

# AIRPORT NOISE POLLUTION: THE PROBLEM AND THE REGULATORY RESPONSE\*

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One of the most serious of contemporary environmental problems is presented by noise generated by aircraft at or in the vicinity of airports. It is amenable, however, to solution or improvement by a variety of very diverse strategies.

This article describes, firstly, noise measurement techniques, which are important both in establishing and enforcing meaningful regulatory standards, and secondly the sources and characteristics of aircraft noise. The various control options which have been utilized or are in prospect are then examined, with particular reference to the associated legal limitations.

The article is comparative in approach, dealing comprehensively with Canadian and American responses to the problem in the context of the North American legal systems, and with subsidiary references to the experience of other jurisdictions and relevant international efforts at co-operation.

## *I. Noise Measurement and Monitoring.*

The sensation of sound is detected by the human ear responding to minute variations in the ambient air pressure (acoustic waves) set up by a sound source. Unwanted sound is what we normally describe as noise. Particular sounds or sound levels may be considered to be objectionable, and hence to constitute noise, as a result of various direct and consequential effects, including loss of sleep, interference with voice communication, hearing damage in the case of prolonged exposure to intense sounds, mental stress, depreciation of property values, interference with relaxation and

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\* The preparation of this article was facilitated by a grant under the University of Toronto-York University Joint Programme in Transportation out of funds provided by the Canadian Transport Commission. This research project grew out of interests in both transportation law and environmental law, which were stimulated by earlier support from the Joint Programme and the Canada Council, respectively.

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general deterioration in the community amenity.<sup>1</sup>

The basic unit for the measurement of sound is the decibel (dB), an indicator of what is called the intensity level of sound.<sup>2</sup> The decibel scale ranges upward in logarithmic progression<sup>3</sup> from a reference point taken as the lowest audible sound, represented by zero dB. It takes a reduction of ten dB, more or less depending on the frequency of the sound, to decrease the loudness sensation by one half. Doubling the distance between a sound source and the receiver results in a reduction in the sound intensity level of six dB, plus some variable additional reduction due to atmospheric attenuation. One of the important methods of controlling airport noise, described below, is to increase the distance factor. However, the returns, in terms of noise alleviation, naturally diminish significantly with a given increase in distance between aircraft and the ground at higher altitudes.

The decibel scale does not take account of the variation in human response to differing frequencies of sound. Modifications to the scale have, therefore, been made to give a more realistic measure of human tolerance. Two of the scales in common use are the A scale and the D scale, which selectively weigh different sound frequencies, to give what are denoted as dB(A) or dB(D) ratings. These are determined directly by sound level meters incorporating an electronic weighting network.

An even more sophisticated frequency weighted measurement has been developed specifically for aircraft noise, namely the Perceived Noise Level (PNL, which is given in PNdB). However, it is not capable of direct determination but must normally be arrived at through detailed calculations from a series of sound pressure level readings.<sup>4</sup>

Where aircraft noise monitoring occurs, it is done either with mobile equipment or through permanent monitoring field stations equipped with microphones and linked, by a communications

<sup>1</sup> Good non-technical summaries of the effects of noise pollution are contained in Hildebrand, *Noise Pollution: An Introduction to the Problem and an Outline for Future Legal Research* (1970), 70 Col. L. Rev. 652, at pp. 656-665, and Commerce Technical Advisory Committee, U.S. Department of Commerce, *The Noise Around Us* (1970), pp. 48-67. For a comprehensive technical discussion see Kryter, *The Effects of Noise on Man* (1970).

<sup>2</sup> On the subject of noise measurement see Anthop, *Noise Pollution and the Law* (1970), 20 U.T.L.J. 1, esp. at pp. 2-4, and, with special reference to aircraft noise measurement, Alekshun, *Aircraft Noise Law: A Technical Perspective* (1969), 55 A.B.A.J. 740.

<sup>3</sup> Because the scale is logarithmic the combination of two sound sources does not result in an intensity level that is the sum of the two individual noise levels. In fact the resulting intensity level is never more than three dB above the highest of the two individual levels.

<sup>4</sup> An approximation of the PNL may be obtained by adding fifteen to the value derived from monitoring with a D filter sound level meter or, to give a somewhat more accurate PNdB figure, adding seven to the reading of an A filter decibel meter.

system, to a central recording position, at which some data processing may take place.<sup>5</sup> The locations for monitoring microphones are often selected so as to be in proximity to the most noise sensitive communities but, otherwise, they may simply be at designated distances from particular runways under the flight path of departing and approaching aircraft.

Effective Perceived Noise Level (EPNL, which is given in EPNdB) is a modification of Perceived Noise Level. It takes more accurate account of discrete frequency components, which are typical of the noise from the more recent, turbo-fan jets, and adds in as well a correction factor for duration. To date, the principal use of the EPNL scale has been for aircraft design purposes, including the formulation and application of noise certification standards for aircraft.<sup>6</sup>

Measurements of single events, such as particular overflights, are often not clear indicators, in themselves, of the total noise impact to which broad areas are continually exposed. Yet, for land use planning purposes, it is useful to be able to project in spatial terms, as accurately as possible, the reaction of the inhabitants of an airport region to a series of noise disturbances. To this end a number of indices of community response to aircraft noise have been developed. Such noise measurements have served, as well, the important function of enabling an assessment to be made of the overall benefit that may be achieved by the adoption of any one or a combination of many of the noise control options which are discussed in this article.<sup>7</sup>

The index which has been used extensively in Canada and the United States is the Composite Noise Rating (CNR).<sup>8</sup> Single num-

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<sup>5</sup> Recommendations as to the techniques and practices to be followed in aircraft noise monitoring were made by a special meeting sponsored by the International Civil Aviation Organization in 1969, see ICAO, Report of the Special Meeting on Aircraft Noise in the Vicinity of Aerodromes, ICAO Doc. No. 8857 NOISE (1969), hereinafter cited as Report of the Special Meeting, pp. 1-5.

<sup>6</sup> It has been recommended for these purposes in the Report of the Special Meeting, *op. cit.*, *ibid.*, pp. 1-4. And see *infra*, part III.

<sup>7</sup> See, for example, Franken and Standley, Aircraft Noise and Airport Neighbors: A Study of Logan International Airport, Rep. No. DOT/HUD IANAP 70-1 (Mar., 1970), prepared for the U.S. Department of Transportation and the U.S. Department of Housing and Urban Development by Bolt, Beranek & Newman, Inc., pp. 81-105, and Tri-State Transportation Commission, Metropolitan Aircraft Noise Abatement Policy Study of John F. Kennedy International Airport (1970), prepared for the same government Departments, hereinafter cited as MANAP Kennedy Airport Study, pp. 81-105.

<sup>8</sup> This index, as first adopted for civil as well as military aircraft movements, was originally described in Bolt, Beranek & Newman, Inc., Land Use Planning Relating to Aircraft Noise (1964), being a technical report prepared for the U.S. Federal Aviation Administration (FAA). The basic methodology of estimating CNR is described, with some modifications to suit the Canadian civil aviation environment, in Civil Aviation Branch, Ministry of Transport, Calculating the Composite Noise

ber values are arrived at through calculations, rather than direct measurements, and are presented, most usefully, in the form of CNR contours drawn on a map of the particular airport and its surroundings.<sup>9</sup> CNR contours for each runway are arrived at by taking the known Perceived Noise Level for the different aircraft types in actual and projected use, adding correction factors for the type of operation (take-off or landing), configuration of flight profile, number of exposures, their time of day (day or night) and runway utilization and then calculating CNR values for each aircraft class, which are combined to give the appropriate maxima. Composite noise contours may then be drawn for the whole airport and its environs. Both the expected community response to particular CNR levels and the extent of many of the corrections used in arriving at the CNR have been determined on the basis of empirical evidence derived from sociological surveys of a number of communities located near large American airports.<sup>10</sup>

Other descriptors of community noise include the International Noise Exposure Reference Unit (INERU),<sup>11</sup> Noise and Number Index (NNI)<sup>12</sup> and Noise Exposure Forecast (NEF).<sup>13</sup> NEF, like CNR, was developed for the United States Federal Aviation Administration and has now replaced CNR as the standard unit in the United States and is in process of adoption by the Canadian Ministry of Transport. It is a computer based system which works from the more sophisticated Effective Perceived Noise Level.<sup>14</sup>

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Rating, Doc. No. S-70-5 (Sept., 1970). CNR contours have been produced for those major Canadian airports in respect of which air traffic statistics are available, see Civil Aviation Branch, Ministry of Transport, General Comments on Aircraft Noise, Doc. No. S-70-4 (July, 1970), p. 7.

<sup>9</sup> Experience indicates that 100 CNR is the level at which complaints are likely to be forthcoming, with vigorous and repeated complaints at levels above 115 CNR, see Bolt, Beranek & Newman, Inc., *op. cit.*, *ibid.*, p. 12.

<sup>10</sup> One of the few reported social surveys in Canada was made in Winnipeg, see Gerrard and Rodrigue, *Analysis of Aircraft Noise in Metro Winnipeg* (May, 1971), a publication of the Department of Mechanical Engineering, University of Manitoba, esp. at chs 5 and 6.

<sup>11</sup> The special meeting on aircraft noise convened by ICAO in 1969 recommended the adoption, for international usage, of an international noise exposure reference unit, see Special Meeting on Aircraft Noise, *op. cit.*, footnote 5, pp. 1-7.

<sup>12</sup> NNI, the British measure, evolved from a survey in the vicinity of London (Heathrow) Airport, see Committee on the Problem of Noise, *Noise: Final Report*, Cmnd. 2056 (1963), p. 73 *et seq.* and app. XI.

<sup>13</sup> For a description of NEF and a comparison with other noise exposure indices see: Galloway, *Noise Exposure Forecasts as Indicators of Human Response*, in *Proceedings of a Conference on Aircraft and the Environment*, sponsored by the Society of Automotive Engineers, Inc. and the U.S. Department of Transportation (Feb., 1971), hereinafter cited as *Aircraft and the Environment*, part 1, p. 56.

<sup>14</sup> The 30 and 40 NEF contours correspond roughly to the 100 and 115 CNR contours.

## II. *The Generation of Aircraft Noise.*

The most objectionable exposure from subsonic aircraft occurs when the aircraft are engaged in the procedures of take-off, landing and ground run-up for test or maintenance purposes. The noise characteristics in each case are distinct. Moreover different varieties of aircraft leave very different noise signatures or footprints, on take-off and landing, due to the peculiar frequency and directional aspects of the noise generated.

Supersonic aircraft, now in the stage of development for commercial purposes, present additional environmental problems of a very different nature. The sonic boom, which is set up by supersonic flight, could detrimentally affect large areas at ground level while the aircraft producing the shock wave is at cruising altitude.<sup>15</sup> This characteristic of supersonic flight does not, therefore, fall within the category of airport noise. However, it should be noted that the noise of these aircraft, at subsonic speeds on take-off and landing, is expected to exceed that of the current fleet of aircraft, in intensity and at sideline positions, in the immediate airport area.<sup>16</sup>

Vertical and Short Take-off and Landing (VTOL and STOL) aircraft, which may make possible another major innovation in mass air travel,<sup>17</sup> will present some very serious and distinctive airport noise problems.<sup>18</sup> The required city centre or suburban air terminals would bring the aircraft noise into highly developed areas though existing high levels of background noise in such locations will probably reduce the subjective annoyance factor. STOL craft have, by definition, higher approach and climb angles than conventional aircraft and if propeller driven<sup>19</sup> will evidence lower frequency

<sup>15</sup> For a discussion of the legal aspects see Montgomery, *The Age of the Supersonic Jet Transport: Its Environmental and Legal Impact* (1970), 36 J. Air L. & Com. 577; Baxter, *The SST: From Watts to Harlem in Two Hours* (1968), 21 Stan. L. Rev. 1, and Huard, *The Roar, the Whine, the Boom and the Law: Some Legal Concerns about the SST* (1969), 9 Santa Clara Lawyer 189.

<sup>16</sup> See Montgomery, *op. cit.*, *ibid.*, at pp. 580-583.

<sup>17</sup> The Science Council of Canada has recommended that immediate action be taken to develop a distinctively Canadian STOL system, having concluded that Canada already enjoys a significant technological advantage in this field, see Science Council of Canada, *A Canadian STOL Air Transport System—A Major Program*, Rep. No. 11 (Dec., 1970). Considerably less enthusiasm for a limited STOL service in the Montreal-Toronto transportation corridor is reflected in the Intercity Passenger Transport Study, prepared by the Research Branch of the Canadian Transport Commission (Sept., 1970), which suggests, however, that further research be conducted into STOL technology (see esp. pp. 12-15, 77-79). In the United States, the Civil Aeronautics Board has concluded that a VTOL/STOL service in the Northeast Corridor is technologically and economically feasible, see CAB Order No. 70-9-44 (Sept. 8th, 1970).

<sup>18</sup> See Metzger and Foley, *STOL Aircraft Noise Certification* (April, 1970), a paper published by the Society of Automotive Engineers.

<sup>19</sup> However, the second generation of STOL aircraft is likely to have a turbo-fan jet powerplant, see Intercity Passenger Transport Study, *op. cit.*, footnote 17, p. 14.

noise than jets, all of which will reduce the ground disturbance. And the STOL's capacity for variable approach and take-off patterns may facilitate the use of approach and departure patterns over noise insensitive areas, for example, offshore in the case of waterfront STOL ports.

Of the conventional commercial aircraft, it was the jet which gave rise to our current acute awareness of the noise problem. With the introduction of jet service in 1958, the number of complaints about aircraft noise increased dramatically.<sup>20</sup>

There are two principal sources of jet aircraft noise—the exhaust and the turbo-machinery of the engine.<sup>21</sup> Exhaust noise results from the turbulent mixing of high velocity exhaust gases with the surrounding ambient air. The sound is broadband in character, covering a wide range of audible, but generally low, frequencies. It is perceived by the listener as a growl, buzz or low-pitched rumble. Turbo-machinery noise emanates from fan, compressor and turbine components of the engine, and is generated by air movements around the rotor and stator blades in these engine stages. The sound has a high frequency and is broadband in range though, significantly, discreet frequency tones are evident. To the ground observer it is a penetrating whistle or whine.

Exhaust is the most significant noise source from the turbo-jet, which embodies the earliest jet propulsion system. The most manageable factor influencing this noise is the velocity of the discharged air particles. Reduction in the speed of the emissions will reduce exhaust noise, but the problem is how to achieve this without sacrificing too much in the way of performance characteristics, particularly thrust on take-off. Some take-off noise improvement has been achieved by fitting turbo-jets with daisy shaped exhaust nozzles.

<sup>20</sup> See Committee on the Problem of Noise, *op. cit.*, footnote 12, p. 61. 1958 marked the establishment by the Ontario Department of Planning and Development (now the Department of Municipal Affairs) of a committee with federal, provincial and municipal representatives, to study the intensity of aircraft noise at Toronto's Malton Airport, its impact on the surrounding communities and proposed courses of remedial action, see Ontario Department of Municipal Affairs, *Aircraft Noise at Malton Airport* (Jan., 1960), p. 2. This was the first official manifestation of any real concern for the noise problem at the Toronto airport.

<sup>21</sup> The description which follows is derived principally from the following sources: Russell and Kester, *Aircraft Noise, Its Sources and Reduction*, in *Aircraft and the Environment*, *op. cit.*, footnote 13, part 1, p. 15; McPike, *The Generation and Suppression of Aircraft Noise*, in *Aircraft and the Environment*, part 2, p. 5; Tyler, *Developments in Engines, in Alleviation of Jet Aircraft Noise Near Airports*, A Report of the Jet Aircraft Noise Panel (Mar., 1966), hereinafter cited as *Alleviation of Jet Aircraft Noise*, p. 59; Gebhardt, *Effect of Designing Aircraft to Noise Criteria*, in *Alleviation of Jet Aircraft Noise*, p. 69; McPike, *Considerations in Matching Airframes and Engines to Reduce Airport Neighborhood Noise Levels*, in *Alleviation of Jet Aircraft Noise*, p. 72. See also Civil Aviation Branch, Can. Ministry of Transport, *Aircraft Engine Noise Technology, A Review*, Doc. No. R-70-13 (Oct., 1970).

The turbo-fan engine, which is used in the newer jets, produces much less exhaust noise than the turbo-jet. This results from the fact that a large proportion of the air taken in undergoes reduced compression, by-passing the engine and exhausting out the side so that the over-all exhaust velocity is lower. This is accomplished by the addition of one (or more) fan stage at the front of the engine connected aft to the compressor stage but with its own secondary or fan exhaust system. The higher the by-pass ratio, a measure of the proportion of air which passes through the fan exhaust as opposed to the engine exhaust, the greater the reduction in exhaust noise. At the same time greater fuel economy and more thrust, which enables faster climbout and hence geographically less noise exposure, were achieved with the turbo-fan jet. The jumbo jets, embodying this technique of moving larger quantities of air at low velocities to achieve greater thrust, produce less exhaust noise than their predecessors. However, on the debit side turbo-machinery noise has created serious problems. With the reduction of exhaust noise and the addition of the fan component, high pitched noise, particularly at approach power, has tended to dominate the noise picture. The suppression technology that has been developed and is developing to meet this situation includes changing the configuration of the fan rotor and stator blades and acoustically treating the nacelle, or engine casing, particularly the fan inlet duct and fan exhaust ducts.<sup>22</sup>

It is no doubt evident that the incorporation of noise reduction techniques, at the design stage, may involve all sorts of trade-offs which may or may not prove to be realistic. Exhaust noise may be suppressed at the expense of increased fan noise, direct path noise at the expense of sideline noise. Noise reduction may be achieved at the cost of performance, safety or economy. Finally, improvement of the total noise exposure will depend as well on other factors such as the noise characteristics of other unmodified aircraft types which continue to be part of the aircraft mix at a particular airport, flight procedures, aircraft load factors and the frequency of aircraft movements. Therefore, the success of noise suppression devices for particular aircraft may be diluted so as to make the changes unrealistic on a cost benefit analysis or the alternative approaches, when properly assessed, may offer a more attractive substitute or a least suggest complementary measures.

### *III. Control at Source: Noise Certification Standards.*

One method of controlling aircraft noise that has recently been

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<sup>22</sup> For a summary of the research and development currently under way in the United States with respect to aircraft noise suppression technology, see Second Federal Aircraft Noise Abatement Plan, FY 1970-71 (Jan., 1971), published by the Inter-Agency Noise Abatement Program, at pp. 17-43.

given considerable attention focuses on the source of the disturbance, the aircraft itself. Sometimes called the technical option, this approach is intended to ensure an emphasis upon noise attenuation as an important parameter in airframe and engine design, through the imposition of noise certification standards, in terms of maximum noise levels, for aircraft. The most promising results in terms of noise reduction are likely to be attainable in relation to new aircraft types though the lead time before significant improvement results from a given set of standards will be substantial. Additionally, as the state of the aircraft noise suppression art advances, it may prove feasible and desirable to introduce noise standards for some of the current generation of aircraft, necessitating retrofit with new or modified equipment that will substantially lessen the noise impact.

In the United States, the first enabling legislation to specifically authorize the adoption of noise certification standards for aircraft was introduced in 1968 in the form of an amendment to the Federal Aviation Act of 1958.<sup>23</sup> In substance the new provision requires the Administrator of the Federal Aviation Administration (FAA), in consultation with the Secretary of Transportation, to prescribe standards for the measurement of aircraft noise and sonic boom and, as deemed necessary, to require that such standards be applied in the aircraft safety certification proceedings already provided for in Title VI of the Act.<sup>24</sup> In exercising his new statutory function, the Administrator is required to consult widely and to consider whether any proposed standard is economically reasonable, technologically practicable, appropriate for the particular type of

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<sup>23</sup> 49 U.S.C. § 1431 (Supp. IV, 1969), amending the Federal Aviation Act, 49 U.S.C. §§ 1301-1542 (1964). (And see the Department of Transportation Act of 1966, 49 U.S.C. §§ 1651-1659 (1970), establishing the Federal Aviation Administration within the new Department of Transportation to replace the former Federal Aviation Agency).

For a summary of the criticisms of the 1968 amendment from the point of view of the noise harassed airport neighbour, see Berger, *Nobody Loves an Airport* (1970), 43 So. Cal. L. Rev. 631, at pp. 763-769. Some of the previous attempts to confer a mandate on the predecessor of the Federal Aviation Administration to adopt and enforce noise standards are documented in Tenzer, *Jet Aircraft Noise Problems and Their Solutions* (1967), 13 N.Y. Law Forum 465, at pp. 471-475.

<sup>24</sup> An Administration Bill to enact a comprehensive Noise Control Act of 1971, H.R. 5275, 92nd Cong., 1st Sess. (1971) (S. 1016 is in identical terms), would amend s. 1431 of the Federal Aviation Act so as to require the prescription of appropriate noise standards as a pre-condition to issuing any aircraft type certificate under s. 1423 of the Act and to require the approval of any standards by the Administrator of the Environmental Protection Agency (established pursuant to Reorganization Plan No. 3 of 1970, see 42 U.S.C.A. § (Supp., 1971), who may also initiate a review of any existing standards (see s. 6(c)). And see Hearings on H.R. 5275, H.R. 923, H.R. 3364, H.R. 6002, H.R. 6986, and H.R. 6988 before the Subcomm. on Public Health and Environment of the House Comm. on Interstate and Foreign Commerce, 92nd Cong., 1st Sess., ser. 92-30 (1971).



aircraft and consistent with the highest degree of safety in air commerce.<sup>25</sup>

Regulations have now been adopted, pursuant to this new authority, prescribing noise standards in relation to the type certification of subsonic jet airplanes.<sup>26</sup> For the purposes of certification detailed test and measurement conditions are prescribed<sup>27</sup> and three monitoring points are specified,<sup>28</sup> having been selected as reasonably indicative of an aircraft's noise characteristics under normal conditions and of its capacity to achieve reasonable noise levels at points representative of the usual distance between an aircraft and airport neighbours.<sup>29</sup> The maximum noise levels permitted vary on a sliding scale, heavier aircraft being allowed higher maxima.<sup>30</sup> However, certain trade-offs are permitted so that the maximum at one or two points may be exceeded, within certain limits, so long as there is a compensating reduction at the other points or point.<sup>31</sup> Apart from the noise-weight scale no account is taken of the differing noise signatures that result from various aircraft types.

The FAA has since issued advance notice of rule making that would extend the regulations so as to add requirements for two

<sup>25</sup> S. 1431(b)(1)(2)(3) & (4).

<sup>26</sup> Federal Aviation Regulations, Part 36, 14 C.F.R. §§ 36.1-36.1581 (1970); 35 Fed. Reg. 18355-18379 (1969), amended by 34 Fed. Reg. 18815 (1969) and corrected by 34 Fed. Reg. 19025 (1969). The application of the specific standards is limited, except for acoustical changes to type designs (which are covered if effected after Dec. 1st, 1969), to type certificates for which proceedings were commenced after either Jan. 1st, 1967, or Dec. 1st, 1969, depending on the engine by-pass ratio (s. 36.201 and s. 36.2(b)). This limitation has the effect of excluding the existing generation of turbo-fan and turbo-jet aircraft including the first editions of the Boeing 747, see Comment, Port Noise Complaint (1970), 6 Harv. Civ. Lib.-Civ. Rights L. Rev. 61, at pp. 90-91. However subsequent editions will likely be brought into line with the standards, see Aircraft Engine Noise Technology, A Review, *op. cit.*, footnote 21, p. 3. The DC 10, sections of which are being manufactured in Canada, and the Lockheed 1011 are the first aircraft to be subjected to the full impact of the new regulations, *ibid.*

<sup>27</sup> See 14 C.F.R., Part 36, app. A and app. C, §§ 36.7 and 36.9 (1970); 34 Fed. Reg. 18365-18370 and 18378-18379 (1969), as amended and corrected by 34 Fed. Reg. 18815 (1969) and 34 Fed. Reg. 19025 (1969).

<sup>28</sup> The monitoring positions are: for take-off, a point on the extended line of runway 3.5 nautical miles from the start of take-off roll, for approach, a point on the extended line of runway 1 nautical mile from touchdown and, for the measurement of the maximum noise after lift-off, a point a quarter of a nautical mile to the sideline, see 14 C.F.R., Part 36, app. C, § 36.3 (1970); 34 Fed. Reg. 18378 (1969).

<sup>29</sup> See the preamble to the Federal Aviation Regulations, Part 36, 34 Fed. Reg. 18357 (1969), and Powers, The Federal Aviation Administration's Environmental Activities (FAA, 1971), p. 2.

<sup>30</sup> The scale ranges between 108 EPNdB and 102 EPNdB at approach and sideline measurement points, and between 108 EPNdB and 93 EPNdB, at the take-off measuring point, 14 C.F.R., Part 36, app. C, § 36.5(a) (1970); 34 Fed. Reg. 18378 (1969).

<sup>31</sup> 14 C.F.R., Part 36, app. C, § 36.5(b) and (c) (1970); 34 Fed. Reg. 18379 (1969).

new categories, namely currently type certificated subsonic turbofan jets (retrofit requirements)<sup>32</sup> and civil supersonic aircraft.<sup>33</sup>

The regulations have been criticized by aircraft manufacturers and the airline industry as unreasonably harsh in a number of respects.<sup>34</sup> Others, including airport neighbours and airport operators, have claimed that the rules are much too lax.<sup>35</sup> One particular limitation of this federal initiative is that there is no assurance that noise-approved aircraft will be flown so that in practice the noise generated will come within the limits at the three measuring points, though this may have been achieved under test conditions.<sup>36</sup> Only if an airplane could be said to no longer comply with the approved type conditions would it be possible to revoke its airworthiness certificate for nonconformity with the type design, an action which, it has been stated, the FAA would "consider" in the circumstances.<sup>37</sup> So far the FAA has declined to promulgate general flight procedures designed to assure that the noise levels achieved under test conditions are duplicated in day-to-day operations. This matter is generally left to the local airport authorities.<sup>38</sup> The federal regulations simply provide that operating procedures during certification testing are to be included in the airplane flight manual but that the only resulting flight requirement is that of meeting the test weight, if lower than the maximum for airworthiness certification.<sup>39</sup>

The reluctance of the federal authorities to take the noise certification programme further is characteristic of the whole federal involvement in the airport noise problem. This situation is explained, in large part, by the Supreme Court decision in *Griggs v. Allegheny County*.<sup>40</sup> That case held that the proper defendant in a noise damage suit is the airport operator which, in the United States civil aviation system, is normally a county, municipal or

<sup>32</sup> 35 Fed. Reg. 16980 (Nov. 4th, 1970).

<sup>33</sup> 35 Fed. Reg. 12555 (Aug. 6th, 1970). Also the FAA has given notice of proposed rule making to amend Part 91 of the Federal Aviation Regulations, in accordance with the Federal Aviation Act, 49 U.S.C. § 1431 (1970), so as to afford public protection from civil aircraft sonic boom, see 35 Fed. Reg. 6189 (Apr. 16th, 1970).

<sup>34</sup> See Larsen, *Improving the Airport Environment: Effect of the 1969 FAA Regulations on Noise* (1970), 55 Iowa L. Rev. 808, at pp. 825-826.

<sup>35</sup> *Ibid.*, at p. 825 and Berger, *op. cit.*, footnote 23, at pp. 769-774.

<sup>36</sup> See the preamble to the Federal Aviation Regulations, Part 36, 34 Fed. Reg. 18357 (1969), and Larsen, *op. cit.*, footnote 34, at p. 819.

<sup>37</sup> *Ibid.*, Part 36, 34 Fed. Reg. 18357 and 18359 (1969).

<sup>38</sup> See *infra*, part V.

<sup>39</sup> 14 C.F.R., Part 36, §§ 36.1501 and 36.1581 (1970). However, specific exemptions from this one mandatory provision may be granted under the authority of the Federal Aviation Act, 49 U.S.C. § 1421(c) (1970), see preamble to Federal Aviation Regulations, Part 36, 34 Fed. Reg. 18358 (1969).

<sup>40</sup> (1962), 369 U.S. 84. This case has been commented on in a number of articles but see particularly Lesser, *The Aircraft Noise Problem: Federal Power but Local Liability* (1971), 3 Urban Lawyer 175, for a recent summary of the U.S. case law on aircraft noise, including *Griggs* and its aftermath.

other local authority. The court ruled out liability on the part of the United States, notwithstanding that the federal authority was implicated in the regulation of air commerce through the supervision of airport construction and design as an exercise of the federal spending power, the promulgation of air navigation rules and the designation of navigable airspace.<sup>41</sup> Civil remedies in the United States have been based, as in *Griggs*, largely on inverse condemnation, a strange breed of trespass, nuisance and substantive due process.<sup>42</sup> While governmental units have the power of eminent domain (expropriation) property may not be constitutionally taken except by due process of law.<sup>43</sup> An inverse condemnation claim will arise from low and frequent flights substantially interfering with the use of property "brought against a governmental entity having the power of eminent domain to recover the value of property which has been appropriated in fact, but with no formal exercise of the power".<sup>44</sup>

The 1968 amendment to the Federal Aviation Act enabling the promulgation of noise certification standards was passed with a Congressional awareness of the *Griggs* decision and an evident intent not to intrude into the realm of the airport owner's noise abatement jurisdiction so as to attract federal responsibility for the purchase of "noise lands" or easements near airports or, in the absence of such action, for paying damages to injured airport neighbours.<sup>45</sup> The regulations evidence a similar restraint on the part of the FAA from entering into any involvement in airport affairs.<sup>46</sup>

The noise certification programme of the FAA has, at present, no Canadian counterpart.<sup>47</sup> However, it is important in the context

<sup>41</sup> See Black J., dissenting, at pp. 91-92.

<sup>42</sup> See *United States v. Causby* (1946), 328 U.S. 256. And see Dunham, *Griggs v. Allegheny County in Perspective: Thirty Years of Supreme Court Expropriation Law*, [1962] Sup. Ct. Rev. 63; Hill, *Liability for Aircraft Noise: The Aftermath of Causby and Griggs* (1964), 19 U. of Miami L. Rev. 1; Munro, *Aircraft Noise as a "Taking" of Property* (1967), 13 N.Y.L. Forum 497 and Stoebuck, *Condemnation by Nuisance: The Airport Cases in Retrospect and Prospect* (1967), 71 Dick. L. Rev. 207.

<sup>43</sup> U.S. Const., amend. V and amend. XIV, s. 1. Most state constitutions contain similar provisions, sometimes extending however to cover damaging as well as taking of property, see Stoebuck, *op. cit.*, *ibid.*, at p. 223.

<sup>44</sup> *Martin et al. v. Port of Seattle* (1964), 391 P. 2d 540, at p. 542, footnote 1 (Wash. S.C.).

<sup>45</sup> Senate Comm. on Commerce, *Aircraft Noise Abatement*, S. Rep. No. 1353, 90th Cong., 2nd Sess., pp. 6-7 (1968).

<sup>46</sup> See 14 C.F.R., Part 36, §§ 36.5 and 36.1581 (1970), *re* airplane flight manuals, referred to above. See also the preamble to Federal Aviation Regulations, Part 36, 34 Fed. Reg. 18355-18356 (1969).

Doubt has been expressed as to whether the federal authorities will be able to continue to maintain successfully that there is no federal legal responsibility for regulating airport noise, see Larsen, *op. cit.*, footnote 34, at p. 810.

<sup>47</sup> The only noise certification standards for transportation vehicles in Canada are those relating to snowmobiles that are imported, exported or transported interprovincially, see s. 1204(2) of the Motor Vehicle Safety

of Canadian airport noise regulation for the reason that the FAA requirements will affect the noise levels of the jet equipment of Canadian carriers, all of which rely heavily on the United States aircraft manufacturing industry, and the noise levels of other users of Canadian airport facilities (particularly, of course, American carriers) and, secondly, the United States standards have provided a stimulus for an attack on the airport noise problem through internationally agreed upon noise certification standards.

On the international level the first major conference on aircraft noise took place in London in 1966.<sup>48</sup> This meeting resulted in agreement on the principle that noise standards for aircraft ought to be arrived at on the international level so as to avoid commercial discrimination between aircraft manufacturers resulting from widely varying national noise suppression requirements.<sup>49</sup> The next significant development was a special meeting on aircraft noise in the vicinity of aerodromes convened by the International Civil Aviation Organization (ICAO), in Montreal, in November of 1969.<sup>50</sup> This meeting was attended by the representatives of twenty-eight member states, including the United States and Canada.<sup>51</sup>

The International Civil Aviation Organization, which is constituted under the terms of the 1944 Convention on International Civil Aviation (Chicago Convention),<sup>52</sup> is a specialized inter-governmental body concerned with the development of international air transport and the principles and techniques of international air navigation.<sup>53</sup> Its specific authority, in article 37, includes the adop-

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Regulations, SOR/70-487, passed pursuant to the Motor Vehicle Safety Act, R.S.C., 1970, c. 26 (1st Supp.). This regulation establishes a maximum sound intensity of 82 dB(A), measured at 50 feet, to have effect from Feb. 1st, 1972. For the report of the study that led to this regulation see Division of Physics, National Research Council of Canada, Snowmobile Noise, Its Sources, Hazards and Control, Rep. No. APS-477 (1970). Noise certification standards are now being prepared for other motor vehicles with complementary noise performance standards to be introduced by the provinces. Ontario already has enabling legislation under which maximum noise levels may be established, see the Environmental Protection Act, S.O., 1971, c. 86, ss 1(c), 5 and 94(1).

<sup>48</sup> British Board of Trade, Aircraft Noise: Report of an International Conference on the Reduction of Noise and Disturbance Caused by Civil Aircraft (1967). For a general discussion of the international effort to date toward the regulation of aircraft noise see Meynell, International Regulation of Aircraft Noise, in *Aircraft and the Environment*, *op. cit.*, footnote 13, part 1, p. 170.

<sup>49</sup> Aircraft Noise, *op. cit.*, footnote 48, at pp. 3 and 7.

<sup>50</sup> See Report of the Special Meeting, *op. cit.*, footnote 5. And see further FitzGerald, Aircraft Noise in the Vicinity of Aerodromes and Sonic Boom (1971), 21 U.T.L.J. 226.

<sup>51</sup> Report of the Special Meeting, *op. cit.*, footnote 5, pp. ii-1, iii-2 to iii-3.

<sup>52</sup> The text of the treaty is contained in 1944 Canada Treaty Series, No. 36.

<sup>53</sup> Art. 44.

tion of international standards and recommended practices and procedures dealing generally with the safety, regularity and efficiency of air navigation. It was agreed, in the special meeting at Montreal, that there was a need for internationally acceptable specifications for noise certification and that these ought to take the form of standards under the umbrella of article 37.<sup>54</sup>

The standards recommended by the meeting are somewhat less stringent, in some details, than those adopted in the United States, though this is a result that is to be expected from the process of reaching, through compromise, a generally acceptable norm. The suggested maximum noise levels<sup>55</sup> are virtually the same as those imposed by the FAA, though the lateral and approach measuring points are slightly further out from the runway and the permissible trade-offs between measuring points are greater.<sup>56</sup> It was contemplated, of course, that member states might wish to apply stricter standards than those accepted through ICAO in respect of aircraft on their own national registers.<sup>57</sup>

The recommended standards, emanating from the special meeting, have been circulated amongst member states and, if ultimately accepted, will be adopted as annex 16 to the Chicago Convention.<sup>58</sup> Though a new annex is adopted and promulgated, the contracting states will not be legally obliged to implement it unless they find it "practicable".<sup>59</sup> However there is an obligation on the part of a contracting state, not always honoured in practice,<sup>60</sup> to

<sup>54</sup> Report of the Special Meeting, *op. cit.*, footnote 5, p. 3-1. While there may be some question as to whether noise certification standards relate to "safety . . . of air navigation", within the terms of art. 37, it has been pointed out elsewhere that ICAO, as a body concerned with the resolution of non-political and largely technical questions on a consensual basis, has often moved rather far away from the governing provisions of the Chicago Convention, see Buergenthal, *Law-Making in the International Civil Aviation Organization* (1969), p. 58.

<sup>55</sup> To be applied to all new jet aircraft with a by-pass ratio of two or more, or for which an application for certification was made on or after Jan 1st, 1969, except very light aircraft and VTOL/STOL aircraft, see Report of the Special Meeting, *op. cit.*, footnote 5, pp. 3-6.

<sup>56</sup> *Ibid.*, pp. 3-5 to 3-8.

<sup>57</sup> *Ibid.*, pp. 3-1.

<sup>58</sup> FitzGerald, *op. cit.*, footnote 50, at p. 228. The procedure for adopting annexes is described in detail in Buergenthal, *op. cit.*, footnote 54, pp. 62-69.

<sup>59</sup> Arts 28 and 38. However, if compliance with the noise certification standards is attested to, in any case, in an aircraft's certificate of airworthiness, rather than a separate noise certificate, an option left open by the special meeting (see Report of the Special Meeting, *op. cit.*, footnote 5, p. 3-3), then an argument might be made that another contracting state does have a legal obligation to give full recognition to the certification under art. 33 of the Chicago Convention. This argument is tenuous, at best, since that article refers to recognition of airworthiness certificates which are specifically provided for elsewhere in the Convention and do not appear to contemplate the inclusion of noise considerations, see, for example, arts 29(b), 31 & 37 (e). See further Buergenthal, *op. cit.*, *ibid.*, pp. 76-80. 86-88.

<sup>60</sup> See Buergenthal, *op. cit.*, *ibid.*, pp. 96, 98-101.

notify the Organization of any difference between its own practices and those established by the international standards.<sup>61</sup>

The United Kingdom, one of the major aircraft manufacturing nations, has already acted to implement domestically the specific terms of the recommendations of the special meeting. The Air Navigation (Noise Certification) Order, 1970,<sup>62</sup> was made on May 29th, 1970, under the authority of section 19 of the Civil Aviation Act, 1968,<sup>63</sup> enabling executive action to prohibit aircraft from taking off or landing in the United Kingdom except in compliance with such noise certificates as may be specified. The noise certificates recognized by the Order are those issued by the Board of Trade,<sup>64</sup> in accordance with prescribed standards, which are, in effect, those agreed upon in the special meeting, those issued by a country with substantially equivalent standards and, anticipating the adoption of annex 16, those issued pursuant to the Chicago Convention.<sup>65</sup> Enforcement is through the revocation and suspension of Board-issued certificates, fines, imprisonment, and detention of aircraft to prevent contravention of the Order.<sup>66</sup>

The effect of noise certification standards will be to force aircraft manufacturers, at the developmental stages of new aircraft types, to take serious account of noise, one of the most important social costs associated with the air transportation industry.<sup>67</sup> On a much broader scale, proposals have been made to introduce new governmental institutions, possibly taking the form of administrative tribunals, to act as watch dogs in respect of all major technological advances.<sup>68</sup> The function of technology assessment to be so exercised would involve an evaluation, by an independent body, of the potential benefits and undesirable side effects of a particular technology, and possible alternative courses of action, at an early stage before the development had assumed a strong momentum. Public exposure would thus be given to the total impact of new technology and the legislative and executive branches would be provided with a valuable planning aid in the exercise of their appropriate roles. The outcome of the American SST programme has given new

<sup>61</sup> Art. 38.

<sup>62</sup> S.I. 1970/823 (May 29th, 1970).

<sup>63</sup> 1968, c. 61 (U.K.).

<sup>64</sup> The functions of the Board of Trade are now exercised concurrently with the Secretary of State for Trade and Industry, S.I. 1970/1537 (Oct. 20th, 1970). And see the white paper on *The Reorganization of Central Government*, Cmnd. 4506 (Oct., 1970).

<sup>65</sup> S. 4.

<sup>66</sup> Ss 8, 10 and 14.

<sup>67</sup> See Ticer, *Legal Methods of Eliminating Certain Undesirable By-Products of the Transportation Industry* (1971), 11 N.R.J. 177.

<sup>68</sup> See Daddario, *Technology Assessment Legislation* (1970), 7 Harv. J. Legis. 507. See also Green, *Technology Assessment and the Law: Introduction and Perspective* (1968), 36 Geo. Wash. L. Rev. 1033, one of a series of papers reproduced in this law review volume on the general subject of technology assessment and the law.

poignancy to such proposals.

The usefulness of this approach has in fact been mooted in the context of the airport noise problem.<sup>69</sup> However, the suggestions for new technology assessment institutions have not been sufficiently refined and the difficulties inherent adequately explored to warrant putting much faith, at this time, in this broad front as enabling an effective attack on the airport noise problem.

#### IV. *Control of Air Carriers: Restricting the Volume and Variety of Air Traffic.*

The noise exposure at a particular airport will clearly be influenced by the quantity and type of commercial air services authorized to operate from that terminus. And when authority to operate any service is granted it may be conditioned upon such factors as the use of a particular type of equipment, which in turn will have further noise implications. Regulatory control of commercial air services is, therefore, an existing decision-making process in which the noise impact might be made an ingredient.

In the United States, the economic regulation of interstate and international air transport is entrusted to the Civil Aeronautics Board (CAB).<sup>70</sup> Air carriers are required to obtain certificates from the Board with respect to all routes served.<sup>71</sup> The Board, on the other hand, must issue a certificate on being satisfied of the capacity of an applicant to conform to all relevant legal requirements, to perform the transportation role requested, and that such transportation is required by the "public convenience and necessity".<sup>72</sup> This last phrase has been treated as synonymous with "public interest",<sup>73</sup> an expression which also describes the types of conditions the Board may attach to its certificates,<sup>74</sup> and is defined elsewhere in the Act in equivalent terms as including "the promotion, encouragement, and development of civil aeronautics".<sup>75</sup>

Is, then, the environmental impact of a proposed route allocation a matter that is relevant to the determination of whether the service in question is in the public interest?<sup>76</sup> This issue was

<sup>69</sup> See Wollan, *Controlling the Potential Hazards of Government Sponsored Technology* (1968), 36 Geo. Wash. L. Rev. 1105, at pp. 1118-1125, 1134-1137. And cf. Kramon, *Noise Control: Traditional Remedies and a Proposal for Federal Action* (1970), 7 Harv. J. Legis. 553, at pp. 551-553.

<sup>70</sup> Federal Aviation Act, 49 U.S.C. §§ 1371-1387 (1970).

<sup>71</sup> S. 1371(a) and (e)(1). <sup>72</sup> S. 1371(d)(1).

<sup>73</sup> See *C.A.B. v. State Airlines Inc.* (1950), 338 U.S. 572, at p. 580, and *Airport Commission of Forsyth County, N.C., et al. v. C.A.B.* (1962), 300 F. 2d 185, at p. 186 (4th Cir.).

<sup>74</sup> S. 1371(e)(1). <sup>75</sup> S. 1302(e).

<sup>76</sup> A positive answer is given to this question in a comment entitled, *Federal Regulation of Air Transportation and the Environmental Impact Problem*, in (1968), 35 U. Chi. L. Rev. 317, which was written without the benefit of the final disposition in *Palisades Citizens Association, Inc. et al. v. C.A.B.* (1969), 420 F. 2d 188 (D.C. Cir.), a discussion of which follows (see at pp. 320-333 of the comment).

faced squarely by the federal Court of Appeals in the case of *Palisades Citizens Association, Inc. et al. v. C.A.B.*<sup>77</sup> The court there stated that a certificate for the institution of a service which would substantially increase noise, air pollution or the risk of accidents would be contrary to the spirit and letter of the Federal Aviation Act. These hazards, it was said, affect people on the ground whose interests must come within the broad expression "public interest" since the Board's functions fit within a national system of industry regulation and cannot be viewed in isolation. The Board must therefore weigh in environmental impact against the need for the service in effecting the balance which it is required to achieve, and this notwithstanding that other arms of government, such as the FAA, have been given explicit authority in relation to the environmental impact of air transport. However, on an issue of standing to intervene in a Board hearing, the court upheld the Board's exclusion of the Palisades Citizens Association, which objected to the proposed Washington-Baltimore helicopter service on environmental grounds. In fact the Association had been given the opportunity to participate quite fully, though short of formal intervention, and the Department of Transportation, an intervenor, had raised the environmental considerations. In the result the court concluded that the Board had given adequate attention to noise and other external factors and upheld the issue of a certificate in the circumstances.<sup>78</sup>

The certification functions of the CAB have recently been affected by the enactment of the National Environmental Policy Act (NEPA) of 1969.<sup>79</sup> This Act contains two distinct parts:

<sup>77</sup> *Ibid.*

<sup>78</sup> The board decision, however, evidences somewhat less emphasis on environmental factors than the court's decision would suggest is appropriate, see *Washington-Baltimore Helicopter Service Investigation*, CAB Order Nos. 68-11-71 and 68-11-72 (Mar. 18th, 1968), in which the Board noted:

- (i) That the area affected by the proposed service was already blanketed by aircraft noise and "a helicopter is less noisy than a jet" (at p. 13),
- (ii) that only a showing of "unusual noise" might justify refusing a certificate for a service the effect of which would be to contribute to the promotion of a well-rounded air transportation system (at p. 15),
- (iii) that other agencies have been given authority to protect the public against the inconvenience of noise created by air operations (at p. 15), and
- (iv) that the applicant for a new service does not have the onus to establish the safety of the operation in terms of noise and air pollution and to establish its comparative advantage, in these respects, to other forms of transport (at p. 14).

This matter has since been re-opened by the Board, see CAB Order Nos. 70-11-85 (Nov. 19th, 1970) and 71-1-75 (Jan. 15th, 1971).

<sup>79</sup> Publ. L. No. 91-190 (1970); 42 U.S.C. §§ 4321-4347 (1970). And see, directing the implementation of certain programmes under the Act, Executive Order No. 11514, 35 Fed. Reg. 4247 (Mar. 5th, 1970), and at



Title 1 which includes a broad declaration of a national policy of preserving and enhancing the environment (section 101) and a mandate to federal agencies to ensure the execution of that policy (section 102) and Title 2 which provides for the establishment of a council on environmental quality. Section 102 of the Act directs that, to the fullest extent possible, all policies, regulations and public laws of the United States shall be interpreted in accordance with the Act and, specifically, all federal agencies shall take account of any environmental considerations in planning and decision-making and, by the terms of sub-section (2)(C), shall "include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the environment", a detailed statement on the environmental impact of, and alternatives to, the proposed action.<sup>80</sup> It has been correctly observed that section 102 simply prescribes a methodology but does not tell the decision-maker what values to prefer.<sup>81</sup> The legislative history suggests that the Act has the very positive effect, however, of enlarging the jurisdiction of federal agencies so as to enable the implementation of the policies enunciated in section 102, except to the extent that existing law makes full compliance impossible.<sup>82</sup>

The Civil Aeronautics Board has taken the view that a number of its activities may come within section 102(2)(C) of the National Environmental Policy Act and, accordingly, a policy statement has been issued on the subject of the implementation of that Act.<sup>83</sup> The Board has declared therein that those of its actions falling within section 102(2)(C) are primarily, but not exclusively, licensing activities resulting in the authorization of air services:

42 U.S.C.A. § 4321 (Supp., 1971).

While there is no Canadian counterpart to this legislation, s. 102(2)(C) of the U.S. Act was clearly the model for s. 653(1) of the City of Greater Winnipeg Act, S.M., 1971, c. 105, which requires that the executive policy committee of city council review every proposal for the undertaking by the city of a public work which may significantly affect the quality of the human environment and report on the environmental impact of and alternatives to the proposed action.

<sup>80</sup> There is considerable uncertainty as to the meaning of the quoted portion of the sub-section, see White, *A Panoramic View of the National Environmental Policy Act* (1970), 16 *How. L.J.* 116. at pp. 124-127. Some assistance in interpreting the provision is afforded by the Guidelines for Statements on Proposed Federal Actions Affecting the Environment, issued by the Council on Environmental Quality, 36 *Fed. Reg.* 7724 (Apr. 23rd, 1971).

<sup>81</sup> Gray (ed.), *Cases and Materials on Environmental Law* (1970), p. 9.

<sup>82</sup> See Hanks and Hanks, *An Environmental Bill of Rights: The Citizen Suit and the National Environmental Policy Act of 1969* (1970), 24 *Rutgers L. Rev.* 230, at pp. 251-257. And consider also ss 103 and 105 of the Act.

<sup>83</sup> CAB, *Implementation of the National Environmental Policy Act of 1969*, 14 C.F.R. § 339.110; 35 *Fed. Reg.* 10582 (effective June 25th, 1970), recently amended by Reg. PS-47, Amendment No. 26 to Part 399, 36 *Fed. Reg.* 12513 (effective July 1st, 1971).

- (1) To an area not previously served by air transportation; or
- (2) To be operated under conditions or with equipment that might result in changes significantly affecting noise or air pollution levels.<sup>84</sup>

In a number of applications for certificates of public convenience and necessity, which have since come before the Board, orders have been made directing that the proceedings be conducted in accordance with the standards established in the Board's policy statement.<sup>85</sup>

In Canada, the body entrusted with the economic regulation of air transport is the Canadian Transport Commission (CTC).<sup>86</sup> The Commission is authorized to issue commercial air service licences but only if, in a particular case, it is satisfied, "that the proposed commercial air service is and will be required by the present and future public convenience and necessity".<sup>87</sup> No commercial service may be initiated by an air carrier without such a licence.<sup>88</sup> And licences may be made subject to such conditions as the Commission considers necessary or desirable in the public interest.<sup>89</sup>

In an application by Nordair Ltd. in 1969 to operate two services, between Hamilton, Ontario, and Montreal, Quebec, and between Hamilton, Ontario, and Pittsburgh, Pennsylvania, the Commission heard objections from a number of residents of the Mount Hope area, in which the Hamilton airport is located.<sup>90</sup> The argument advanced by these airport neighbours was that the pro-

<sup>84</sup> *Ibid.*, at para. (c)(1). The Board recently dismissed a formal complaint, which, because of a jurisdictional defect, was treated as a petition for rule making, to the effect that the Board, in its policy statement, had construed its authority too narrowly by failing to consider how the policies of NEPA could be advanced in contexts other than air carrier route certification proceedings and that the Board erred in reporting to the President, pursuant to s. 103 of NEPA, that there were no deficiencies in its statutory authority, regulations and procedures preventing full compliance with the Act, see *Complaint of the Natural Resources Defense Council*, CAB Order No. 71-7-140 (July 26th, 1971), reported at 2 ERC 1808 [Environment Reporter Cases].

<sup>85</sup> *Application of County of Sullivan, State of New York and the Sullivan County Airport Commission*, CAB Order No. 71-1-64 (Jan. 13th, 1971); *Northeast Corridor VTOL Investigation*, CAB Order No. 71-1-74 (Jan. 15th, 1971) (and see the subsequent pre-hearing conference report therein of examiner William H. Dapper, served June 10th, 1971, CAB Docket No. 19078 *et al.*); *Reopened Washington-Baltimore Helicopter Service Investigation*, CAB Order No. 71-1-75 (Jan. 25th, 1971); *Mainland-Ponce Service Investigation*, CAB Order No. 71-3-14 (Mar. 2nd, 1971); *Reopened TAG-Wright Case; TAG-Executive Agreement*, CAB Order No. 71-5-9 (May 4th, 1971).

<sup>86</sup> Aeronautics Act, R.S.C., 1970, c. A-3, ss 9-19. Prior to the proclamation of the National Transportation Act, S.C., 1966-67, c. 69, the authority in question was vested in the Air Transport Board. See also the Commercial Air Services Regulations, S.O.R., Cons./55, vol. 1, 28, as am.

<sup>87</sup> S. 16(3).

<sup>88</sup> S. 17(1).

<sup>89</sup> S. 16(6).

<sup>90</sup> Air Transport Committee, CTC Decision No. 2689 (Feb. 24th, 1969).

posed service would result in damage to their health and enjoyment of land, and depreciation in property values. The Air Transport Committee of the Commission, however, concluded that these allegations were not of the sort that the Committee should take into consideration in determining whether a particular commercial air service is required in the public interest.<sup>91</sup> In the result, the applications were approved.

However, a different view was taken in the Commissioner's report, adopted by the Air Transport Committee, in the matter of a recent application to provide a charter and flying training service with float-equipped aircraft to a lakeside community in the Okanagan Valley in British Columbia.<sup>92</sup> In that case a number of residents opposed the application on the grounds that the desired air services would destroy the ecological balance of the lake and create a noise nuisance and a hazard to boating. It was found that a demand for the services had not been clearly established. But it was also noted that the interests of the objecting residents which had been advanced were of the kind that should be taken into account, though these might, "in some circumstances be outweighed by the genuine requirements of commerce".<sup>93</sup> The application was denied by the Committee.

There are clearly inconsistent statements in these two CTC decisions, but if the most recent of the cases indicates a widening of the range of inquiry to include environmental impact, the CTC may now be in much the same position, without specific judicial and legislative direction, as the CAB to the extent that regard may be had to expected noise levels in any determination of whether a commercial service is justified by the public convenience and necessity. But whether a decision ignoring such factors, when put in evidence, would be quashed on judicial review is an open question.

<sup>91</sup> *Ibid.*, at p. 5. The conclusion of the Committee on this matter is in line with some *dicta* in the judgment of the Nova Scotia Supreme Court in the case of *Re Hamilton*, [1937] 1 D.L.R. 807. In that case the expression "public convenience and necessity" in a service station licensing statute was interpreted, by the majority, as including the consuming and patronizing public but not the general public or private individuals and hence as excluding consideration of the objection to the issue of a licence, on the grounds of anticipated noise and noxious odours, by a neighbouring hotel proprietor (but compare the judgment of Doull J., dissenting in part). On the other hand, the British Columbia Court of Appeal has taken the view that American decisions are entitled to "particular weight" in interpreting the phrase "public convenience and necessity" because of the origin of the phrase in the United States and its common use there in statutes concerning public utility regulation (see *Colwood Cemetery Co. et al. v. P.U.C. et al.* (1957), 9 D.L.R. (2d) 653, at p. 656), which would suggest that reliance on the U.S. Court of Appeals decision in the *Palisades Citizens Association* case, *supra*, footnote 76, would be appropriate in determining whether "public convenience and necessity" in the Canadian Aeronautics Act encompasses environmental considerations such as expected noise damage.

<sup>92</sup> Air Transport Committee, CTC Decision No. 3141 (Mar. 31st, 1971).

<sup>93</sup> *Ibid.*, at p. 2.

V. Control of Aircraft Operation: Noise Abatement  
Flight Procedures.

Noise exposure is intimately affected by the manner in which aircraft are operated and the path which they follow on both take-off and landing. This physical relationship provides the basis for noise abatement operating procedures,<sup>94</sup> which are designed essentially to alter the intensity and the transmission path of aircraft noise so as to benefit noise impacted communities. In practice these results are achieved by reducing the power used in over-flying noise sensitive areas and creating the maximum separation between such areas and the aircraft. Procedures of this kind may be required of the pilot in command of an aircraft or may consist of administrative directions to air traffic control (ATC) in the form of instructions to be given to pilots. In respect of controls directed, in the first instance, to pilots there are two distinct methods of attempting to ensure the adoption of those flight procedures most compatible with noise attenuation. Either the preferred procedures may be specified or a maximum noise level at designated monitoring points may be established, leaving it to the pilot to follow such procedures as will enable compliance, though the latter technique may have the added effect, if the standard is sufficiently strict, of absolutely precluding some types of aircraft that are incapable of meeting the standard from taking off or landing at the airport or airports in question.

All aircraft types demonstrate a fairly wide range of noise-making capabilities depending upon the operational procedures followed during the approach and departure from airports. It has already been noted that the FAA's noise certification standards might be criticized as deficient in failing to include a general requirement that certificated aircraft be flown so as to keep within the prescribed standards.<sup>95</sup> On the other hand, there are a number of factors that commend the development of noise abatement operating procedures on an airport-to-airport basis rather than a uniform national aircraft-weight-related basis. Firstly, the necessity for this

<sup>94</sup> The general description, which follows, of noise abatement operating procedures, and their limitations, has been developed principally from the following sources: Report of the Special Meeting, *op. cit.*, footnote 5; Powers and Ball, Noise Reduction Operational Procedures, in Aircraft and the Environment, *op. cit.*, footnote 13, part 1, p. 9; Sperry, The Federal Aviation Administration Aircraft Noise Abatement Program (FAA, 1970), pp. 18-22; Powers, The Federal Aviation Administration's Environmental Activities (FAA, 1971), pp. 4-5; Bakke, Air Traffic Control and Flight Procedures, in Alleviation of Jet Aircraft Noise, *op. cit.*, footnote 21, p. 86; Frankum, Jet Aircraft Noise Abatement Flight Procedures, in Alleviation of Jet Aircraft Noise, *ibid.*, p. 99; Ruby, Operational Procedures, in Alleviation of Jet Aircraft Noise, *ibid.*, p. 102; Odell, Jet Noise at John F. Kennedy International Airport, in Alleviation of Jet Aircraft Noise, *ibid.*, p. 162.

<sup>95</sup> See *supra*, part III.

form of control, and indeed for the particular varieties thereof, will vary in relation to the direction, nature and density of urban encroachment upon a particular airport and the volume of traffic and aircraft mix which the airport happens to serve. Secondly, the feasibility of various noise abatement procedures will depend upon the local topography, available navigation aids and runways and expected meteorological conditions.

The major constraint on noise abatement operating procedures is safety. There are, for example, certain margins, above what may be technically the minimum altitude or power setting, which must be maintained to enable the pilot to respond to emergencies brought about by such events as engine failure, control or instrument system malfunctions, turbulence, intrusion of other aircraft into the flight path and physical incapacity of a crew member. Runways preferred from a noise point of view may be temporarily unsafe due to weather conditions (for example, ice or cross winds in excess of fifteen knots) or may already be at maximum safe utilization and these limitations must, therefore, be taken account of in any preferential runway regulations. And any proposed operational procedures must be evaluated against already existing pilot, crew and air controller workloads to determine whether the added burden will compromise safety.

Economic considerations may also be important, particularly where aircraft are required to circumnavigate noise sensitive areas increasing flight time and, therefore, fuel requirements and where aircraft are required to reduce take-off weight either in the form of payload or fuel, creating economic penalties as a result of loss of revenue per flight and shortening of non-stop flight range. And the efficiency and capacity of an airport system may be seriously impaired by the imposition of some noise abatement requirements.

The various types of operational procedures that may be imposed to reduce community noise exposure resulting from aircraft departures include the following; changes in power management (most commonly in the form of reduced power, at a specified altitude or over noise sensitive areas, after an initial climbout at a steep gradient), turns during take-off climb and preferred flight paths to avoid populated areas, variation of flap settings and speeds so as to affect climb gradients to the benefit of noise exposed communities, and reduction of take-off weight to enable departure with less thrust required. Approach procedures to reduce noise exposure include use of highest possible approach angles (instrument landing systems, where installed, now enable glide slopes of up to three degrees depending on the local situation), two segment descent with initial large angle approach before low angle on final approach, interception with the approach path at higher altitudes (circuit heights) than otherwise might be dictated so as to give

relief to communities some distance from the runway threshold, turns and preferred flight paths to avoid populated areas, displacement of threshold or touchdown point further from the end of the runway. The noise problem on both take-off and landing may be alleviated by a system of noise preferential runways, and, closely related to operational controls, night curfews and airport traffic density control.

In many cases the implementation of any one or a combination of these procedures may not reduce the total overall noise impact at ground level but may simply shift the burden from one area to another, or distribute it more evenly, a result that may or may not prove to be desirable depending upon the local geography and land development patterns.

In Canada all noise abatement operating procedures emanate from the federal Ministry of Transport. Under section 516(bb) of the Air Regulations,<sup>96</sup> added in 1962,<sup>97</sup> the pilot in command of an aircraft operated on or in the vicinity of an aerodrome must conform to all directions made by the Minister relating to noise abatement. However, noise abatement procedures have been incorporated in various documents issued by the Ministry,<sup>98</sup> only one of which, the *Canada Air Pilot*, might be characterized as embodying Ministerial directions. The *Canada Air Pilot* is described simply as "published under the authority of the Minister of Transport",<sup>99</sup> which may be sufficient to constitute its content

<sup>96</sup> S.O.R./61-10, as am.

<sup>97</sup> S.O.R./62-163.

<sup>98</sup> Instructions have been issued in the following forms:

- (i) Notices to Airmen (NOTAM), see NOTAM 12/71 (July 20th, 1971), entitled Special Procedures and Hazards to Air Navigation, which includes noise abatement procedures for Montreal (p. 36), Ottawa (non-turbo-jet aircraft only, p. 29), Toronto (p. 30), Winnipeg (p. 26) and the two Edmonton Airports (pp. 20 and 21). The Class II NOTAM, of which 12/71 is an example, that are current at the end of the calendar year are incorporated into an annual publication of the Ministry of Transport, entitled Flight Information Manual.
- (ii) Standard Instrument Departure (SID) Charts, which have been prepared for Montreal, Toronto, Ottawa and Vancouver International Airports, and consist of coded departure routings which are issued by ATC as part of the departure clearance required for all flights on instrument flight rules (IFR), see the Air Regulations, s. 546, and Flight Information Manual (1971), pp. 6-14 to 6-15. The SID charts conform to all approved noise abatement departure procedures but may incorporate special procedures for the purpose of noise abatement that are additional to those in the current *Canada Air Pilot* or NOTAM.
- (iii) The *Canada Air Pilot*, into which the noise abatement procedures are gradually being transferred, and which includes, at the time of writing, such procedures for Ottawa International Airport (Mar. 25th, 1971), Hamilton Civic Airport (Aug. 6th, 1971), Edmonton International Airport (Oct. 8th, 1971) and Vancouver International Airport (Nov. 1st, 1971).

<sup>99</sup> Though compiled and issued by the Surveys and Mapping Branch of the Department of Energy, Mines and Resources, see p. GEN. 1.

"directions made by the Minister".<sup>100</sup> If so, a pilot in violation of noise abatement procedures contained therein would be subject to having his licence cancelled or suspended by the Minister<sup>101</sup> and would be guilty of an offence under the Act<sup>102</sup> if he could not establish one of the various defences available.<sup>103</sup> For violation of the noise abatement procedures not in the *Canada Air Pilot* only licence cancellation or suspension would be possible, and then only if it could be established to the satisfaction of the Minister that the conduct in question amounted to incompetence.<sup>104</sup> But, in any case, the noise abatement procedures are so qualified that the captain remains responsible, first and foremost, for the safe operation of the aircraft and, therefore, the procedures may be compromised in isolated cases in favour of safety considerations.<sup>105</sup> And where flagrant and repeated violations occur, the warnings of an airport's flight operations director will usually carry sufficient weight to bring a recalcitrant pilot, either directly or through his employer, into line.

At Toronto International Airport, by way of example of the noise abatement procedures in effect at major Canadian airports, there is a preferential runway system, a minimum circuit height of 2,500 feet, a direction to keep at or above the approach angles of the landing aid systems and to use thrust, gear and flap settings, on approach, to give the best possible noise performance consistent with safety and a late night curfew.<sup>106</sup> In addition, there is a noise monitoring programme at the Toronto airport, carried out through mobile equipment but soon to be replaced by a permanent automatic noise monitoring system.<sup>107</sup> There is no official noise limit

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<sup>100</sup> Certain procedures that "may be published" in the *Canada Air Pilot* by the Minister are described in the *Air Regulations*, see ss 552 and 552A. These do not include visual flight rules (VFR), which form part of the usual noise abatement procedures. However, the language of ss 552 and 552A does not suggest that these sections are exclusive of the matters that the Minister may publish in the *Canada Air Pilot*.

<sup>101</sup> S. 407(a) of the *Air Regulations*.

<sup>102</sup> S. 815(a) or (d).

<sup>103</sup> The defences that are set out in the *Regulations* are lack of knowledge or consent, the exercise of all due diligence to prevent the commission of the offence, or that the contravention took place due to stress of weather or other special circumstances rendering non-compliance necessary to avoid immediate danger, ss 815 and 816.

<sup>104</sup> S. 407(b).

<sup>105</sup> See, for example, NOTAM 12/71, p. 31, (*re* Toronto International Airport).

<sup>106</sup> NOTAM 12/71, pp. 29-31.

<sup>107</sup> A private member's Bill before the 1971 session of the Ontario Legislature provides for the establishment of aircraft noise standards by the provincial Minister of Health which, if exceeded adjacent to or over built up areas, would constitute an offence, see Bill 137, 4th Sess., 28th Leg., Ont. (1971). Provincial legislation of this character, specifically directed to aircraft noise, would probably be unconstitutional. The Environmental Protection Act, S.O., 1971, c. 86, s. 94(1)(c), also provides for the establishment of noise standards, but it is understood that the

but air carriers whose flights have produced excessive noise are informed by letter and invited to offer an explanation.

In the United States, the FAA has imposed a limited number of generally applicable noise-related operational requirements, pursuant to its authority under the Federal Aviation Act to adopt air traffic regulations to protect property and persons on the ground, as well as in the air.<sup>108</sup> Specifically, turbine powered or large aircraft, at airports served by operating control towers, are directed to maintain an altitude of 1,500 feet upon entering airport traffic areas, until descent for landing, to approach at or above the glide slope of the landing aid systems, to climb as rapidly after take-off as practicable to 1,500 feet unless otherwise required, and, subject to the pilot's assessment of safety considerations, to follow any preferential runway scheme established by the FAA.<sup>109</sup> Also some operational regulations designed, in whole or in part, to reduce the noise impact at particular airports have been promulgated by the FAA.<sup>110</sup>

Attempts by local government to control air traffic in the interest of alleviating aircraft noise have been generally unsuccessful in the face of judicial challenges.<sup>111</sup> Municipal ordinances have taken the form of minimum altitude restrictions, maximum noise limits and night curfews on jet operations. These ordinances have been held invalid on one or several of the grounds of direct conflict with federal rules or certifications, pre-emption of the field of air traffic control by federal legislation and regulations and impingement upon federal jurisdiction under the commerce clause of the constitution.<sup>112</sup>

An airport operator, in its proprietary capacity, however, may have a good deal of latitude in imposing noise abatement restric-

standards now being devised relate to motor vehicle noise but do not touch noise generated by aircraft. For a discussion of the pertinent constitutional questions see McNairn, *Aeronautics and the Constitution* (1971), 49 Can. Bar Rev. 411, esp. at p. 444.

<sup>108</sup> 49 U.S.C. § 1348(c) (1970).

<sup>109</sup> 14 C.F.R. § 91.87 (1970). And see FAA Order No. 7110.22 (Sept. 19th, 1970) directing "actions to configure ATC arrival and departure procedures so that operating time of high performance airplanes at low altitudes in terminal areas is kept to a minimum".

<sup>110</sup> See Tondel, *Federal Regulation of Aircraft Noise, the Legal Rights of Airport Neighbors, and Legal Aspects of Compatible Land Use, in Aircraft and the Environment*, *op. cit.*, footnote 13, part 1, p. 189, at p. 191.

<sup>111</sup> See, for example, *Allegheny Airlines Inc. v. Village of Cedarhurst* (1956), 238 F. 2d 812 (2d Cir.); *American Airlines, Inc. v. City of Audubon Park* (1969), 407 F. 2d 1306 (6th Cir.), cert. denied (1969), 396 U.S. 845; *American Airlines Inc. v. Town of Hempstead* (1968), 398 F. 2d 369 (2nd Cir.), cert. denied (1969), 393 U.S. 1017, and *Lockheed Air Terminal, Inc. v. City of Burbank* (1970), 318 F. Supp. 914 (C.D. Cal.). And see generally Lesser, *op. cit.*, footnote 40, and Christopher, *Legal Aspects of Aircraft Noise and Sonic Boom in the United States, in Aircraft and the Environment*, *op. cit.*, footnote 13, part 2, p. 46.

<sup>112</sup> U.S. Const., art. 1, s. 8, para. 3.



tions in the absence of a direct conflict with federal rules.<sup>113</sup> The Port of New York Authority, for example, has established certain requirements with respect to take-off noise levels under the umbrella of a general regulation to the effect that no jet aircraft may land or takeoff at any Port Authority air terminal without permission.<sup>114</sup> To satisfy this regulation, first of all the plane for which permission to land or takeoff is sought must be of a type which has demonstrated its capability of operating, on take-off, within a maximum noise limit of 112 PNdB, measured in the surrounding communities.<sup>115</sup> Secondly, terms and conditions for the operation of jet aircraft are imposed to the effect that take-offs will be permitted only if "so planned and conducted" that the noise level of 112 PNdB is not exceeded and, at Kennedy International Airport, a curfew for take-offs on certain runways is imposed, all such terms and conditions being expressly subject to ATC procedures and FAA rules and regulations.<sup>116</sup> The theory of this type of control would seem to be that the airport operator is acting not as a legislative body but as a landowner imposing contractual or other conditions upon the use of its facilities.<sup>117</sup>

Ground run-up operations of aircraft, for testing or maintenance purposes, may also result in objectionable noise levels, though this is a problem which seems to be diminishing due to actions that have been taken by airport authorities, aircraft operators and aircraft manufacturers. The significant noise impact is usually internal to the airport concerned, affecting ground service personnel most directly but also others present within the airport complex. However, property, and activities thereon, outside the boundaries of the airport may be seriously affected in some cases as well.<sup>118</sup> Techniques to reduce ground run-up noise include test cells for engines removed from aircraft, selection of appropriate run-up

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<sup>113</sup> See *Port of New York Authority v. Eastern Air Lines, Inc.* (1966), 259 F. Supp. 142 (E.D.N.Y.). And cf. *Aircraft Owners and Pilots Association v. Port Authority of New York* (1969), 305 F. Supp. 93 (E.D.N.Y.). And for an unusual instance of the imposition of noise abatement procedures devised by a court see *Hanover v. Morristown* (1969), 261A. 2d 692 (N.J. Super. Ct.).

<sup>114</sup> See Goldstein, A Problem in Federalism, Property Rights in Airspace and Technology, in *Alleviation of Jet Aircraft Noise*, *op. cit.*, footnote 21, p. 132, and *Port of New York Authority v. Eastern Air Lines, Inc.*, *ibid.*

<sup>115</sup> *Ibid.*, p. 132 and Odell, *op. cit.*, footnote 94, pp. 163-164. *Quaere* whether this aircraft type related noise requirement is now pre-empted by the noise certification regulations of the FAA.

<sup>116</sup> Terms and Conditions for Operation of Jet Aircraft for Kennedy International Airport, La Guardia Airport, Newark Airport and Teterboro Airport (Port of New York Authority).

<sup>117</sup> Goldstein, *op. cit.*, footnote 114, p. 136.

<sup>118</sup> Social surveys have indicated that, for run-up noise, complaints may be forthcoming within the 80 CNR contour while, for take-off and landing noise, the complaint threshold is 100 CNR, see Bolt, *etc.*, *op. cit.*, footnote 8, p. 12.

areas, preferred aircraft headings, the use of physical barriers (buildings, special blast fences or natural barriers), the use of engine mufflers or noise suppressors, restriction of run-up hours, ear plugs for employees working close to the aircraft and noise insulation of airport buildings.<sup>119</sup>

In Canada noise suppression procedures for ground run-up do not take the form of regulations but are generally worked out by local arrangement between the airport management and the Ministry of Transport.<sup>120</sup> The imposition of ground run-up restrictions at American airports is a matter for the individual airport proprietor, the possible forms of control involving in no way the use of navigable airspace which is subject to federal regulation.<sup>121</sup>

## VI. Planning Controls for Compatible Airport — Vicinity Relationships.

### A. Airport Oriented.

#### *Airport Location, Design and Expansion*

Any decision to construct a new airport facility will be governed by a host of diverse factors, such as projected air transportation needs, accessibility to the traffic generating area, availability of public utilities, airspace requirements, topography, expected meteorological variations, amount of land necessary and its cost, present ecological conditions and the nature and extent of development in the area and the potential effect of the airport thereon. The particular weight and assessment given to a number of these factors, but especially the last one, will have a bearing on the amount of noise damage likely to be inflicted as a result of airport operations. Noise, therefore, may loom large as a consideration in

<sup>119</sup> See Aircraft Noise, Report of an International Conference on the Reduction of Noise and Disturbance caused by Civil Aircraft, *op. cit.*, footnote 48, pp. 84-88. And see also Report of the Special Meeting, *op. cit.*, footnote 5, pp. 6-1 to 6-12.

<sup>120</sup> Compare the Australian approach which is to include, in appropriate cases, ground maintenance rules together with other noise abatement operating procedures for particular airports, see Report from the House of Representatives Select Committee on Aircraft Noise (1971), pp. 75-90, for the text of the regulations. In the U.K. the only general regulation in respect of ground run-up has the effect of declaring such operations, together with take-off and landing, to be permitted sources of noise and vibration in respect of which no nuisance action may lie, see s. 230 of the Air Navigation (General) Regulations, S.I. 1949/374, adopted pursuant to s. 41 of the Civil Aviation Act, 1949, c. 67. But for the ground run-up procedures adopted at Heathrow see Committee on the Problem of Noise, *op. cit.*, footnote 12, pp. 68-69.

<sup>121</sup> For a list of airports employing ground run-up restrictions see Franken and Standley, *op. cit.*, footnote 7, p. 30, table III-6.

site selection.<sup>122</sup> Likewise, it may be important in any determination of the question of whether to physically expand an operating airport.<sup>123</sup> The airport design, particularly the orientation of runways, will have further noise implications.

In the United States there is no comprehensive national scheme to govern airport location, design and expansion.<sup>124</sup> However where federal assistance is involved there are now fairly extensive controls applied. Section 1653 (f) of the Department of Transportation Act of 1967<sup>125</sup> requires that the Secretary of that Department not approve any programme or project which requires the use of any publicly owned park, recreational area, wildlife refuge or historic site unless no feasible alternative exists and the project is planned so as to minimize the harm to such public lands.<sup>126</sup> Another important recent enactment that relates to the environmental impact of new airports or airport improvements, involving federal aid, is the Airport and Airway Development Act of 1970.<sup>127</sup> That Act provides a ten-year annual authorization of \$250 million for airport assistance, including funds for airport development, normally to a maximum of fifty per cent of project costs, and for local airport

<sup>122</sup> See, for example, Port of New York Authority, *A New Major Airport for the New Jersey-New York Metropolitan Area, A Report on Preliminary Studies* (1959), p. 3; Port of New York Authority, *Report on Airport Requirements and Sites in the Metropolitan New Jersey-New York Region* (1961), p. 8; Port of New York Authority, *Airport Requirements and Sites to Serve the New Jersey-New York Metropolitan Region* (1966), p. 32, and the Report of the Commission on the Third London Airport (1971), ch. 7.

<sup>123</sup> See, for example, Jamaica Bay and Kennedy Airport, *A Multi-disciplinary Environmental Study* (1971), 2 vols., a report prepared for the Environmental Studies Board (a joint board of the National Academy of Sciences and the National Academy of Engineers) pursuant to a request from the Port of New York Authority, vol. 1, p. 2.

<sup>124</sup> The absence of effective federal controls, or indeed state controls, was cause for concern in the Miami Jetport controversy relating to the decision of the Dade County Port Authority, only revoked after much criticism and pressure, to build a new airport in a location which, according to the project's detractors, would have caused irreparable harm to the ecological balance of the Everglades, see Brennan, *Jetport: Stimulus for Solving New Problems in Environmental Control* (1971), 23 U. Fla. L. Rev. 376, at pp. 379-380. And see *New Windsor v. Ronan* (1971), 3 ERC 1023 (S.D.N.Y.). It may be that the FAA could deny the use of navigable airspace to an airport authority that had not received federal assistance, on environmental grounds, under the Federal Aviation Act, 49 U.S.C. § 1348(a)(1970), though under that section the FAA is required to act to "insure the safety of aircraft and the efficient utilization of airspace", but may revoke an assignment of airspace on broad public interest grounds.

<sup>125</sup> 49 U.S.C. §§ 1651-1659 (1970).

<sup>126</sup> It has been suggested that the term "use" in this section might be taken to include the imposition, on the defined categories of public land, of excessive aircraft noise and other ecological disruptions as the result of an airport project, see Brennan, *op. cit.*, footnote 124, at p. 394.

<sup>127</sup> 49 U.S.C. §§ 1701-1742 (1970). This Act is an extension of the Federal Airport Act of 1946, 49 U.S.C. §§ 1101-1120 (1964), which it replaces.

system and master planning.<sup>128</sup> The Secretary is directed to prepare a national airport system plan and in so doing to consult with various officials of other Departments and to incorporate, where feasible, the views expressed on the preservation of environmental quality, such plan to govern all project applications under the Act.<sup>129</sup>

All airport development projects, to qualify for aid, must be approved by the Secretary.<sup>130</sup> And no approval is to be granted unless certain statutory conditions are met, including; satisfaction by the Secretary that fair consideration has been given to the interests of communities in or near which the project may be located,<sup>131</sup> and that, in respect of any project involving airport location, a runway extension or runway location,<sup>132</sup> there has been, firstly, an opportunity afforded for public hearings to consider the economic, social and environmental effects of the airport location and its consistency with local urban planning objectives,<sup>133</sup> secondly, where adverse effects upon natural resources and environmental quality are apparent, after consultation with other named cabinet officers, the Secretary has made a written finding, after a full review, that no feasible alternative exists and all possible steps have been taken to minimize the adverse effects,<sup>134</sup> and, finally, that the Governor of the State of location has certified in writing to the

<sup>128</sup> Ss 1701, 1713, 1714 and 1717.

<sup>129</sup> S. 1712.

<sup>130</sup> S. 1716(c).

<sup>131</sup> S. 1716(c)(3).

<sup>132</sup> Only runway extensions of a major character are subject to the second and third requirements, described herein, see ss 1716(c)(4) and 1716(e)(1).

<sup>133</sup> S. 1716(d)(1). Also, before submitting a formal application for federal aid, an applicant is required to notify the planning and development clearinghouse of the state and the region or metropolitan area within which the project is located and incorporate any resulting comments, which may include the extent to which the project is consistent with or contributes to the fulfillment of comprehensive planning for the state, region, metropolitan area or locality and objectives at these various levels in relation, *inter alia*, to appropriate land uses, conservation of natural resources, adequate open space, and high standards of design, and the extent to which the project significantly affects the environment, with consideration of the various factors to be dealt with in environmental statements under the terms of s. 102(2)(C) of the National Environmental Policy Act of 1969, see revised Circular No. A-95 (Feb. 9th. 1971), as amended by revised Circular No. A-95, Transmittal Memorandum No. 1 (July 26th, 1971), of the Office of Management and Budget, in the Executive Office of the President, promulgating regulations under the Demonstration Cities and Metropolitan Development Act of 1966, 42 U.S.C. § 3334 (1970). Title IV of the Intergovernmental Cooperation Act of 1968, 42 U.S.C. §§ 4231-4233 (1970), and s. 102(2)(C) of NEPA, Publ. L. No. 91-190 (1970), 42 U.S.C. §§ 4321-4347 (1970). And see, for further proposed federal-state consultation and co-ordination requirements, H.R. 4332, 92nd Cong., 1st Sess. (1971) (S. 992 is in identical terms), an Administration Bill to enact the National Land Use Policy Act of 1971, see ss 106 and 107.

<sup>134</sup> S. 1716(c)(4).

Secretary that the project will be so located, designed, constructed or operated so as to comply with applicable air and water quality standards.<sup>135</sup>

The third federal statute that is relevant in respect of impact evaluation of federally assisted airport projects is the National Environmental Policy Act of 1969,<sup>136</sup> already discussed,<sup>137</sup> which requires the preparation of a detailed environmental statement in respect of all major federal actions significantly affecting the quality of the environment.<sup>138</sup>

The FAA has established instructions for processing airport development actions affecting the environment pursuant to the authority and direction of these three statutes.<sup>139</sup> Their scope is defined broadly so as to include every airport development action "potentially involving federal aid"<sup>140</sup> and the significant effects on the quality of the environment of major federal actions, for which a statement is required under NEPA, are defined to include the likelihood of considerable controversy on environmental grounds and noticeable changes in the ambient noise level for a significant number of people.<sup>141</sup>

Where major airport developments are undertaken without federal aid, the establishment of statewide and regional planning agencies,<sup>142</sup> which has been encouraged by recent federal legislation,<sup>143</sup> will facilitate proper consideration of regional impacts, such

<sup>135</sup> S. 1716(e)(1).

<sup>136</sup> Publ. L. No. 91-190 (1970); 42 U.S.C. §§ 4321-4347 (1970).

<sup>137</sup> *Supra*, part IV.

<sup>138</sup> S. 102(2)(C).

<sup>139</sup> Interim Instructions for Processing Airport Development Actions Affecting the Environment, FAA Order No. 5050.2 (Dec. 7th, 1970), as amended by FAA Notice No. 5050.2 (June 25th, 1971).

<sup>140</sup> S. 5. The Airport Act and the FAA instructions also concern applications for federal aid other than of a financial nature, *viz.* requests for the transfer of federal lands for airport purposes, see s. 1723 of the Act and s. 5(3) of the FAA instructions. Other federal assistance, in the form of the transfer of surplus government airports to the civil airport system, is dealt with in the Surplus Property Act of 1944, as amended, 50 App. U.S.C. §§ 1622(g), 1622a-1622c (1970), and interim guidelines for the processing of applications under this Act will apparently be forthcoming.

<sup>141</sup> S. 9f(1) and (2)(a). For further discussion of the three relevant federal statutes, the FAA instructions, and Departmental practices, see Convisser, *An Environmental Approach to Air Transportation Needs: Guidelines for Federal Assistance*, and Bacon, *Airport Planning for Environmental Quality*, both papers appearing in *Aircraft and the Environment*, *op. cit.*, footnote 13, part 1, p. 240 and part 2, p. 58.

<sup>142</sup> For a review of state land use legislation, and proposals therefor, see Weinberg, *Regional Land-Use Control: Prerequisite for Rational Planning* (1971), 46 N.Y.U. L. Rev. 786. And see American Law Institute, *Model Land Development Code*, Tentative Draft No. 3 (1971), arts 7 and 8.

<sup>143</sup> See the Demonstration Cities and Metropolitan Areas Act of 1966, 43 U.S.C. § 3334 (1970), and the Intergovernmental Cooperation Act of 1968, 42 U.S.C. §§ 4231-4232 (1970). See also H.R. 4332, 92nd Cong., 1st Sess. (1971) (S. 992 is in identical terms), an Administration Bill to

as that of noise, in the development decision or state level review thereof.

Attempts, by resort to the courts, to enjoin the construction or extension of airports, usually on nuisance grounds,<sup>144</sup> have been largely unsuccessful.<sup>145</sup> And this is true even where a municipality has intervened by ordinance to declare airports to be nuisances or to zone them out.<sup>146</sup>

In Canada, the federal government plays a much more dominant role in airport location and expansion. Most of the major airports servicing jet traffic are owned and operated by the Ministry of Transport. The selection of new international airport sites has, therefore, been basically a discretionary decision for the federal authority, which is not confined significantly by any statutory limitations. But recent practice has been to engage in close consultation with provincial officials and the noise problem was certainly a prime consideration in the planning of the new Montreal International Airport, as is evident from the extensive land banking programme accompanying the establishment of the airport.<sup>147</sup> While there is a federal assistance programme for private airport development it too is not based on any specific legislative arrangement.<sup>148</sup>

All airports must be licensed by the Minister of Transport who "may" issue such licences and in so doing may impose conditions as he deems necessary in relation to such matters as the use and operation of the airport.<sup>149</sup> And the Minister has the apparently uncontrolled discretion to cancel or suspend an airport licence "at any time for any reason that to him seems sufficient".<sup>150</sup> These powers could conceivably be used to control the location of non-federal airports, but as to airport expansions it is not entirely clear that a new licence would be required except to the extent that the conditions of the original licence could no longer be complied with.<sup>151</sup>

enact the National Land Use Policy Act of 1971, providing for financial aid for the development and management of state land use programmes that meet certain federal requirements.

<sup>144</sup> But see *New Windsor v. Ronan*, *supra*, footnote 124.

<sup>145</sup> See, for example, *City of Heath v. Licking County Regional Airport Authority* (1967), 237 N.E. 2d 173 (Ohio Ct. C.P.). For a general discussion of the airport injunction cases see Tondel, *op. cit.*, footnote 110, at pp. 192-193. One attempt to force an airport authority to select an airport site, through mandamus proceedings, on the other hand, has also been unsuccessful, see *Application of Stoll v. Port of New York Authority* (1969), 305 N.Y.S. 2d 17 (Sup. Ct.), *aff'd* (1969), 301 N.Y.S. 2d 943 (App. Div.), motion for leave to appeal denied (1969), 306 N.Y.S. 2d 1025.

<sup>146</sup> *City of Heath v. Licking County Regional Airport Authority*, *ibid.*, and see Anderson, *American Law of Zoning* (1968), vol. 2, pp. 191-192.

<sup>147</sup> See *infra*, part VI, B, 4.

<sup>148</sup> See Ministry of Transport, Innovation, Annual Report, 1971, p. 10.

<sup>149</sup> Air Regulations, S.O.R./61-10, ss 300-302.

<sup>150</sup> S. 304.

<sup>151</sup> See s. 307.

## B. Vicinity Oriented.

### 1. Land Use Controls.

The traditional tools of land use regulation, namely subdivision control and zoning, preceded sometimes by a master or official plan, may be utilized so as to assure that the development around an airport is compatible with expected noise exposures. Of these techniques, zoning has often been relied upon, in airport areas, for the related but distinctive purpose of establishing a clearance zone, typically through building height restrictions, to eliminate hazards to flight safety on the take-off and landing of aircraft.<sup>152</sup> It is not intended to deal directly with this type of zoning since, though it may have the incidental effect of precluding some development that would be incompatible on noise sensitivity grounds, this is not in fact the purpose of such regulation.

There are two basic limitations or difficulties, experienced in both Canada and the United States, in employing land use controls to effectively alleviate urban encroachment on airports which is objectionable because of the impact of aircraft noise. Firstly, such controls do little to remedy the situation in respect of incompatible developments which are already established. Non-conforming uses are protected, in the event of supervening zoning by-laws or ordinances, and amortization provisions, where they exist,<sup>153</sup> only provide for the elimination of such uses after an extended period of time. Therefore, if an airport is already hedged in by a surrounding community the traditional land use control devices are useful only to the extent of preventing or controlling in-filling of open space

<sup>152</sup> These hazards may take the form of physical obstructions to flight paths and related safety margins, interferences with the operation of navigational aids and communications equipment, attractions to bird populations and sources of significant vision obscuring smoke or dust, see generally Civil Aviation Branch, Ministry of Transport. *Land Use in the Vicinity of Airports, Planning Guidelines for the Use of Land Outside the Airport Property Boundary* (Dec., 1970).

In Canada the Aeronautics Act, *supra*, footnote 86, s. 6(1)(j), authorizes the Minister of Transport to make regulations with respect to the height, use and location of structures in the vicinity of airports, "for purposes relating to navigation of aircraft and use and operation of airports", with compensation to be provided if injurious affection occurs (s. 6(10)). Height limitations have in fact been imposed around a number of Canadian airports see, for example, the Toronto Malton Airport Zoning Regulations, S.O.R., Cons./55, vol. 1, 37, as amended. In the United States airport hazard zoning has been exercised by the various states either directly or, more commonly, by delegation of the appropriate authority to municipalities, see Anderson, *op. cit.*, footnote 146, vol. 2, p. 186. Where federal funding is involved the sponsoring agency must give assurances that steps will be taken to prevent the establishment or creation of future airport hazards, see the Airport and Airway Development Act of 1970, 49 U.S.C. § 1718(3) (1970).

<sup>153</sup> The zoning enabling legislation in Canada does not generally provide for the amortization of non-conforming uses, see Milner, *An Introduction to Zoning Enabling Legislation* (1962), 42 Can. Bar Rev. 1, at p. 26.

and preventing the extension of existing uses or their conversion to even less compatible uses. Secondly, the forms of regulation are normally exercised at the local level so that, in the vicinity of the typical major airport facility, there will be several governmental bodies with the authority to impose noise-related land use controls. Those local government units which have no responsibility for the airport itself may not be inclined to respond to the noise problem in the way suggested by other more concerned bodies or the airport proprietor, which may have closely limited or no zoning power itself. Municipalities on the urban fringe are inevitably faced with pressures to increase their assessment and to provide land to accommodate population growth, which ends may be ill-served by zoning out a wide range of land uses around an airport. This fragmentation of jurisdiction also means that, even where municipalities do respond positively to the need for measures to control noise exposure, regional uniformity or co-ordination in approach are neither assured nor likely.

In most of the Canadian provinces, however, the majority of local land use planning decisions are subject to some form of approval at the provincial level.<sup>154</sup> This provides the opportunity for the introduction of regional or provincial policies and objectives. In Ontario advantage has been taken of this opportunity in order to assure that airport vicinity development proceeds only in accordance with provincially established<sup>155</sup> noise sensitivity plans.

The Ontario scheme was first introduced in relation to the Toronto International Airport, but has since been extended to other major airports in the province. No statutory amendments have been found necessary but rather controls are exercised pursuant to a policy statement of the Minister of Municipal Affairs.<sup>156</sup> The Minister has considerable discretion under the Ontario Planning Act<sup>157</sup> in giving the required approval to official plans, subdivision plans and redevelopment (urban renewal) proposals<sup>158</sup> and has indicated, in his policy statement, that with regard to the exercise

<sup>154</sup> *Ibid.*, at p. 32.

<sup>155</sup> There has been extensive co-operation, through the Ministry of Transport, in establishing this plan. In May of 1968 a policy statement was issued by the Department of Transport, as it was then designated, to the effect that as there was no federal constitutional authority to control land use in the vicinity of airports, except in relation to heights, the Department would confine itself to providing advice and noise contour maps in respect of airport vicinity zoning for other than prevention of flight hazards, see: Department of Transport Policy with respect to Land Use in the Vicinity of Airports used by Large Jet Aircraft (May, 1968).

<sup>156</sup> See Statement of the Minister of Municipal Affairs *re* Aircraft Noise at Toronto International Airport (Malton) (Oct. 9th, 1969). A constitutional challenge to this provincial initiative has been unsuccessful, see *Bramalea Consolidated Developments Ltd. v. A.G. for Ont. et al.*, [1971] 1 O.R. 252 (H.C.), *aff'd* [1971] 2 O.R. 570. And see McNairn, *op. cit.*, footnote 107, at pp. 444-445.

<sup>157</sup> R.S.O., 1970, c. 349.

<sup>158</sup> Ss 14, 33 and 22.



of these functions he will be guided by a noise sensitivity zone plan and land use compatibility table as described in the statement.<sup>159</sup> The plan shows CNR contours around the airport with the various zones between limited, by the terms of the accompanying table, to certain designated uses deemed compatible with expected noise exposures.

Under the Planning Act the Minister may be required, on application therefor, to transfer his approval or consent function in any particular matter to the Ontario Municipal Board.<sup>160</sup> Also it is the latter tribunal, rather than the Minister, that is charged with approving restricted area or zoning by-laws.<sup>161</sup> One might well question, therefore, whether the terms of the policy statement can effectively govern the approval of all relevant local regulatory action. In practice, however, the Board does have regard to demonstrable general government policy, reserving to itself the right to interpret and apply that policy to a particular set of facts,<sup>162</sup> a practice that is no doubt reinforced by the existence of a right of appeal from the Board to the provincial cabinet.<sup>163</sup> While the Board, unlike the Minister in exercising comparable statutory functions, proceeds to decisions following notice to interested parties and a hearing, the Ontario Court of Appeal has held that the considerations that must go into its ultimate decisions make it an administrative rather than a judicial body,<sup>164</sup> a result that lends support to the Board practice in respect of government policy.

The necessary limitation of this administrative solution to the problems of divided jurisdiction is that, because planning initiatives remain with local authorities,<sup>165</sup> there is no way to force the adoption or amendment of an official plan or the initiation of a zoning by-law amendment where such action would be required to achieve conformity with the provincial noise sensitivity land use scheme.<sup>166</sup>

<sup>159</sup> The provincial government is relying upon at least two of these same statutory powers as one method of giving force to regional development guidelines for the Toronto-Centred Region, see *Design for Development: The Toronto-Centred Region* (May, 1970), as amended by *Design for Development: A Status Report of the Toronto-Centred Region* (Aug., 1971), see esp. p. 4 of the latter document.

<sup>160</sup> S. 44.

<sup>161</sup> S. 35.

<sup>162</sup> See *In the Matter of the Official Plan of the Township of Caledon*, OMB File No. P9239-69 (Sept. 29th, 1970).

<sup>163</sup> Ontario Municipal Board Act, R.S.O., 1970, c. 323, s. 94.

<sup>164</sup> *Re Cloverdale Shopping Centre Ltd.* (1968), 57 D.L.R. (2d) 206 (Ont. C.A.).

<sup>165</sup> However the Minister can, by order, assume zoning powers with respect to any land in Ontario, see the Planning Act, *supra*, footnote 157, s. 32(1)(a).

<sup>166</sup> Compare the noise planning control policy adopted by the Surrey planning authority in respect of the land surrounding Gatwick Airport near London which, because of the English land use control system based on development control, can be applied by the county-wide planning authority in respect of any development of land within the described area, see

In Quebec, however, certain further steps have been taken and, through the necessary legislation, a number of municipalities in the vicinity of the new Montreal International Airport, now under construction, have been amalgamated into a single municipality, the City of St. Scholastique, and the Minister of Municipal Affairs has been given the responsibility of preparing a master plan for a planning area covering the new city and thirty-three other municipalities near the airport.<sup>167</sup> The various municipalities are then required to adopt conforming local plans and implementing by-laws, in both cases subject to the approval of the Minister, all construction and subdivision being prohibited in the meantime.<sup>168</sup> This direct provincial legislative intervention was, no doubt, facilitated by the fact that the new airport site is some distance from the metropolitan centre and the area is relatively undeveloped. The provincial response has also been influenced by the federal expropriation, and proposed management, of the most noise sensitive sector.<sup>169</sup>

In Canada, unlike the United States, there is no recognized constitutional principle that zoning may be so restrictive as to constitute a taking of property rights requiring compensation.<sup>170</sup> Indeed, in most provinces there is no statutory recognition of such a limitation so that a municipality may introduce open space or parkland zoning confining land to open space, public park or recreational uses, though provincial agencies for zoning by-law approval may only give assent for a limited period of time to such a by-law to enable the municipality to commence an acquisition programme.<sup>171</sup> It may be legally possible, therefore, for a municipality to introduce open space zones or, with the likelihood of greater acceptance on administrative review, agricultural zones around an airport as a method of precluding development.

The American courts have not always looked favourably on local airport hazard zoning, concluding in a number of instances that the power of eminent domain must be exercised in the circumstances.<sup>172</sup> Zoning is justifiable, in general, as an exercise of the

Sibert, *Aircraft Noise and Development Control* (1969), 55 *Journal of the Town Planning Institute* 149. For comparisons between the English and American systems of land use control see Haar, *Law and Land* (1964).

<sup>167</sup> See *An Act Respecting the Vicinity of the New International Airport, S.Q.*, 1970, c. 48, esp. ss 1 and 19.

<sup>168</sup> See ss 20-23.

<sup>169</sup> See *infra*, part VI, B, 4.

<sup>170</sup> But see s. 1(a) of the Canadian Bill of Rights, R.S.C., 1970, app. III, which recognizes a right not to be deprived of property except by due process of law. This statute, however, applies only in respect of federal but not provincial law, is subject to being excluded from application in respect of a particular law by an appropriate declaration and has not been given a very large scope of operation by the courts (see generally Tarnopolsky, *The Canadian Bill of Rights* (1966)).

<sup>171</sup> See Milner, *op. cit.*, footnote 153, at pp. 8-9.

<sup>172</sup> See, for example, *Roark v. City of Caldwell* (1964), 394 P. 2d

police power of the state but as such it must meet tests of public welfare purpose and reasonableness in application, which latter necessitates an inquiry as to whether a particular land owner is so unfairly burdened that the regulation amounts in effect to a taking.<sup>173</sup> Given the reluctance of many courts to support airport hazard zoning, it is unlikely that noise dictated airport zoning will be consistently upheld.

Open space zoning or agricultural zoning when resorted to outside the airport environment may meet difficulties in securing judicial support where, for example, land has significant non-agricultural value.<sup>174</sup> In the airport zoning situation this may well be the case given the usual effect of an airport upon land values for certain industrial and commercial uses. On the other hand, zoning to permit only these last named uses, to the exclusion of residences, is a form of non-cumulative zoning, differing from the usual cumulative zoning provisions which permit uses of more restricted districts in districts of less restricted uses, for example, residences in industrial zones. The courts, when faced with this form of zoning, have usually been able to conclude that the exclusion of the higher uses bears a substantial relationship to the promotion of the public health, safety, morals or general welfare.<sup>175</sup> Only if there is no reasonable likelihood of demand for the land for industrial or commercial purposes will the validity of such non-cumulative zoning be denied, a situation that will not be usual around a major thriving airport.

Despite these uncertainties, the project sponsor of an airport development, for which federal aid is sought under the Airport and Airway Development Act,<sup>176</sup> must provide an assurance to the Secretary of Transportation, as a pre-condition to project approval, that appropriate action, including the adoption of zoning laws, has been or will be taken to restrict the use of land in the immediate vicinity of the airport to purposes compatible with normal airport operations, including take-offs and landings.<sup>177</sup> The language of the rel-

641 (Sup. Ct. Idaho), and *Indiana Toll Road Commission v. Jankovich* (1963), 193 N.E. 2d 237 (Sup. Ct. Ind.), cert. denied (1965), 379 U.S. 487, but compare *Waring v. Peterson* (1962), 137 So. 2d 268 (Fla. Dist. Ct. App.), and *Baggett v. City of Montgomery* (1963), 160 So. 2d 6 (Sup. Ct. Ala.). For further references see Tondel, *op. cit.*, footnote 110, p. 196, footnotes 80-83.

<sup>173</sup> See *Village of Euclid v. Ambler Realty Co.* (1926), 272 U.S. 365, and *Nectow v. City of Cambridge* (1928), 277 U.S. 183.

<sup>174</sup> See Note, Protection of Environmental Quality in Nonmetropolitan Regions by Limiting Development (1971), 57 Iowa L. Rev. 126, at p. 144.

<sup>175</sup> See *People ex rel. Skokie Town House Builders, Inc. v. Village of Morton Grove* (1959), 157 N.E. 2d 33 (Sup. Ct. Ill.), and the airport zoning cases of *Township of Hickory v. Chadderton* (1967), 10 Av. Cas. 17, 686 (Pa. Ct. C.P.), and *Smith v. County of Santa Barbara* (1966), 52 Cal. Repr. 292 (Dist. Ct. App.).

<sup>176</sup> 49 U.S.C. §§ 1701-1742 (1970).

<sup>177</sup> S. 1718(4).

evant sub-section and its immediate context indicate that something more than the normal airport hazard zoning was intended.<sup>178</sup> It has been argued elsewhere that state airport zoning enabling legislation ought to be enacted to specifically confer the power to zone out uses incompatible with the operation of an airport because of the noise factor and that such legislation should be supportable, notwithstanding some of the airport hazard zoning decisions, under the police power, given the compelling public purpose feature of airports.<sup>179</sup> To the extent, however, that it may be necessary to preclude all reasonable uses of particular parcels of land, the power of eminent domain may have to be resorted to.

The lack of sufficiently stringent and comprehensive standards of land use control, around a single airport, due to the multiplicity of local jurisdictional bodies normally involved in exercising such control, remains a problem in most states. However, in some isolated cases, regional and statewide authorities have been given airport zoning powers by special legislation.<sup>180</sup> Statewide planning jurisdiction, in relation to development problems of state or regional concern generally, is being assumed or proposed in a number of states<sup>181</sup> and this could provide state level standards or review in relation to land use control measures in the vicinity of airports.<sup>182</sup>

## 2. Conditional Spending.

Many new residential developments depend, for their attractiveness to purchasers, upon the support of a government lending institution, through the provision either of direct mortgage financing or, more commonly, mortgage insurance, in either case resulting usually in a larger loan and more favourable terms than could be obtained in an uninsured borrowing from a conventional mortgage lender. Such government institutions, in both Canada and the United States, are also increasingly involved in direct subsidization of low income housing. These government housing agencies are then in a position to insist upon the observance of various land use control conditions to secure the realization of sound community planning objectives. This power of the purse has in fact been used at the federal level to restrict incompatible residential encroachment upon airports.

<sup>178</sup> See the full text of s. 1718(3) and (4).

<sup>179</sup> Seago, *The Airport Noise Problem and Airport Zoning* (1968), 28 Md. L. Rev. 120.

<sup>180</sup> See Harper, *The Airport Location Problem: The Case of Minneapolis-St. Paul* (1971), 38 I.C.C. Prac. J. 550, at p. 569, and Seago, *op. cit.*, *ibid.*, at pp. 130-131.

<sup>181</sup> See Weinberg, *op. cit.*, footnote 142.

<sup>182</sup> See American Law Institute, *Model Land Development Code*, *op. cit.*, footnote 142, esp. ss 7-201 to 7-208, and H.R. 4332, 92nd Cong., 1st Sess. (1971) (S. 992 is in identical terms), An Administration Bill to enact the National Land Use Policy Act of 1971, see esp. s. 104(a)(3).

The United States Department of Housing and Urban Development, acting under the authority of its constitutive Act<sup>183</sup> and the National Environmental Policy Act of 1969,<sup>184</sup> has issued a policy statement indicating that the Department will discourage the construction of new dwelling units on sites which have unacceptable noise exposure by withholding all forms of assistance.<sup>185</sup> Noise exposure standards have been promulgated in terms of three basic categories; unacceptable (above forty NEF), discretionary (thirty to forty NEF) and acceptable (less than thirty NEF and, in the case of new and rehabilitated residential construction, satisfying as well specified interior noise exposure standards).<sup>186</sup> Any exception to approve a site within the first category must be accompanied by an environmental statement as defined in the National Environmental Policy Act and secure the approval of the Secretary of the Department.<sup>187</sup>

The Federal Housing Administration (FHA), which comes within the Department of Housing and Urban Development, imposes extensive requirements as a condition of approving development proposals that call for FHA assistance pursuant to the National Housing Act.<sup>188</sup> The FHA instructions to the Underwriting Division of its field offices, which process all applications for mortgage commitments under the Act, include directions relating to the analysis of residential properties near airports in terms of expected noise exposure.<sup>189</sup> However, the potential adverse effects of aircraft noise, which may preclude federal support, are treated as limited largely to effects upon the continuing marketability of the property, which may not be an accurate reflection of the noise impact.<sup>190</sup>

<sup>183</sup> Department of Housing and Urban Development Act of 1965, 42 U.S.C. §§ 3531-3537 (1970).

<sup>184</sup> Publ. L. No. 91-190 (1970); 42 U.S.C. §§ 4321-4347 (1970).

<sup>185</sup> HUD Circular No. 1390.2, Noise Abatement and Control: Departmental Policy, Implementation Responsibilities and Standards (Aug. 4th, 1971), as amended by Circular No. 1390.2 CHG 1 (Sept. 1st, 1971).

<sup>186</sup> *Ibid.*, pp. 8-9.

<sup>187</sup> *Ibid.* Applications for HUD housing programme assistance, involving new construction projects of a specified magnitude, must also be submitted to the planning and development clearinghouses of the appropriate state and region or metropolitan area for assessment and review, in terms of consistency with state and areawide development plans, and identification of environmental concerns, see revised Circular No. A-95, as amended, of the Office of Management and Budget, *op. cit.*, footnote 133, see esp. s. 7.

<sup>188</sup> 12 U.S.C. §§ 1701-1750 (1970). And, for further reference, see Bartke, *The Federal Housing Administration: Its History and Origins* (1967), 13 Wayne L. Rev. 651.

<sup>189</sup> FHA Manual, vol. 7, book 1, as amended to May, 1970 (FHA Underwriting Handbook, Home Mortgages), ss 71453-71453.9. These instructions to field offices would seem to require modification in order to conform them with the Departmental policy statement on noise, referred to *supra*, footnote 185.

<sup>190</sup> The efforts of the FHA are criticized in Yannacone and Frangella,

In Canada, the Central Mortgage and Housing Corporation (CMHC) constituted under the National Housing Act<sup>191</sup> has issued a Site Planning Handbook,<sup>192</sup> which contains both recommendations and requirements in relation to proposals submitted for financing under the Act.<sup>193</sup> The existing restrictions in respect of housing adjacent to airports,<sup>194</sup> now in the course of revision, have the effect of denying financing in defined rectangular zones projected from the ends of runways.<sup>195</sup> The proposed amendments will provide for a much more sophisticated analysis of airport noise considerations based on NEF contours.

A Ministry of State for Urban Affairs, which brings within it the CMHC, has recently been created,<sup>196</sup> but the role which this new department will play is not yet clear in general terms let alone in relation to the particular problem of airport noise.

### 3. Building Regulation.

While airport vicinity land use controls have the object of preventing incompatible uses, soundproofing requirements for buildings have the object of attempting to make incompatible uses compatible or, at the very least, more compatible by reducing interior noise levels. The approach is likely to be most effective in relation to those uses of land that involve exclusively or essentially indoor activities.

There are various noise reducing materials and construction techniques that are available.<sup>197</sup> Since sound is more readily trans-

Environmental Concern — The Law and Aviation, in Cerchione, Rothe and Vercellino (eds), *Master Planning the Aviation Environment* (1970), pp. 127-128, and in Jamaica Bay and Kennedy Airport Study, *op. cit.*, footnote 123, vol. 2, p. 108.

<sup>191</sup> R.S.C., 1970, c. N-10.

<sup>192</sup> CMHC, *Site Planning Handbook* (1970).

<sup>193</sup> Conditions imposed by CMHC have had a very important and far-reaching influence on building standards and subdivision design in Canada, see Milner, *An Introduction to Subdivision Control Legislation* (1965), 43 Can. Bar Rev. 49, at pp. 88-91.

<sup>194</sup> S. E3.

<sup>195</sup> For jet runways the zone is 4 miles from the start of take-off and 2000 feet on each side of the centre line of the runway and its projection (subs. (b)(i)), while for non-jet runways it is 5000 feet from both ends of the runway and 1000 feet on each side of the centre line of the runway and its projection (subs. (a)). It is also provided, though the authority has not been utilized of late, that the Corporation may apply recommendations of the Ministry of Transport with respect to a particular airport and exclude housing, "in those zones where noise will seriously affect residential development" (subs. (b)(ii)).

<sup>196</sup> See Proclamation, 105 Can. Gazette, part 1, no. 28, p. 1768 (July 10th. 1971).

<sup>197</sup> See U.S. Department of Housing and Urban Development, *A Guide to Airborne, Impact and Structure Borne Noise Control in Multifamily Dwellings* (1967) and Goodfriend-Ostergaard Associates, *Noise-Reducing Construction and Cost Estimating in High Noise Areas* (1970), being a technical supplement to the MANAP Kennedy Airport Study, *op. cit.*, footnote 7, pp. 38-61.

mitted through windows than other parts of a building, particular attention must be directed to fenestration. The most effective method, in this regard, is to drastically reduce window space and introduce sealed double glazed units, in either case necessitating, in most climates, the use of air conditioning, and hence introducing an added expense.

While the costs of soundproofing are high, it has been recommended, after careful technical study, as economically feasible and worthwhile in terms of expected interior noise reduction in relation to new construction in the vicinity of the John F. Kennedy International Airport in New York.<sup>198</sup> The same study came up with the novel alternative, which is claimed to be cheaper though requiring further testing, of soundmasking, that is introducing a homogeneous interior background noise through an electronic sound system in order to soften unwanted aircraft noise.<sup>199</sup> Other reports have recommended generally the inclusion of noise insulation requirements in building codes.<sup>200</sup>

In the absence of an amendment to municipal by-law or ordinance enabling legislation, it will not be very clear, in most North American jurisdictions, as to what is the appropriate source of authority, if any, for local soundproofing requirements. They might take the form of additions to the building code or by-law, the restricted area or zoning by-law or they might be introduced pursuant to the general power of a municipality.<sup>201</sup>

While soundproofing may logically be subsumed under the title of building controls, it would be impracticable to require it of all structures, or even specified categories of structures, everywhere within the limits of a municipality regardless of the anticipated external noise. Yet the typical enabling statute does not usually contemplate the limitation of building code provisions to defined

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<sup>198</sup> In relation to land within the 30 NEF contours, see *ibid.*, pp. 16 and 18.

<sup>199</sup> *Ibid.*, pp. 17, 19, 107 and 108 and see Goodfriend-Ostergaard Associates, *op. cit.*, footnote 197, pp. 58-59.

<sup>200</sup> See, for example, East Central Florida Regional Planning Council, Metropolitan Aircraft Noise Abatement Policy Study of Cape Kennedy Regional Airport, Melbourne, Fla., Rep. No. HUD/DOT IANAP-71-2 (June, 1971), prepared for the U.S. Departments of Transportation and Housing and Urban Development, hereinafter cited as MANAP Cape Kennedy Regional Airport Study, pp. 37, 47 and 71; Goedlike *et al.*, A Proposal for a Ten Point Program by the Inglewood City Council for the Alleviation of Noise Pollution in Inglewood, Cal. (1968), p. 9 (this report is discussed in Goedike, Communities Act to Reduce the Impact of Jet Aircraft Noise, in Aircraft and the Environment, *op. cit.*, footnote 13, part 2, p. 71); Report from the House of Representatives Select Committee on Aircraft Noise, *op. cit.*, footnote 120, pp. 44-45; Jamaica Bay and Kennedy Airport Study, *op. cit.*, footnote 123, vol. 1, p. 6.

<sup>201</sup> These options are examined in the New York context in Cleary, Gottlieb, Steen and Hamilton, Certain Legal Aspects of Required Soundproofing in High Noise Areas (1970), being a technical supplement to the MANAP Kennedy Airport Study, *op. cit.*, footnote 7, see app. II.

areas.<sup>202</sup> And, if there is any doubt, the courts will usually be inclined to resolve it in favour of the property owner, construing the delegated legislative authority in the parent Act strictly, against a municipality, so as to preserve traditional common law rights.<sup>203</sup> In this case, therefore, the creation of distinct noise attenuation districts, with special soundproofing requirements therein, would probably be held to be unauthorized in most jurisdictions.<sup>204</sup> A municipality-wide requirement relating to soundproofing would make sense only if it could be framed adequately in terms of a performance standard, specifying the maximum noise level that would be permitted to penetrate structures from external sources.<sup>205</sup>

Likewise, it is doubtful if the typical American zoning enabling statute,<sup>206</sup> which includes the power to regulate the height, bulk and area of buildings, would permit the inclusion of soundproofing requirements.<sup>207</sup> In the Canadian provinces, however, the incorporation of noise insulation features in zoning by-laws would appear to be authorized by the usual enabling provision which extends to the regulation of such matters as the cost or type of construction,

<sup>202</sup> Consider for example, s. 38(1) of the Ontario Planning Act, *supra*, footnote 157. Paragraph 12 thereof provides generally for provisions, "for regulating the construction, alteration or repairs of buildings", but it has been observed that such regulation must apply to all buildings wherever situated, see Rogers, *The Law of Canadian Municipal Corporations* (2nd ed., 1971), p. 834 (but see s. 38(1), paras 13 and 14, and s. 38(2) of the Ontario Planning Act). And see Cleary, Gottlieb, Steen and Hamilton, *op. cit.*, footnote 201, app. II, p. 7. Historically, there has been one class of by-law powers relating to the construction of buildings which clearly provides for application to defined areas within a municipality, that is that relating to fire protection areas, within which the erection of all wooden buildings may be prohibited, see, for example, the Ontario Municipal Act, R.S.O., 1970, c. 284, s. 354(1), para. 33. And *cf.* the Planning Act, *ibid.*, s. 38(1), paras 13 and 14.

<sup>203</sup> See, for example, *Pickering v. Godfrey* (1958), 14 D.L.R. (2d) 520, esp. at p. 524 (Ont. C.A.), and *Nance v. Mayflower Tavern Inc.* (1944), 150 P. 2d 773, at pp. 774-775 (Sup. Ct. Utah).

<sup>204</sup> There is another respect in which noise attenuation districts may be held to be unauthorized as part of building by-laws and that is that the latter have often been viewed as limited, by the enabling statutes, to requirements strictly to promote public safety, usually in terms of structural safety, and fire protection (see Rogers, *op. cit.*, footnote 202, pp. 833-834), objects which do not easily encompass the rationale for soundproofing.

<sup>205</sup> Performance standards are suggested in Ross, *Strategies of Noise Abatement Through Land Use, in Aircraft and the Environment*, *op. cit.*, footnote 13, part 1, p. 261, at p. 265, and have been included in a U.S. Department of Housing and Urban Development policy statement designed to provide noise exposure standards for projects involving Departmental assistance, see HUD Circular No. 1390-2, as amended, *op. cit.*, footnote 185, p. 9.

<sup>206</sup> See Mandelker, *Managing Our Urban Environment* (2nd ed., 1971), p. 675.

<sup>207</sup> See Cleary, Gottlieb, Steen and Hamilton, *op. cit.*, footnote 201, app. II, p. 4. A stronger case can be made for such authority in jurisdictions which follow the model of the Standard State Zoning Enabling Act (1926) which, in s. 2, permits the regulation of the construction of buildings.



external design and the character of buildings.<sup>208</sup> But this method of introducing soundproofing requirements may be viewed, by some municipalities, as unduly cumbersome, certainly by comparison to proceeding pursuant to other municipal powers, due to the procedural restraints in the adoption of zoning by-laws, including in most provinces the need for provincial level approval.<sup>209</sup>

The general by-law authority of municipalities, though framed broadly as comprising such measures as are deemed expedient in the interest of health, safety, morality and welfare,<sup>210</sup> may well be subject to a narrow construction in light of the usual specific and extensive character of coexisting enumerated by-law powers.<sup>211</sup> Finally, it should be mentioned that the fragmentation of local authority, which diminishes the effectiveness of land use control techniques in the vicinity of airports, will similarly inhibit the development of a consistent and comprehensive soundproofing scheme for new buildings in the vicinity of an airport. If soundproofing is to be accepted as an appropriate airport noise control technique, remedial legislation will be necessary in many jurisdictions, therefore, both to establish or clarify the authority to create noise insulation areas and, possibly, to facilitate inter-local co-ordination or regional, state and province wide or national solutions.

In Canada, the National Building Code, which has no force of its own but must be adopted locally,<sup>212</sup> has requirements relating to airborne sound insulation between adjoining dwelling units<sup>213</sup> but does not provide for protection against external noise. The only mandatory code is that of British Columbia,<sup>214</sup> but it simply incorporates portions of the national code and therefore does not deal with soundproofing to any greater extent than the latter code.

Noise insulation may be required, through provincial-level controls, in the vicinity of major Ontario airports in relation to certain classes of new buildings in various noise sensitivity zones. The relevant requirements are contained within the land use com-

<sup>208</sup> See Milner, *op. cit.*, footnote 153, at p. 15. And, for a particular example, see the Ontario Planning Act, *supra*, footnote 157, s. 35(1), para. 4.

<sup>209</sup> See Milner, *op. cit.*, *ibid.*, at p. 32.

<sup>210</sup> For example, the Ontario Municipal Act, *supra*, footnote 202, s. 242.

<sup>211</sup> See Cleary, Gottlieb, Steen and Hamilton, *op. cit.*, footnote 201, app. II, pp. 8-9.

<sup>212</sup> As a result of local adoption the Code is in fact in use, in whole or in part, in areas affecting 70 to 80 percent of the Canadian population. For a good discussion of the function, content, history and use of the Code see Legget, *The National Building Code of Canada: A General Review* (1966), 49 *Engineering Journal* 38.

<sup>213</sup> See s. 11 of National Research Council, *Canadian Code for Residential Construction (Residential Standards)* (1970), which reproduces part 9 of the National Building Code of Canada, 1970, together with additional requirements considered necessary in regulating residential construction under the National Housing Act (see p. iii).

<sup>214</sup> S. 719A of the Municipal Act, R.S.B.C., 1960, c. 255, as amended by S.B.C., 1971, c. 38.

patibility table, accompanying the policy statement of the Minister of Municipal Affairs of October 9th, 1969.<sup>215</sup> The type of noise insulation is not specified, however, and the Minister must simply be assured that the "needed noise control features are included in the building design". The meaning of this clause has not been elaborated.<sup>216</sup>

If an airport is already highly impacted by development, noise insulation may only offer widespread protection if it is directed that it be incorporated in existing buildings, as well as new structures. However, the costs of effectively soundproofing existing buildings will, in most cases, be prohibitive.<sup>217</sup> Indeed, the validity of such a requirement under the United States Constitution has been questioned as beyond the police power of the states, to the extent that privately owned structures are included.<sup>218</sup>

One method of tackling the problem in relation to existing dwellings is through government grants towards the cost of noise insulation.<sup>219</sup> Such a scheme has been introduced in the United Kingdom in the limited context of the Heathrow Airport environs,<sup>220</sup> pursuant to a recommendation of the Committee on the Problem of Noise.<sup>221</sup> Another possible form of direct action by the state is acquisition of land in the most noise sensitive areas and the resale or rental of the property after the installation of noise insulation, or resale on the condition that the buildings be soundproofed.<sup>222</sup>

#### 4. *Land Acquisition and Management.*

Land in the vicinity of an airport may be acquired, finances permitting, by an appropriate public authority and then held or

<sup>215</sup> Discussed *supra*, part VI, B, 1.

<sup>216</sup> In a somewhat similar fashion, in the United Kingdom, development approval for land in the vicinity of a major airport has been conditioned by the local planning authority upon the inclusion of noise insulation, in accordance however with precise technical requirements, as part of a noise related planning policy, see Sibert, *op. cit.*, footnote 166.

<sup>217</sup> Consider, for example, the costs projected for soundproofing within the 40 NEF contour in areas around Boston's Logan Airport, see Franken and Standley, *op. cit.*, footnote 7, at pp. 103-105.

<sup>218</sup> MANAP Kennedy Airport Study, *op. cit.*, footnote 7, p. 14, and Cleary, Gottlieb, Steen and Hamilton, *op. cit.*, footnote 201, app. I.

<sup>219</sup> This approach has been recommended in respect of certain classes of building within the 30 NEF contour around the JFK International Airport in New York, see MANAP Kennedy Airport Study, *op. cit.*, footnote 7, p. 18.

<sup>220</sup> See the London (Heathrow) Airport Noise Insulation Grant Scheme, S.I. 1966/424, as amended by S.I. 1968/1842. A similar scheme is soon to be introduced in respect of the area around Gatwick Airport.

<sup>221</sup> See Committee on the Problem of Noise, *op. cit.*, footnote 12, pp. 78-79.

<sup>222</sup> The MANAP Study on the Cape Kennedy Regional Airport recommends as a strategy proposal the selective purchase, by the airport authority, of developed properties within the 35-50 NEF contours, their sound insulation and sale or lease with appropriate complaint waivers and lease restrictions, see MANAP Cape Kennedy Regional Airport Study, *op. cit.*, footnote 200, p. 69.

disposed of on terms which assure that it will be maintained, developed or redeveloped in a manner that is compatible with existing or projected noise exposures. This tactic is most attractive in the case of new airport sitings, in which case "noise lands" may be acquired together with airport facility lands at a time when little development has taken place and the inflationary pressures on land prices, typically exerted by a major operating airport, have not yet begun. An established airport, already heavily impacted by development, is in a less advantageous position. The interests acquired by the public authority may consist of leasehold, easements or full title in fee, in each case obtained either immediately or through various delayed acquisition arrangements.<sup>223</sup> Any or all of these interests may be obtained by purchase in the market but, if any large scale acquisition programme is in contemplation, powers of compulsory purchase will normally be necessary.

At the site of the new Montreal International Airport the Canadian government, in March, 1969, initiated the largest public land banking programme ever undertaken in association with the development of a major airport facility. The federal government expropriated a total of 88,000 acres to the north-west of the City of Montreal, only 18,000 of which will be ultimately used for the airport proper.<sup>224</sup> The remaining 70,000 acres were acquired to assure the control and development of all land potentially exposed to airport operations so as to protect the investment in the airport against the encroachment of incompatible development, to enable the provision of adequate assistance for those required to re-locate and to give direction to and realize a public benefit from the stimulus to regional development and land values generated by the airport.<sup>225</sup>

As the basis for the development of the lands surrounding the airport site, the concept of an "airport operational envelope" has been adopted, in a preliminary Ministry of Transport report.<sup>226</sup> The envelope, which includes nearly all of the expropriated area, is described, subject to possible later contraction, so as to assume the worst conditions and therefore to include the maximum area that, it is felt, should be subject to long term federal land use and management controls. For new development, the land use restrictions therein would be designed to avoid hazards to flight created by birds and to exclude development incompatible with aircraft

<sup>223</sup> See Note, Protection of Environmental Quality in Nonmetropolitan Areas by Limiting Development, *op. cit.*, footnote 174, at pp. 153-154.

<sup>224</sup> See Bureau d'Aménagement du Nouvel Aéroport International de Montréal (BANAIM), The Use and Management of Land in the Vicinity of the New Montreal International Airport Based on Technical Constraints (March, 1971), pp. 1 and 3.

<sup>225</sup> See *ibid.*, pp. 3-5.

<sup>226</sup> *Ibid.*, pp. 7-8. The report was prepared by BANAIM, a specialized agency established by the Federal Ministry of Transport.

noise. It is assumed that noise exposure of the order of 100 CNR will occur within the envelope and detailed noise-related restrictions, including the prohibition of all residential development, are proposed on this basis. In addition some more limited controls beyond the envelope are envisaged in areas within ninety-five CNR, though provincial zoning initiatives would apparently be relied upon in this regard.<sup>227</sup> A scheme of short to long term leasing and staged re-location of presently existing incompatible uses is also described.<sup>228</sup> Finally, it is recommended that the responsible federal land development agency be governed by joint federal-provincial regional development objectives and that federal and provincial land use controls within the airport region be closely integrated.<sup>229</sup> In fact the province of Quebec has co-operated closely through the freezing of construction and subdivision around the airport proper,<sup>230</sup> the constitution of a new municipality of St. Scholastique taking in most of the expropriated area, the creation of an expanded planning area, including thirty-four municipalities around the site, for which the Minister of Municipal Affairs must prepare a plan by December 31st, 1971<sup>231</sup> to govern the municipal plans required thereafter, and the establishment of a special agency to engage in the regional planning process.<sup>232</sup>

In the United States there are a number of impediments to the Montreal approach which do not exist in Canada. Firstly, the typical civil airport operator is not the federal government, but regional, state or local authorities, which are much less favourably positioned in terms of access to revenues, though they may qualify for federal grants in aid for airport construction.<sup>233</sup> Secondly, an airport operator may not have adequate authority to purchase or exercise the power of eminent domain or condemnation, though it appears that most operators do in fact possess such powers.<sup>234</sup>

<sup>227</sup> *Ibid.*, pp. 8-9.

<sup>228</sup> *Ibid.*, p. 15 *et seq.*

<sup>229</sup> *Ibid.*, pp. 22-23.

<sup>230</sup> See An Act to Promote the Development of the Site and Neighbourhood of a New International Airport in the Province of Quebec, S.Q., 1968, c. 57, s. 1; An Act respecting the Board for the Development of the Neighbourhood of a New International Airport in the Province of Quebec, S.Q., 1969, c. 57, s. 2, and An Act Respecting the Vicinity of the New International Airport, S.Q., 1970, c. 48, s. 23.

<sup>231</sup> An Act Respecting the Vicinity of the New International Airport, *ibid.*

<sup>232</sup> *Viz.* Service d'aménagement du territoire de la région aéroportuaire (SATRA), see Ministère des Affaires Municipales, *Satara Vous Informe* (1971).

<sup>233</sup> See the Airport and Airway Development Act, 49 U.S.C. §§ 1701-1742 (1970), discussed *supra* in part VI, A.

<sup>234</sup> See HUD, *Airport Environs: Land Use Controls* (1970), p. 13. For an example of an enabling provision permitting the public acquisition, in the vicinity of airports, of airspace, air easements or fee simple subject to a limited right of user by the former owner, see Cal. Civ. Proc. Code, §§ 1239.2-1239.4 (West, 1967).

Thirdly, there are federal and, in most cases, state constitutional limitations on the power of eminent domain.<sup>235</sup> Generally speaking condemnation must be for a public use and just compensation paid.<sup>236</sup> Consistent with the need for establishing public use, excess condemnation will not be permitted.<sup>237</sup> However, more land than is needed for a particular public work may sometimes be lawfully acquired, in particular on the theories, amongst others, of protecting the public work and, possibly, recouping the investment, both of which would seem to fit the situation of condemnation of airport "noise lands" in addition to facility lands.<sup>238</sup> In any event, public use might be seen to include the avoidance of undue noise annoyance particularly since, from a practical point of view, public reaction to noise has had the effect of curtailing airport operations and expansion in many locations.

If the area around an established airport is heavily built up, the costs of large scale property purchases will likely be very large. Existing federally funded urban renewal programmes, in Canada and the United States, will not usually be of assistance to local governments for this purpose since they require that areas subject to urban renewal be sub-standard or blighted,<sup>239</sup> a condition much more typical of city centres than the usual extra-urban airport sites. A more likely source of federal funding, in the United States, is the open space programme of the Department of Housing and Urban Development.<sup>240</sup>

In some cases it may be less expensive for the acquiring authority to purchase easements,<sup>241</sup> rather than fee simple interests, thus

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<sup>235</sup> See Nichols, *The Law of Eminent Domain* (3rd ed. rev., 1964), vol. 1, p. 420.

<sup>236</sup> *Ibid.*, pp. 3-7. Recently, however, "public use" has been equated with the wider expression "public welfare" and considerable deference has been given to state determinations thereof, see, for example, *Berman v. Parker* (1954), 348 U.S. 26.

<sup>237</sup> For a case, on this point, involving the condemnation of land adjoining an airport, see *City of Carlsbad v. Ballard* (1963), 378 P. 2d 814 (New Mex. Sup. Ct.).

<sup>238</sup> See Note, *Excess Condemnation — To Take or Not to Take — A Functional Analysis* (1969), 15 N.Y. Law Forum 119. And, in the airport context, see *New Windsor v. Ronan*, *supra*, footnote 124.

<sup>239</sup> National Housing Act, R.S.C., 1970, c. N-10, s. 22, and The Housing Act, 42 U.S.C. § 1460(a) (1970). The eligibility requirements imposed pursuant to the latter Act include adverse influences from noise but, to qualify for assistance, this condition must exist together with some other type of environmental deficiency and one or more building deficiencies, see U.S. Dept. of Housing and Urban Development, *Urban Renewal Handbook*, RHA 7205.1 (1968).

<sup>240</sup> Open Space Land Act, 42 U.S.C. §§ 1500-1500e (1970). A strategy of selective acquisition, with reliance on this programme, has been recommended in the MANAP Cape Kennedy Regional Airport Study, *supra*, footnote 200, p. 44.

<sup>241</sup> Easements are usually perpetual but it has been suggested that, in the airport situation, they should combine a leasehold feature so that they would be time limited, see Aitree and Baxter, *Legal Aspects of Air-*

preserving as well the local assessment base, with the advantage to the occupants of affected properties that they will often be able to stay in possession or at least continue to make some use of the land, without further transactions of re-purchase or lease. In fact an easement may often cost as much as the fee. This would be the case if the only economically feasible uses of the property are precluded by the existence of the easement. And in the long run, the relevant public authority may be faced with the need of taking a new easement and paying further compensation if the initial grant proves inadequate.<sup>242</sup>

Easements over airport vicinity lands may take either a positive or negative form. An easement of flight, sometimes called an aviation easement,<sup>243</sup> and a noise easement, conferring the right to occasion a certain amount of noise in relation to the grantor's land,<sup>244</sup> are examples of the first category. But to preclude all further development of a particular parcel of land an airport proprietor, with the appropriate authority, may acquire a form of negative easement, akin to a conservation or scenic easement, consisting of a right to the maintenance of such land in its undeveloped state.<sup>245</sup> The transaction may also be characterized, in a positive sense, as a sale of development rights to the airport operator.<sup>246</sup>

Land acquisition and management, where authorized, is, then, a planning technique which enables the maximum amount of control by the concerned public authority and is capable of being applied in any one of a variety of forms to suit particular circumstances. However, as has been noted above, it may be very costly, particularly in relation to lands around established airports. It

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port Noise and Sonic Boom (1968), a report prepared for the FAA, esp. at pp. 67-88, 214-251. For a similar proposal see Haar, *Airport Noise and the Urban Dweller, A Proposed Solution* (1968), 68 *Appraisal J.* 551.

<sup>242</sup> See, for example, *Avery v. United States* (1964), 330 F. 2d 640 (Ct. Cl.).

<sup>243</sup> In the U.S. cases in which airport neighbours have succeeded in aircraft noise damage suits the nature of the interest which the airport proprietor is deemed to have taken, necessitating compensation, has been termed an aviation easement or easement of flight, see, for example, *United States v. Causby*, *supra*, footnote 42.

<sup>244</sup> Cf. *Duchman v. Oakland Dairy Co.*, [1929] 1 D.L.R. 9, esp. at p. 28 (Ont. S.C., App. Div.). Some doubt has been expressed, however, as to whether the right to make a noise can, as such, be the subject of an easement. see Megarry and Wade, *The Law of Real Property* (3rd ed., 1966), p. 874.

<sup>245</sup> Cf. generally Note, *Protection of Environmental Quality in Non-metropolitan Regions by Limiting Development*, *op. cit.*, footnote 173; Comment, *Control of Urban Sprawl or Securing Open Space: Regulation by Condemnation or by Ordinance?* (1962), 50 *Cal. L. Rev.* 483, and Note, *Preservation of Open Spaces Through Scenic Easements and Greenbelt Zoning* (1960), 12 *Stan. L. Rev.* 638.

<sup>246</sup> The acquisition of development rights in airport area lands is recommended in the MANAP Cape Kennedy Regional Airport Study, *op. cit.*, footnote 200, pp. 37-38, 69.

must be viewed, therefore, like the other techniques examined in this article, as simply one tool in the broad spectrum of control options available to alleviate the problem of airport noise.

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