SUBJECT: John C. Munro Hamilton International Airport - Updated Noise Exposure Forecasts (PED05119) (Ward 11 & 12)

RECOMMENDATION:

(a) That the City of Hamilton request Transport Canada to assist City staff and their agents to update the John C. Munro Hamilton International Airport Noise Exposure Forecasts/Projections and related contours.

(b) That $45,000, representing the City of Hamilton’s 50% share of the total cost of revising and updating the John C. Munro Hamilton International Airport Noise Exposure Forecasts/Projections and related contours, be funded from the City’s Development Charge Studies Reserve #110324.

(c) That the General Manager of Planning and Economic Development Department retain the services of a consultant to update the Noise Exposure Forecasts/Projections and related contours in accordance with the City of Hamilton Purchasing Policy.

Lee Ann Coveyduck
General Manager
Planning and Economic Development Department

EXECUTIVE SUMMARY:

The City of Hamilton is responsible for revisions or updates to John C. Munro Hamilton International Airport (HIA) Noise Exposure Forecasts/Projections and related contours and paying all costs associated with such amendments. Transport Canada is the certifying authority for airports in Canada and will assist the City in producing such forecasts/projections and contour maps to Transport Canada standards. The entire
process is estimated to take approximately one year and will cost an estimated $90,000. The City has secured 50% of this estimated cost from Tradeport International Inc. This report formally requests the remaining share of costs to be approved (i.e. $45,000) and that an appropriate consultant be engaged to conduct this specialized work.

BACKGROUND:

An accurate assessment of the annoyance resulting from exposure to aircraft noise is essential to both aviation planners and those responsible for directing the nature of development of lands adjacent to airports. The noise levels around the HIA need to have not been updated since 1996 and need to be reviewed on a regular basis for accuracy and currency. This report will discuss noise measurement, annoyance prediction, the Noise Exposure Forecast and the Noise Exposure Projection.

Noise Measurement

The sound pressure level created by an aircraft (or any other noise source) can be measured by means of a sound level meter. The microphone of the sound level meter senses the pressure fluctuations over a short period of time. For mathematical convenience, the logarithmic parameter called sound pressure level (SPL) is used. The unit of sound (noise) measurement is the decibel (dB).

A particular sound signal may comprise several different frequencies to which the human ear may respond in various ways. Some sound level meters have the capability of reading on A, B, C, and D weighting scales, and decibel values are correspondingly indicated as dB(A), dB(B), dB(C) or dB(D), according to the weighting network used. However, the dB(A) is the most commonly used since it has been found to have good utility in determining annoyance reactions to a wide variety of noises occurring in communities.

Predicting Annoyance

In addition to the annoying characteristics of an individual noise signal, overall subjective reaction to noise is dependent on the number of times the disturbance occurs as well as the daily distribution of these events. These factors must be included in any noise forecasting system if it is to be applicable to the communities located in the vicinity of airports. The Noise Exposure Forecast (NEF) system used by Transport Canada takes into consideration all of these factors.

The NEF system provides for the summation of noise from all aircraft types operating at an airport based on actual or forecast aircraft movements by runways and the time of day or night the events occur. The large number of mathematical calculations necessary for the construction of NEF contours requires the use of computer techniques for the practical application of this system.

The Noise Exposure Forecast System (NEF)

Effective Perceived Noise Level (EPN L) which was developed for use in the measurement of aircraft noise is the basis for estimating noise annoyance in the Noise
Exposure Forecast System.

The data required for determining NEF contours consist of EPNL versus distance information for various aircraft types, along with generalized aircraft performance data. Thus, the determination of NEF contours is strictly a numerical calculation procedure. As stated previously, due to the large number of mathematical calculations involved, computer techniques provide the only practical means of constructing NEF contours.

The Noise Exposure Forecast (NEF) is produced to encourage compatible land use planning in the vicinity of airports. NEFs are approved (official) contours and Transport Canada will support them to the level of accuracy of the input data. Accordingly, the input data must be as accurate as current technology permits. Traffic volume and aircraft type and mix used in calculating the noise contours are normally forecast for a period of between five and ten years into the future. Runway geometry must be the current layout, except that new and approved projects involving changes in the runways may be included, when the completion date of the project lies within the forecast period. For example, the proposed extension of Runway 06-24 at HIA is expected to be constructed within the next ten years and should be part of the next NEF update.

NEFs are made available to Provincial and local governments for use in conjunction with Transport Canada’s recommended Land Use Tables, which will enable planners to define compatible land use in the vicinity of airports over the short term.

Transport Canada retains copies of NEFs, both regionally and at headquarters, in order to:

a. provide municipalities with a basis for zoning; and,

b. inform the public of noise sensitive areas in the vicinity of airports.

Transport Canada does not support or advocate incompatible land use (especially residential housing) in areas affected by aircraft noise. These areas may begin as low as NEF 25. At NEF 30, speech interference and annoyance caused by aircraft noise are, on average, established and growing. By NEF 35 these effects are very significant. New residential development is therefore not compatible with NEF 30 and above, and should not be undertaken. Council has recently endorsed NEF 28, which is slightly more restrictive, as part of the Airport Influence Area around HIA.

Noise Exposure Projection (NEP)

It is recognized that much land use planning involves projections beyond five years into the future, when aircraft fleet mixes and runway configurations are most likely to be different from the known conditions of today. To provide Provincial and Municipal authorities with long range guidance in land use planning, Transport Canada introduced the Noise Exposure Projection (NEP). The NEP is based on a projection (not a forecast) of aircraft movements for more than 10 years into the future, and includes aircraft types and runway configurations that may materialize within this period: NEPs are approved (official) contours and Transport Canada will support them to the level of accuracy of the input data. The information required to produce an NEP is contained in the HI Airport

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1 Table 3, Land Use Tables, Aircraft Noise Considerations Only, TP1247E, Transport Canada
ANALYSIS OF ALTERNATIVES:

The preparation and approval of noise contours for airports that are neither owned, nor operated by the Federal government is not a responsibility of Transport Canada. The City is therefore responsible to ensure the NEF/NEP contours are kept up to date and accurate. However, Transport Canada will assist the owner (the City) and/or airport operator to produce noise contours for the HIA, provided that:

a. the owner or operator initiates this action;

b. supplies or approves a projection of aircraft traffic, both as to type and numbers; and,

c. uses the noise impact prediction methods, procedures and recommended practices relating to aircraft operations as established by Transport Canada.

This information is partly compiled by the HIA staff through their Master Plan and other aeronautical data sets they have available. However, due to the specialized nature of the work, a consultant will have to be engaged.

FINANCIAL/STAFFING/LEGAL IMPLICATIONS:

Revisions/updates to John C. Munro Hamilton International Airport (HIA) Noise Exposure Forecasts/Projections and related contours assist the City in producing such forecasts/projections and contour maps to Transport Canada standards. This would be considered a necessary component with regards to the direction and scope of future development within the Airport development area. That is why development charges will be funding this project which will be added to the City’s list of growth-related capital in the subsequent City Development Charges Background Study.

The cost of completing revised NEF/NEP contours for the HIA is estimated to be a total of $90,000. City staff have secured 50% of this cost from Tradeport International Inc. Thus, the cost to the City is estimated to be $45,000. The process is expected to take one year to complete.

Since this is a very specialized area of expertise, a consultant is required to be engaged. City staff will work with HIA staff and Transport Canada staff to ensure that Federal guidelines are met and implemented.

POLICIES AFFECTING PROPOSAL:

N/A.
CONSULTATION WITH RELEVANT DEPARTMENTS/AGENCIES:

The following Departments/Agencies were consulted:

Finance
Long Range Planning
Economic Development
City Manager – GRIDS
Tradeport International Inc.
Airport Implementation Task Force
Transport Canada

CITY STRATEGIC COMMITMENT:

City Council's Strategic Plan “Right on Course” commits to the following:

(a) to focus all available resources on economic development as its No. 1 priority with particular attention to the airport as a key economic node to future prosperity;
(b) to pursue initiatives at the airport to ensure benefits of economic development are felt City-wide; and,
(c) to pursue investment in strategic infrastructure to attract new non-residential business.

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