

CANADIAN ACOUSTICS ASSOCIATION

AIRCRAFT NOISE AND LAND USE AT CANADIAN AIRPORTS

Tom Lowrey
Chief Noise Management
Airports Group, Transport Canada

INTRODUCTION

Internationally, in the developed world, noise at airports is being reduced through the introduction of new generation jet aircraft that may be anywhere from 10 to 14 dBA quieter at the same ground location under a flight path than their predecessors. With the passage of a resolution at the special assembly of the International Civil Aviation Organization (ICAO) in the Fall of 1990, the international aviation community took the first step in eliminating the use of noisy second generation jet transport aircraft (those compliant with the noise certification criteria contained in Annex 16 to the International Civil Aviation Convention) from the international fleet.

The principle features of the resolution are that elimination of these jets should occur over a period not less than seven years in length and not begin before 1995. Various countries in the developed world have enacted domestic rules to achieve a phase out of the use of these aircraft from their skies.

The resolution went on to address the issue of individual airports such that where procedures could be enacted to solve noise problems and obviate the need to phase out these aircraft, then they should be introduced. It was recognized that land use in the vicinity of airports should be studied further to attempt to obtain protection from residential encroachment and to consolidate gains in terms of reduced numbers of noise impacted people that would result from the phase out.

THE CANADIAN SETTING

On March 9, 1992, the Minister of Transport announced that the Canadian air carrier industry would be regulated for the purpose of phasing out the use of the Chapter 2 compliant jet aircraft.

The phase out will be accomplished through a staged reduction, on certain pre-determined dates. Air carriers may comply in one of two different methods, either through a percentage reduction of the number of Chapter 2 jets in their fleets or through an increase in the proportion of quieter Chapter 3 compliant aircraft, to their fleets.

Aircraft that will be phased out include the B737, B727 & DC9. The phasing will begin in 1995 and end in December 2002. Under the proposed regulation, air carriers must;

- on December 31, 1995, reduce the percentage of older aircraft by 25% or increase the percentage of newer aircraft to 55%;
- on December 31, 1997 these percentages must change to 50% and 65% respectively;
- on December 31, 1999, these percentages must change to 25% and 75% respectively;

after Dec 31, 2002, no Chapter 2 aircraft may operate in Canada.

The only aircraft from this generation that will be left are the gravel kitted Boeing 737 jets that have been modified to operate on northern gravel runways. These aircraft have been exempted from phase out because there is no replacement for them that can operate safely on these runways. They will be permitted to operate at southern airports on their way to or from the north.

The impact of all this is that noise levels are forecast to decrease over the phase out period. Noise predictions are formulated using computer programs that calculate noise level at specified points on the ground. The calculations are based on forecast numbers of aircraft, the type of aircraft expected to be flown, its flight characteristics and noise emission levels, the runways used and the time of day each will be flown at. This last input is used to account for increased disturbance from night flights. A penalty is applied to each flight during the nighttime. The results of the calculations provide a set of contours that are used for land planning purposes. Based on social response studies, public reaction to aircraft noise is predicted and land is developed accordingly.

With the phase out of the noisier Chapter 2 jets, these contours at Canadian airports are expected to shrink over the phase out period with the area impacted by intrusive aircraft noise reduced. It is expected that pressures will be exerted for development on the lands "freed up" from noise. The aviation industry worldwide is looking to land use control authorities for protection from encroachment by non compatible uses. Airports are expecting noise contours to shrink over the period during which Chapter 2 aircraft are being phased out but begin to grow after this period. This growth will be due to traffic growth and the greater proportional use of larger aircraft.

NOISE CONTOUR SHRINKAGE

The noise contours in place for major airports in Canada, are a land use planning tool depicting noise levels around airports.

Traffic forecasts and noise forecasts presently are predicting a shrinkage in contours up to the final phase out date but thereafter the size of contours are expected to grow again as traffic increases in the next century.

In addition, as new aircraft are modified and enlarged or stretched (to use the vernacular), they will be lifting larger weights and will generate more noise. The 767 is being stretched by 20 feet and strengthened. More weight will be added to the aircraft requiring higher thrust levels and therefore greater noise emissions.

Land use planners and developers are eagerly awaiting the contour shrinkages to take advantage of valuable urban land, close to both cities and airports, that is expected to be freed up for development.

The industry is looking to this shrinkage as a respite from pressure to curtail operations at several airports. Air carriers view relief from pressure for operational restrictions as a payback for the massive investments in new aircraft, airports consider the contour shrinkage as an opportunity to achieve a greater degree of compatibility with their neighbours.

The industry, as a whole, both domestically and internationally, is focusing its efforts on land use planning agencies to promote concerns for careful management of available land adjacent to airports.

Land use planning authorities must be convinced of the need to protect airports from encroachment to avoid non compatible development in adjacent lands and to consolidate the gains made.

CONCLUSION

In conclusion, aircraft are becoming quieter, the impacts of aircraft noise are being reduced and the public stands to benefit. In order to ensure that these benefits are preserved, land use planning authorities must act now to keep these lands for uses that are compatible with our nation's airports. This country cannot afford to move airports to greenfield locations and waste billions in airport infrastructure investment, not to mention the current positive economic benefits derived from airports, to satisfy the land development lobby.