear, the need for these six available runways has decreased to the point that today airport designers are thinking in terms of one long runway which, of course, gives two available directions for traffic. This change has been brought about also for other reasons, such as the length and strength of runways needed for our modern aircraft, which result in a greatly increased construction cost. The acreage required for the airport itself is forty percent less under the single or parallel runway design;<sup>10</sup> also it is much less expensive to purchase the necessary overruns and avigation easements, and less property has to be zoned restrictively. Existing airports can also be converted to the single runway concept by carefully considering factors such as prevailing wind; area over which the approach will be located; and availability, price, and type of land necessary for lengthening.

<sup>10</sup> President's Airport Commission, *The Airport and Its Neighbors* 37 (1952).

The Airways Modernization Board, created in 1957, has recommended the use of parallel runways with one runway for light and the other for heavy aircraft, or with one runway for takeoffs and the other for landings. The Air Force has utilized parallel runways for several years at its training bases which handle a large amount of air traffic. Of course, many cities at the present time do not have the volume of traffic to warrant the construction of the additional runway. However, if an adequate protection plan is established for a single runway, then the addition of the parallel runway in future years should present no problem.

Even with the use of the single runway, the jet airliner raises several problems because of its inherently different operational and aerodynamic characteristics. One of the foremost differences is that the jet aircraft requires a longer and more shallow approach than the conventional aircraft. This is caused by its higher stall speed<sup>11</sup> and the necessity for making "power on"<sup>12</sup> approaches, since it takes a jet engine approximately eleven seconds to develop full power from an idling position which could be disastrous if, during a "power off" approach, power were needed to compensate for a high wind or if for some other reason a "go around" were necessary. The jet's high stall speed plus its high take-off weight (due to the large amount of fuel it must carry) causes it to have a much flatter early climb than conventional aircraft. The jet aircraft, because of its high speed, also requires a large turning radius.<sup>13</sup> These factors all add to two of the most serious problems in the airport's operation—noise and the elimination of obstructions.

#### PROTECTION OF THE AIRPORT

Finding a suitable location is often an extremely difficult task, and once such an area is found adequate measures must be taken to insure that the area remains suitable. The pros and cons of each method of protecting an airport should be considered in setting up a plan to protect the airport's use from interference by owners of the surrounding area and to protect these surrounding owners from the undesirable effects of the airport.

<sup>11</sup> The stall speed of an aircraft is the forward speed below which an aircraft will not maintain altitude nor be controllable. This speed varies with each aircraft and is much higher in a jet aircraft since it is designed for high speeds and thus sacrifices some of its lift coefficient.

<sup>12</sup> "Power on" approach signifies that the aircraft makes its final approach under partial power. In jet aircraft this is usually at a minimum of forty percent of its total thrust.

<sup>13</sup> An airplane's turning radius is geometrically proportional to its speed. If the speed is doubled, the radius of the turn will be quadrupled.

### *Purchase of Surrounding Land*

This method, of course, is the most desirable, but the prohibitive cost involved makes it impractical except for perhaps small areas at the ends of the runways. The Civil Aeronautics Administration has instituted a policy whereby the airport must acquire extensive approach areas at the ends of runways as a prerequisite to obtaining federal aid. For an instrument runway this area covers approximately seventy acres of land and must be free from all buildings except those housing aids to navigation.

A jet airplane now needs 10,000 feet or nearly two miles of runway. In the future, with airplanes that fly three times the speed of sound, this could easily be increased to 20,000 feet. Already some of the larger Air Force fields have 15,000 foot runways, and an 18,000 foot runway is under construction. Thus, it appears that the airport should purchase a strip of land at least 20,000 feet by 3,000 feet. This would provide adequate overrun facilities, room for runway extension, and space for the construction of a parallel runway in the future. Of course, it is realized that obtaining this much land is impossible in some areas, but it is a goal which should be striven for, especially when a new airport is being constructed on relatively inexpensive property.

### *Avigation Easements*

If the funds are not available for the outright purchase of the desired amount of property, then an avigation easement should be secured over this land which would limit its use to agriculture. The property would thus be much less expensive in case the need arose for future runway expansion. Avigation easements are highly recommended for the approaches to the runway for a distance of one mile from the ends of the runway. This is especially necessary because of the need for cleared areas when flying in adverse weather.<sup>14</sup> The instrument landing system utilized by commercial aircraft takes a fifty to one rate of descent. Thus, no structure which even approaches being as high as one-fiftieth of its distance from the end of the runway is desirable.

A Kentucky statute specifically provides for the acquisition of airport protective easements when it is desirable to eliminate a nonconforming use or when the necessary protection cannot be secured by the use of zoning regulations.<sup>15</sup> Many other jurisdictions have similar

<sup>14</sup> For a successful operation it is necessary that airlines be able to operate in practically any weather and with the advent of better aids to weather flying, much of commercial flying is performed in adverse weather conditions.

<sup>15</sup> Ky. Rev. Stat. § 183.757 (1959) provides:

In any case in which it is desired to remove, lower, or otherwise

statutes. Of course, the securing of such easements will involve the need for additional funds which would not be needed if the surrounding area could be adequately zoned, but as indicated by the statute this is not always possible. In any event, it is much less expensive than the outright purchase of the property and it is a satisfactory means of protection, except perhaps for the property immediately adjacent to the ends of the runways.

Two of the major problems in securing these easements are the multiplicity of suits if the property in the area is owned in small parcels and the measurement of the diminution in the value of the property over which the easement is secured. With many of the major airports now being constructed in the country, the first problem does not seem too severe, since in such areas property is usually owned in larger parcels. As to the second problem, there is likely to be a tendency to assess the diminution in value not at the present worth of the property but at a figure which would compensate the landowner for any loss if the land could potentially be utilized in a more valuable manner. A recent federal district court decision well illustrates this problem.<sup>16</sup> This case involved a suit to acquire avigation easements over certain farm land and was for the purposes of prohibiting any obstruction from infringing upon or extending into or above the glide-angle plane. Although it was not shown that the easements would impair the present use of the land for farming, the court held that just compensation should include the diminution in the market value of the lands which was due to impairment of its future utility. The court found from the evidence that a large segment of the land could potentially be used for residential sites and thus the land with the easement would have its future marketability impaired.

Another system which is similar to, and could be utilized in place of, the avigation easement is the English system of condemnation of development rights.<sup>17</sup> Under this system, after the landowner is paid by the state for loss in value of his land by not being able to build on

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terminate a nonconforming use; or the approach protection necessary cannot, because of unconstitutional limitations, be provided by airport zoning regulations under KRS 183.750 to 183.758; or it appears advisable that the necessary approach protection be provided by acquisition of property rights rather than by airport zoning regulations, the governmental unit within which the property or nonconforming use is located or the airport board or governmental unit owning the airport or served by it may acquire, by purchase, grant, condemnation or otherwise in the manner provided by KRS 416.120, such air right, easement, or other estate or interest in the property or nonconforming use in question as may be necessary to effectuate the purposes of KRS 183.750 to 183.758.

<sup>16</sup> *United States v. 48.10 Acres of Land*, 144 F. Supp. 258 (S.D. N.Y. 1956).

<sup>17</sup> Cheshire, *Modern Real Property* 121-33 (8th ed. 1958).

it, he can only build on it by repurchasing the development rights from the state, and it is left entirely to the discretion of the state as to whether the rights will be sold.

### *Zoning*

The Civil Aeronautics Administration has recommended zoning for many years, and since 1939 it has urged that every state adopt a model airport zoning enabling act which was drafted by the Civil Aeronautics Administration and the National Institute of Municipal Law Officers. At least thirty-five states have a statute similar to this recommended statute which authorizes the adoption of zoning ordinances for land surrounding airports. The Kentucky statute, which is similar to the majority of such statutes, states:

Every governmental unit may adopt, administer, and enforce, under the police power . . . airport zoning regulations for any airport owned or operated by it, which regulations shall divide the area surrounding the airport into zones, and, within such zones, specify the land uses permitted and regulate and restrict the height to which structures and trees may be erected or allowed to grow . . .<sup>18</sup>

Such statutes also contain provisions relating to non-conforming uses, permits and variances, notice, hearings, review, appeals and the requirement that all zoning regulations be reasonable. Airport zoning certainly seems to fall within the police power of a state, and it is believed that such an act with these provisions, which are adequate to insure due process, would certainly be held valid in the event its constitutionality were ever questioned.<sup>19</sup> However, zoning cannot be used indiscriminately, for it must not be unreasonable and it must not constitute a "taking." Thus the really difficult question is: How restrictive can an airport zoning ordinance be in regulating the use of private property without being unreasonable and therefore invalid?

This point is well illustrated by a recent Kentucky case.<sup>20</sup> In this case the zoning regulations, passed under the authority of Kentucky Revised Statutes sections 183.745-.758 (1959), controlled an area within a two-mile radius of the airport terminal. The regulations primarily dealt with height of structures and electrical or visual interferences with aircraft. The ordinance further stated that no use could be made of the land which did not conform to the zoning classification of Fayette County known as "Residence B." The plaintiff sought to build a motel within the zoned area and the permit was denied solely because it was not within the "Residence B" classifica-

<sup>18</sup> Ky. Rev. Stat. § 183.752 (1) (1959).

<sup>19</sup> See *Village of Euclid v. Ambler Realty Co.*, 272 U.S. 365 (1926).

<sup>20</sup> *Banks v. Fayette County Bd. of Airport Zoning Appeals*, 313 S.W.2d 416 (Ky. 1958).

tion, which excluded buildings or structures to be used for commercial purposes. The Kentucky Court of Appeals stated that the airport zoning law was for the purpose of eliminating airport hazards and that the attempt ". . . to limit structures to those coming within the 'Residence B' classification has no relation to the purpose of eliminating airport hazards, and is unreasonable, arbitrary and capricious."<sup>21</sup> The contention was made that the "Residence B" classification was valid since it eliminated congestion of people in an airport area, which would be a proper purpose of zoning. The court rejected this argument on the ground that the "Residence B" classification permitted hospitals and apartment houses which might accomodate more people than a motel, and thus it was not reasonably related to its purpose—density control.

It is believed that the elimination of congregations of people in certain areas surrounding an airport is very properly a function of airport zoning but that in this case the regulation in question was unreasonable. This was due to the failure of the drafters of the regulation to enact a specific zoning regulation for the particular area and their attempt merely to use an existing zoning classification which was designed for a much different purpose than the elimination of "airport hazards."

Only two other cases have been found construing the validity of airport zoning ordinances. In one of these the ordinance was found to be unconstitutional, but the decision was based on the fact that the city lacked the power to adopt such an ordinance in the absence of state enabling legislation.<sup>22</sup>

In the other case, a Maryland circuit court in a 1939 decision, which seems to conform only with opinions in the early days of aviation, stated, "[T]he zoning of the area surrounding an airport is rather for the benefit of those who desire to use aerial transportation and for those who own airplanes than for the general public."<sup>23</sup> In this case the zoning ordinance in question provided that the vertical height of a building could not exceed one foot for every fifteen feet from the perimeter of an airport. The court held that since a landowner could only erect a building six and two-thirds feet in height at a distance of 100 feet from the perimeter, the owner was deprived of a substantial right, for in fact he could build no buildings at all. This decision seems to correspond with decisions in other zoning cases when it is found as

<sup>21</sup> *Id.* at 418.

<sup>22</sup> *Yara Engineering Corp. v. City of Newark*, 132 N.J.L. 370, 40 A.2d 559 (Sup. Ct. 1945).

<sup>23</sup> *Mutual Chemical Co. of America v. Mayor & City Council of Baltimore*, 1939 U.S. Av. 11 (Md. Cir. Ct. 1939).

here that the landowner actually is forbidden to build any structure for which his property is suited, as evidenced by the use of the surrounding property.<sup>24</sup> However, if the landowner is allowed a reasonable use of his property with the necessary structures incident to that use, so long as they are compatible with the objectives of the zoning ordinance, a court will be much more likely to construe the ordinance as being valid.<sup>25</sup>

Airport zoning actually encompasses two distinct types of zoning. The first of these, "vertical zoning," seems to be more consistent with the original purpose behind airport zoning, for its function is the elimination of hazards. It has been recognized by decision that a landowner cannot make an unusual use of his property by building a structure to such a height that it constitutes a hazard to aircraft.<sup>26</sup> A federal district court has indirectly upheld this type of zoning.<sup>27</sup> In the case cited, the federal government sought to condemn an easement in the airspace twenty-five feet above land adjacent to an airport. A condemnation jury gave a verdict of "no dollars," since an airport zoning ordinance prohibited the erection of structures above twenty-five feet in height in this area. The district court upheld this verdict.

Undoubtedly, a much greater problem is involved in "horizontal zoning." It is in this type of zoning that there is much more apt to be a "taking" due to a serious diminution of property values, without an immediately foreseeable benefit to the airport and the general public. A major function of this type of zoning is the restricting of land near an airport from being used for residences and other uses which would permit people to be congregated in the area near an airport where a crash is most likely to occur. Closely related to this function is the function of lessening the friction between the airport and its neighbors, for it has been found that due to psychological factors there is less friction per person when the number of neighbors is reduced. Naturally the validity of this portion of a zoning ordinance will be governed by the facts of the particular case, weighing the public interest served against the diminution in value of the regulated property. Thus it is readily apparent that there must be

<sup>24</sup> *Vernon Park Realty, Inc. v. City of Mount Vernon*, 307 N.Y. 493, 121 N.E.2d 517 (1954).

<sup>25</sup> *McCarthy v. City of Manhattan Beach*, 41 Cal.2d 879, 264 P.2d 932 (1953).

<sup>26</sup> *Roosevelt Field, Inc. v. Town of North Hempstead*, 84 F. Supp. 456 (E.D.N.Y. 1949); *Schroder v. VonBestecki*, 30 Pa. D. & C. 137 (C.P. 1937). But where the airport's operation is not appreciably impaired, a court may hold that the structure is not a hazard and refuse to enjoin its construction. *Reaver v. Martin Theatres of Florida, Inc.*, 52 So.2d 682 (Fla. 1951).

<sup>27</sup> *United States v. 357.25 Acres of Land*, 55 F.Supp. 461 (W.D. La. 1944).

a thorough analysis of the different profitable uses to which the zoned property could be put, and the zoning regulation must be carefully drafted to coincide with this analysis to insure that there is not a "taking." The landowner must be left with *some* profitable use of his property.

#### RECOMMENDATIONS

Of course, zoning is the ideal method costwise for controlling the use of land surrounding the airport, but in the case of land in close proximity to the airport the severe limitations which need to be imposed on the use of the property would very likely be deemed a "taking." Adequate protection for the public and for the airport in its future operation can best be insured by zoning regulations which would include the land not owned by the airport or over which an avigation easement has not been secured. Basically, the zoning should be established in concentric circles in the following manner.<sup>28</sup> (See illustration, page 283).

*Zone 1—Within one mile radius of the center of the airport.* Prohibit all buildings except for perhaps small sheds incident to farming operations.

*Zone 2—Within next one mile radius.* Limit all structures to a specified height; prohibit places of public assembly such as churches, hospitals, and schools; limit residences to single family dwellings on a rather large sized lot.

*Zone 3—Within next one mile radius.* Permit all structures of reasonable height in this area with the exception of places of public assembly and multi-storied apartments.

Cutting through each of these zones should be a fan-shaped area which would start at the end of the runway and extend from its initial width of 3,000 feet to a width of 6,000 feet at the outer perimeter of Zone 3. The portion of this area which lies in each of the numbered zones would be known by the corresponding number plus the suffix "a." Zone 1a would be the 3,000 foot center section of Zone 1.

Zone 1a would prohibit all buildings. Actually, it is recommended that this area be purchased or an avigation easement be secured over it.

Zone 2a would have the same regulations as Zone 1.

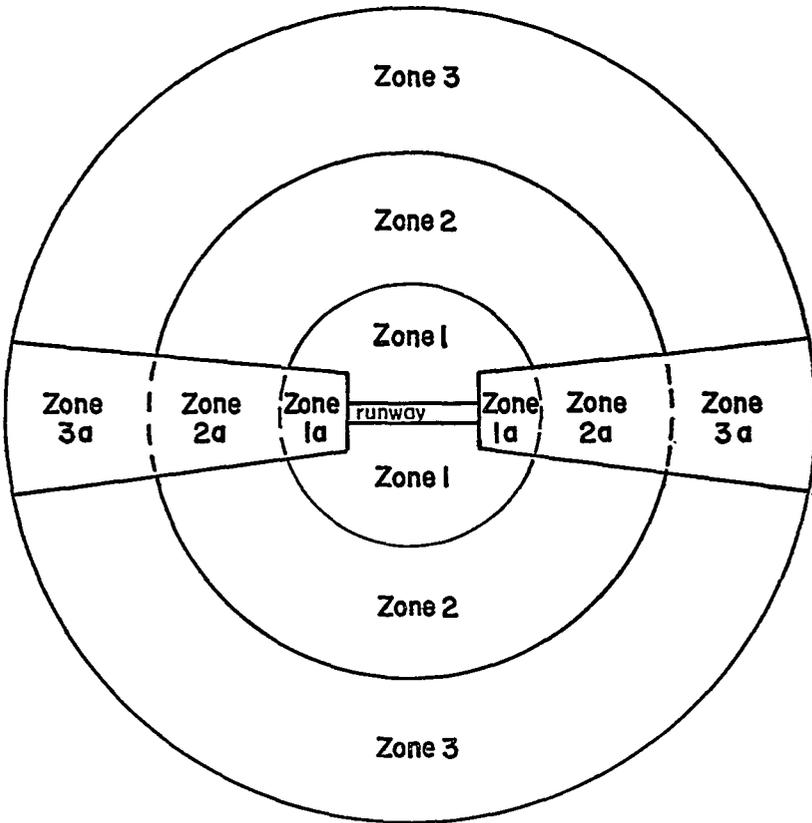
Zone 3a would have the same regulations as Zone 2.

In establishing an airport protective plan it should be noted that no one method is satisfactory in itself. However, a combination of

<sup>28</sup> Of course, deviations can and should be made in this suggested plan to suit the particular situation, with such deviations being based on many local factors.

purchase, easement, and zoning will insure adequate protection for the airport and the public at the least possible expenditure of public funds and the minimum diminution in the value of surrounding land-owners' property.

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RECOMMENDED AIRPORT ZONING PLAN