

# **Star Oak Developments**

## **Environmental Noise Assessment Oakville, ON**

**SLR Project No: 241.30043.00000**

January 2021

**Environmental Noise Assessment  
Star Oak Developments  
Oakville, ON,  
SLR Project No: 241.30043.00000**

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January 14, 2021

This document has been prepared by SLR Canada. The material and data in this report were prepared under the supervision and direction of the undersigned.

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- Appendix C: Required Warning Clauses

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# 1. INTRODUCTION

SLR Consulting (Canada) Ltd., was retained by Star Oak Developments to conduct an Environmental Noise Assessment for the proposed Star Oak development (site), located on the south-west corner of Burnhamthorpe Road West and Sixth Line in North Oakville, Ontario.

## 1.1 NATURE OF THE SUBJECT LANDS

The subject property is located on the south-west corner of Sixth Line and Burnhamthorpe Road West in North Oakville.

The proposed development includes single detached lots, street townhouse blocks, lane-based townhouse blocks, a stormwater management facility, natural heritage system encompassing woodland and channel, and a street system.

The preliminary draft plan of the proposed development is provided in **Appendix A**.

## 1.2 NATURE OF THE SURROUNDINGS

The lands surrounding the proposed development are currently vacant, with new residential developments under construction on Sixth Line north of Burnhamthorpe Road and to the east of the development.

Sixth Line is scheduled to be widened and reconstructed to a 4-lane minor urban arterial by the Town of Oakville within the next 3 years. The Highway 407 is located approximately 900 m north of the development lands. Dundas Street is located approximately 1.5 km south of the development.

A context plan can be found in **Figure 1**.

The topography of the area is mostly flat in nature with very minor changes in elevation.

# 2. TRANSPORTATION NOISE IMPACTS

## 2.1 TRANSPORTATION NOISE SOURCES

Roadway noise sources of interest with the potential to produce noise at the proposed development include Burnhamthorpe Road and Sixth Line.

Sound exposure levels at the development have been predicted, and this information has been used to identify façade, ventilation and warning clause requirements.

## 2.2 SURFACE TRANSPORTATION NOISE CRITERIA

### Noise Sensitive Developments

Ministry of the Environment, Conservation and Parks (MECP) Publication NPC-300 provides sound level criteria for noise sensitive developments. The applicable portions of NPC-300 are Part C – Land Use Planning and the associated definitions outlined in Part A – Background. **Tables 1 to 4** below summarizes the applicable surface transportation (road and rail) criteria limits.

## Location Specific Criteria

**Table 1** summarizes criteria in terms of energy equivalent sound exposure ( $L_{eq}$ ) levels for specific noise-sensitive locations. Both outdoor and indoor locations are identified, with the focus of outdoor areas being amenity spaces. Indoor criteria vary with sensitivity of the space. As a result, sleep areas have more stringent criteria than Living / Dining room space.

**Table 1: MECP Publication NPC-300 Sound Level Criteria for Road and Rail Noise**

Type of Space	Time Period	Equivalent Sound Exposure Level - $L_{eq}$ (dBA)		Assessment Location
		Road	Rail <sup>[1]</sup>	
Outdoor Living Area (OLA)	Daytime (0700-2300h)	55	55	Outdoors <sup>[2]</sup>
Living / Dining Room	Daytime (0700-2300h)	45	40	Indoors <sup>[3]</sup>
	Night-time (2300-0700h)	45	40	Indoors <sup>[3]</sup>
Sleeping Quarters	Daytime (0700-2300h)	45	40	Indoors <sup>[3]</sup>
	Night-time (2300-0700h)	40	35	Indoors <sup>[3]</sup>

**Notes:** [1] Whistle noise is excluded for OLA noise assessments, and included for Living / Dining Room and Sleeping Quarter assessments.

[2] Road and Rail noise impacts are to be combined for assessment of OLA impacts.

[3] An assessment of indoor noise levels is required only if the criteria in **Table 4** are exceeded.

## Outdoor Amenity Areas

**Table 2** summarizes the noise mitigation requirements for communal outdoor amenity areas (“Outdoor Living Areas” or “OLAs”).

For the assessment of outdoor sound levels, the surface transportation noise impact is determined by combining road and rail traffic sound levels. Whistle noise due to railway trains is not included in the determination of levels.

**Table 2: MECP Publication NPC-300 Outdoor Living Area Mitigation Requirements**

Time Period	Equivalent Sound Level in Outdoor Living Area (dBA)	Ventilation Requirements
Daytime (0700-2300h)	≤ 55	<ul style="list-style-type: none"> <li>None</li> </ul>
	55 to 60 incl.	<ul style="list-style-type: none"> <li>Noise barrier <b>OR</b> Warning Clause A</li> </ul>
	> 60	<ul style="list-style-type: none"> <li>Noise barrier to reduce noise to 55 dBA <b>OR</b></li> <li>Noise barrier to reduce noise to 60 dBA and Warning Clause B</li> </ul>

## Ventilation and Warning Clauses

**Table 3** summarizes requirements for ventilation where windows potentially would have to remain closed as a means of noise control. Despite implementation of ventilation measures where required, if sound exposure levels exceed the guideline limits in **Tables 1**, warning clauses advising future occupants of the potential excesses are required. Warning clauses also apply to OLAs.

**Table 3: MECP Publication NPC-300 Ventilation & Warning Clause Requirements**

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - $L_{eq}$ (dBA)		Ventilation and Warning Clause Requirements <sup>[2]</sup>
		Road	Rail <sup>[1]</sup>	
Outdoor Living Area	Daytime (0700-2300h)	56 to 60 incl.		Type A Warning Clause
Plane of Window	Daytime (0700-2300h)	$\leq 55$		None
		56 to 65 incl.		Forced Air Heating /provision to add air conditioning + Type C Warning Clause
		$> 65$		Central Air Conditioning + Type D Warning Clause
	Night-time (2300-0700h)	51 to 60 incl.		Forced Air Heating/ provision to add air conditioning + Type C Warning Clause
$> 60$		Central Air Conditioning + Type D Warning Clause		

**Notes:** [1] Rail whistle noise is excluded.

[2] Road and Rail noise is combined for determining Ventilation and Warning Clause requirements.

### Building Shell Requirements

**Table 4** provides sound level thresholds which if exceeded, require the building shell and components (i.e., wall, windows) to be designed and selected accordingly to ensure that the **Table 3 and 4** indoor sound criteria are met.

**Table 4: MECP Publication NPC-300 Building Component Requirements**

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - $L_{eq}$ (dBA)		Component Requirements
		Road	Rail <sup>[1]</sup>	
Plane of Window	Daytime (0700-2300h)	$> 65$	$> 60$	Designed/ Selected to Meet Indoor Requirements <sup>[2]</sup>
	Night-time (2300-0700h)	$> 60$	$> 55$	

**Notes:** [1] Including whistle noise.

[2] Building component requirements are assessed separately for Road and Railway noise. The resultant sound isolation parameter is required to be combined to determine an overall acoustic parameter.

## 2.3 TRAFFIC DATA AND FUTURE PROJECTIONS

### 2.3.1 ROADWAY TRAFFIC DATA

Projected turning movement counts were obtained from the Municipal Environmental Assessment report produced by Morrison Hershfield for the widening of Sixth Line. Counts were taken in the year 2011 by Halton Region and projected based on a 2% increase/annum to the year 2031. Volumes were further projected an additional 10 years to a typical mature-state-of-development year of 2041, as ultimate traffic data was unavailable from the Town of Oakville at the time of this assessment.

Commercial vehicle percentages were calculated based on turning movement counts obtained from the Region. Sixth Line truck percentages were applied to Burnhamthorpe Road, as a conservative assumption, in the absence of counts at the time of this assessment. Copies of applicable traffic data and calculations can be found in **Appendix B**. The following **Table 5** summarizes the road traffic volumes used in the analysis.

**Table 5: Summary of Road Traffic Data Used in the Transportation Analysis**

Roadway Link	2041 Traffic Volumes (AADT)	% Day/ Night Volume Split <sup>[1]</sup>		Commercial Traffic Breakdown <sup>[2]</sup>		Vehicle Speed (km/h)
		Daytime	Night-time	% Medium Trucks	% Heavy Trucks	
Burnhamthorpe Road	17,525	90	10	0.9	2.3	60
Sixth Line	21,964	90	10	0.9	2.3	60

**Notes:** [1] The Day/Night split was determined from historic data at SLR for urban areas.  
 [2] Commercial Traffic Breakdowns were assumed based on turning movement count data within the area.

### 2.3.2 ROADWAY TRAFFIC IMPACT MODELLING

Roadway traffic sound levels at the proposed development were predicted using Cadna/A, a commercially available noise propagation modelling software. Roadways were modelled as line sources of sound, with sound emission rates calculated using ORNAMENT algorithms, the road traffic noise model of the MECP. These predictions were validated and are equivalent to those made using the MECP’s ORNAMENT or STAMSON v5.04 road traffic noise models.

Ground absorption was assessed as an absorptive surface, as the majority of the intervening ground is foliage and grassy areas, with the exception of the proposed stormwater management (SWM) pond. As a conservative assessment of impacts, the SWM pond and lands between the SWM and Sixth Line were all assessed as reflective ground.

As STAMSON does not accommodate varied ground absorption easily, a simplified validation file (½ absorptive + ½ reflective ground) is provided in **Appendix B**.

### 2.3.3 PREDICTED SOUND LEVELS

Predicted worst-case sound levels are presented in **Table 6**. The transportation façade sound levels of the development, showing the ranges of predicted daytime and night-time sound levels are shown in **Figure 2 and 3** for roadway impacts, respectively.

#### 2.3.3.1 Façade Sound Levels

**Table 6: Summary of Transportation Façade Sound Levels**

Type	Lot/Block No. <sup>[1]</sup>	Roadway Sound Levels <sup>[2]</sup>	
		L <sub>eq</sub> Day (dBA)	L <sub>eq</sub> Night (dBA)
Detached	Lots 1 to 35	< 55 dBA	< 50 dBA
Detached	Lots 36 to 44	54 to 57 dBA	43 to 45 dBA
Detached	Lots 55 to 68	< 55 dBA	< 50 dBA
Townhouse	Blocks 69 to 88	< 55 dBA	< 50 dBA

**Notes:** [1] Refer **Figure 2 and 3** for Lot and Block Numbers.



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An assessment of indoor noise levels is required providing the façade sound levels due to road traffic exceed 65 dBA during the daytime or 60 dBA during the night-time periods.

Based on roadway sound levels summarized in **Table 6**, exceedances are not predicted within the residential portion of the development. Therefore, a detailed assessment of glazing requirements was not warranted.

#### **2.3.3.2 Outdoor Living Areas**

Predicted OLA sound levels are below 55 dBA for the development, with the exception of Lots 36 to 44. Roadway noise levels ranging from 54 to 57 dBA are predicted. As the sound levels are below 60 dBA, physical noise control measures are not required.

### **2.3.4 VENTILATION AND WARNING CLAUSE REQUIREMENTS**

#### **2.3.4.1 Facades**

The requirements regarding warning clauses are summarized in **Table 2**. Where required, the Warning Clauses should be included in agreements registered on Title for the residential units, and included in all agreements of purchase and sale or lease, and all rental agreements. Warning Clauses are summarized in **Appendix C**.

Forced air heating with provisions for future installation of central air-conditioning, as well as a **Type C** warning clause are recommended for all units where the daytime and nighttime sound levels from the combination of roadway traffic exceed 55 and 50 dBA  $L_{eq}$ , respectively. This affects the **Lots 36-44**.

#### **2.3.4.2 Outdoor Living Areas**

As the roadway sound levels within the rear yard OLAs of Lots 36-44 are predicted to be 56 dBA, a **Type A** warning clause is required for units in **Lots 36-44**.

## **3. STATIONARY SOURCE NOISE IMPACTS**

A preliminary review was completed for the surroundings based on available aerial photography. The surrounding land include either agricultural lands, or other residential developments. No significant industries are located within 1000m of the development.

Based on the above review of the surrounding area, stationary noise is not a concern for the development and a detailed assessment was not completed.

## **4. Conclusions and Recommendations**

The potential for noise impacts on and from the proposed development have been assessed. Based on the results of our studies, the following conclusions have been reached:

### **4.1 TRANSPORTATION NOISE**

- An assessment of transportation noise impacts from surrounding roadways has been completed.
- Based on transportation façade sound levels upgraded glazing is not required within the development as outlined in **Section 2.3.3.1**.

- 
- Noise impacts within the rear yard outdoor amenity areas are predicted to be within acceptable levels and no physical mitigation measures are required, as outlined in **Section 2.3.3.2**.
  - Forced air heating with provisions for future installation of central air-conditioning, as well as a **Type C** warning clause are recommended for units in **Lots 36-44** within the development, as outlined in **Section 2.3.4.1**. Warning clause text is attached in **Appendix C**.
  - A **Type A** warning clause is required for units in **Lots 36-44** due to sound levels in outdoor amenity spaces exceeding 55 dBA during the daytime, as outlined in **Section 2.3.4.2**. Warning clause text is attached in **Appendix C**.

## **4.2 STATIONARY NOISE**

- SLR staff completed an aerial review of the development lands and surrounding area. No significant sources of noise were noted to be included in the assessment.

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## 5. REFERENCES

International Organization for Standardization, *ISO 9613-2: Acoustics – Attenuation of Sound During Propagation Outdoors Part 2: General Method of Calculation*, Geneva, Switzerland, 1996.

Morrison Hershfield Limited (July 2014). *Town of Oakville, Sixth Line From Dundas Street to Highway 407 ETR, Class Environmental Assessment Study, Town of Oakville Project no. EA-067-11, Environmental Study Report*.

National Research Council, (NRC, 1985). *Building Practice Note: Controlling Sound Transmission into Buildings*, ISSN 0701-5216

Ontario Ministry of the Environment, Conservation and Parks (MECP, 1989). *Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT)*

Ontario Ministry of the Environment, Conservation and Parks (MECP, 1996). *STAMSON v5.03: Road, Rail and Rapid Transit Noise Prediction Model*

Ontario Ministry of the Environment, Conservation and Parks (MECP, 2013), *Publication NPC-300: Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning*

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## **FIGURES**

Environmental Noise Assessment  
Sixth & Burnhamthorpe  
SLR Project No.: 241.30043.00000

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Aerial Photography from Google

**STAR OAK DEVELOPMENTS**

STAR OAK DEVELOPMENT BURNHAMTHORPE & SIXTH - OAKVILLE, ONTARIO

SITE AND CONTEXT PLAN

True North



Scale: 1:10,000

Date: Dec 23, 2020 Rev 0.0

Project No. 241.30043.00000

METRES

Figure No.

**1**





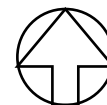
Aerial Photography from Google

**STAR OAK DEVELOPMENTS**

STAR OAK DEVELOPMENT BURNHAMTHORPE & SIXTH - OAKVILLE, ONTARIO

PREDICTED TRANSPORTATION NOISE SOUND LEVELS  
DAYTIME

True North



Scale: 1: 3,000

METRES

Date: Dec 23, 2020

Rev 0.0

Figure No.

**2**

Project No. 241.30043.0000







Aerial Photography from Google

**STAR OAK DEVELOPMENTS**

STAR OAK DEVELOPMENT BURNHAMTHORPE & SIXTH - OAKVILLE, ONTARIO

PREDICTED TRANSPORTATION NOISE SOUND LEVELS  
NIGHT-TIME

True North



Scale: 1: 3,000

Date: Dec 23, 2020

Rev 0.0

Project No. 241.30043.00000

METRES

Figure No.

**3**



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**APPENDIX A**  
**Development Drawings**

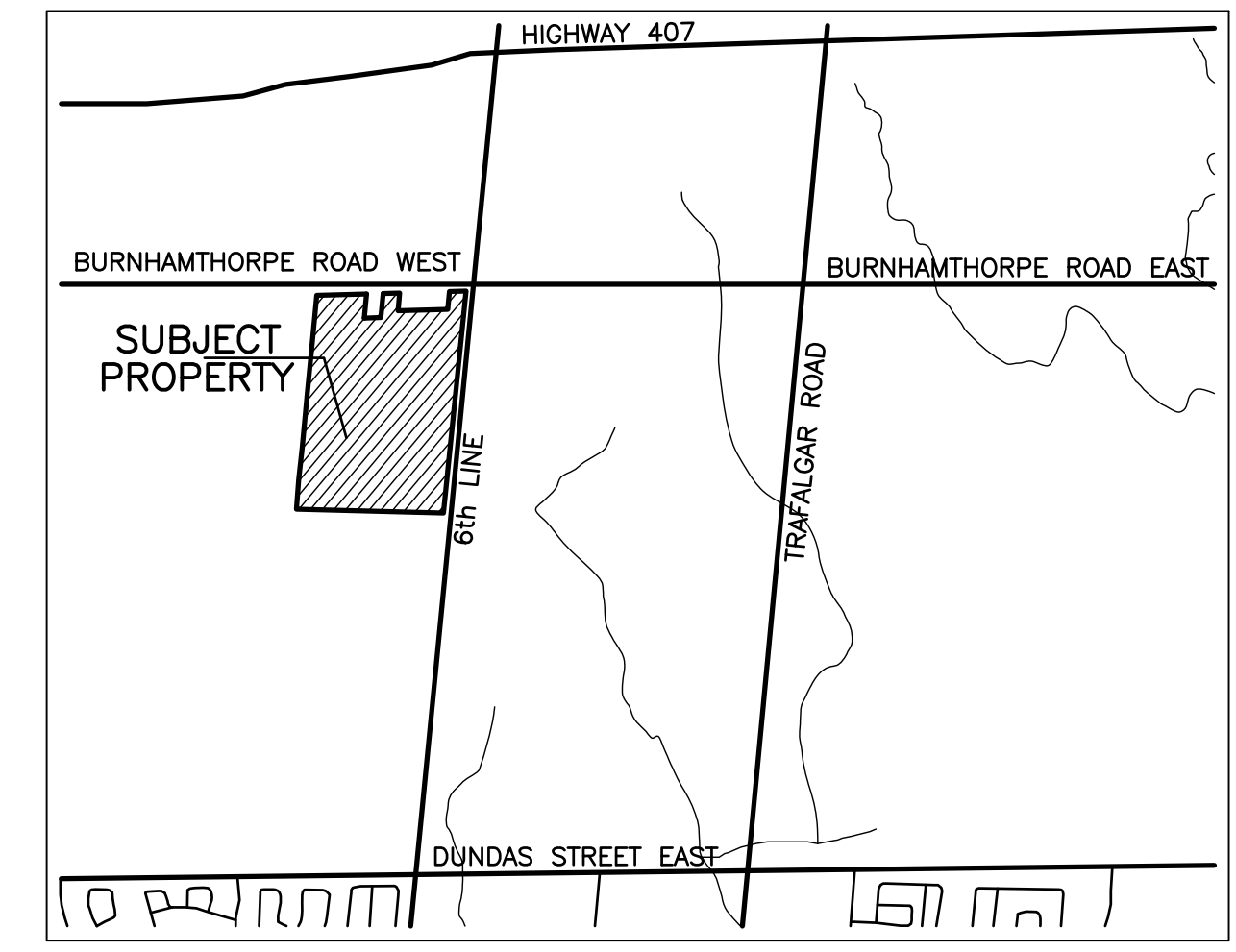
Environmental Noise Assessment  
Sixth & Burnhamthorpe  
SLR Project No.: 241.30043.00000

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# DRAFT PLAN OF SUBDIVISION PART OF LOT 16, CONCESSION 1 NORTH OF DUNDAS STREET (GEOGRAPHIC TOWNSHIP OF TRAFALGAR) TOWN OF OAKVILLE REGIONAL MUNICIPALITY OF HALTON

SCALE 1:1250

DRAFT PLAN T-



KEY PLAN

## SECTION 51, PLANNING ACT, ADDITIONAL INFORMATION

- A. AS SHOWN ON DRAFT PLAN
- B. AS SHOWN ON DRAFT PLAN
- C. AS SHOWN ON DRAFT PLAN
- D. SEE SCHEDULE OF LAND USE
- E. AS SHOWN ON DRAFT PLAN
- F. AS SHOWN ON DRAFT PLAN
- G. AS SHOWN ON DRAFT PLAN
- H. MUNICIPAL PIPED WATER AVAILABLE AT TIME OF DEVELOPMENT
- I. CLAY-LOAM
- J. AS SHOWN ON DRAFT PLAN
- K. SANITARY AND STORM SEWERS, GARBAGE COLLECTION, FIRE PROTECTION
- L. AS SHOWN ON DRAFT PLAN

## SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE CORRECTLY SHOWN.

DATE -----, 2020  
C. P. EDWARD OLS

## OWNER'S CERTIFICATE

I AUTHORIZE KLM PLANNING PARTNERS INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE TOWN OF OAKVILLE FOR APPROVAL.

OWNER  
**STAR OAK DEVELOPMENTS LIMITED**

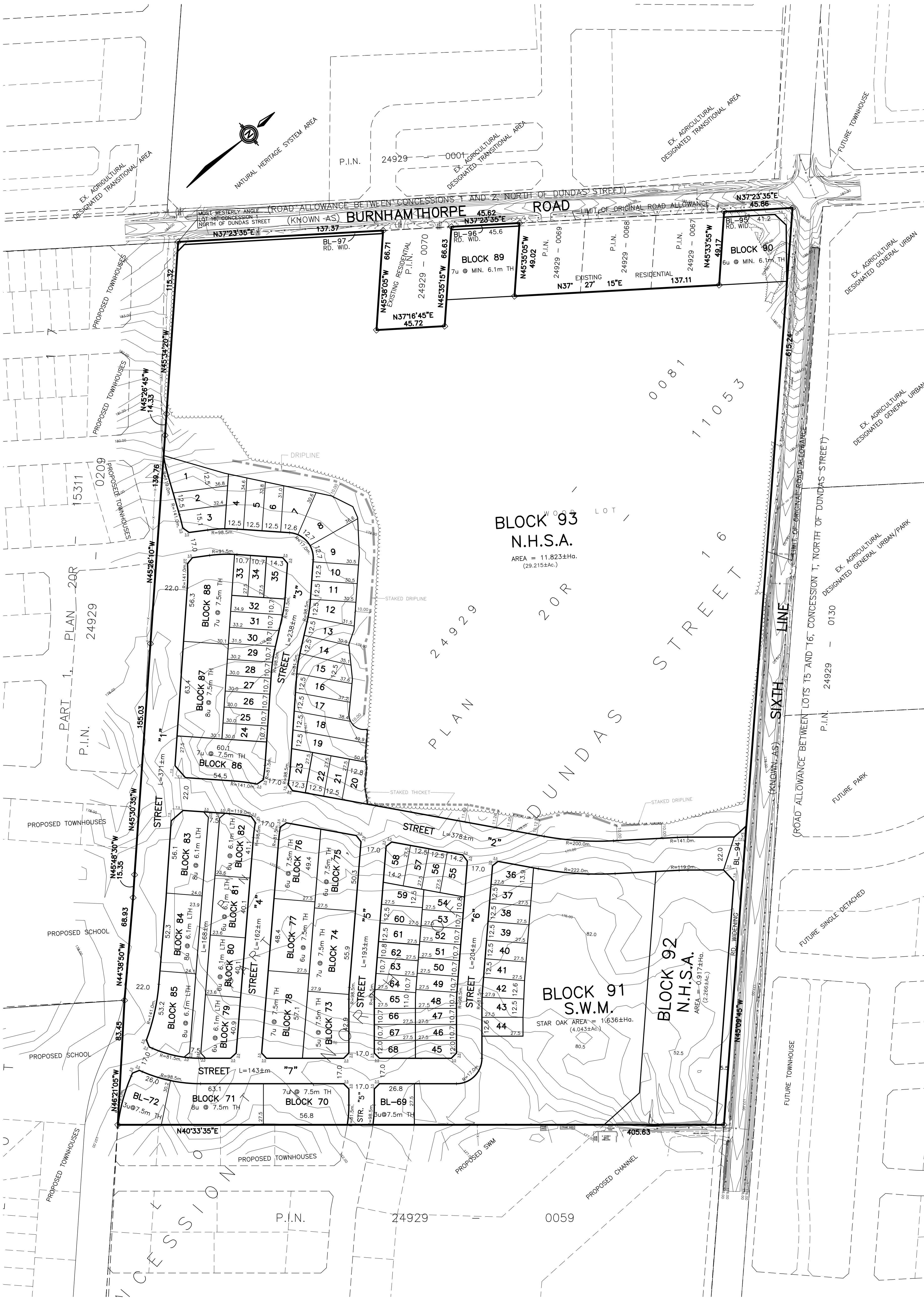
145 REYNOLDS STREET  
SUITE 400  
OAKVILLE, ONTARIO  
L6J 0A7  
SILVIO GUGLIETTI A.S.O.

## SCHEDULE OF LAND USE

TOTAL AREA OF LAND TO BE SUBDIVIDED = 23.583±Ha. ( 58.275±Acs. )

DETACHED DWELLINGS	BLOCKS	LOTS	UNITS	±Ha.	±Acs.
LOTS 1-22, 35-44, and 55-61 MIN. LOT FRONTAGE=12.5m. MIN LOT AREA=340sq.m.		39	39	1.657	4.095
LOTS 23-34, 45-54, and 62-68 MIN. LOT FRONTAGE=10.7m. MIN LOT AREA=290sq.m.		29	29	0.912	2.254
<b>TOWNHOUSES DWELLINGS</b>					
BLOCKS 69-78 and 86-88 MIN. UNIT FRONTAGE 7.5m.	13		80	1.887	4.663
BLOCKS 79-85, 89, and 90 MIN. UNIT FRONTAGE 6.1m.	9		61	1.190	2.940
<b>SUBTOTAL</b>	<b>22</b>	<b>68</b>	<b>209</b>	<b>5.646</b>	<b>13.952</b>
BLOCK 91 - STORM WATER MANAGEMENT		1		1.636	4.043
BLOCKS 92 and 93 - NATURAL HERITAGE SYSTEM AREA		2		12.740	31.481
BLOCKS 94-97 - ROAD WIDENING		4		0.189	0.467
<b>STREETS</b>				<b>3.372</b>	<b>8.332</b>
22.0m. WIDE TOTAL LENGTH= 748m. AREA= 1.648Ha.					
17.0m. WIDE TOTAL LENGTH= 940m. AREA= 1.598Ha.					
8.5m. WIDE TOTAL LENGTH= 168m. AREA= 0.126Ha.					
<b>TOTAL</b>				<b>LENGTH=1857m. AREA= 3.372Ha.</b>	
<b>TOTAL</b>	<b>29</b>	<b>68</b>	<b>209</b>	<b>23.583</b>	<b>58.275</b>

NOTE - ELEVATIONS RELATED TO CANADIAN GEODETIC DATUM



**KLM** PROJECT No. P-2012  
SCALE 1:1250 NOV. 2, 2020  
( 2012DES36 ) X-REF: ( 2012MAS4 & 2012MTO92 )  
**DWG. No. - 20:1**  
64 JARDIN DRIVE - UNIT 1B, CONCORD ONTARIO L4K 3P3  
PLANNING PARTNERS INC. TEL: (905)669-4055 FAX: (905)669-0097 design@klmplanning.com  
Planning • Design • Development

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**APPENDIX B**  
**Traffic Data and Calculations**

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**Table 4-4 – Unsignalized Intersection LOS Analysis – Existing 2012 Traffic Volumes**

Intersection	Movement	AM Peak Hour		PM Peak Hour	
		Approach Delays (s/veh)	LOS	Approach Delays (s/veh)	LOS
Sixth Line at Burnhamthorpe Road	EBLTR	42.0	E	17.3	C
	WBLTR	17.9	C	86.1	F
	NBLTR	118.5	F	23.5	C
	SBLTR	50.4	F	21.2	C
	<b>OVERALL</b>	<b>69.8</b>	<b>E</b>	<b>47.4</b>	<b>B</b>

Notes: LOS – Level of Service

The intersection of Sixth Line at Burnhamthorpe Road is currently operating at an overall LOS of E and B during the AM and PM peak hours, respectively. The NB and SB movements fail during the morning peak hour. The movement with the highest approach delay for this intersection is for the NB traffic during the morning peak hour.

Detailed HCM reports for the AM and PM peak hours under existing (2012) conditions are presented in **Appendix B**.

### 4.3 Forecasting Approach and Assumptions

For the purpose of this study, a 2021 and 2031 planning horizon was used consistent with other area studies such as the Region of Halton’s EMME model. Numerous discussions were held with the Town of Oakville and Halton Region regarding current proposed new development, anticipated future development, expected background traffic growth, and other related traffic matters. The following assumptions have been used for the purpose of the traffic analysis:

- A two percent annual growth rate was applied for Sixth Line and Dundas Street. This value was confirmed by Halton Region;
- Existing analysis to include the following developments:
  - Timsin;
  - Lower 4th Mattamy; and
  - Cityzen (Townhomes on Sixth Line south of Dundas and Apartment buildings on Dundas east of Sixth).
- Future 2031 horizon analysis to include the following developments:
  - Petcor Mattamy;
  - Argo;



## 7 Project Description

Based on the evaluation of Alternative Designs, Alternative #3 was selected as the Preliminary Preferred Design with refinements and carried forward for further design considerations. The Preferred Design widens the road about the centerline between Dundas Street and Future Street “D”, minimizing property impacts to the property owners on both sides of the road. Between Future Street “D” and Burnhamthorpe Road, the widening shifts east to mitigate impacts to the Natural Heritage System located to the south-west of the Sixth Line and Burnhamthorpe Road intersection. The alignment then shifts back to the existing centreline between Burnhamthorpe Road to Highway 407 ETR.

The key elements of the Preliminary Preferred Design are as follows:

- Sixth Line widened to four lanes from Dundas Street to Highway 407 (ETR);
- Left turn lanes provided throughout the corridor;
- The signalization of intersections;
- The provision of sidewalks and on-street bicycle lanes and potential for on street parking layby’s in front of Neighbourhood Centre and Park lands;
- The provision of continuous medians to enhance the streetscape and landscaping features; and
- Culvert structure replacements.

The following sub-sections provide the details of the Preferred Design in order to meet the requirements of the Class EA process.

### 7.1 Design Criteria

Sixth Line is currently is a two-lane road with a rural cross section and a posted speed of 60 km/h between Dundas Street and Highway 407 ETR. Once the improvements have been implemented, the posted speed limit on Sixth Line will be maintained at 60 km/h; this is consistent with the transformation of Sixth Line from a rural corridor to a pedestrian and cyclist-friendly transit corridor.

To develop the preliminary design for the widening of Sixth Line, design criteria for the roadway geometrics were established based on direction from the Town of Oakville staff, the Town of Oakville’s road design standards and design standards from Transportation Association of Canada (TAC) – *Geometric Design Guide for Canadian Roads*. TAC guidelines were used to select and assess the horizontal and vertical curve geometry for the recommended design.

The preliminary design criteria for the recommended road design are presented in **Table 7-1** and **Appendix J**.

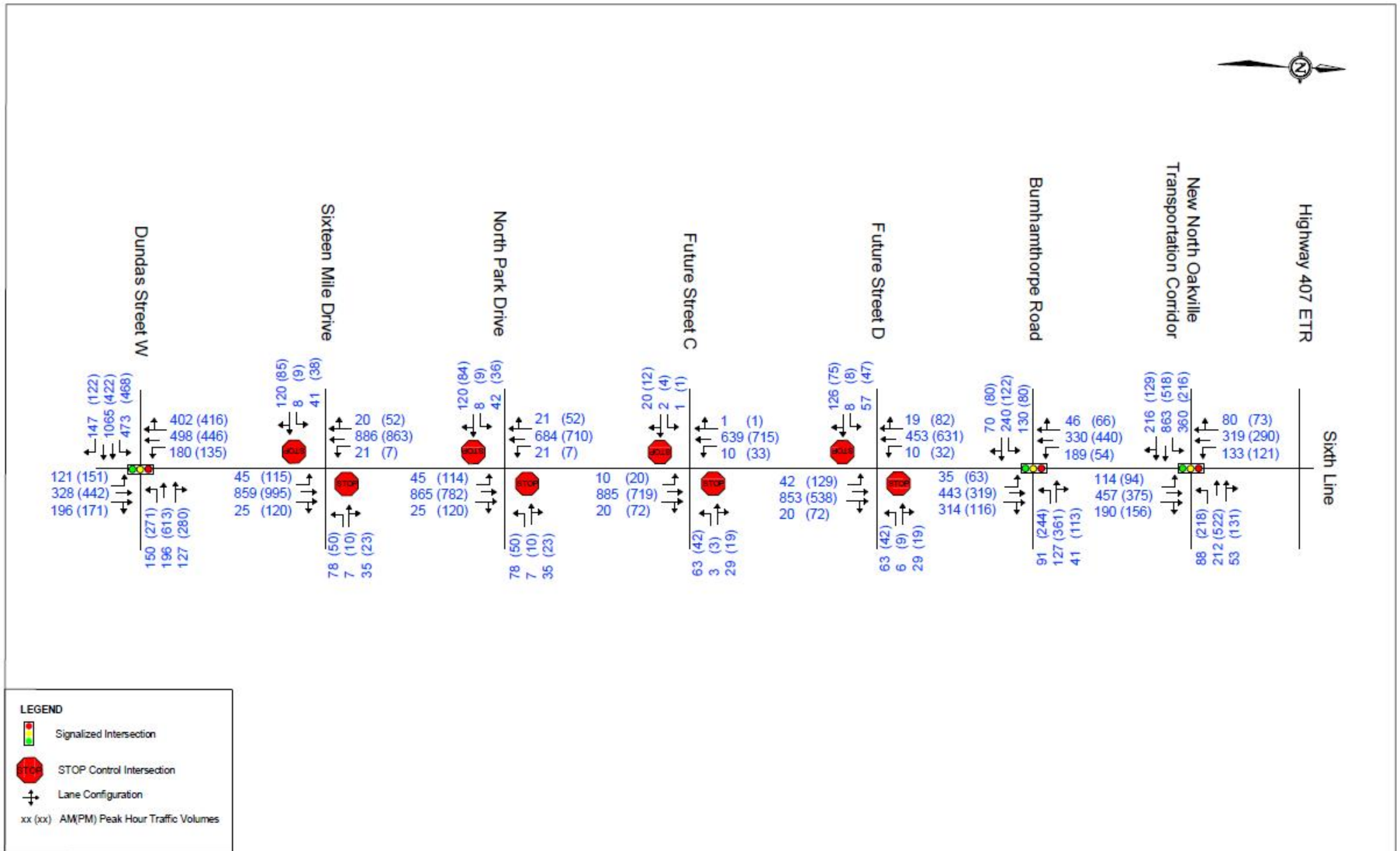


Figure 4-4 Future (2021) Peak Hour Traffic Volumes

## O R N A M E N T - Sound Power Emissions & Source Heights

Ontario Road Noise Analysis Method for Environment and Transportation

Road Segment ID	Roadway Name	Link Description	Speed (kph)	Period (h)	Total Traffic Volumes	Auto %	Med %	Hvy %	Auto	Med	Heavy	Road Gradient (%)	PWL (dBA)	Source Height, s (m)
Sixth_avg	Sixth Line	Daytime Impacts	60	16	19767	96.8%	0.9%	2.3%	19135	178	455	0	83.8	1.2
Sixth_avg	Sixth Line	Nighttime Impacts	60	8	2196	96.8%	0.9%	2.3%	2126	20	51	0	77.2	1.2
Burnham_avg	Burnhamthorpe Road	Daytime Impacts	60	16	15773	96.8%	0.9%	2.3%	15268	142	363	0	82.8	1.2
Burnham_avg	Burnhamthorpe Road	Nighttime Impacts	60	8	1753	96.8%	0.9%	2.3%	1696	16	40	0	76.3	1.2



Aerial Photography from Google

**STAR OAK DEVELOPMENTS**

STAR OAK DEVELOPMENT BURNHAMTHORPE & SIXTH - OAKVILLE, ONTARIO

STAMSON AND CADNA RESULTS COMPARISON

True North



Scale: 1: 3,000

Date: Dec 23, 2020 Rev 0.0

Project No. 241.30043.0000

METRES

Figure No.

**B.1**



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Description: Lot36-44 1.5m

Road data, segment # 1: Burnham

-----  
Car traffic volume : 15268 veh/TimePeriod  
Medium truck volume : 142 veh/TimePeriod  
Heavy truck volume : 363 veh/TimePeriod  
Posted speed limit : 60 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Burnham

-----  
Angle1    Angle2                    : -90.00 deg    90.00 deg  
Wood depth                        : 0            (No woods.)  
No of house rows                   : 0  
Surface                            : 1            (Absorptive ground surface)  
Receiver source distance : 450.00 m  
Receiver height                    : 1.50 m  
Topography                        : 1            (Flat/gentle slope; no barrier)  
Reference angle                    : 0.00

Road data, segment # 2: Sixth

-----  
Car traffic volume : 19135 veh/TimePeriod  
Medium truck volume : 178 veh/TimePeriod  
Heavy truck volume : 455 veh/TimePeriod  
Posted speed limit : 60 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Sixth

-----  
Angle1    Angle2                    : -90.00 deg    0.00 deg  
Wood depth                        : 0            (No woods.)  
No of house rows                   : 0  
Surface                            : 1            (Absorptive ground surface)  
Receiver source distance : 150.00 m  
Receiver height                    : 1.50 m  
Topography                        : 1            (Flat/gentle slope; no barrier)  
Reference angle                    : 0.00

Road data, segment # 3: Sixth

-----  
Car traffic volume : 19135 veh/TimePeriod  
Medium truck volume : 178 veh/TimePeriod  
Heavy truck volume : 455 veh/TimePeriod  
Posted speed limit : 60 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: Sixth

-----  
Angle1 Angle2 : 0.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 150.00 m  
Receiver height : 1.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Results segment # 1: Burnham

-----

Source height = 1.23 m

ROAD (0.00 + 41.74 + 0.00) = 41.74 dBA  
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq  
-----  
-90 90 0.66 67.72 0.00 -24.52 -1.46 0.00 0.00 0.00 41.74  
-----

Segment Leq : 41.74 dBA

Results segment # 2: Sixth

-----

Source height = 1.23 m

ROAD (0.00 + 47.63 + 0.00) = 47.63 dBA  
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq  
-----  
-90 0 0.66 68.70 0.00 -16.60 -4.47 0.00 0.00 0.00 47.63  
-----

Segment Leq : 47.63 dBA

Results segment # 3: Sixth

-----

Source height = 1.23 m

ROAD (0.00 + 55.69 + 0.00) = 55.69 dBA  
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq  
-----  
0 90 0.00 68.70 0.00 -10.00 -3.01 0.00 0.00 0.00 55.69  
-----

Segment Leq : 55.69 dBA

Total Leq All Segments: 56.47 dBA

TOTAL Leq FROM ALL SOURCES: 56.47



**APPENDIX C**  
**Required Warning Clauses**

Environmental Noise Assessment  
Sixth & Burnhamthorpe  
SLR Project No.: 241.30043.00000

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## SUMMARY OF MITIGATION MEASURES AND WARNING CLAUSES

### Warning Clauses

Warning Clauses may be used individually or in combination. The following Warning Clauses should be included in agreements registered on Title for the residential units, and included in all agreements of purchase and sale or lease, and all rental agreements:

#### *Transportation Sources (Road)*

##### *MECP Type A Warning Clause (Units in Lots 36-44)*

“Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment.”

##### *MECP Type C Warning Clause (Units in Lots 36-44)*

“This dwelling unit has been designed with the provision for adding central air conditioning at the occupant’s discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment.”

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