
APPENDIX I
NOISE ANALYSIS

MEMO

RE: Halton Region
Dundas Street (Regional Road 5) Transportation Improvements
(from Brant Street to Bronte Road)
Class Environmental Assessment Study

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DATE: June 4, 2012

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SUBJECT: Dundas Street Class EA Study
Noise Assessment

1. Introduction

Halton Region is undertaking a Class Environmental Assessment (Class EA) Study for road improvements along the Dundas Street (Regional Road 5) corridor from Brant Street to Bronte Road (Regional Road 25), within the City of Burlington and the Town of Oakville. The road improvements include the implementation of curb lane High Occupancy Vehicle (HOV)/ transit operations in the interim (2021) and the long term goal for Bus Rapid Transit (BRT) by 2031. Dundas Street between Brant Street and Bronte Road currently operates with a posted speed limit of 60 km/h and 80 km/h but will be reduced to 60 km/hr in the future as the road transitions from a rural corridor to an urban arterial road. It is proposed that Dundas Street be reconstructed to a 6-lane cross section.

As part of the Class EA Study, a noise assessment was conducted to assess the potential increase in noise level to noise sensitive areas as a result of the proposed improvements to Dundas Street between Brant Street and Bronte Road. Existing land uses south of Dundas Street are mainly residential. North of Dundas Street, lands are currently largely vacant between Brant Street and 407 ETR. East of 407 ETR, lands are either planned for future development (e.g. between 407 ETR and Walkers Line), or have been developed (e.g. Alton Community). The noise assessment was undertaken based on a selection of several private residential homes within the Study Area. These residential houses located adjacent to Dundas Street were selected to represent the potential noise impact to noise sensitive areas in proximity to Dundas Street.

This memorandum summarizes the findings of the noise assessment.

2. Methodology

Noise levels are predicted in decibels in the A-weighted dBA scale, which best approximates the human perception of sound over a specified time period. An increase of 2 – 3 decibels in noise levels is considered to be just perceivable to the average person. It should be noted that a 3 dBA increase in noise equates to a doubling of traffic volumes.

Ministry of the Environment Guidelines

Since roadway sound levels vary over time, the noise descriptor used in Ontario to assess noise is the “equivalent sound level” - L_{eq} . L_{eq} is identified as the continuous sound level, which has the same energy as a time varying sound level over a specified time period. For the purposes of assessing municipal roadway noise, L_{eq} is calculated on the basis of the 16 hour daytime period, 7:00 a.m. to 11:00 p.m. For new residential development adjacent to existing roads, the provincial objective is 55 dBA in the outdoor living area (OLA) for the daytime period.

Based on the Ontario Ministry of Transportation (MTO)/Ministry of the Environment and Climate Change (MOECC) Noise Protocol, where an existing roadway is proposed to be modified / widened adjacent to a Noise Sensitive Area (NSA), MOECC requires that the future noise levels without the proposed improvements be compared to the future noise level with the proposed improvements. The assessment is done at the outdoor living area (typically backyards) of each NSA. The provision of noise mitigation is to be investigated should the future noise level with the proposed improvements result in a greater than 5 dBA increase over the future noise level without the proposed improvements. If noise mitigation is provided, the objective is a minimum 5 dBA reduction. Mitigation will attempt to achieve levels as close to, or lower than, the objective level as is technically, economically and administratively feasible.

The STAMSON 5.0 computer modelling program, which is approved for use in Ontario by the MOE, was used to assess existing and future noise levels on Dundas Street. This program is used to predict noise levels generated from the road at the outdoor living areas (typically backyards) of NSA’s.

3. Analysis

Three scenarios were calculated:

- i) future noise levels without improvements to Dundas Street (Year 2021 / 2031)*
- ii) future interim noise levels with HOV / transit lane on Dundas Street (Year 2021)
- iii) future noise levels with BRT lane on Dundas Street (Year 2031)

The following table summarizes the main assumptions and factors used in the analysis.

* It should be noted that existing (2013) traffic volumes on Dundas Street were used to represent the future without widening of Dundas Street scenario as Dundas Street is currently operating at or near capacity.

Table 3-1 - Factors Used In Noise Analysis

Factor	Assumptions
Noise Descriptor	L_{eq} (16 hr)
Posted Speed	Dundas Street between Brant Street and Bronte Road <ul style="list-style-type: none"> - 80 km/h (existing) - 60 km/h (future)
Traffic Volumes AADT	Dundas Street, Between Brant Street and Guelph Line: <ul style="list-style-type: none"> - Existing (2013) – 24,829 - Future Interim (2021) – 33,000 - Future (2031) – 33,800 Dundas Street, Between Guelph Line and Appleby Line: <ul style="list-style-type: none"> - Existing (2013) – 29,524 - Future Interim (2021) – 41,600 - Future (2031) – 41,400 Dundas Street, Between Appleby Line and Bronte Road: <ul style="list-style-type: none"> - Existing (2013) – 30,042 - Future Interim (2021) – 42,200 - Future (2031) – 42,800
Truck Percentages (Medium / Heavy)	Medium truck – 3 % Heavy truck – 2 %
Receptor Height	1.5 m above the ground
Noise Barrier	Existing developer barriers were taken into consideration in noise calculations

Note: The HOV lane 16 hour volume for the interim 2021 scenario was estimated to be 3602 from Brant Street to Guelph Line, 4544 from Guelph Line to Appleby Line and 4612 from Appleby Line to Bronte Road vehicles per direction. Similarly, for the future 2031 BRT lane scenario, the 16 hour volume was estimated to be 56 vehicles per direction for the section from Brant Street to Bronte Road per direction.

4. Noise Sensitive Areas

There are existing residential houses abutting Dundas Street within the study limits on the south side. Several were selected to be included in the noise calculations as representatives to these residential houses on the south side of Dundas Street. The selected receiver locations are summarized in Table 4-1.

Table 4-1 – Receiver Locations

Receiver #	Location	Characteristic of Property in Relation to Dundas Street
Receiver 1	2430 Kristie Court	Reversed Frontage
Receiver 2	2481 Overton Drive	Reversed Frontage
Receiver 3	2293 Kirkburn Drive	Reversed Frontage
Receiver 4	2423 Torquay Court	Reversed Frontage
Receiver 5	2376 Malcolm Crescent	Reversed Frontage
Receiver 6	2453 Whittaker Drive	Reversed Frontage
Receiver 7	2461 Whittaker Drive	Reversed Frontage
Receiver 8	3079 Fontana Court	Reversed Frontage
Receiver 9	3113 Autumn Hill Crescent	Reversed Frontage
Receiver 10	3146 Driftwood Drive	Reversed Frontage
Receiver 11*	2470 Headon Forest Drive	Frontage (separated by a local road)
Receiver 12	2490 Headon Forest Drive	Reversed Frontage
Receiver 13	2530 Northhampton Boulevard	Reversed Frontage
Receiver 14	2531 Northhampton Boulevard	Reversed Frontage
Receiver 15	2986 Jackson Drive	Side Lot
Receiver 16*	2976 Guire Common	Side Lot
Receiver 17*	2962 Singleton Common	Side Lot
Receiver 18*	4178 Rawlins Common	Side Lot
Receiver 19*	4400 Millcroft Park Drive	Reversed Frontage
Receiver 20*	2563 Hogan Court	Reversed Frontage
Receiver 21	2557 Armour Crescent	Frontage (separated by a local road)
Receiver 22*	2574 Armour Crescent	Side Lot
Receiver 23	5238 Stonehaven Drive	Frontage (separated by a local road, set back from Dundas Street)
Receiver 24	5360 Dundas Street	Frontage
Receiver 25*	2627 Valley Ridge Drive	Side Lot
Receiver 26	3123 Stornoway Circle	Frontage (separated by a local road)

*Note: * Properties with existing noise barrier by developer / noise wall*

5. Results

Noise levels were calculated at the selected receiver locations for the future with and without improvements scenarios (interim condition with HOV/transit lanes in 2021, and ultimate condition with BRT lanes in 2031). Table 5-1 and Exhibits 1a to 1e summarize the predicted daytime noise levels at Receivers 1 to 26, as well as the potential changes in future noise levels.

STAMSON output sheets for existing and future noise levels for Receivers 1 to 26 for the alternatives are on file with MMM Group Limited.

Table 5-1: Dundas Street Class EA – Summary of Calculated Noise Levels

Receiver Location (see key plan)	Distance from Receiver Location to Noise Source (m)			Project Noise Level dBA Leq (16)				
	Existing or Future without Improvements (4 Lanes)	Future with Improvements (6 Lanes)		Existing (2013) / Future Without Improvements	Future With HOV / Transit Lanes (2021)	Difference in Noise Level with HOV / Transit Lanes	Future With BRT Lanes (2031)	Difference in Noise Level with BRT Lanes
		GPL	HOV/BRT					
<u>Receiver 1</u> 2430 Kristie Court	EB -71 WB -85	EB -74 WB -89	EB -68 WB -95	60.7	59.0	-1.7	59.0	-1.7
<u>Receiver 2</u> 2481 Overton Drive	EB -76 WB -88	EB -76 WB -90	EB -70 WB -95	59.7	58.3	-1.4	58.4	-1.3
<u>Receiver 3</u> 2293 Kirkburn Drive	EB -76 WB -88	EB -76 WB -90	EB -72 WB -95	58.9	57.2	-1.7	57.3	-1.6
<u>Receiver 4</u> 2423 Torquay Court	EB -75 WB -85	EB -73 WB -87	EB -68 WB -92	58.8	57.3	-1.5	57.4	-1.4
<u>Receiver 5</u> 2376 Malcolm Crescent	EB -80 WB -90	EB -77 WB -91	EB -72 WB -96	58.6	57.1	-1.5	57.2	-1.4
<u>Receiver 6</u> 2453 Whittaker Drive	EB -115 WB -125	EB -112 WB -128	EB -107 WB -133	57.1	55.6	-1.5	55.8	-1.3
<u>Receiver 7</u> 2461 Whittaker Drive	EB -64 WB -76	EB -62 WB -77	EB -57 WB -82	60.4	59.0	-1.4	59.1	-1.3
<u>Receiver 8</u> 3079 Fontana Court	EB -65 WB -78	EB -64 WB -79	EB -59 WB -84	61.0	59.8	-1.2	59.8	-1.2

Receiver Location (see key plan)	Distance from Receiver Location to Noise Source (m)			Project Noise Level dBA Leq (16)				
	Existing or Future without Improvements (4 Lanes)	Future with Improvements (6 Lanes)		Existing (2013) / Future Without Improvements	Future With HOV / Transit Lanes (2021)	Difference in Noise Level with HOV / Transit Lanes	Future With BRT Lanes (2031)	Difference in Noise Level with BRT Lanes
		GPL	HOV/BRT					
<u>Receiver 9</u> 3113 Autumn Hill Crescent	EB – 75 WB – 85	EB – 72 WB – 87	EB – 67 WB – 92	59.5	58.3	-1.2	58.3	-1.2
<u>Receiver 10</u> 3146 Driftwood Drive	EB – 77 WB – 86	EB – 77 WB – 86	EB – 72 WB – 91	59.7	58.4	-1.3	58.4	-1.3
<u>Receiver 11*</u> 2470 Headon Forest Drive	EB – 62 WB – 71	EB – 62 WB – 71	EB – 57 WB – 76	52.8	51.4	-1.4	51.4	-1.4
<u>Receiver 12</u> 2490 Headon Forest Drive	EB – 118 WB – 128	EB – 118 WB – 128	EB – 113 WB – 132	57.5	56.2	-1.3	56.2	-1.3
<u>Receiver 13</u> 2530 Northhampton Boulevard	EB – 25 WB – 41	EB – 28 WB – 41	EB – 25 WB – 46	66.6	64.9	-1.7	64.8	-1.8
<u>Receiver 14</u> 2531 Northhampton Boulevard	EB – 27 WB – 40	EB – 29 WB – 43	EB – 24 WB – 48	66.3	64.6	-1.7	64.5	-1.8
<u>Receiver 15</u> 2986 Jackson Drive	EB – 34 WB – 46	EB – 32 WB – 48	EB – 27 WB – 53	64.9	63.9	-1	63.7	-1.2
<u>Receiver 16*</u> 2976 Guire Common	EB – 34 WB – 46	EB – 34 WB – 46	EB – 29 WB – 41	57.6	56.4	-1.2	56.3	-1.3
<u>Receiver 17*</u> 2962 Singleton Common	EB – 46 WB – 54	EB – 46 WB – 60	EB – 41 WB – 65	60.9	59.6	-1.3	59.3	-1.6

Receiver Location (see key plan)	Distance from Receiver Location to Noise Source (m)			Project Noise Level dBA Leq (16)				
	Existing or Future without Improvements (4 Lanes)	Future with Improvements (6 Lanes)		Existing (2013) / Future Without Improvements	Future With HOV / Transit Lanes (2021)	Difference in Noise Level with HOV / Transit Lanes	Future With BRT Lanes (2031)	Difference in Noise Level with BRT Lanes
		GPL	HOV/BRT					
<u>Receiver 18*</u> 4178 Rawlins Common	EB – 35 WB – 45	EB – 35 WB – 48	EB – 30 WB – 53	59.9	59.1	-0.8	58.9	-1
<u>Receiver 19*</u> 4400 Millcroft Park Drive	EB – 56 WB – 69	EB – 55 WB – 69	EB – 50 WB – 74	58.6	56.6	-2	56.5	-2.1
<u>Receiver 20*</u> 2563 Hogan Court	EB – 27 WB – 43	EB – 26 WB – 40	EB – 21 WB – 45	55.9	54.8	-1.1	54.8	-1.1
<u>Receiver 21</u> 2557 Armour Crescent	EB – 60 WB – 71	EB – 62 WB – 74	EB – 57 WB – 79	61.0	59.5	-1.5	59.4	-1.6
<u>Receiver 22*</u> 2574 Armour Crescent	EB – 22 WB – 37	EB – 24 WB – 36	EB – 19 WB – 41	58.2	56.8	-1.4	56.8	-1.4
<u>Receiver 23</u> 5238 Stonehaven Drive	EB – 171 WB – 181	EB – 175 WB – 185	EB – 170 WB – 190	56.6	55.8	-0.8	55.4	-1.2
<u>Receiver 24</u> 5360 Dundas Street	EB – 68 WB – 81	EB – 68 WB – 82	EB – 63 WB – 87	60.6	59.8	-0.8	59.1	-1.5
<u>Receiver 25*</u> 2627 Valley Ridge Drive	EB – 32 WB – 53	EB – 39 WB – 51	EB – 35 WB – 56	60.6	59.1	-1.5	58.6	-2
<u>Receiver 26</u> 3153 Stornoway Circle	EB – 51 WB – 68	EB – 52 WB – 67	EB – 47 WB – 72	62.1	61.4	-0.7	60.9	-1.2

* Properties with existing noise barrier by developer / noise wall

6. Findings

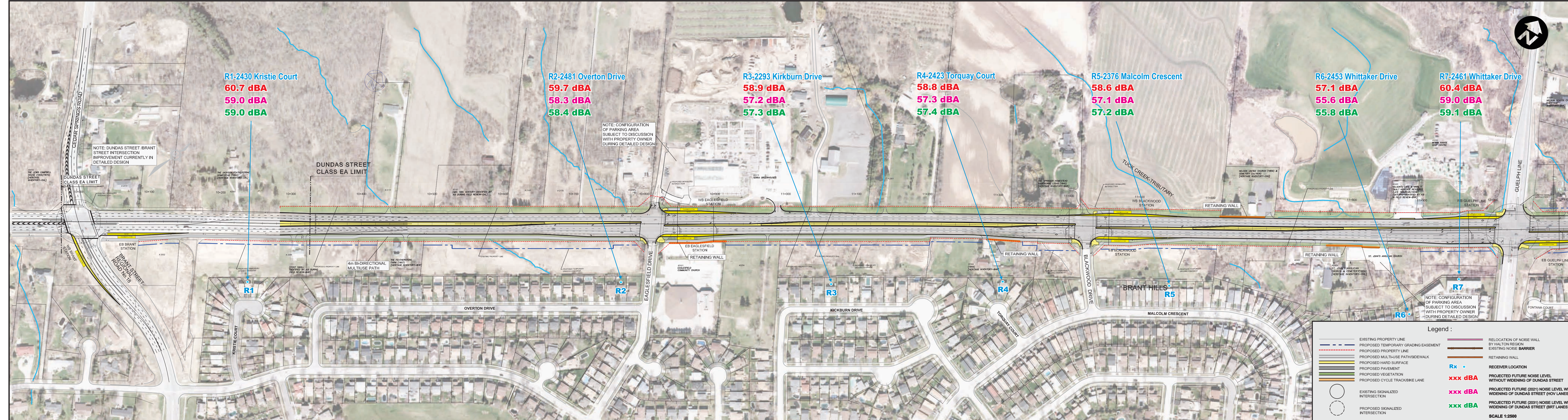
The findings of the noise assessment are as follows:

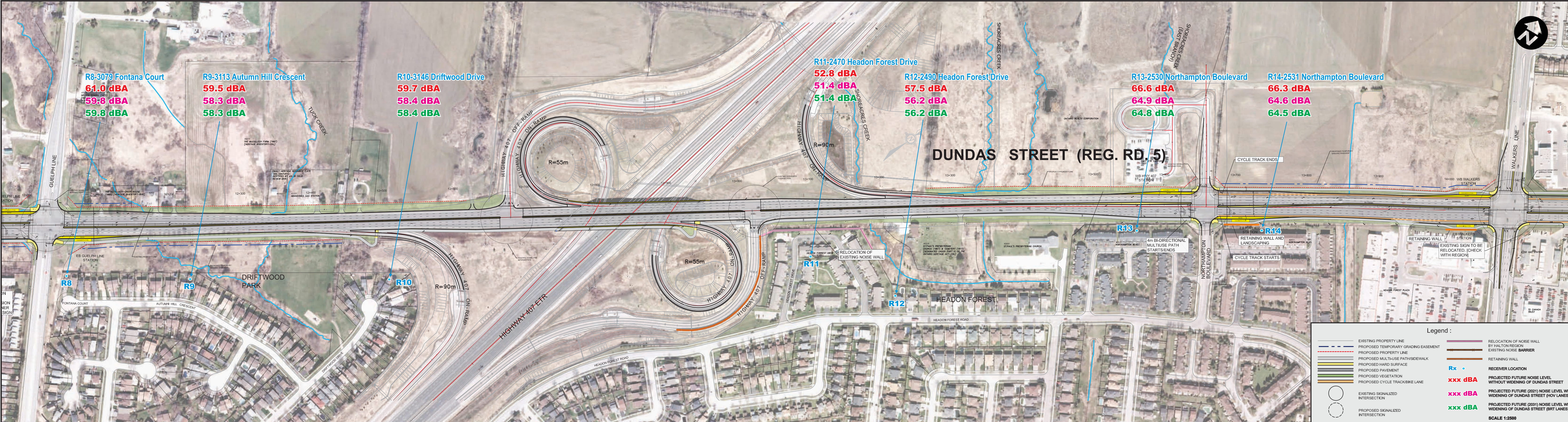
- The projected noise levels in Year 2031 at Receivers 1 to 26 without improvements to Dundas Street are calculated to range from 52.8 to 66.6 dBA.
- The projected noise levels in Year 2021 at Receivers 1 to 26 with the improvements to Dundas Street (HOV lanes) are calculated to range from 51.4 dBA to 64.9 dBA.
- The projected noise levels in Year 2031 at Receivers 1 to 26 with the improvements to Dundas Street (BRT lanes) are calculated to range from 51.4 dBA to 64.8 dBA.
- The maximum potential increase in noise level between the future 2021 and 2031 without improvements and the future 2021 and 2031 with improvements at the twenty six receiver locations was calculated to be less than 5 dBA.
- Since the potential increases in the projected noise levels are less than 5 dBA, the consideration of noise mitigation based on MTO/MOECC Noise Protocol is not warranted.
- Receivers 13, 14, 15 and 26 have predicted noise levels of greater than 60 dBA for existing (2013) and under future conditions (2021 and 2031).

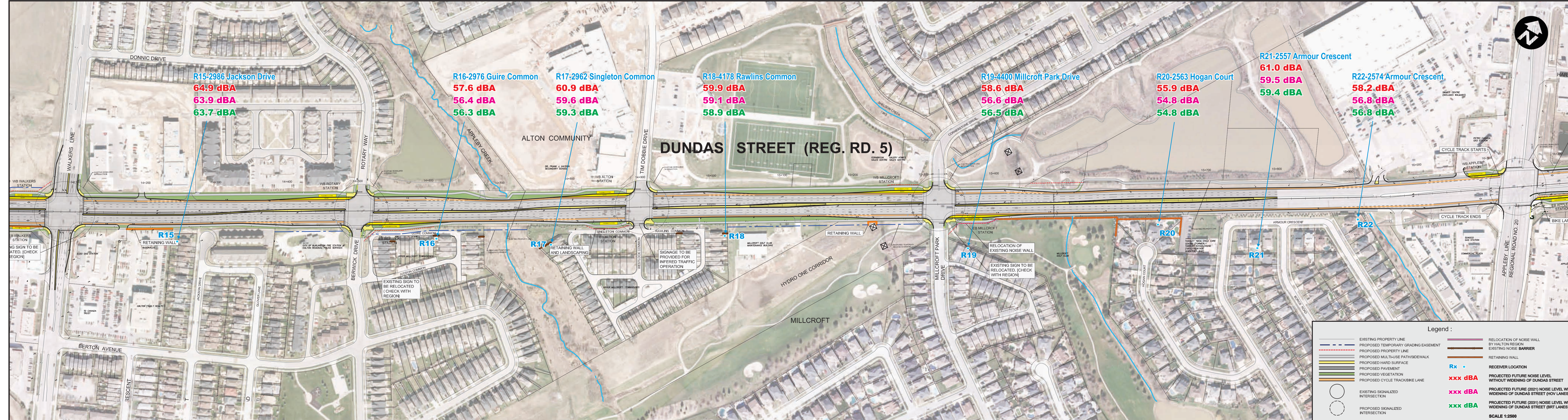
7. Conclusions

The conclusions of the noise assessment for the Dundas Street improvements are as follows:

- The difference between the projected noise levels with and without the proposed improvements to Dundas Street for the 2021 (HOV/transit lanes) and 2031 (BRT lanes) conditions were determined to be less than 5 dBA.
- Therefore, the consideration of noise mitigation is not warranted based on MTO/MOECC Noise Protocol.
- Receivers 13, 14, 15 and 26 have predicted noise levels of greater than 60 dBA under existing and future conditions so they may qualify for mitigation under the Region of Halton's retrofit policy.







R15-2986 Jackson Drive
64.9 dBA
63.9 dBA
63.7 dBA

R16-2976 Guire Common
57.6 dBA
56.4 dBA
56.3 dBA

R17-2962 Singleton Common
60.9 dBA
59.6 dBA
59.3 dBA

R18-4178 Rawlins Common
59.9 dBA
59.1 dBA
58.9 dBA

R19-4400 Millcroft Park Drive
58.6 dBA
56.6 dBA
56.5 dBA

R20-2563 Hogan Court
55.9 dBA
54.8 dBA
54.8 dBA

R21-2557 Armour Crescent
61.0 dBA
59.5 dBA
59.4 dBA

R22-2574 Armour Crescent
58.2 dBA
56.8 dBA
56.8 dBA





R25-2627 Valley Ridge Drive
60.6 dBA
59.1 dBA
58.6 dBA

R26-3153 Stornoway Circle
62.1 dBA
61.4 dBA
60.9 dBA

DUNDAS STREET (Reg. Rd. 5)

Legend :

	EXISTING PROPERTY LINE		RELOCATION OF NOISE WALL BY HALTON REGION
	PROPOSED TEMPORARY GRADING EASEMENT		EXISTING NOISE BARRIER
	PROPOSED PROPERTY LINE		RETAINING WALL
	PROPOSED MULTI-USE PATH/SIDEWALK		RECEIVER LOCATION
	PROPOSED HARD SURFACE		PROJECTED FUTURE NOISE LEVEL WITHOUT WIDENING OF DUNDAS STREET
	PROPOSED PAVEMENT		PROJECTED FUTURE (2021) NOISE LEVEL WITH WIDENING OF DUNDAS STREET (HOV LANES)
	PROPOSED VEGETATION		PROJECTED FUTURE (2031) NOISE LEVEL WITH WIDENING OF DUNDAS STREET (BRT LANES)
	PROPOSED CYCLE TRACK/BIKE LANE		PROJECTED FUTURE (2031) NOISE LEVEL WITH WIDENING OF DUNDAS STREET (BRT LANES)
	EXISTING SIGNALIZED INTERSECTION		SCALE 1:2500
	PROPOSED SIGNALIZED INTERSECTION		