

technical skill and the elaborate facilities necessary for the development of such criteria, the tedious chore of measuring the noise characteristic of each aircraft operation, and the difficulty of enforcing the procedure.

Obviously, it would be better if some central agency, such as the FAA, were to develop aircraft noise standards and enforce maximum noise limits.

5. *Restrictions on night operations*

In the United States, limitations of some kind on night operations exist at perhaps 18 to 20 airports.

The most common restriction is the prohibition of training flights at night by either civil or military aircraft.

Jet departures are limited to certain runways, certain weather conditions, or certain hours at perhaps half a dozen airports in the United States and at additional airports abroad.

Maintenance runups are also prohibited or limited at other airports.

Night restrictions like maximum noise limits, if set by airport operators can, if sufficiently widespread, cause severe limitations on the air transport system. These are measures that airport operators take reluctantly therefore, but will take when necessary.

6. *Fences, deflectors, signs, etc.*

Among the many ideas tried by airport operators to reduce aircraft noise annoyance are:

- Screening aircraft noise from nearby communities by block-walls, blast fences, and even the use of stands of pine trees;

- Lighted signs reminding pilots of noise abatement procedures;

- Reversed direction of instrument approach to runway;

- Increased visual glide slope angle;

- Sought from FAA increase on non-visual glide slope angles.

All these are limited, but under certain circumstances, useful measures.

7. *Zoning*

Height restriction zoning is in effect at many airports throughout the U.S. and is being sought at many others. Height restriction zoning, in general, has survived a number of court tests as to constitutionality; but there still remains doubt in some jurisdictions. Height restriction zoning, however, is seldom a solution to the noise problem. Its basic intent is to protect the flight of aircraft from hazards in the approach zone.

Land-use zoning is quite another matter. Although the State laws and the court tests make it possible in some jurisdictions to achieve the control of land-use through zoning, the vast majority of such decisions, particularly at the highest state court levels, have held land use zoning to be a constitutional taking. Further, land-use zoning can be of little use in built-up metropolitan areas. Even the Federal Government found that land-use zoning for a new airport in farming areas—Dulles International Airport—cannot be readily achieved.

Even assuming there were no legal obstacles to land-use zoning, however, airport planners have no guide as to how much land should be zoned because there are no limits on the amount of noise today's aircraft can make; and even worse, no limits on future aircraft.

8. *Purchase of land interests*

Purchase of fee title, and in some cases of avigation easements, is also a method which airport operators have explored carefully as a possible way to alleviate aircraft noise.

For years, before the jets were introduced in 1958, airport operators had diligently sought additional land off the ends of runways for future airport expansion and for navigation aids which, incidentally, serve to prevent development of close-in residential areas.

Based upon Federal standards, 8,400 foot-long runways were the maximum to be required. Over night, however, the Federal Aviation Agency (through its predecessor the Civil Aeronautics Administration) certificated aircraft which required 10,500 feet and more of runway. This brought the end of the runway nearly one-half mile closer to the community and imposed great additional costs for land acquisition upon the airport operators.

Today, there is still no assurance that the Federal Government will not certifi-