

Billy Bishop Toronto City Airport

Noise Management Sub Committee Meeting 1 – Summary

November 14, 2016
6:30pm-9:00pm

PARTICIPANTS

Angela Homewood (PortsToronto)
Bryan Bowen (City of Toronto, Waterfront Secretariat)
Hal Beck (York Quay Neighbourhood Association)
Leah Winter (Lura Consulting - Notetaker)

KEY THEMES

- Participants agreed that there needs to be a shared understanding of how the various policies and guidelines relate to the management of the airport and the development of the waterfront community.
- Overarching questions are:
 - (1) What was the intention of the signatories when they drafted the Tripartite Agreement in terms of the actual noise impact to residents on the waterfront?
 - (2) Are the signatories fulfilling the obligations and expectations set out in 1983 when it was established that the NEF contour would be the model to ensure no undue impact on adjacent residents?
- Discussions with MOE should:
 - Provide clarification around what components or operations NPC-300 applies to (e.g. the Ferry).
 - Address the technical items/questions raised by Hal (see below).
 - Address how building noise design standards were applied to existing sensitive land uses and whether this has been implemented effectively.
- Discussions with Transport Canada should:
 - Address the calibration of the NEF contour model to account for the water surface.
- It is important that a controlled ambient noise study be conducted to ensure accurate baseline data can be used going forward.
- Participants agreed that an initial meeting should be held with the Ministry of Environment and Climate Change (MOECC) followed by a meeting with Transport Canada to clarify the various technical elements. An agenda for the meeting with MOECC will be drafted collectively via conference call.

SUMMARY OF DISCUSSION

What are the issues that need to be addressed?

- Bryan expressed that there has been a longstanding conversation about the role, jurisdiction, and applicability of various policies and guidelines related to noise at BBTCA (i.e. Provincial Policy Statement, NPC-300, how the Tripartite Agreement addresses aggregate noise, whether the annual NEF reporting is meeting the expectations of signatories of the Tripartite Agreement, MOE D6 - separation distance for stationary noise sources).
- Bryan would like to achieve a shared understanding of how each of these layers relate to the management of the airport. Transport Canada and MOECC will need to be included in the discussions to fill in the gaps in understanding.
- Hal's previous questions, as understood by Bryan, have been: (1) What was the intention of the signatories when they drafted the Tripartite Agreement in terms of the actual noise impact to residents on the waterfront? (2) Are the signatories fulfilling the obligations and expectations set out in 1983 when it was established that the NEF model would ensure no undue impact on future surrounding communities?

Background documents

- The 1981 Staff Report is available on the City of Toronto's webpage regarding the BBTCA Airport Review.
- Hal provided an overview of the evolution of the noise documents/guidelines in place from 1978 to 2013 (currently the NPC-300).
- A new aspect of NPC-300 is the Class 4 lands designation which refers to infill development and areas of future development. Hal would like MOECC to clarify the various classes of lands and why Class 4 has been added.

Which parties should be invited to the next meeting?

- It was discussed whether MOECC and Transport Canada should both be in attendance to discuss the technical questions/concerns at the next meeting. It was agreed that this group should meet with MOE and Transport Canada separately to first reach a technical understanding of the various documents. After establishing a baseline understanding, the Tripartite Agreement signatories should meet to discuss any areas of disagreement.
- Angela, Bryan and Hal will collectively draft an agenda via conference call for the initial meeting with MOECC.

Discussion related to MOE guidelines

- From the community's perspective, the most important piece of legislation is NPC-300. Building permits for the waterfront community were issued based on the assumptions that are buried in these guidelines.
- The discussion with MOECC should begin with the question of: To what components or operations does NPC-300 apply with respect to existing airports? "Stationary source" definition (4, p.21), indicates that airports are a stationary noise source that do not require MOECC approval. However, the content on page 54 (C7.4) refers to Aircraft Noise Control Measures determined by the outdoor NEF value (which relates to flyby noise).

- Bryan’s understanding is that some documents have to do with land use zoning and the permission for a sensitive land use within a certain NEF contour. Further to that is the need for the building design itself to anticipate and mitigate noise around it. A subtopic of building design is whether the windows can be opened and what materials are used.

Discussion related to the Provincial Policy Statement (PPS)

- How much influence did noise guidelines have on the terms of the Tripartite Agreement? Bryan suspects that the municipal signatories of the Tripartite Agreement used the PPS as the standard to which they informed their planning decisions relative to BBTCA.
- Angela explained that the PPS gets reviewed every five years. The document talks about land uses and the policy in terms of future development. It broadly refers to all development in the province. All municipal Official Plans must conform to the PPS. The PPS is under the jurisdiction of the Ministry of Municipal Affairs and Housing (MMAH) whereas enforcement of noise guidelines is the jurisdiction of the MOECC.
- When the PPS is applied to Pearson Airport, it establishes a wide swathe of non-sensitive land uses which serve to buffer impacts from non-stationary noise sources and other impacts associated with airports.

Concerns related to NEF contour modelling

- Hal’s concern is that the 25 contour line for BBTCA is on the water. All of the annual compliance reports are simply plotting data without any calibration for the water surface. The process is valid; however, modelling is being done without recognition of the application of engineering principles.
- Ground attenuation is a major concern. There are assumptions in the NEF calculation that the ground is attenuating the noise. At the very least, the ground attenuation should be zero in the calculations.
- There are also concerns with the terminology used in the annual NEF contour reporting. The word “actual” causes confusion and should be reconsidered. The word “actual” refers to only the Statistics Canada flight statistics, not the noise.
- There is a need to clarify what days are used to provide the data for the annual NEF reporting.

Technical questions for MOECC regarding NPC-300

- In preparation for a subsequent meeting with MOECC, Hal prepared a list of technical questions related to NPC-300 that he would like to be addressed. The topics for consideration are: background sound level, stationary source noise limit, predictable worst case noise impact, outdoor noise issues, indoor noise issues, emergency aircraft limits, and warning clauses.
- **Background sound level**
 - Page 6 includes the definition of background sound level. Paragraph 2 notes that highly intrusive short duration noise caused by a source such as an aircraft flyover is normally excluded from the determination of the background sound levels. Hal is concerned because this is not what has been happening to date. Measurements have been including flyover noise which he believes is falsely inflating the background sound level.
 - Section B5, page 27 refers to how the lowest background sound level is supposed to be established. Hal noted that along the waterfront there are seasonal variations in

background noise level and limiting the measurement to a 48-hour period is not ideal. Hal suggested, a measurement of background noise must exclude any noise contributions from airport facilities and any aircraft. It can be challenging to capture these moments during airport operating hours. NPC-300 states that in general, the sound level data included in an impact assessment needs to be representative of the background conditions and the predictable worst case noise impact from the stationary source.

- The document also states that the lowest hourly Leq value should be selected to represent the background sound level. Hal would like clarification on how the lowest hourly Leq value has been selected to date. Is it the lowest value in each given hour, or the lowest value in the 24-hr day? Is the baseline moving over the 24-hr period or is it fixed? Exclusion limits are set by the hour.
- Hal has continually advocated for a controlled ambient noise study to properly establish the baseline at various worst predictable locations across the waterfront. There are also ambient noise gradients that need to be studied. As the elevation increases up the high residential towers, the ambient noise starts to drop off. Hal is concerned that ambient noise level data that was modeled and then repurposed for various studies is inaccurate.
- ***Predictable worst case noise impact at the point of reception.***
 - Page 14 includes the definition of point of reception. There is concern that this definition does not capture waterfront tower and effects, particularly with Item 4 and Item 6a, respectively.
 - Page 16 includes the definition for “predictable worst case noise impact”. Hal would like clarification on what is the worst case noise impact on the waterfront and which Class of land should be applied. Hal believes the waterfront is Class 2 land. Class 4 areas are assessed with windows assumed to be closed whereas Classes 1-3 are assumed to have windows open. The interpretation of the Class of land determines which noise exclusion limits are applied.
- ***Stationary sources***
 - Pages 16-20 provide the definition of “stationary sources”. Category 1 includes “auxiliary transportation facilities” which would include the airport ferry.
 - Bryan would like to confirm whether routine loading/unloading as part of airport operations are exempt based on the provisions of Category 4 which states that airports do not require MOECC approval.
 - Page 46 includes exclusion limit values for outdoor points of reception and plane of window (Table C-5 and C-6). The preceding text indicates that Class 4 lands are assumed to have windows closed. This is an important point as it applies to infill development.
 - Page 47 includes exclusion limit values that apply to impulse sounds (Table C-7 and C-8). In Table C-7 the time of day is 7am-11pm. Clarification is required regarding impulse sounds from the airport that occur overnight (Refer to NPC-300 pages 40, 41, 46, 47, 52 and 53).
- ***Air traffic noise (outdoor and indoor limits)***
 - Section 3.4.1, page 40, paragraph 2 includes a formula for calculating indoor NEF values: $NEF = Leq(24) - 31\text{dBA}$. Clarification on what this formula means and how it gets applied is requested. This formula assumes that windows and doors are closed. How does one

determine compliance with Table C-4 (Indoor Aircraft Noise Limits)? (Refer to NPC-300 pages 40 and 41)

- Page 52, section C7.4, paragraph 2 refers to building design and components for receptor locations within the 25 and 30 NEF contour. The PPS does not include any provisions outside of the 30 NEF. Bryan would like clarification on when and how section C7.4 inserts itself into the planning process. (Refer to NPC-300 pages 52 and 53)
- **Emergencies**
 - According to BBTCA, medevac flights are considered emergency flights. “Emergencies” in the Tripartite Agreement refers to emergencies at the airport, not emergencies across Ontario. Hal would like clarification regarding what is considered an emergency flight.
 - Section B 7.3, page 29, shows noise limits of emergency equipment. From Hal’s perspective, Ornge is a business; it is not a facility-related emergency. Why were helicopter flights exempted in the Tripartite Agreement? Angela will follow up on the inclusion of medevac in the Tripartite Agreement.

The meeting adjourned at 9:00 pm.

Appendix A: NPC 300 Excerpts

This difference results in a requirement for acoustically superior architectural components such as windows and walls, for railway noise.

C3.4 Air Traffic Noise

C3.4.1 Method

Aircraft noise impact assessment is based on Noise Exposure Forecast/Noise Exposure Projection (NEF/NEP) contours determined by methods approved by Transport Canada.

Where the noise impact exceeds the applicable limits, warning clauses and mitigation measures for indoor spaces such as architectural design, special building components and/or central air conditioning may be required. The indoor NEF/NEP values, specified in Table C-4 and Table C-10, are related to the outdoor values and the acoustical insulation provided by the building. The indoor NEF values can be calculated by converting the indoor sound levels, expressed as $L_{eq}(24)$ (dBA), using the expression $NEF = L_{eq}(24) - 31$ dBA.

Section 1.6.7.2 of the 2005 Provincial Policy Statement, Reference [26], establishes the applicable development criterion. With the exception of redevelopment or infilling, Section 1.6.7.2 of the 2005 Provincial Policy Statement, Reference [26], prohibits new residential development and other sensitive land uses in aircraft noise zones above the NEF/NEP 30 contour. The noise impact on the proposed noise sensitive land use is determined based on the location of the noise sensitive land use with respect to the official NEF/NEP contours. NEF/NEP contours are usually available for major civil aviation airports from the airport authority. The more restrictive of the NEF and NEP contours would apply.

C3.4.2 Outdoor Limit

Table C-3 gives the aircraft noise limit in terms of an NEF/NEP value in any outdoor area, including the OLA. The limit applies to the entire 24-hour period. The distance separation from the airport and, consequently, the location of the noise sensitive land use with respect to the NEF/NEP contours, is the only measure that controls the outdoor noise impact.

Table C-3
Outdoor Aircraft Noise Limit

Time Period	NEF/NEP
24-hour	30

C3.4.3 Indoor Limits

Indoor aircraft noise limits in terms of NEF/NEP values for the indicated type of indoor space are provided in Table C-4. These limits apply to the indoor spaces with the windows and doors closed for the entire 24-hour period.

Table C-4
Indoor Aircraft Noise Limits
(Applicable over 24-hour period)

Type of Space	Indoor NEF/NEP*
Living/dining/den areas of residences, hospitals, schools, nursing/retirement homes, daycare centres, etc.	5
Sleeping quarters	0

* The indoor NEF/NEP values in Table C-4 are used to determine acoustical insulation requirements based on the NEF/NEP contour maps.

C4 Noise Impact Assessment – Stationary Sources

This Section applies to the introduction of new noise sensitive land uses or the redevelopment of existing noise sensitive land uses within the potential influence area of existing or planned new stationary sources.

C4.1 General

The information and the sound level limits are the same for Part B and Part C of this guideline.

In comparison to noise from transportation sources, in many circumstances, noise from stationary sources may be controlled more effectively at the source. If noise control measures are recommended to reduce the noise impact, these measures should be designed in accordance with the following principles:

- (1) communication and cooperation between the proponent of the noise sensitive land use and the stationary source owner are desirable and highly encouraged;
- (2) where practicable, source mitigation is the preferred option;
- (3) implementation of noise control measures at the source will typically require an MOE approval;
- (4) the goal of implementing receptor based noise control measures at the noise sensitive land use is to ensure compliance with the sound level limits in this guideline;
- (5) measures aimed at the indoor environment, such as air conditioning, which would allow windows to remain closed, are not considered relevant in a Class 1, 2 or 3

consequence of meeting the sound level limits at the adjacent plane of window of noise sensitive spaces.

Note that for Class 1, 2 and 3 areas, the plane of window limits apply to a window that is assumed to be open. For Class 4 areas, the plane of window limits apply to a window which is assumed to be closed. This distinction does not affect the prediction of plane of window sound levels.

Table C-5
Exclusion Limit Values of One-Hour Equivalent Sound Level (L_{eq} , dBA)
Outdoor Points of Reception

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	55
19:00 – 23:00	50	45	40	55

Table C-6
Exclusion Limit Values of One-Hour Equivalent Sound Level (L_{eq} , dBA)
Plane of Window of Noise Sensitive Spaces

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	60
19:00 – 23:00	50	50	40	60
23:00 – 07:00	45	45	40	55

C4.5.2 Impulsive Sound – Outdoors and Plane of Window

For impulsive sound, other than Quasi-Steady Impulsive Sound, from a stationary source, the sound level limit at a point of reception expressed in terms of the Logarithmic Mean Impulse Sound Level (L_{LM}) is the higher of the applicable exclusion limit value given in Table C-7 or Table C-8, or the background sound level for that point of reception. The outdoor sound level limits for stationary sources apply only to daytime and evening (07:00 – 23:00 hours). Sound level limits apply during the nighttime period (23:00 – 07:00) for the plane of the window of a noise sensitive space. In general, the outdoor points of reception will be protected during the nighttime as a consequence of meeting the sound level limits at the adjacent plane of window of noise sensitive spaces.

Notwithstanding Publication NPC-103, Reference [29], the following sound level limits in Table C-7 and Table C-8 below apply to impulsive sounds:

Table C-7
Exclusion Limit Values for Impulsive Sound Level (L_{LM} , dBAI)
Outdoor Points of Reception

Time of Day	Actual Number of Impulses in Period of One-Hour	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 23:00	9 or more	50	50	45	55
	7 to 8	55	55	50	60
	5 to 6	60	60	55	65
	4	65	65	60	70
	3	70	70	65	75
	2	75	75	70	80
	1	80	80	75	85

Table C-8
Exclusion Limit Values for Impulsive Sound Level (L_{LM} , dBAI)
Plane of Window – Noise Sensitive Spaces (Day/Night)

Actual Number of Impulses in Period of One-Hour	Class 1 Area (07:00–23:00)/ (23:00–07:00)	Class 2 Area (07:00–23:00)/ (23:00–07:00)	Class 3 Area (07:00–19:00)/ (19:00–07:00)	Class 4 Area (07:00–23:00)/ (23:00–07:00)
9 or more	50/45	50/45	45/40	60/55
7 to 8	55/50	55/50	50/45	65/60
5 to 6	60/55	60/55	55/50	70/65
4	65/60	65/60	60/55	75/70
3	70/65	70/65	65/60	80/75
2	75/70	75/70	70/65	85/80
1	80/75	80/75	75/70	90/85

C4.5.3 Sound Level Limits for Emergency Equipment

The sound level limits for noise produced by emergency equipment operating in non-emergency situations, such as testing or maintenance of such equipment, are 5 dB greater than the sound level limits otherwise applicable to stationary sources, described in Sections C4.5.1 and C4.5.2.

The noise produced by emergency equipment operating in non-emergency situations should be assessed independently of all other stationary sources of noise. Specifically,

and rail noise. The resultant acoustical descriptors should be subsequently combined to determine the required components.

C7.4 Aircraft Noise Control Measures

If the outdoor NEF/NEP value is less than 25, further assessment is not required.

If the receptor location is within the NEF/NEP contours of 25 and 30, the dwelling should be designed with a provision for central air conditioning. In addition, building components including windows, doors, walls and ceiling/roof should be designed to achieve the indoor sound level limits of Table C-4. Warning clause Type C is also recommended.

If the municipality, in accordance with Reference [26], approves residential development above NEF/NEP 30, central air conditioning should be implemented with warning clauses Type B and D. In addition, building components including windows, doors, walls and ceiling/roof should be designed to achieve the indoor sound level limits of Table C-4.

C7.5 Combination of Road, Rail and Aircraft Noise

The noise impact in the OLA and in the plane of a window, and the requirements for outdoor measures, ventilation measures and warning clauses, should be calculated separately for surface transportation and aircraft noise. The surface transportation noise impact should be determined by combining road and rail traffic sound levels.

The assessment of the indoor sound levels, and the requirements for the acoustical performance of building components should be done separately for road noise, rail noise and aircraft noise. The resultant sound isolation parameters should be subsequently combined logarithmically (on an energy basis) to determine the overall acoustical parameter. Selection of the required components should be based on the overall combined acoustical parameter.

C7.6 Stationary Source Noise Control Measures

Where the noise impact exceeds the applicable sound level limits, mitigation is required in order to meet MOE approval requirements.

The noise control measures may be implemented on the site of the noise sensitive land use or at the source. For noise impacts from stationary sources, the preferred and normally the most economical and practical option is to implement noise control measures at the source.

Although the MOE is not involved in the approval of the noise sensitive land use, the MOE is involved with the stationary sources in the context of MOE approvals. The

following noise control measures, described in the definition in Part A, are acceptable for the purposes of an application for an MOE approval of a stationary source:

1. Source based noise control measures.
2. Receptor based outdoor noise control measures.
3. Receptor based “on building” noise control measures, under the condition that the noise sensitive land use is classified as Class 4 area.
4. Receptor based site configuration noise control measures.

The general design principles that facilitate the juxtaposition of sensitive land uses and stationary sources are:

- the building(s) closest to the stationary source will provide shielding for the remainder of the development;
- the building(s) closest to the stationary source will “face away” from the stationary source;
- the “exposed” side of the building(s) should not contain sensitive indoor spaces such as bedrooms and living rooms, and should only include insensitive spaces such as corridors, washrooms, etc.; and
- no outdoor areas amenable for use on the “exposed” side of the building(s).

In the case of residential developments, single loaded high-rise multi-unit buildings where the units are located on the side of the building facing away from the stationary source may present a solution.

Should the receptor based noise control measures be used, their implementation and maintenance should be included in an agreement as defined in Part A of this guideline or other agreement between the developer/owner of the noise sensitive land use, the land use planning authority (e.g., municipality) and the owner(s) of the stationary source(s). Such agreements should be documented in an appropriate and legally binding manner and registered on title with the appropriate warning clause. The agreement and all other relevant documentation should be submitted to MOE by the stationary source owner when applying for an MOE approval.

C7.7 Combination of Transportation and Stationary Sources of Noise

The noise control measures required for transportation and stationary sources of noise need to be evaluated separately for daytime and nighttime periods. The final selection of noise control measures needs to ensure compliance with the applicable sound level limits of this guideline, for each category of noise source.