PORTSTORONTO

BILLY BISHOP TORONTO CITY AIRPORT

NOISE MANAGEMENT SUB-COMMITTEE MEETING #20

MEETING MINUTES

June 26, 2024
6:30 PM to 9:30 PM
In-Person at the Radisson Blu Toronto Downtown
Toronto, Ontario

Minutes prepared by:

LURA
LISTEN · UNDERSTAND · RELATE · ADVANCE

These meeting minutes were prepared by LURA Consulting. LURA provides neutral third-party consultation services for the Ports Toronto Noise Management Sub-Committee. These minutes are not intended to provide verbatim accounts of committee discussions. Rather, they summarize and document the key points made during the discussions, as well as the outcomes and actions arising from the committee meetings. If you have any questions or comments regarding the Meeting Minutes, please contact either:

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OR

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Summary of Action Items from Meeting #20

Action Item	Action Item Task	Who is Responsible for Action Item
M#20-A1	RJ Burnside will send the weighting table to the committee before the final report.	**RJ Burnside**
M#20-A2	PortsToronto will connect with RJ Burnside regarding the Q400 takeoff pilot takeoff technique noise concerns.	**PortsToronto**
M#20-A3	PortsToronto will send photos received from Ms. Monette (BQNA) regarding the small aircraft engines facing the Eastern condos to RJ Burnside.	**PortsToronto**
M#20-A4	RJ Burnside will note that sensitive sites have been considered, even if they have not been measured in the final report.	**RJ Burnside**
M#20-A5	LURA will arrange to schedule a meeting in September for RJ Burnside to present the draft report.	**LURA**

List of Attendees

Name	Organization (if any)	Attendance
COMMITTEE MEMBERS		
Hal Beck	York Quay Neighbourhood Association	Present
Max Moore	Bathurst Quay Neighbourhood Association	Present
Lesley Monette	Bathurst Quay Neighbourhood Association	Present
Jay Paleja	City of Toronto – Waterfront Secretariat	Present
PORTS TORONTO REPRESENTATIVES		
Angela Homewood	PortsToronto	Present
Michael MacWilliam	PortsToronto	Present
Noah Meneses	PortsToronto	Present
FACILITATION		
Geoffrey Mosher – Lead Facilitator	LURA Consulting	Present
Hasnaa Maher – Notetaker	LURA Consulting	Absent
Denise Soueidan-O'Leary - Notetaker	LURA Consulting	Present
GUESTS		
Harvey Watson	RJ Burnside & Associates	Present
Brent Miller	RJ Burnside & Associates	Present

Appendices:

Appendix A: Meeting Agenda

Appendix B: Ground Noise Study Update Presentation

1. Agenda Review and Action Item Review

Geoffrey Mosher (LURA Consulting) welcomed attendees to the 20th Noise Management Subcommittee (NMSC) meeting, which was held in person at the Radisson Blu Toronto Downtown. Mr. Mosher then introduced the committee members to the RJ Burnside & Associates project team, Harvey Watson and Brent Miller. Mr. Mosher provided an overview of the agenda items and asked if the committee had additional items to add. The meeting agenda is included in **Appendix A**.

Mr. Mosher notes that there are no outstanding actions from the last meeting.

2. Ground Noise Study Update on Findings

Mr. Watson and Mr. Miller (RJ Burnside & Associates) updated the committee on the findings of the Ground Noise Study, covering the project introduction, methodology, and findings. The presentation deck can be found in Appendix B.

Key points from Mr. Watson and Mr. Miller's update were:

Comments, questions, and responses are listed as sub-bullets.

- Subconsultants, Akoustik Engineering Limited, based in Windsor, are responsible for consulting on the equipment setup. Dr. Colin Novak – Senior Engineer at Akoustik - is an expert in noise physics and the airports acoustics. Mr. Watson and Mr. Miller are industrial noise experts. Akoustik's expertise helped the RJ Burnside team adapt their methods to the Airport's unique features.
    - Hal Beck (YQNA) inquired about Dr. Novak's experience in environmental noise engineering.
    - Mr. Watson explained that Dr. Novak's work involves acoustic consulting related to NPC300. They work on similar project to RJ Burnside, but on a smaller scale. He clarified that Dr. Novak is the expert on the physics and that Mr. Watson himself is an expert on NPC300 and how to deal with it around industry.
    - Lesley Monette (BQNA) noted Dr. Novak significant work around noise and annoyance impact.
- The project's objective is to assess ground noise at the Billy Bishop Toronto City Airport (the Airport) by measuring sources, creating models as outlined in NPC300 - the provincial noise document. The purpose is to identify and rank the Airport's noise emissions for mitigation analysis.
- Anything on the ground, or any noise that can be controlled, was measured, resulting in the creation of thirty (30) models. There are initial findings on which of these cases cause the most, least, and no disturbance. This will give RJ Burnside a focus on where to go with mitigation analysis of around 10 possible mitigation strategies. With the knowledge given by RJ Burnside, PortsToronto can implement these strategies in order to reduce noise emissions from the Airport.
- RJ Burnside invented an impact formula because of NPC300's limitations. RJ Burnside placed twenty (20) receptors to study the following:

1. The difference between unmitigated impacts minus the background noise and with the background noise.
2. The number of impacted units (people living in the buildings) at each point of reception.
3. The frequency of noise occurrences.

- The created impact formula equates different noise-emitting sources to provide a uniform way of studying each unique scenario. This formula also helps to calculate the degree of how much noise is improving under mitigation implementations. The end goal is to present PortsToronto with a final rank list that includes how many improvement points can be expected after mitigations are implemented.
    - Mr. Beck (YQNA) inquired about the duration of time that NL values are averaged.
    - Mr. Miller responded that it is unique to each operational scenario. For instance, the ferry impulses would be one second and HVAC would be an hour. Each model has been given a weighting according to their time span, so that inputted sound levels are treated equally when calculated using the formula. This presentation does not include the specific number of seconds and times for each scenario but will be in the final report.
    - Jay Paleja (City of Toronto) inquired about how people reading the report would know that the one-second noise was not being normalized and drowned out.
    - Mr. Watson clarified that they are not normalizing but rather multiplying the impacts to equate different noise sources.
    - Mr. Beck (YQNA) asked if this was similar to NPC104 where a sliver of noise is averaged to the hour.
    - Mr. Watson responded that it is not the same. NPC104 takes three measurements.
    - Max Moore (BQNA) inquired about UPORI.
    - Mr. Miller responded that it is the number of residential units at each point of reception (building).
    - Mr. Beck (YQNA) requested that the weighting table be sent to the committee before the report.

M#20-A1 RJ Burnside will send the weighting table to the committee before the final report.

- One impact point on the scale means one decibel above background for one dwelling. A zero or near-zero is measured only in two circumstances: 1. The noise was below the background level. 2. The modeled situation is rare. For instance, garbage collection happens so infrequently that it receives a near-zero result.

    - Mr. Paleja (City of Toronto) asked if near-zero impact scores would be lower on the list of priorities and whether these sources actually have no noise emissions.
    - Mr. Watson clarified they can emit noise, but it blends into the background, making it unlikely to cause annoyance.

- DBZ is the energy in the sound pressure wave - it measures 12.5 to 20,000 HTZ. Human ears can perceive some frequencies better than others. For instance, humans can hear 1000 HTZ, much more than 32 HTZ. DBA was an attempt to take DBZ measurements and turn them into a number that humans can hear.
- Three (3) of the thirty (30) scenarios were studied in DBZ as well as DBA. They were studied in the day, evening, and night. Therefore, nine (9) total periods are studied in both measurements. In eight (8) of those periods, the assessment showed a larger impact under DBA than it did under DBZ. In the one time period that it didn't, DBZ was only 10% higher.
- In one scenario, the air carts indicated having a near-zero impact in DBZ, indicating that it should not be considered in the study. However, through conversations with Lesley Monette (BQNA) and others, it is evident that the air carts are audible and should not be excluded. Overall, measuring the thirty (30) sources in DBZ would tweak some of their scores slightly but ultimately would not change their ranking. Therefore, measuring the sources in DBZ wouldn't have impacted where priorities will be allocated for mitigation modeling efforts. If anything, it would have accidentally removed some of the scenarios that should be considered.
    - Mr. Paleja (City of Toronto) commended clarifying that the project is not an exercise to measure the total ground noise from Airport sources; rather, the goal is to identify the most impactful sources.
    - Ms. Monette (BQNA) raised concern about measuring vibration impact. Vibration is felt throughout the body and causes great discomfort and disturbance.
    - Mr. Watson responded that this is currently out of scope but worth future pursuit.
    - Mr. Beck (YQNA) inquired about the different findings retrieved through measuring in DBZ versus DBA.
    - Mr. Watson responded that the background is weighted more in the lower frequency for DBZ. Therefore, there is a proportionally larger DBZ number than a DBA number.
    - Mr. Beck (YQNA) inquired about how to measure subsonic frequency.
    - Mr. Watson replied that acquiring a meter that can measure those frequencies is quite difficult, considering they aren't audible.
    - Mr. Moore (BQNA) commented that DBA is useful for ranking noise sources but that it is not useful for noise measurement reports. However, that's not what this study is about, so that is fine.

- The impact scores are retrieved from background measurements. Therefore, the team had to canvas the community for volunteers. Two (2) meters were then installed for two (2) weeks each. The Akoustik team was involved in installing these meters and processing that data. The background noise was taken to simulate the area's sound in the speculative absence of the Airport. Therefore, it removed taking-off and landing noise. It also removed weather-related noise emissions, such as rain.
    - Mr. Beck (YQNA) inquired about the accuracy of removing the Airport's general baseline noise from the background noise.
    - Mr. Watson responded that this would not change the ranking of the impact sources - rather, it would only slightly inflate all the measurements.
    - Mr. Moore (BQNA) inquired about the duration of time that the meters were placed to measure the background noise.
    - Ms. Homewood (PortsToronto) responded, reminding Mr. Moore that the duration had been extended from one (1) to two (2) weeks, as per his request.
    - Mr. Beck (YQNA) inquired about the accuracy of the background noise measurements due to its limited two-week time frame.
    - Ms. Homewood responded that the measurements were made in January when no leaves were present or falling, and no environmental impacts could have been presented to act as a barrier from measuring noise.
    - Mr. Beck (YQNA) noted that he would have appreciated receiving specific information regarding the time of year, duration, and mapped location of the meters before the meeting.
    - Ms. Homewood responded that this presentation is not intended to be the final report - rather, it is an update on the study.
- Thirty-two (32) different operational scenarios were studied, excluding rarely used back-up systems GPU (Ground Power Unit) and APU (Auxiliary Power Unit).
    - Mr. Beck (YQNA) asked about how these scenarios were determined and if community complaints informed them.
    - Mr. Watson responded that the team had gone to the Airport and identified everything they had found emitting noise.
    - Ms. Homewood noted that Mr. Watson was present during a previous noise management sub-committee meeting, along with the 7 other interested consultants, to converse with the community about their concerns. Therefore, community concerns also informed these scenarios.
- Q400 measurements will come later. This is predicted to be high on the priority list.

    - Ms. Monette (BQNA) inquired about how to measure and differentiate helicopter noise.
    - Mr. Miller responded that wherever possible, certain scenarios are grouped together in an effort to reduce the extensiveness of the list. There is no way to collect enough information to measure the overlap time of different scenarios occurring at the same time. The data collection would be inaccurate, and subsequently, the conclusions.
    - Mr. Watson added that when mitigation modeling is made, they will be carried over across different noise sources, even if they are not included in the impact scenario list. Therefore, for instance, if a mitigation effort is measured to be successful in reducing noise from the Q400, then it will also apply to helicopters.
- The models that the study has determined have no impact above the background are the following: small aircraft landing, aircraft support activities, lawn care, general snow removal, mainland vehicle idle, shuttle bus idle, HVAC noise, and fire safety training. Therefore, mitigations were not made in consideration of these scenarios.
- In the ranked list of the top twenty (20) scenarios, the diesel ferry was not included, because it doesn't run constantly anymore and is mitigated by implementing the electric ferry. Therefore, it was only measured to showcase the impact of mitigation efforts on noise emissions.
    - Mr. Beck (YQNA) inquired about when the second ferry will be replaced.
    - Mr. MacWilliams responds that the second ferry will never be electric as the Airport will always need a Diesel backup – for instance, if there is a power outage. The diesel ferry is only used 10% of the time.
- Ranked first on the list is Ferry Loading Impulses.
    - Mr. Beck (YQNA) noted that it was the time of the day that particularly caused the annoyance with the ferry loading.
    - Mr. Miller responded that every scenario is weighted based on a summary of their daytime, evening, and nighttime scores as per NPC300. Therefore, night occurrences are weighted differently, with a lower background noise.
    - Mr. Beck (YQNA) noted that for YQNA and BQNA residents, the Q400 takeoff is their top concern.
    - Mr. Watson responded that this study is on ground noise and, therefore, could not study the noise impact after the 36 seconds that the plane spends with its wheels on the ground to take off.
    - Ms. Monette (BQNA) noted a complaint she had made in previous meetings regarding the pilots revving their engines and releasing the brakes before taking off.
    - Mr. Wilson questioned whether this disturbance would be classified under pilot operational technique concern.

- Mr. MacWilliams responds that this is required as pilots must reach full engine power before releasing the brake, due to the limited runway space available.
- Ms. Monette agrees that this can be referred to as a pilot take-off technique concern as pilots could release the brake slowly to ease the rattling of the planes that occurs when the brakes are released with haste.

M#20-A2 PortsToronto will connect with RJ Burnside regarding the Q400 takeoff pilot takeoff technique noise concerns.

- The Ferry Loading Impulses occur when heavier trucks drive over the ramp onto the ferry, creating a bang from the flap that bounces due to the weight change. The flaps had been replaced and used for around three (3) months before they needed to be replaced again. The study will measure the noise impact associated with replacing these flaps and whether they need to be changed more frequently or if the material needs to be changed.
    - Mr. Moore (BQNA) inquired if the solution could be to park the buses on the city side.
    - Mr. MacWilliams explained that with the electrification of the busses, their charging infrastructure is also stored on the island, therefore needing them to be parked there overnight.
- Ranked second on the list is ferry travel as it exists today, which is 90% electric and 10% diesel. The use of the electric ferry reduces noise by 89%.
- Ranked third is GRE testing. This noise is already being mitigated. GRE is only allowed to be start being used at 6:45 am but if moved to 7:00 am, it's impacts will be reduced because it will not be occurring during the classified nighttime.
    - Mr. Moore (BQNA) suggested shifting the GRE testing to later in the day – for instance at 8 a.m. rather than 7 a.m.
    - Ms. Monette (BQNA) seconded this suggestion as it would mitigate the impact on nearby residents who may be sleeping.
    - Mr. MacWilliams responded that this is a fair concern. However, the Airport needs to conduct these jet engines earlier in the day, considering that the first flights out every morning are at 6:45 a.m.
- Ranked fourth is the small aircraft ramp-up at the east end.
    - Ms. Monette (BQNA) noted that engines face the condo buildings cause disturbance.

M#20-A3 PortsToronto will send photos received from Ms. Monette (BQNA) regarding the small aircraft engines facing the Eastern condos to RJ Burnside.

- The Q400 is ranked fifth. Three (3) scenarios, including the plane leaving the gate, taxiing, and queuing, will be used to study this.
    - Mr. Moore (BQNA) noted that this is the loudest sound people hear.

    - Mr. Watson acknowledged this and stated that the team is working on quantifying the number and duration of planes sitting there.
    - Mr. MacWilliams mentioned that they do not track this number due to the Airport's size. However, they are working to gather accurate data from the tower manager.
- Ranked sixth are air carts, which are portable air conditioning carts that move with the Q400 planes as they wait to take off. The gates at the east end of the Airport dominate this score. They emit quite loud, high-humming noise, which is particularly noticeable from condos on the east side. They measured this scenario in the quietest environment at its loudest operating noise setting.
    - Mr. Beck (YQNA) asked if there is a difference between whether the cart is cooling or heating the plane.
    - Mr. Watson responded that there is no difference. He also noted that this scenario could be eliminated if the Airport invests in acquiring a large air conditioning system attached to the Airport itself that would connect to the airplanes.
- Ranked seventh are small aircraft takeoffs, which, while not as loud as Q400 planes occur more frequently – around 6000 times a year.
    - Ms. Monette (BQNA) noted that these planes are nosier once they are in the air than when they are in take-off or landing. This is because they have a high-pitched whine, and the noise refracts from the buildings.
    - Mr. Mosher responded that this is not in the scope of the work.
    - Mr. Watson explained that this whine, known as tonal noise, is acknowledged in the study with a 5-decibel penalty increase.
- Ranked eighth is the Q400 deceleration, previously referred to as reverse thrust which is noisier do to the ability to pitch their blades. This scenario will account for both the pitching and the rare reverse thrust.
- Ranked nineth is small aircraft taxiing, occurring further north than Q400 taxiing due to hangar location. This is scored high because there are more of them than there are Q400s, and they are located closer to residents.
- The Ornge Air Helicopter is ranked tenth. This hover taxi does not touch the ground, but it is low enough to that a barrier can be used to reduce its noise.
- Ranked eleventh is the Q400 single-engine taxi. This is ranked higher than dual-engine taxiing only due to frequency. Air Canada Jazz uses a dual engine, and Porter uses a single engine. The Air Canada Jazz planes need both engines because one is used to operate another system on the plane and cannot be turned off. Therefore, they would need to make a significant physical change to the airplane to be able to run on a single engine.
    - Mr. MacWilliams noted that Air Canada can potentially consider making this change to a single engine, but over the next 20 years.

    - Mr. Beck (YQNA) asked about where the single-engine taxiing was measured from. There are two (2) Q400s that taxi south of the buildings that would be shielded.
    - Mr. Watson responded that the model considers how noise travels from the Airport to the height of the receptors on the nearby buildings.
- Ranked twelfth is the Leonardo AW139 ramp-up. Similar to the small aircrafts, it conducts prechecks before starting to hover. This can take a couple of minutes and is shielded by the buildings.
    - Mr. Beck (YQNA) asked about the fixed wing or the helicopter medical aircraft.
    - Mr. MacWilliams responded that these aircraft are a single-engine Pilatus PC-12.
    - Mr. Beck (YQNA) inquired about whether these aircraft fly at night as well.
    - Mr. MacWilliams responded that they primarily operate during the day, with occasional night-time flights. Ornge also contracts other private charter firms to transport people or organs. These aircraft may not always look orange, but they are still operable by Ornge.
    - Mr. Beck (YQNA) asked for confirmation that the ferry would not remain open due to these flights taking place overnight.
    - Mr. MacWilliams confirmed this.
- Among the last nine (9) operational scenarios is the ferry horn, ranked at thirteen (13). There is not much to mitigate regarding the ferry horn, as maritime rules require a certain level of noise. However, completely removing this noise would not make much of a difference due to its low ranking.
    - Mr. Moore (BQNA) commented that sometimes the ferry horn is worse than other times.
    - Mr. MacWilliam responded that the crew must use the full extent of the ferry horn every time when exiting the slip.
    - Mr. Beck (YQNA) inquired about the anti-bird measures and whether this refers to the gun sound used to deter birds. The duration of this sound is minimal – three (3) seconds – however, the sound itself is quite disturbing.
    - Mr. MacWilliams responded that car horns or distress sounds are used alternatively sometimes and are preferred as they are cheaper.
    - Mr. Paleja (City of Toronto) commented that the ranking should only be one part of the mitigation decision-making process. Community input and resident comments should be included. Therefore, even though the ferry horn may not be ranked very high, it should still be considered in the mitigation analysis.

    - Mr. Watson responded that making the horn quieter won't significantly impact overall noise emissions, but a noise wall at the east end of the Airport would.
    - Mr. Beck (YQNA) inquired about the Robinson R44 Ramp Up, ranked seventeenth.
    - Mr. Miller responded that this is the tour helicopter. Its noise is already well-shielded as the helicopters do their run-up behind hangar one (1). However, the helicopter still impacts residents once it is off the ground. According to the scope of the ground study, this scenario's score is quite minimal.
- Among the bottom-ranked operational scenarios are the garbage, emergency generator tests, and icebreaking due to their infrequency. The garbage pick-up is one case that was not measured. Rather, there are standard numbers that are accepted for trucks that were used. The noise studied is that of the garbage trucks' movements on the island going to the three (3) pick-up points.
    - Mr. Beck (YQNA) inquired if garbage complaints had been made.
    - Mr. Miller responded that there haven't been any and that the operational scenarios showcase anything that emits ground noise and is not necessarily derived from community complaints. He also explained the low score being due to the garbage pickup only happening once every two (2) weeks at three (3) locations. Therefore, completing it only takes a half-hour.
    - Mr. Beck (YQNA) inquired about the icebreaking, ranked last at number twenty-one (21).
    - Mr. Miller responded that this is also infrequent, happening only three (3) times a winter season. It is also a rare overnight occurrence, not constant.
    - Mr. MacWilliams noted that he has not received any complaints about breaking.
    - Mr. Beck (YQNA) commented that the noise was unbearable many years ago, and he complained about it then, but since he hasn't heard it. He then inquired about if new boats had been used.
    - Mr. MacWilliams responded that the Marilyn bell was in service in 2006, so the boats are much more robust now. The ice breaker is only used when the ice is severe.
- The list of ranked operational scenarios informs the mitigation analysis. There have been conversations about a barrier at the east end of the Airport, which might be something to explore. However, this would not affect all operational scenarios, such as the ferry. Therefore, other solutions have been discussed regarding the ferry flaps.
- The project team is open to suggestions for mitigation tactics, even non-feasible ones to model their impact on noise levels.

    - Mr. Moore (BQNA) inquired if the team would accept suggestions for noise-proofing material.
    - Mr. Watson responded that noise levels typically fall under two categories: absorptive and non-absorptive. The study area consists of much space that cannot be mitigated. For instance, water is a valuable and productive reflector of sound.
    - Mr. Moore (BQNA) responded that the south wall of hanger one (1) can use a sound-absorbing material.
- Some mitigation models that have been explored so far are the following: creating barriers near the small aircraft ramp-up area, replacing carts at exposed gates with electric building connections, increasing the replacement frequency and improving the quality of the ferry pad, and moving GRE testing away from the lower ambient times. This is not a final list; it will be further developed, especially with the committee's input. Suggestions can be inputted into the model to illustrate the degree of impact it has on the level of noise emitted.
    - Ms. Monette (BQNA) suggested pushing the planes out to face the water either east or west instead of south for the GRE testing before they start taxiing. Considering the high costs of barriers, physical and operational changes might be more feasible.
    - Ms. Homewood responded that there is no space for sound barriers to be built on the south end because there is no clearance.
    - Mr. Miller responded that the team is seeking mitigation suggestions regarding both physical and procedural changes.
- The final report will include the following table of contents: Introduction, Project Background, Noise Standards and Annoyance, Points of Reception, Ambient Noise Monitoring, Noise Measurement Procedures, Noise Sources, Assessment Methodology, Noise Models – Existing, Existing Impacts, Mitigation Considerations, Noise Models Mitigated, Mitigation Effectiveness Evaluation, Conclusions, References
    - Mr. Beck (YQNA) asked if the data captured for the projections will be in the report.
    - Mr. Miller responded that every scenario has an operational percentage that reflects the percentage of seconds per day it was occurring on average. All numbers are legitimately quantified through data and information received from Airport staff. This information will be included in the final report - at least in the appendix.
    - Ms. Homewood stated that this study is not an NEF compliance check.
    - Mr. Watson responded adding NEF numbers would only change the ranking of the Q400 due to increased frequency.
    - Mr. Beck (YQNA) noted that if the 246 Q400 slots are approved, it would cause community concern and should be considered.

- Ms. Homewood responded that the study is based on current data gathered by noise monitors and modeling conducted. It is not for a future proposed scenario because this is not an environmental assessment. If we were doing an environmental assessment to increase growth beyond the master plan, we would have to do this to justify the added growth.
- Jay Paleja (City of Toronto) reworded the question to ask if the model being built in this project can be used in the future for other purposes – for instance, to identify the impact of future growth.
- Mr. Miller responded that the frequency would need to be changed. However, this assumes nothing else on the island changes or moves - which expansion almost always requires. If anything changes, the entire model would need to be changed subsequently. Using this model would help to inform the impact that expansion would have, but we would not be asked to do that.
- Mr. Beck (YQNA) asked if the group could have the first six (6) parts of the study in draft now.
- Mr. Watson responded that this information is currently being drafted.
- Mr. Miller responded that the information is not boilerplate and is custom written for this project. Many safety considerations change how things are measured, which changes how the report will be written.

Mr. Mosher opened the floor to additional comments and questions from the committee.

- Mr. Paleja (City of Toronto) inquired about the measuring impact gathered from the monitors. He asked if only the number of units was being considered. Are sensitive sites being considered? For instance, there are nearby schools, playgrounds, and daycares. How are different populations impacted differently by the noise?
- Mr. Watson responded that the receptors have only been placed in residential areas. The provincial guidelines do not differentiate between various types of sensitive receptors. Under NPC300, a sensitive receptor is considered anywhere people sleep or expect quiet – for instance, schools, libraries, and places of worship if they are residentially zoned. The issue is that there is no accurate way to equate their existing receptors with the number of people in schools that would be potentially impacted.
- Mr. Miller added that there are other receptors that would be gathering the impact of these places. However overall, when mitigation strategies are implemented, they will also benefit these areas.
- Mr. Paleja (City of Toronto) requested that the final report document that the study considers sensitive sites even if they have not been measured.

M#20-A4 RJ Burnside will note that sensitive sites have been considered, even if they have not been measured in the final report.

- Ms. Monette (BQNA) noted that the school is much closer to the Airport than where the receptors have been placed.
- Mr. Watson responded that the school is shielded from the sound level behind both hangers, as it is at ground level.

3. Business Arising

Geoffrey Mosher (LURA) began the discussion of Business Arising topics.

- Mr. Mosher announced that the next noise management sub-committee meeting has been tentatively scheduled for Wednesday, August 7th, 2024, to be held virtually on Zoom.
- Mr. Beck (YQNA) noted that this date might be too soon, especially because the committee would like materials sent to them three (3) weeks before the meeting.
- Mr. Mosher noted that this is a tentative date and is open for discussion on other possible dates.
- Mr. Miller and Mr. Watson noted that August 7th would be a tight time frame for presenting a draft report as mitigation strategies have yet to be developed.
- Ms. Homewood agreed that the date could be shifted and suggested that RJ Burnside share their top mitigation strategy suggestions with the Airport to circulate to the committee. A meeting in September can be arranged to present the draft report.

M#20-A5 LURA will arrange to schedule a meeting in September for RJ Burnside to present the draft report.

- Ms. Monette (BQNA) and Mr. Paleja (City of Toronto) commended Mr. Miller and Mr. Watson for their hard efforts and groundbreaking work. They requested that a note be made in the report highlighting that this work is unique and unprecedented.

The meeting adjourned at 9:30 PM.

Appendix A

Meeting Agenda

Billy Bishop Toronto City Airport
Noise Sub Committee Meeting 20

Wednesday June 26, 2024
6:30 PM to 8:00 PM
In Person – Radisson Blu Toronto Downtown

AGENDA ITEMS

6:30 Welcome

6:35 Agenda and Action Item Review

6:40 Ground Noise Study Update on Findings (Harvey & Brent – RJ Burnside & Associates)

7:45 Business Arising

- Next meeting Wednesday August 7th, 2024, 6:30-8:00 PM (Virtual - Zoom)

8:00 Adjourn

Appendix B

Ground Noise Study Presentation

Ground Noise Assessment

Billy Bishop Toronto City Airport

Prepared by: Harvey Watson, R.J. Burnside & Associates Limited
Brent Miller, R.J. Burnside & Associates Limited
Colin Novak, Akoustik Engineering Limited

Presented to: Noise Management Subcommittee

Delivered on: Wednesday June 26, 2024

Agenda

- Team Background
- Ground Noise Assessment Mission
- Why are we here today?
- Review of Impact Formula
- dBA vs. dBZ units
- Background Noise
- Models with No Impact

Agenda - continued

- Impact Results of each Model
- Mitigation Assessment
- Planned Mitigated Models
- Future Steps
- Questions & Discussion
- Thank You

Team Background

- Dr. Colin Novak, Ph.D. – Akoustik
  - Ph.D. in Mechanical Engineering
  - Extensive experience in Airport noise
- Harvey Watson, P.Eng. – RJ Burnside
  - Manager of Air & Noise at Burnside
  - 15 years acoustics experience
- Brent Miller, P.Eng. – RJ Burnside
  - B.Eng. in Aerospace Engineering
  - 8 years acoustics experience

Ground Noise Assessment Mission

- Find the most effective way for PortsToronto to invest in lowering noise impacts for the community.

- How?
  - modeling all predictable ground noise sources of disturbance from the airport.
  - Propose reduction mitigation and rank each by cost and potential to reduce disturbances.

Why are we here today?

- Summary of Initial Findings
- Show the NMSC what noise we're focused on in Mitigation Analysis
- Show the NMSC what mitigation concepts we're planning to assess.
- Take Questions

Reviewing The Impact Formulas

- **Impact = Noise Level over background * frequency of occurrence**
  - Impact of all sources added together at each POR
- Repeat for Mitigated version and consider the change

$$I_{OS} = \sum_{POR01 \rightarrow POR20}^{i} \left(NL_{unmit} - N_{Bkgnd}\right) * U_{PORi} * O_{OS}$$

$$I_{OS\_mit} = \sum_{POR1 \rightarrow POR20}^{i} \left(NL_{unmit} - NL_{mit} - N_{Bkgnd}\right) * U_{PORi} * O_{OS}$$

- Result is a ranked list of which noise is most disturbing
- This helps us focus where to address mitigation efforts

Variable Definitions

$$I_{OS} = \sum_{POR01 \rightarrow POR20}^{i} \left(NL_{unmit} - N_{Bkgnd}\right) * U_{PORi} * O_{OS}$$

I_{OS} = Impact Score – For 1 Operational Scenario

POR01 – POR20 = Point of Reception – 20 Locations where we calculate the noise levels

NL_{unmit} = Unmitigated Noise Level

NL_{mit} = Mitigated Noise Level

N_{Bkgnd} = Background Noise Level

U_{PORi} = Number of Units at POR number being considered

O_{OS} = Operational Percentage – What percent of seconds per day does this occur?

Reviewing The Impact Formulas

- What does 1 Impact point mean?
  - 1 decibel above background for 1 dwelling for 1 day.
- What does 0 Impact or Near 0 Mean?
  - Noise was below background or…
  - The situation modeled is very rare.

$$I_{OS} = \sum_{POR01 \rightarrow POR21}^{i} \left(NL_{unmit} - N_{Bkgnd}\right) * U_{PORi} * O_{OS}$$

dBA vs. dBZ

- Background values at 680 Queens Quay W are:
  - Daytime - 60 dBA / 72 dBZ
  - Evening - 55 dBA / 68 dBZ
  - Nighttime - 52 dBA / 65 dBZ
- We assessed the impact of three Operational Scenarios under both dBA and dBZ.

dBA vs. dBZ cont.

- 8 of 9 time periods (3 OS * 3 time of day), impact was higher in dBA than in dBZ.
- For the one case where the impact was higher in dBZ, the increase was small (10%).
- Assessment in dBZ showed no impact from Air Carts, which are clearly audible.
- Since ranking is done based on difference in impacts ($NL_{unmit} - N_{Bkgnd}$), choice of dBA vs dBZ must be done in audible range.
- Criteria intended for human assessment worldwide use dBA.

Background

- 5 Volunteers in community were sought
- 2 Volunteers came forward
- Volunteers let the Study Team install noise monitors at their homes outdoors for 2 weeks
- Results were interpolated out to the 20 calculation points for Day, Evening and Nighttime periods.

Operational Scenarios (O.S.)

- 1. Q400 Taxi – 1 Engine
- 2. Q400 Taxi – 2 Engines
- 3. Q400 Takeoff
- 4. Q400 Landing
- 5. Q400 Deceleration
- 6. Q400 Max Thrust
- 7. Small Aircraft Taxi
- 8. Small Aircraft Ramp Up
- 9. Small Aircraft Takeoff
- 10. Small Engine Landing
- 11. Aircraft Support Activities
- 12. AW139 Heli Ramp up
- 13. AW139 Heli Taxi
- 14. R44 Heli Ramp up
- 15. Ferry Loading – Impulse
- 16. Ferry Travel
- 17. Ice Breaking Ferry
- 18. Anti Bird Measures
- 19. Lawncare
- 20. Snow Removal
- 21. Runway/taxiway Snow Removal
- 22. Mainland vehicle idling
- 23. Shuttle bus idling
- 24. HVAC
- 25. Emergency Generator Testing
- 26. Fire Safety Training
- 27. GPUs
- 28. Air carts
- 29. APUs
- 30. Garbage Pickup
- 31. Ferry Horn
- 32. Q400 Taxiway queuing

O…S.)

Models 27 & 29 were canceled:

The Reasons:

- GPUs and APUs are only used as back up systems and very rare.
- Difficult to get accurate usage rate
- Very low score inevitable

- 1. Q400
- 2. Q400
- 3. Q400
- 4. Q400
- 5. Q400 …w Removal
- 6. Q400 …ng
- 7. Small
- 8. Small
- 9. Small …r Testing
- 10. Sma… Engine Landing … Fire Safety Training
- 11. Aircraft Support Activities
- 12. AW139 Heli Ramp up
- 13. AW139 Heli Taxi
- 14. R44 Heli Ramp up
- 15. Ferry Loading – Impulse
- 16. Ferry Travel
- 27. GPUs
- 28. Air carts
- 29. APUs
- 30. Garbage Pickup
- 31. Ferry Horn
- 32. Q400 Taxiway queuing

Operational Scenarios Calculated Impacts: Zero Impact Models

- Starting with the models the Study have determined have no impact above background
  - Small Aircraft Landing
  - Aircraft Support Activities
  - Lawncare
  - General Snow Removal
  - Mainland Vehicle Idling
  - Shuttle Bus Idling
  - HVAC Noise
  - Fire Safety Training
- Neighbouring residents are unlikely to notice noise reductions of these sources.

Rank	O.S. Name	Total Score	% of #1 Rank
-	Diesel Ferry	16,497	718.3%
1	Ferry Loading Impulses	2,297	100%
2	Ferry Travel	1,807	78.7%
3	GRE Testing	1073	46.7%
4	Small Aircraft Ramp Up	1027	44.7%
5	Q400 Takeoff	794	34.6%
6	Air Cart	745	32.5%
7	Small Aircraft Takeoff	366	15.9%
8	Q400 Deceleration	337	14.7%
9	Small Aircraft Taxiing	322	14.0%
10	Leonardo AW139 Taxiing	267	11.6%

Rank	O.S. Name	Total Score	% of #1 Rank
11	Q400 - Single Engine Taxi	204	8.9%
12	Leonardo AW139 Ramp Up	184	8.0%
13	Ferry Horn	138	6.0%
14	Q400 - Landing	44.4	1.9%
15	Anti Bird Measures	23.3	1.0%
16	Q400 - Dual Engine Taxi	23.0	1.0%
17	Robinson R44 Ramp Up	22.6	1.0%
18	Garbage	18.5	0.8%
19	Runway / Taxiing Snow Removal	10.5	0.5%
20	Emergency Generator Tests	0.5	0.0%
21	Ice Breaking	0.2	0.0%

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Diesel Ferry:

- Not Ranked
- Replaced by Electric Ferry already
- By far the most impactful

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Ferry Loading Impulses:

- Rank #1
- Noise Occurs from vehicles driving onto ferry ramp causing a “bang” impulse sound

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Ferry Travel:

- Rank #2
- 90% Electric, 10% Diesel during maintenance
- 89% reduction of Impact score.

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GRE Testing:

- Rank #3
- “Ground Run-up Enclosure”
- Testing of engines after maintenance at max power before flight.
- Huge Noise Control Structure Exists

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Small Aircraft Ramp Up:

- Rank #4
- Noise Occurs from area east of airport main building

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Q400 Takeoff:

- Rank #5
- Ground Noise Only
- Scenario ends after wheels liftoff.

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Air Carts:

- Rank #6
- Portable Air conditioning supply for Q400
- Score dominated by Q400 gates on east of airport.

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Small Aircraft Takeoff:

- Rank #7
- Noise counted for as long as aircraft wheels touch the ground.

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Q400 Deceleration:

- Rank #8
- Q400 Landing when pilot angles the propellor blades to assist with slowing the aircraft.

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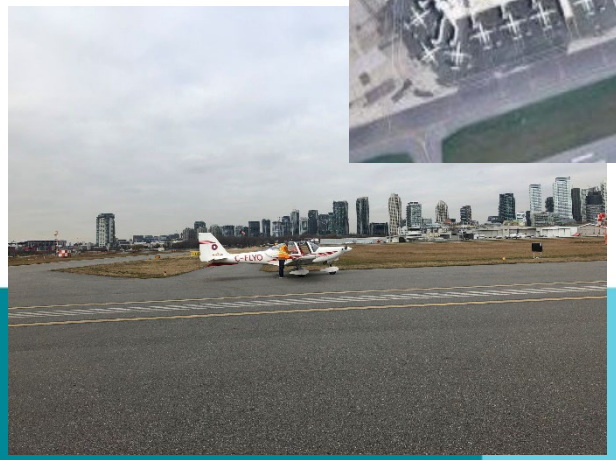
Small Aircraft Taxiing:

- Rank #9
- Taxiing can occur further north than Q400 taxiing due to hangar location



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Leonardo AW139 Taxiing:

- Rank #10
- Ornge Air Helicopter
- Hover taxi following path of taxiways
- Airborne noise considered due to consistent low altitude

Q400 Single Engine Taxiing:

- Rank #11
- Ranked higher than dual engine taxiing only due to frequency

Rank	O.S. Name	Total Score	% of #1 Rank
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17	Robinson R44 Ramp Up	22.6	1.0%
18	Garbage	18.5	0.8%
19	Runway / Taxiing Snow Removal	10.5	0.5%
20	Emergency Generator Tests	0.5	0.0%
21	Ice Breaking	0.2	0.0%

Leonardo AW139 Ramp Up:

- Rank #12
- Done near the hangar used for Ornge

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20	Emergency Generator Tests	0.5	0.0%
21	Ice Breaking	0.2	0.0%

The Rest of the O.S.:

- Ferry Horn
  - Cannot get quieter / Safety
- Q400 Landing
- Anti-Bird Measures
- Q400 Dual Engine Taxi
  - Hardwired into some of the Q400s.
- Robinson R44 Ramp Up
  - Well shielded by Hanger while on the ground
- Garbage Pickup
  - Infrequent
- Emergency Generator Tests
  - Infrequent
- Ice Breaking
  - Infrequent

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20	Emergency Generator Tests	0.5	0.0%
21	Ice Breaking	0.2	0.0%

Mitigation Assessment

- Study Team now will propose mitigation concepts
  - Ideas large and small, realistic and unrealistic, near term and long term are all possibilities to be included.
- Mitigation concepts are modeled to show impact change.

Mitigation Models

- Barriers
  - Small Aircraft Ramp up
  - Taxiing
- Air carts
  - Replacing carts at exposed gates with building connection.
- Ferry Impulse pads
  - Frequency of replacement
  - Quality of pad
- GRE testing time changes
  - Moving tests away from lower ambient times
- **Final list not yet determined**

Future End Results

- Mitigation concepts ranked by potential benefit and costs estimated
- PortsToronto implements the most effective measures assessed based on business case reviews

What's Coming in the Report

Table of Contents:

- Introduction
- Project Background
- Noise Standards and Annoyance
- Points of Reception
- Ambient Noise Monitoring
- Noise Measurement Procedures
- Noise Sources
- Assessment Methodology
- Noise Models – Existing
- Existing Impacts
- Mitigation Considerations
- Noise Models Mitigated
- Mitigation Effectiveness Evaluation
- Conclusions
- References

Questions & Discussion

Thank You!

- Thank you for listening and participating

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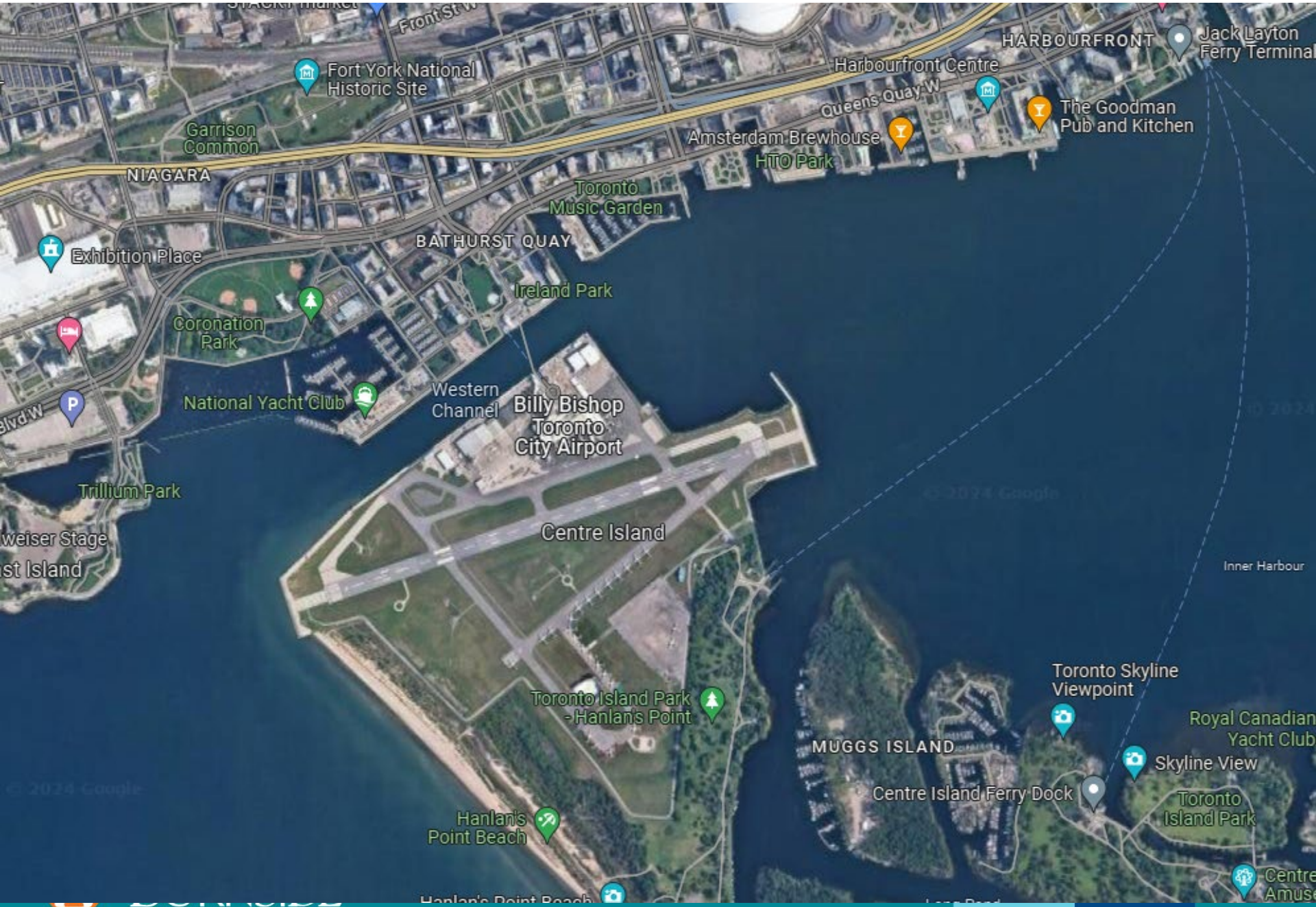
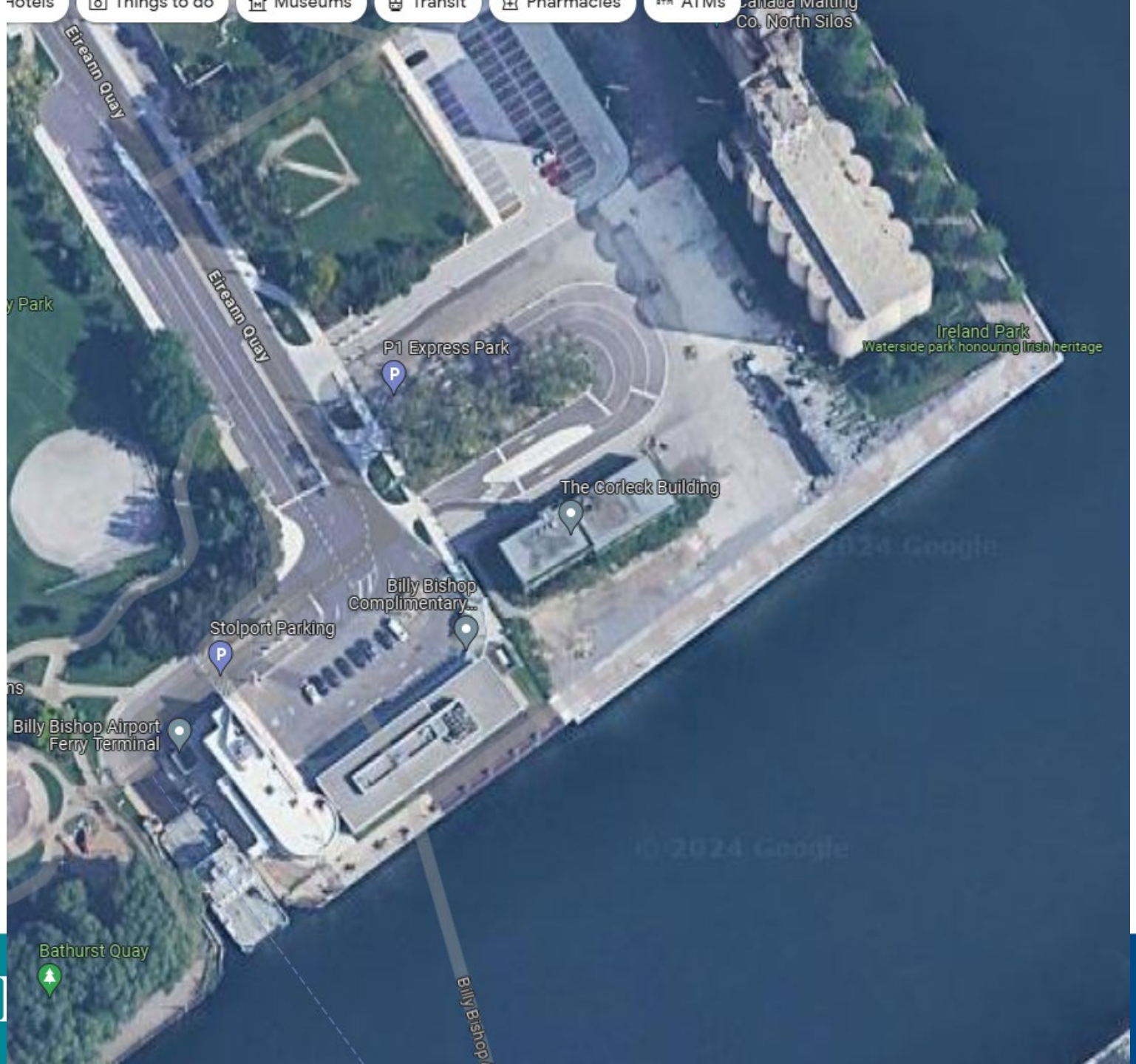

Front St W
HARBOURFRONT
Jack Layton Ferry Terminal
Fort York National Historic Site
Harbourfront Centre
Queens Quay W
The Goodman Pub and Kitchen
Garrison Common
Amsterdam Brewhouse
HTO Park
NIAGARA
Toronto Music Garden
BATHURST QUAY
Exhibition Place
Ireland Park
Coronation Park
National Yacht Club
Western Channel
Billy Bishop Toronto City Airport
Trillium Park
Centre Island
Inner Harbour
Toronto Skyline Viewpoint
Toronto Island Park - Hanlan's Point
Royal Canadian Yacht Club
MUGGS ISLAND
Skyline View
Centre Island Ferry Dock
Toronto Island Park
Hanlan's Point Beach


Stadium
Road Park
City Skyline and
Sunset Viewpoint
National Yacht Club
Western
Channel
Billy Bishop
Toronto
City Airport
Porter FBO Limited
Hanlan's Point
Ferry Dock
Toronto Island Park
- Hanlan's Point
Blockhouse
Bay
Hanlan's
Point Beach


Hotels
Things to do
Museums
Transit
Pharmacies
ATMs
Canada Malting Co. North Silos
Eireann Quay
Eireann Quay
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P1 Express Park
Ireland Park
Waterside park honouring Irish heritage
The Corleck Building
Billy Bishop Complimentary...
Stolport Parking
ns
Billy Bishop Airport Ferry Terminal
Bathurst Quay
Billy Bishop