Secondary Suite at 511 Bernard Mews NW

By Kristoffer Moen for Calgary City Council | January 22, 2018

Thank-you for the opportunity to comment on the proposed land use amendment at 511 Bernard Mews NW. I have read the Calgary Planning Commission Report to Council (CPC2018-016) and the proposed Land Use Bylaw.

My objection to the proposed development as listed on CPC2018-16 is unorthodox. I hope to convince council the subject property is experiencing excessive amounts of aircraft noise, specifically the amount of noise experienced is above the 30 Noise Exposure Forecast ("NEF"), a level that Transport Canada recommends that is incompatible with residential development.

For most people aircraft noise is an acceptable factor in everyday life. For some people aircraft noise is a minor nuisance. However, for a small number of people even moderate levels of aircraft noise are a major debilitating factor in their everyday life that causes high anxiety, stress, lack of sleep, and depression. It is the small number of people that experience serious negative mental health impacts from aircraft noise that is my focus.

My reasons for objection are listed below. Additional more detailed analysis follows in the attached Background Material section.

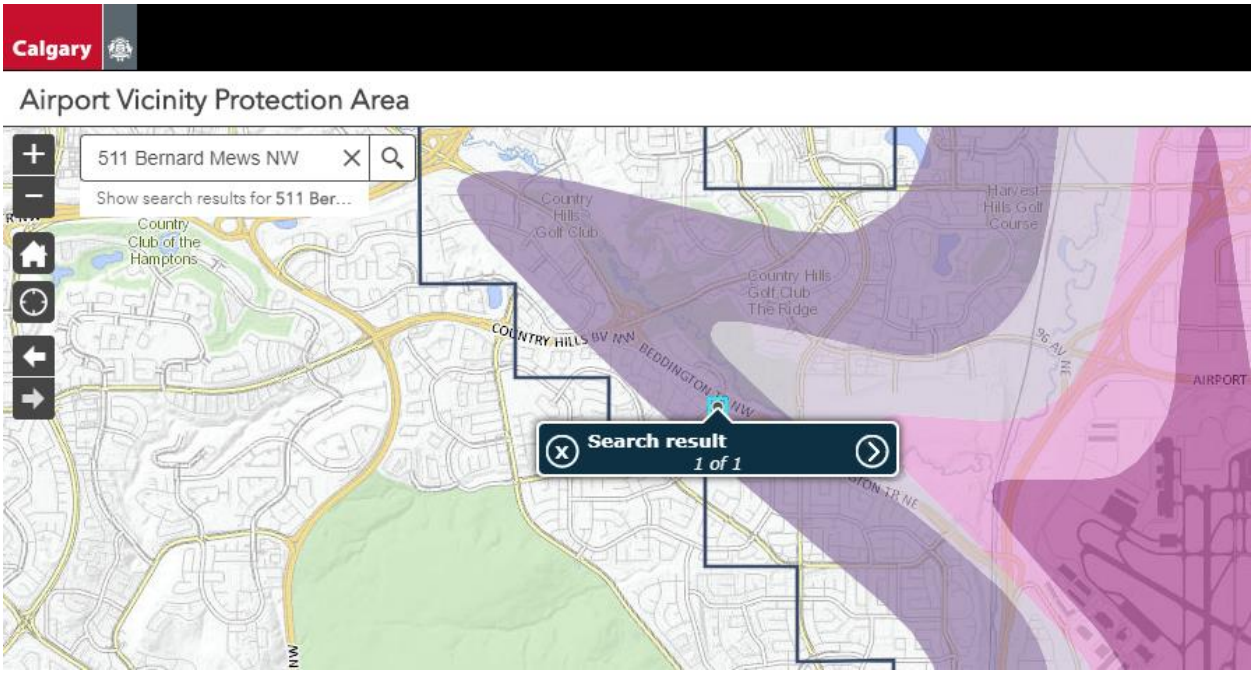
Airport Noise as a Planning Consideration

The cover report contents indicate the subject property is within the Airport Vicinity Protection Area ("AVPA").

The AVPA map indicates the subject property is within the AVPA Protection Area and within the 25-30 NEF noise contours.

Based on Section 3 of the YYC AVPA (listed in the attached background material), I submit that a discussion regarding airport operations, aircraft noise and the effects of a proposed Land Use change from RC-1 to RC-1s should allowed within the parameters of "Planning Considerations".

A map of the subject property in relation to the AVPA is provided by the City of Calgary as follows:



Duties of the Municipality.

I note that under section 6(1) of the YYC AVPA, the municipality must -prior to adopting a bylaw - refer to the Airport Operator any land use bylaw or amendment to the Land Use Bylaw relating to a change of land use in the Protection Area, prior to adopting the bylaw. A review of the Cover Report and Attachment 1 for the subject property does not contain reference to the Administration referring the proposed Bylaw to the Airport Operator, nor is there an indication regarding the Airport Operator's objection or concern with the proposed land use change.

Aircraft Noise at 511 Bernard Mews NW

Officially, according to the YYC ACVPA the subject property is within the 25-30 NEF contours.

The closest runway to the subject property is the crosswind runway 29-11. As described in the Background Material, the approved NEF model only considers typical weather conditions and preferred runway configuration. The NEF model excludes Chinook wind conditions when majority of aircraft departures cannot utilize the parallel runways due to high wind from the west. Consequently, aircraft are flying over the community of Beddington, particularly the subject property and are generating significant noise throughout the 18 hours per day of commercial aircraft operations during chinook weather conditions.

As discussed in the backgrounder, the NEF model takes into consideration:

- the number of arrivals and departures at the airport,
- the distribution of arrivals and departures across various runways,
- the mix of aircraft types used by operators,
- site-specific arrival and departure procedures.

Each of the above four NEF considerations has increased substantially since the NEF was last reviewed in 2009 and initially implemented in 1981. I therefore submit that the subject property is experiencing NEF 30+ levels of aircraft noise discomfort.

As stated in the Background Material, Transport Canada recommends against proceeding with new residential development in areas where the NEF exceeds 30. If the development does proceed, a detailed noise analysis should be conducted, and noise reduction practices should be implemented.

Aircraft Noise accommodation and Economic Risk Mitigation

According to Calgary Airport Authority ("CAA") statistics, the airport generates $8 Billion economic activity and is responsible for 35,000+ jobs.

Supporting this economic activity is efficient airport operations. The YYC runway configuration is nearly identical to that of Vancouver-YVR and Montreal-YUL, however our peak aircraft arrival rate of 44 airplanes is 25% greater than the other 2 airports. Fewer noise abatement procedures were cited as the reason for Calgary-YYC having more efficient operations compared to Vancouver-YVR and Montreal-YUL.

As discussed in the Background Material, noise complaints at YYC in 2016 decreased 39% compared to 2015 when the new east parallel runway was operational. As documented by the CAA in their 2016 Annual Report, the top 2 noise complainant properties accounted for 46% of all noise complaints. The top 10 noise complainant properties accounted for 78% of all noise complaints.

My primary concern is an increase of 1-5 frequent noise complainants could have a dramatically negative impact on commercial airline operations, resulting in less service and increased costs for all Calgary travellers.

New model for Noise Exposure Forecasts

For the past several years, the Greater Toronto Airport Authority ("GTAA"), airport operator for Toronto Lester B. Pearson International Airport ("YYZ") has been researching innovative solutions to aircraft operations and the effect on community members. Of interest to Land Use Planning, the GTAA has initiated an updated noise forecast model called Multiple Scenario Envelope ("MSE") NEF noise contour. This MSE NEF model is more consistent with best practice at airports around the world. The MSE NEF model is further discussed in the Background Material.

A Multiple Scenario Envelope NEF noise contour study would have following benefits for the Beddington community and the subject property:

- The new NEF model would take into consideration the expanded operations and frequencies that have pushed traffic growth 33% since 2009.
- A Multiple Scenario Format would expand analysis to include winter Chinook conditions that force airport operations onto the cross-wind runway 29-11.
- The aircraft mix would be updated to include the Boeing 737max and 787 Dreamliner, aircraft chosen by both of Canada's major airlines.

Conclusion

What ever the decision reached regarding by Council regarding the subject property at 511 Bernard Mews NW, I hope this Council treats aircraft noise as a serious Land Use Planning Matter worthy of thorough consideration.

Airport operations have changed significantly since the NEF contours were last studied in 2009. I urge this Council to consider requesting, through a Motion Arising or other Procedure Bylaw tool to formally ask the Calgary Airport Authority to update the NEF Contours that are at the source of the Calgary International Airport Vicinity Protection Area Regulation. Further, the CAA should be requested to enhance the noise exposure process through a Multiple Scenario Envelope NEF model.

Thank-you for your time.

Attachment: Background Material

Is Airport Noise a Planning Consideration?

The Calgary International Airport ("YYC") Vicinity Protection Area ("AVPA") Regulation states the following:

> **3(2)** A municipality that receives
>
> (a) an application for the subdivision of land in the Protection Area, or
>
> (b) an application for a development permit relating to land in the Protection Area
>
> must, in addition to complying with Part 17 of the *Municipal Government Act*, comply with this Regulation.

In 2017, the YYC AVPA was updated to include reference to secondary suites as follows:

> **3(3)** Subject to section 4*, no subdivision approval may be given and no development permit may be issued by a municipality relating to land in the Protection Area if the proposed use of that land is a prohibited use, with the exception of a development permit for a secondary suite in an existing single family development.
>
> **(4)** This section does not apply to a minor development of land in the Protection Area
>
> (a) that will not result in a change in the use of the land, or
>
> (b) that is exempt under any one of the authorities listed in section 1(c) from the requirement to obtain a development permit.
>
> * Section 4 is titled "**Continuation of validity of pre-existing approvals**"

With regard to duties of the municipality, the AVPA states the following:

> **6(1)** A municipality must refer to the Airport Operator any statutory plan or land use bylaw relating to land in the Protection Area, and any amendment of that plan or bylaw, before adopting the statutory plan or land use bylaw, or an amendment of either.
>
> **(2)** A municipality must refer to the Airport Operator a copy of any application it receives for
>
> (a) a subdivision of land in a NEF Area described in section 1(e)(i), (ii) or (iii), or
>
> (b) a development permit relating to land in a NEF Area described in section 1(e)(i), (ii) or (iii)
>
> where the use of the land will change as a result of the application being approved.

Economic Impact and Operational Statistics at YYC

Calgary International Airport is a key economic generator (Figures from the CAA website):

- 35,000+ jobs occur on or around airport lands to support commercial aviation, cargo and logistics.
- Economic output is estimated at $8 Billion dollars.
- On December 22, 2017; YYC celebrated the 16 millionth passenger. Passenger estimates for 2017 will be a record breaking year at 16.1 to 16.3 million passengers.
- YYC is the primary global hub for one major Canadian airline. The other Canadian airline considers YYC a regional hub.
- 137,255 tonnes of Cargo were transported through YYC in 2016.

There are 4 runways at YYC:

- 35L-17R is the west runway,
- 35R-17L is the east (new) runway.
- One crosswind runway "11-29" used primarily by turboprop aircraft or in Chinook conditions.
- One runway "08-26" is too short for commercial aircraft operation.

Maximum number of aircraft (expressed as number of landings per hour) that can arrive at an airport is a key performance indicator for efficient airport and air traffic system operations. According to NavCanada Air Traffic Management Flow Manual – Appendix C, the following are maximum Aircraft Arrival Rate ("AAR") and number of active runways required to achieve the AAR for each of Canada's four largest airports:

- Toronto Lester B Pearson ("YYZ") AAR = 56 aircraft with 3 active runways.
- Calgary International Airport ("YYC") AAR = 44 aircraft with 2 active runways.
- Vancouver International Airport ("YVR") AAR = 36 aircraft with 2 active runways.
- Montreal Pierre Elliott Trudeau ("YUL") AAR = 36 aircraft with 2 active runways.

Fewer noise abatement procedures were cited as the reason for Calgary-YYC having more efficient operations compared to Vancouver-YVR and Montreal-YUL.

Commercial Aircraft Operations at YYC

Commercial airline operations at YYC have increased exponentially since the introduction of the AVPA. The following example of transcontinental airline operations as a representative example for total airport operations as it pertains to NEF considerations.

In 1981, when the AVPA was enacted and NEF Contours established; Summer peak commercial airport operations included 12-15 narrowbody transcontinental departures to 3 Canadian cities (Toronto, Montreal, and Ottawa). These flights were conducted with very noisy aircraft with noise stage 2 compliant engines such as the DC-8, 737-200, and 727-200.

In 2009, when the AVPA was last updated; Summer peak commercial airport operations included 30-35 narrowbody transcontinental departures to 1 USA and 10 Canadian cities. These flights were conducted

on quieter engine noise stage 3 and 4 compliant aircraft such as the 737 Next Generation, Airbus A320, and Embraer E90.

For the 2018 summer peak schedule, commercial airport operations will include 45 daily flights on a mix of narrowbody and widebody aircraft such as the Boeing 737 Next Generation, Boeing 737 Max, Airbus A320, Boeing 767, and Boeing 787. Additionally, two new entrant airlines have not released their schedule.

Current State of Noise Complaints at YYC

On April 20, 2017; the Calgary International Airport Authority ("CAA") held its Annual General Meeting ("AGM"). At the meeting, the following update regarding noise complaints was delivered:

- There were 6,458 noise complaints from 613 properties.
- Top 2 properties generated 46% or 2,801 complaints.
- The next 8 most frequent properties generated 32% or 2,067 complaints.
- In total, the top 10 most frequent complainant properties generated 78% of all complaints.
- Noise complaints were down 39% compared to 2015, the year that a new east parallel runway opened.

The introduction of the new runway (designated 17L and 35R) required departing aircraft to perform a 15-degree turn away from the other runway to maintain adequate aircraft separation. This caused departing aircraft to fly over residential areas rather than the intended commercial and industrial areas.

In 2016 the CAA successfully negotiated with NavCanada and Transport Canada for a 10-degree divergence for aircraft departures on runway 17L. Recently this was expanded to include departures in the other direction on runway 35R.

The Basics of Noise Exposure Forecast Contours

Transport Canada regulates the Noise Exposure Forecast ("NEF") system and provides recommendations for land use planning around airports with a goal to minimize the annoyance of residents to aircraft noise.

Transport Canada states that an NEF level greater than 25 is likely to produce some level of annoyance. If the NEF level is above 35, complaints will probably be numerous.

Transport Canada recommends against proceeding with new residential development in areas where the NEF exceeds 30. If the development does proceed, a detailed noise analysis should be conducted, and noise reduction practices should be implemented.

The NEF model factors in the subjective reactions of the human ear to the specific aircraft noise stimulus:

- loudness,
- frequency,
- duration,
- time of occurrence, and
- tone.

NEF values represent a cumulative noise index that quantifies long-term aircraft noise exposure based on a typical busy summer day, when both aircraft noise levels and community sensitivity tend to be at a maximum. The NEF model takes into consideration:

- the number of arrivals and departures at the airport
- the distribution of arrivals and departures across various runways
- the mix of aircraft types used by operators
- site-specific arrival and departure procedures.

To account for the greater sensitivity toward aircraft noise at night, the NEF model also applies a penalty to all operations occurring during nighttime hours. The resulting NEF contour lines are drawn on a map by connecting points of equal noise impact that represent selected NEF values.

Development of the Calgary International Airport Vicinity Protection Area

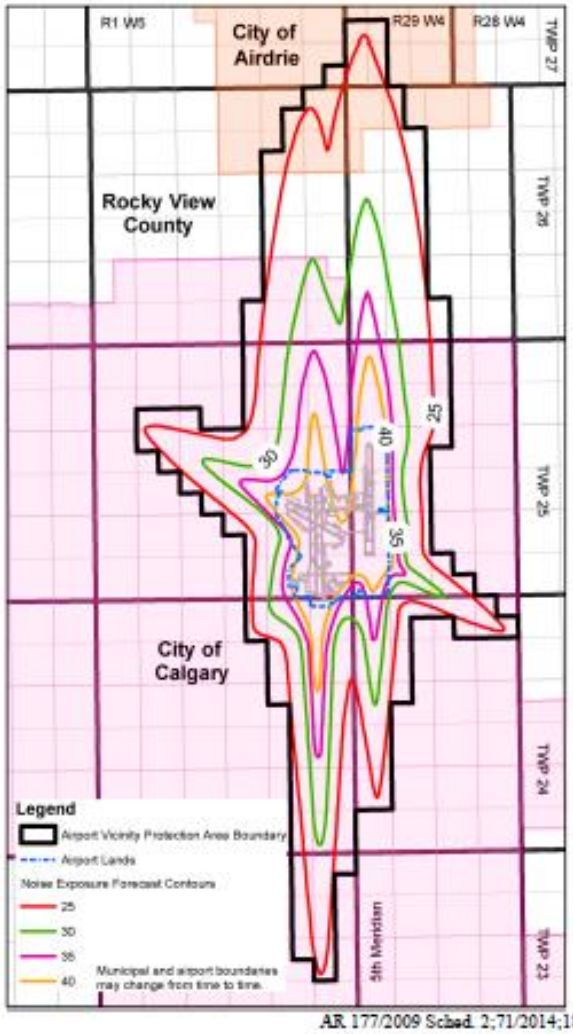
In the 1970s, The Government of Alberta began developing AVPAs for all commercial airports in the province.

In 1981 the first version of the AVPA was implemented for each airport in the province.

In 1996, the Government of Alberta rescinded all AVPAs with exception of Edmonton AVPA and Calgary AVPA. Concurrent with the AVPA changes, the NEF Contour lines were updated. In the case of the Edmonton Airport Vicinity Protection Area, the NEF 30 contour lines were significantly expanded, due in part to the doubling of commercial aircraft traffic from consolidation of all airport operations from Edmonton Municipal.

In 2009, as part of the Environmental Impact Assessment of the proposed new parallel runway 17L-35R, the Calgary AVPA was updated to include the present-day NEF contour lines. The official NEF Contour lines and AVPA Protection Area are depicted in Schedule 2 of the YYC AVPA, a copy of which is included below:

Schedule 2



AR 177/2009 Sched. 2;71/2014;186/2017

In 2012, NavCanada introduced amendments the to Alberta air traffic management system ("playbook" used by air traffic controllers to manage flight operations). Among other changes, the YYC parallel runway operations were altered from "Land one runway, depart the other runway" to "simultaneous independent dual runway operations".

In 2014, Transport Canada required that YYC and NavCanada implement a departure procedure for aircraft on the east runway 17L/35R to perform a 15-degree turn away from the other runway to maintain adequate aircraft separation.

In 2016 the CAA successfully negotiated with NavCanada and Transport Canada for a 10-degree divergence for aircraft departures on runway 17L. Recently this was expanded to include departures in the other direction on runway 35R.

Current Developments on NEF Contours in Toronto Lester B Pearson International Airport

For the past three years, the Greater Toronto Airport Authority ("GTAA") has been researching new approaches to airport noise impact on communities. With regard to NEF contours, the GTAA has developed an innovative approach to forecasting exposure to noise. As explained in their Master Plan 2017-2037 document:

> The regulatory requirement for an airport Master Plan in Canada is to produce Noise Exposure Forecasts (NEFs). Such forecasts produce noise contours defined by noise levels at various locations surrounding an airport. Generally, residential development is not permitted within the 30 NEF contour. We [GTAA] acknowledge that the NEF is not the only or best measure of noise impacts, but it does serve a function in land use planning. Best practice for airports today is to run a series of scenarios based on potential runway operating patterns, aircraft fleet mixes, stage lengths, and day and night operations to create a Multiple Scenario Envelope NEF contour or MSE NEF. The GTAA is in the process of producing a new MSE NEF contour for 2037; we're engaging with our neighbouring municipalities and other interested stakeholders regarding its implications. Once this consultation process is complete, a final MSE NEF will be issued.
>
> *Multiple Scenario Envelope Approach.* The GTAA is adopting an innovative approach to generating Noise Exposure Forecasts that is consistent with best practice around the world, as well as with the method adopted by several other major Canadian airports.
>
> The traditional approach to NEF modelling assumes, for planning purposes, a peak-day flight schedule based on average annual operating conditions – that is, average runway allocation, night/day split and flight tracks. This is somewhat like setting the thermostat in your home for the average annual temperature in Toronto.
>
> The new NEF approach takes the same peak-day flight schedule and bases it on the varied operating conditions we experience over the course of a year and are likely to see again in the future. This yields an aggregate or Multiple Scenario Envelope (MSE) NEF noise contour reflecting all of those varied conditions.