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MEMORANDUM

DATE:	2025-11-25	RWDI Reference No.: 2512374
TO:	Derek Judson	EMAIL: judson@parkin.ca
FROM:	Jordan Gilmour	EMAIL: Jordan.Gilmour@rwdi.com
	Kyle Hellewell	EMAIL: Kyle.Hellewell@rwdi.com
RE:	Transportation Noise Analysis Queensway Carlton Hospital Nepean, Ontario	

Dear Derek,

We have completed the transportation noise analysis for the noise impacts on Queensway Carlton Hospital's (QCH) existing buildings and planned new additions which include a new mechanical and generator room, new parking garage, level 1 expansion of the Material Management & E.V.S, a three level addition to the inpatient tower, a three level addition to the transitional care tower and a one level addition to the emergency department. QCH is exposed to noise from road traffic from Highway 416 to the west, Highway 417 to the north, Baseline Road to the south and Richmond Road to the northwest. Additionally, QCH is exposed to noise from rail traffic due to the CN rail line located to the south. Rail vibration was considered but not assessed since the setback from the rail line is too great. The review was intended to identify the noise impacts from nearby transportation sources, both road and rail on QCH. This memorandum summarizes all results and recommendations.

Introduction

Noise Exposure Criteria

Criteria for transportation noise sources (road and rail) are adopted from the Ontario Ministry of Environment, Conservation and Parks (MCEP) NPC-300 Environmental Noise Guideline (MOE, 2013). NPC-300 presents indoor sound level criteria for road and rail sources, which apply to health care settings such as hospitals. In addition to the sound level criteria, noise control measures and requirements for ventilation and warning clauses are recommended based on predicted transportation source sound levels incident in the plane of window at noise sensitive areas.



For daytime (07:00 – 23:00) impacts below 55dBA and nighttime (23:00 – 07:00) below 50 dBA no noise control measures are required. For daytime impacts above 55 dBA and nighttime impacts above 50 dBA noise control measures such as air conditioning are required, and further 10 dB above these limits, minimum building envelope STCs must be specified.

Road Traffic Volume Data

Average Annual Daily Traffic (AADT) volumes were obtained from open-source data provided by the City of Ottawa for Baseline Rd. and Richmond Rd. Open-source data provided by the Ministry of Transportation (MTO) was used for Highway 416 and 417. AADT volumes do not provide indication of what time of day traffic is present. An 85%/15% day/night volume split was assumed for Baseline Rd. and Richmond road. A 67%/33% day/night volume split was assumed for both Highway 416 and 417.

The traffic volumes for each roadway were increased at a rate of 2% per year to represent the predicted 10-year horizon volumes.

A summary of the traffic data used is included in **Table 1** below with more detailed information included in **Appendix A**.

Table 1: Road Traffic Volumes

Roadway	Segment	2035 Future Traffic (AADT)	% Day/Night	% Trucks
Highway 416	Hunt Club Rd to Richmond Rd	72703	67/33	13
Highway 417	Richmond Rd to Moodie Dr	195547	67/33	13
Baseline Rd	-	29359	90/10	5.6
Richmond Rd	-	41963		4.8

Rail Traffic Volumes

The nearby rail corridor is part of the CN Rail Beachburg sub, which is classified as a main line with freight traffic only. Freight rail volumes were requested but were not provided in time to be included in this memorandum. As such, conservative volumes were assumed for present day operations based on the type and location of the rail. The Beachburg sub has been identified by CN in their July 11, 2025



Three-Year Rail Network Plan as track to be discontinued. Future sound levels from this sub cannot be predicted, since plans for the discontinued track are unknown at this point.

The data used for the analysis is summarized in **Table 2** with details of the data used in **Appendix A**.

Table 2: Rail Traffic Volumes and Configuration

Train Type	Daytime	Nighttime	Type of Locomotive	No. of Locomotives	No. of Cars	Speed (km/h)
CN Freight	4	2	Diesel	2	40	60

Transportation Source Assessment – Analysis and Results

Sound levels due to the adjacent road were predicted by inputting sound emission data from ORNAMENT (MOE, 1989) into ISO 9613 line sources in the Cadna/A software package. ORNAMENT sound emission data was used in accordance with the City of Ottawa Environmental Noise Control Guidelines. The ISO9613 calculation method was used since it provides better detailed calculations around complex buildings like the hospital.

Sound levels due to the adjacent rail line were predicted using the FTA method (FTA, 2018) as implemented in the Cadna/A software package.

To assess the effect of transportation noise on suites, the maximum sound level on each façade was determined, with the results summarized in **Table 3**.

Table 3: Predicted Ground Transportation Source Sound Levels – Plane of Window

Building	Façade	Road		Rail		Road + Rail	
		Day LEQ, 16hr	Night LEQ, 8hr	Day LEQ, 16hr	Night LEQ, 8hr	Day LEQ, 16hr	Night LEQ, 8hr
Existing Hospital	North	64 dBA	64 dBA	48 dBA	48 dBA	64 dBA	64 dBA
	East	57 dBA	57 dBA	44 dBA	44 dBA	57 dBA	57 dBA
	South	63 dBA	63 dBA	47 dBA	47 dBA	63 dBA	63 dBA
	West	65 dBA	64 dBA	49 dBA	49 dBA	65 dBA	64 dBA
	North	56 dBA	55 dBA	37 dBA	37 dBA	56 dBA	55 dBA
	East	56 dBA	54 dBA	38 dBA	38 dBA	56 dBA	54 dBA



Emergency Department Expansion	South	56 dBA	54 dBA	40 dBA	40 dBA	56 dBA	55 dBA
	West	55 dBA	53 dBA	39 dBA	39 dBA	55 dBA	53 dBA
Inpatient Tower Expansion	North	64 dBA	64 dBA	42 dBA	42 dBA	64 dBA	64 dBA
	East	55 dBA	53 dBA	44 dBA	44 dBA	55 dBA	54 dBA
	South	63 dBA	63 dBA	47 dBA	47 dBA	63 dBA	63 dBA
	West	65 dBA	64 dBA	46 dBA	46 dBA	65 dBA	64 dBA
MM & EVS Addition	North	58 dBA	58 dBA	51 dBA	51 dBA	58 dBA	58 dBA
	East	57 dBA	56 dBA	43 dBA	43 dBA	57 dBA	56 dBA
	South	56 dBA	55 dBA	44 dBA	44 dBA	56 dBA	55 dBA
	West	58 dBA	58 dBA	51 dBA	51 dBA	58 dBA	58 dBA
Transit Care Tower Addition	North	61 dBA	60 dBA	39 dBA	39 dBA	61 dBA	60 dBA
	East	56 dBA	55 dBA	43 dBA	43 dBA	56 dBA	55 dBA
	South	57 dBA	56 dBA	45 dBA	45 dBA	58 dBA	57 dBA
	West	62 dBA	61 dBA	36 dBA	36 dBA	62 dBA	61 dBA
New Mechanical/ Generator Room	North	60 dBA	59 dBA	41 dBA	41 dBA	60 dBA	59 dBA
	East	56 dBA	55 dBA	39 dBA	39 dBA	56 dBA	55 dBA
	West	61 dBA	61 dBA	39 dBA	39 dBA	61 dBA	61 dBA

Recommendations

Central air conditioning is recommended in patient areas, and consideration may be given to installing inoperable windows to prevent noise exposure. Although levels are elevated here, construction that meets Ontario Building Code should create acceptable indoor sound levels. Doors and windows should be selected with a minimum Sound Transmission Coefficient (STC) of 29 and exterior walls with a minimum STC of 45.

Since the specified STCs relate to room geometries, we recommended that the room geometries are reviewed during detailed design to confirm that the minimum STC requirements for windows and exterior walls meet the indoor sound level limits. If indoor sound levels limits are not met, the analysis and recommendations will be revised based on the detailed design.



Derek Judson
Queensway Carleton Hospital
RWDI#2512374
November 25, 2025

Conclusion

RWDI was retained to prepare a transportation noise assessment to evaluate the noise impacts on existing and future portions of Queensway Carleton Hospital. Based on the modelling results, it is predicted that the required interior noise levels will be achieved with typical Ontario Building Code construction.

Yours truly,

**Kyle Andrew
Hellewell -- P.Eng.
- PEO**

Digitally signed by Kyle Andrew Hellewell --
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PEO, o=Certificat Pro, ou=Professional
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Date: 2025.11.26 11:24:06 -05'00'

Kyle Hellewell, P.Eng.
Technical Director, Associate
RWDI

Attach.

Statement of Limitations

This memorandum entitled Transportation Noise Analysis Queensway Carleton Hospital was prepared by Rowan Williams Davis Irwin ("RWDI") for Queensway Carleton Hospital ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein to understand the different factors which may impact the conclusions and recommendations provided.

A large decorative graphic on the left side of the page. It features a blue triangular shape in the top-left corner, a white curved line separating it from a large light-grey circular area, and a thin white line separating the grey area from the rest of the page.

APPENDIX A

Highway	Location Description From	Location Description To	Distance (KM)	2021 AADT
416	RM OC RD 32 HUNT CLUB RD IC-72	RM OC RD 36 RICHMOND ROAD IC	2.7	55,100
417	RICHMOND RD BAYSHORE DR IC	MOODIE DR IC-134	2.9	148,200

Roadway	2024 AADT
Baseline Road	23612
Richmond Road	33749