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Appendix M

Air Quality and Noise Impact Assessment

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ReNew Golden Mile: Reconfigured & New Major Streets Environmental Assessment Study - Air Quality and Noise Impact Assessment

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Executive Summary

The City of Toronto is undertaking the ReNew Golden Mile initiative to support the redevelopment of the Golden Mile area in Scarborough into a mixed-use, transit-oriented corridor. As part of the Municipal Class Environmental Assessment (EA) process, an Air Quality and Noise Impact Assessment (AQNIA) was completed to evaluate potential environmental effects associated with proposed roadway realignments and new street connections recommended in the Golden Mile Secondary Plan (GMSP) and Golden Mile Transportation Master Plan (GMTMP).

Assessment Objectives and Scope

The AQNIA was prepared in accordance with applicable provincial and municipal guidance and fulfills the following objectives:

- Characterize existing (2020–2024) air quality and noise conditions within and near the Study Area;
- Evaluate future air emissions under pre-Project (2013 baseline) and future build (2041) scenarios;
- Evaluate future noise conditions under Future No-Build (2041) and Future Build (2041) scenarios;
- Compare predicted effects against relevant regulatory criteria and planning thresholds; and
- Identify potential environmental effects and recommend mitigation, where applicable.

The assessment addresses both construction-phase and operational-phase conditions.

- Air quality impacts were evaluated using the U.S. EPA MOVES5 model using a screening-level burden analysis approach.
- Noise was modeled using CadnaA software with FHWA Traffic Noise Model (TNM) algorithms.

Key Findings

- Air Quality
 - Screening level emissions burden analysis projects a net reduction in emissions of criteria air contaminants and greenhouse gases by 2041 relative to 2013 pre-Project conditions. This outcome is primarily attributed to improved vehicle emission

standards, fleet turnover, mode shifts and increasing adoption of zero-emission vehicles (ZEVs).

- Noise
 - Most projected increases in sound levels at Noise Sensitive Areas (NSAs) are less than 5 dBA, consistent with accepted planning thresholds. At a limited number of NSAs where increases exceed 5 dBA, further evaluation of mitigation options is recommended.
- Construction Effects
 - Construction-related air quality and noise impacts are expected to be short-term and localized, and is expected to be managed through:
 - Compliance with the City of Toronto Noise and Vibration Bylaws;
 - Adherence to MECP sound-level limits (NPC-115/NPC-118) for construction equipment; and
 - Implementation of best management practices (BMPs) for air emissions and noise control.

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LIST OF ACRONYMS AND ABBREVIATIONS

AADT	Annual Average Daily Traffic
AAQC	Ambient Air Quality Criteria
APEI.....	Air Pollutant Emissions Inventory
AQNIA	Air Quality and Noise Impact Assessment
AQNMMP	Air Quality and Noise Management and Mitigation Plan
AVFT	Alternative Vehicle and Fuel Technology
CAAQS	Canadian Ambient Air Quality Standards
CAC.....	Criteria Air Contaminant
CCME.....	Canadian Council of Ministers of the Environment
CH ₄	Methane
CO.....	Carbon Monoxide
CO ₂	Carbon Dioxide
CO ₂ e.....	Carbon Dioxide Equivalent
CSA	Canadian Standards Association
COPC	Contaminant of Potential Concern
dBA	Decibel, A-weighted
dB(C)	Decibel, C-weighted
EA.....	Environmental Assessment
ECCC	Environment and Climate Change Canada
EPS.....	Emissions Performance Standards
EV.....	Electric Vehicle
FHWA.....	Federal Highway Administration (US)
g	grams

GHG	Greenhouse Gas
GMSP	Golden Mile Secondary Plan
GMTMP.....	Golden Mile Transportation Master Plan
Hz.....	Hertz
in	inch
IPCC.....	Intergovernmental Panel on Climate Change
kt	kilotonne
Leq	Energy Equivalent Sound Level
LRT	Light Rapid Transit
m.....	metre
m ²	square metre
mm.....	millimetre
MECP	Ministry of Environment, Conservation and Parks
MEMAC	Machinery and Equipment Manufacturers Association of Canada
mm/s.....	millimetres per second
MOE	Ministry of Environment
MOVES	Motor Vehicle Emission Simulator
MTM	Modified Transverse Mercator
MTO	Ministry of Transportation Ontario
NAPS	National Air Pollution Surveillance
NIR	National Inventory Report
N ₂ O	Nitrous Oxide
NO ₂	Nitrogen Dioxide
NPC.....	Noise Pollution Control

NSA	Noise Sensitive Area
O ₃	Ozone
OLA	Outdoor Living Area
PAH	Polycyclic Aromatic Hydrocarbon
PM ₁₀	Particulate Matter, less than 10 microns
PM _{2.5}	Particulate Matter, less than 2.5 microns
ppb	parts per billion
PPV	Peak Particle Velocity
SAE	Society of Automotive Engineers
SO ₂	Sulphur Dioxide
t	Tonnes
TGS	Toronto Green Standard
TSP	Total suspended particulate
TNM	Traffic Noise Model
UNFCCC	United Nations Framework Convention on Climate Change
US EPA	United States Environmental Protection Agency
VKT	Vehicle Kilometre Travelled
VOC	Volatile Organic Compounds
ZEV	Zero Emission Vehicle
ZOI	Zone of Influence
µg/m ³	Micrograms per cubic metre

1.0 INTRODUCTION

The ReNew Golden Mile project (the Project) is a comprehensive, multi-phase initiative in Scarborough (Toronto) focused on transforming the Golden Mile area—stretching along Eglinton Avenue East between Victoria Park Avenue and Birchmount Road—into a more connected, transit-oriented, mixed-use community. As part of this initiative, the City of Toronto is undertaking a Municipal Class Environmental Assessment (EA) Study to determine the design of new major streets and the design, realignment, and/or extension of existing major streets within the Golden Mile area. The Class EA Study builds on the recommended infrastructure improvements identified in the Golden Mile Secondary Plan (GMSP) [1] and the supporting Golden Mile Transportation Master Plan (GMTMP) [2]. The planned street network improvements are intended to enhance mobility, support future redevelopment, and integrate with new transit infrastructure within this rapidly evolving corridor.

Potential air quality and noise impacts associated with the proposed roadway realignment and new road construction have been assessed as part of the Class EA process, through the development of this Air Quality and Noise Impact Assessment (AQNIA). The objectives of the AQNIA were to:

- Characterize pre-Project air quality and noise conditions within the study area;
- Predict air emissions and traffic noise under pre-Project and future build conditions;
- Compare predicted impacts against applicable regulatory standards and planning criteria; and
- Identify potential environmental effects and recommend mitigation or management strategies as appropriate.

Air quality was assessed using a screening-level emissions burden analysis, which quantified the net change in total annual pollutant emissions attributable to the preferred transportation alternative. This was based on a comparison between a representative pre-Project condition (2013) and a future horizon year (2041) scenario, with results interpreted in the context of transportation sector emissions projections from relevant provincial and federal sources.

Noise impacts were assessed through detailed modeling in accordance with provincial environmental noise assessment protocols, using traffic data for the realigned street network to predict changes in sound levels at nearby receptors. Noise levels were predicted for current (2025), future no-build (2041), and future build (2041) scenarios.

Operational phase impacts were assessed quantitatively, and where appropriate, recommendations for mitigation and management measures are provided to avoid or minimize potential adverse effects. Potential impacts during construction were assessed qualitatively,

based on the nature of construction activities, expected equipment use, applicable municipal by-laws, and typical sources of air emissions and noise.

The remainder of this report is organized as follows:

- **Section 2.0 – Description of Study Area:** Provides an overview of the physical, geographic, and land use characteristics of the Study Area.
- **Section 3.0 – Regulatory Context:** Outlines applicable municipal, provincial, and federal frameworks related to air quality, noise, and construction impacts.
- **Section 4.0 – Existing Environment:** Summarizes ambient air quality and noise conditions, including regional emissions inventory data and monitoring records.
- **Section 5.0 – Assessment Methodology:** Describes the methods, models, and data sources used to evaluate potential impacts, including scenario definitions and modeling tools.
- **Section 6.0 – Modelling Results and Analysis:** Presents the results of the air quality and noise impact assessments for both operational and construction phases.
- **Section 7.0 – Conclusions and Recommendations:** Summarizes key findings and outlines recommended mitigation and management measures.
- **Section 8.0 – References:** Lists all technical sources and guidance documents cited in the report.

2.0 DESCRIPTION OF STUDY AREA

The Golden Mile district of Toronto is bounded by Bermondsey Road to the west, the Gattineau Hydro Corridor Trail to the north, Sunrise Avenue, Holswade Road, Comstock Road, and Foxridge Drive to the south, and Kennedy Road to the east. Within this area is the GMSP area (or, the Study Area), which is generally bounded by Victoria Park Avenue to the west, Birchmount Road to the east, Ashtonbee Road to the north, and lands south of Eglinton Avenue East and Civic Road to the south. The GMSP Study Area is shown in Figure 1.

The Study Area currently includes a mix of:

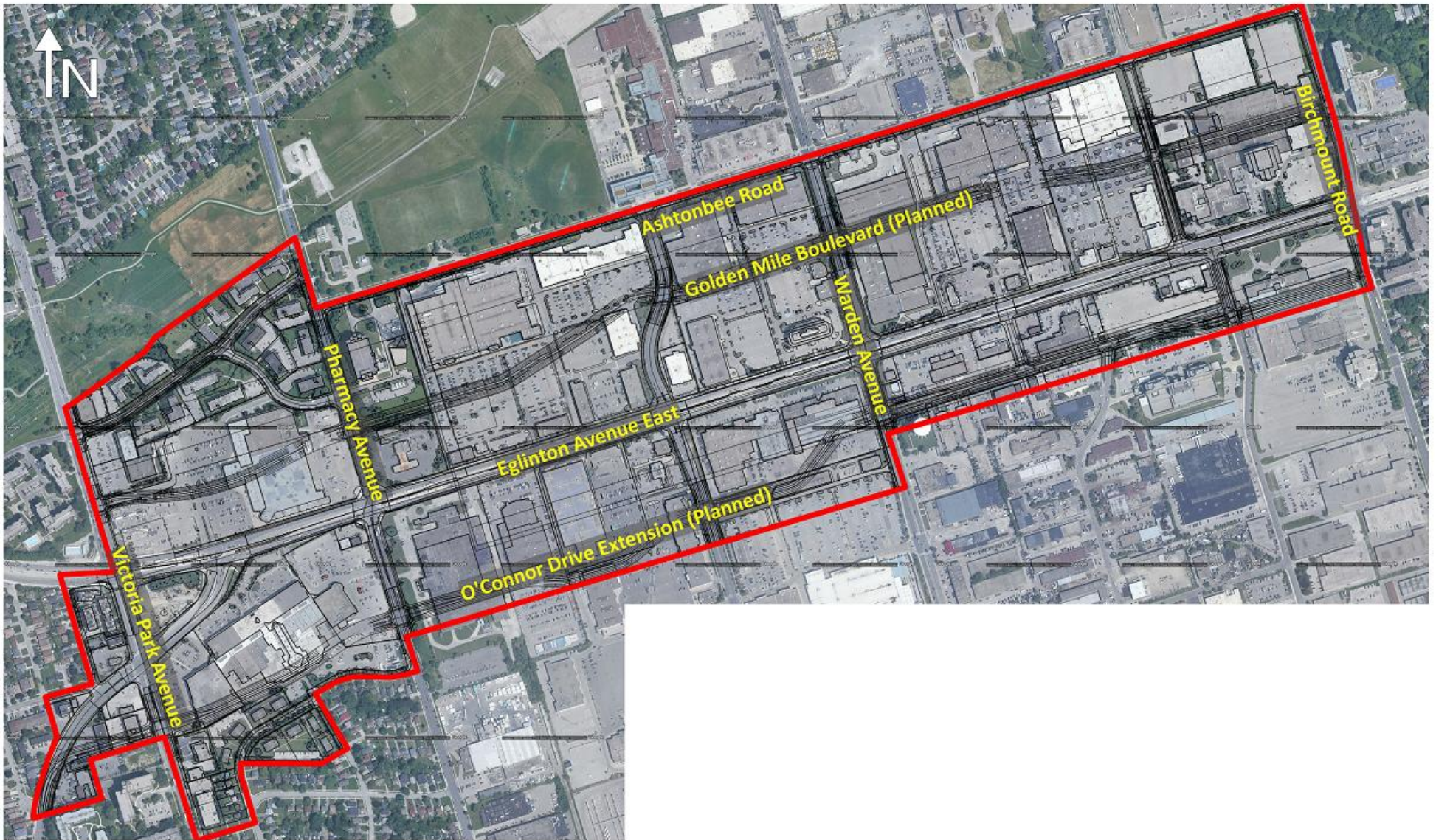
- Major transportation corridors, including Eglinton Avenue East, Victoria Park Avenue, and Birchmount Road, which accommodate significant volumes of passenger and commercial vehicle traffic,
- Rail infrastructure supporting the future Eglinton Crosstown Light Rail Transit (LRT), with five planned stations in the area,

- Active transportation routes, including the Gatineau Hydro Corridor Trail (“The Meadoway”),
- Residential neighbourhoods comprising both single-family and multi-unit dwellings,
- Large-format retail centres (“big box” stores), smaller commercial outlets, and restaurant clusters,
- Industrial and light manufacturing facilities, including warehousing and processing operations,
- Institutional properties, including Centennial College Ashtonbee Campus, and
- Urban green spaces and parkland (e.g., Ashtonbee Reservoir Park).

The existing air quality and noise environments in the Study Area include contributions from the following sources:

- On-road vehicle traffic along the arterial road network and connecting local streets,
- Commercial, institutional, and residential energy use (natural gas combustion),
- Industrial sources, including light manufacturing and processing operations,
- Construction-related activities associated with ongoing development and infrastructure expansion, and
- Rail and transit operations linked to the Eglinton Crosstown LRT corridor.

The Study Area is projected to experience significant growth over the next 20 to 30 years, with an expected addition of up to 65,000 new residents and jobs, further intensifying transportation activity and associated air emissions.



LEGEND



**Golden Mile Secondary Plan
Study Area**

NOTES

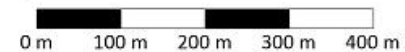
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PROJECT NO.

SX21-0030

SCALE



Drawn by:

NZS

Approved by:

PLK

Date:

Jun. 2025

REVISIONS

No.	Date	By	Revision



**Golden Mile Secondary Plan
Study Area**

FIGURE NO.

1

3.0 REGULATORY CONTEXT

The assessment of potential air quality and noise impacts for transportation infrastructure in Ontario is informed by a multi-tiered regulatory framework that includes federal, provincial, and municipal policies and guidance. This section outlines the key instruments relevant to air quality, greenhouse gas (GHG) emissions, noise, and explains how they were applied in the current study.

3.1 ASSESSMENT OF AIR QUALITY

The City of Toronto has not issued specific technical guidance for assessing traffic-related air quality impacts associated with road realignments or new roadway construction. As such, relevant provincial guidelines were reviewed and applied, where appropriate, to inform the assessment methodology for this Project. The following provincial guidelines were considered:

- The Ministry of Transportation Ontario (MTO) *Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects* [3] (the MTO AQ Guide)

While not strictly applicable to this Project, MTO AQ Guide was used as a reference to inform and guide the assessment process. The guide is primarily intended for application to provincial roadway projects under the jurisdiction of the MTO; however, its recommended methodologies for quantifying Project-related emissions of criteria air contaminants (CACs), greenhouse gases (GHGs), and air toxics, as well as its guidance on best practices for emissions mitigation, are broadly applicable.

In addition, the following frameworks were considered in the development of the assessment approach:

- **Provincial and Federal Ambient Air Quality Framework:** Summarizes relevant air quality standards and guidelines established by the Ontario Ministry of the Environment, Conservation and Parks (MECP) and the Canadian Council of Ministers of the Environment (CCME), including Ambient Air Quality Criteria (AAQC) and Canadian Ambient Air Quality Standards (CAAQS) for key pollutants.
- **Federal CAC/GHG Inventory Framework:** Describes the use of national inventories such as the *Air Pollutant Emissions Inventory (APEI)* and the *National Inventory Report (NIR)* to provide contextual benchmarks for CAC and GHG emissions, respectively.
- **City of Toronto Framework:** Highlights relevant City-led initiatives and planning documents that address local air quality and climate policy, including the TransformTO strategy.

3.1.1 Provincial and Federal Ambient Air Quality Framework

At the provincial level, the Ontario MECP has established AAQCs [4] under the *Environmental Protection Act* [5]. These benchmarks represent health- and environment-based thresholds for various contaminants of potential concern (COPCs), including nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), and particulate matter (PM₁₀ and PM_{2.5}). While AAQCs are not enforceable limits, they are widely used for planning-level impact assessments.

Federally, the Canadian Ambient Air Quality Standards (CAAQS) [6], developed by the CCME provide national benchmarks for PM_{2.5}, NO₂, SO₂, and ground-level ozone (O₃). Although not legally binding, these standards support long-term planning and are referenced in Ontario as supplementary guidance. A summary of the applicable AAQC and CAAQS values is provided in Table 1.

While the Ontario AAQC and the CAAQS values form part of the regulatory framework guiding air quality management, they are designed primarily for use in concentration-based assessments, such as those involving dispersion modeling. In this assessment, these benchmarks are not used to evaluate predicted concentrations, but rather to provide context for understanding general air quality conditions in the area.

Table 1: Ambient Air Quality Criteria and Standards

COPC	Averaging Time	AAQC	Regulatory Body
Total Suspended Particulate Matter (TSP)	24-hour	120 µg/m ³	Ontario MECP
	Annual	60 µg/m ³ [1]	Ontario MECP
Particulate Matter ≤10 micron (PM ₁₀)	24-hour	50 µg/m ³ [2]	Ontario MECP
Particulate Matter ≤2.5 microns (PM _{2.5})	24-hour	27 µg/m ³ [2]	Ontario MECP
		27 µg/m ³ [3]	CCME
	Annual	8.8 µg/m ³ [4]	CCME
Nitrogen Dioxide (NO ₂)	1-hour	200 ppb (377 µg/m ³)	Ontario MECP
		42 ppb (80 µg/m ³) [5]	CCME
	24-hour	100 ppb (189 µg/m ³)	Ontario MECP
	Annual	12 ppb (22 µg/m ³) [6]	CCME
Sulphur Dioxide (SO ₂)	1-hour	40 ppb (105 µg/m ³)	Ontario MECP
		65 ppb (173 µg/m ³) [7]	CCME
	Annual	4 ppb (11 µg/m ³)	Ontario MECP
		4 ppb (11 µg/m ³) [6]	CCME
Carbon Monoxide (CO)	1-hour	36,200 µg/m ³	Ontario MECP

COPC	Averaging Time	AAQC	Regulatory Body
	8-hour	15,700 µg/m ³	Ontario MECP
Acetaldehyde	24-hour	500 µg/m ³	Ontario MECP
Acrolein	1-hour	4.5 µg/m ³	Ontario MECP
	24-hour	0.4 µg/m ³	Ontario MECP
Benzene	24-hour	2.3 µg/m ³	Ontario MECP
	Annual	0.45 µg/m ³	Ontario MECP
1-3 Butadiene	24-hour	10 µg/m ³	Ontario MECP
	Annual	2 µg/m ³	Ontario MECP
Formaldehyde	24-hour	65 µg/m ³	Ontario MECP
	Annual	µg/m ³	Ontario MECP
Benzo(a)pyrene [8]	24-hour	0.00005 µg/m ³	Ontario MECP
	Annual	0.00001 µg/m ³	Ontario MECP
Notes: [1] Geometric mean [2] MECP identifies that this is not an AAQC per se, but provided for decision making purposes [4] [3] 3-year average of the annual 98th percentile of the daily 24-hour average concentrations [6] [4] 3-year average of the annual average of all 1-hour concentrations [6] [5] 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations [6] [6] The average over a single calendar year of all 1-hour average concentrations [6] [7] 3-year average of the annual 99th percentile of the daily maximum 1-hour average concentrations [6] [8] Surrogate for total PAHs [4]			

3.1.2 Federal CAC/GHG Inventory Framework

As part of this screening-level analysis, Project-related CAC and GHG emissions are compared against values from the APEI and NIR to provide regional context and evaluate the Project's relative contribution to broader emission trends. The APEI is Canada's official inventory for criteria air contaminants and other regulated air pollutants, including NO₂, SO₂, CO, volatile organic compounds (VOCs), ammonia (NH₃), and particulate matter (PM₁₀ and PM_{2.5}). Updated annually, the APEI disaggregates emissions by province, economic sector, fuel type, and source category (e.g., point, area, and mobile sources).

The road transportation component of the transportation sector is treated as a major source category and is further broken down by vehicle class (e.g., light-duty gasoline, heavy-duty diesel) and fuel type. In the context of the Golden Mile EA, APEI data are used to:

- Establish pre-Project transportation-related CAC emissions for Ontario;
- Evaluate the contribution of on-road vehicles to regional emissions; and
- Compare Project-related emissions against long-term provincial trends.

The NIR complements the APEI by providing Canada’s official greenhouse gas emissions estimates, submitted annually to the United Nations Framework Convention on Climate Change (UNFCCC). The NIR is prepared according to Intergovernmental Panel on Climate Change (IPCC) guidelines and quantifies emissions of CO₂, CH₄, N₂O, and fluorinated gases across all major sectors. The transportation sector is identified as a distinct reporting category and includes emissions from on-road vehicles, aviation, marine, rail, off-road engines, and pipeline transport.

To explore a range of possible futures, Environment and Climate Change Canada (ECCC) presents two policy scenarios: the Reference Scenario, which assumes no additional actions beyond those already legislated or in force as of September 2022, and the Additional Measures Scenario, which includes both existing policies and anticipated—but not yet fully implemented—initiatives. The Reference Scenario serves as a baseline for evaluating the effectiveness of current measures and does not account for potential developments such as new regulations, technological innovations, or behavioral shifts. In contrast, the Additional Measures Scenario reflects a more proactive policy environment and incorporates proposed initiatives such as vehicle emissions regulations, financial incentives for zero-emission vehicle (ZEV) adoption, low-carbon fuel standards, investments in charging infrastructure, and strategies to encourage public and active transportation.

3.1.3 City of Toronto Framework

At the municipal level, the City of Toronto has established complementary policies that support air quality and GHG management objectives. Through its *TransformTO Net Zero Strategy* [7], the City has set targets to achieve net-zero GHG emissions community-wide by 2040. The City also implements local air quality initiatives under programs such as the Toronto Green Standard (TGS) [8] and supports air quality improvements through land use planning, transportation policy, and municipal operations. While these municipal frameworks do not impose enforceable concentration-based criteria, they help align infrastructure planning with broader sustainability and climate goals. Accordingly, Project-related air quality and GHG considerations are considered with reference to relevant municipal objectives, in addition to applicable provincial and federal initiatives.

3.2 ASSESSMENT OF NOISE AND VIBRATION

The City of Toronto has not issued specific guidelines for the assessment of traffic-related noise and vibration from the realignment of existing roads or the construction of new roads. Accordingly, relevant provincial guidelines have been reviewed and incorporated, as appropriate, into this assessment. The following provincial guidelines pertaining to the assessment of road traffic noise were reviewed to assist with defining the assessment framework for this Project:

- Ontario MECP Publication NPC-300: Environmental Noise Guideline - Stationary and Transportation Sources - Approval and Planning [9],

- MTO Environmental Guide for Noise (the MTO Noise Guide) [10], and
- Ontario Ministry of Environment (MOE) and MTO protocol for dealing with noise concerns during the preparation, review and evaluation of provincial highways environmental assessments (the MOE/MTO Protocol) [11].

Ontario MECP Publication NPC-300 is not strictly applicable to this assessment. Although it provides an assessment methodology and criteria for transportation noise sources, it is intended for application in land use planning contexts—specifically, to assess the compatibility of proposed new sensitive land uses in the vicinity of existing transportation sources. It is not intended for the assessment of proposed new roads near existing sensitive land uses. Accordingly, it has not been considered further in this assessment.

Similarly, the MTO Noise Guide was developed to address provincial highways and freeways under MTO jurisdiction and is not directly applicable to municipal road projects such as this one. Therefore, it has also not been considered further in this assessment other than as a source for MTO definitions of assessment terminology.

In contrast, the MOE/MTO Protocol represents a joint effort between the MECP (formerly MOE) and MTO to establish noise assessment criteria to be considered in the context of EA studies and is commonly applied in municipal Class EA projects for roads in Ontario. It is therefore considered the most relevant guideline for evaluating the potential traffic noise impacts of this Project. The MOE/MTO Protocol is described in greater detail below.

The MOE/MTO Protocol specifies that sound levels are to be assessed at outdoor locations associated with noise-sensitive land uses and defines an objective sound level of 55 dBA (16-hr Leq¹) or the existing ambient sound level, whichever is greater. The significance of a potential noise impact is evaluated based on this objective sound level and the degree to which the project under assessment is predicted to increase the pre-project sound level. The MOE/MTO Protocol requires that mitigation measures be investigated if the project-related noise increase exceeds 5 dBA relative to existing conditions unless the resulting predicted sound level remains below the objective level. If the increase exceeds 5 dBA but the total sound level remains below the objective threshold, an investigation into mitigation is not required. This approach is summarized in Table 2 (adapted from Table 1 of the MOE/MTO Protocol).

As noted above, the assessment is to be completed at outdoor spaces associated with Noise Sensitive Areas (NSAs). While the MOE/MTO Protocol does not provide detailed definitions for

¹ The term Leq refers to an “energy equivalent sound level”. As environmental sounds tend to fluctuate, it is common for environmental noise assessments to be completed using energy equivalent sound levels, which are constant sound levels that contain the same sound energy as the fluctuating sound over the same period, in this case 16 hours. Based on MECP and MTO guidelines, the 16-hour period being referred to is the daytime period between 07:00 and 23:00 [9], [10].

these terms, they are understood to be consistent with definitions provided in other related MECP and MTO documents. Although the assessment methodologies in those documents were not adopted for this assessment, their terminology sections provide a clear and consistent basis for interpreting the NSA and Outdoor Living Area (OLA) definitions applicable to this Project.

In the MTO Noise Guide, the MTO defines a “Traditional” NSA as one of the following land uses, provided that an Outdoor Living Area (OLA) associated with the site:

- Private homes such as single-family residences (owned or rental),
- Townhouses (owned or rental),
- Multiple unit buildings, such as apartments with OLAs for use by all occupants, and
- Hospitals, nursing homes for the aged, where there are OLAs for the patients.

Table 2: MOE/MTO Protocol Assessment Criteria

Future Sound Level (Leq 16-hr, dBA)	Change from Future No-Build Ambient Sound Level (dBA)	Degree of Mitigation Effort Required
<55	≤5	▪ None
	>5	▪ None
>55	≤5	▪ None
	>5	▪ Investigate noise control measures on right-of-way ▪ If project cost is not significantly affected, introduce noise control measures within right-of-way ▪ Noise control measures, where introduced, should achieve a minimum of 5 dBA attenuation over first row receivers ▪ Mitigate to ambient, as administratively, economically, and technically feasible

The MTO also defines certain “Special Land Use” NSAs, which may be considered NSAs if they are part of a community context—that is, if they are adjacent to a Traditional NSA as defined above. For assessments under MTO jurisdiction, these Special Land Use NSAs may only receive

mitigation if noise mitigation for the adjacent Traditional NSA is determined to be technically, economically, and administratively feasible. Special Land Use NSAs include.

- Educational facilities and day care centres, where there are OLAs for students,
- Campgrounds that provide overnight accommodation,
- Hotels/motels where there are OLAs (e.g., swimming pool area, etc.) for visitors,
- Community centres with OLAs (e.g., outdoor basketball courts, etc.),
- Municipal parks (excluding golf courses and trails), and
- Places of worship with OLAs.

Certain land uses are not considered NSAs under the MTO definitions and are excluded from assessment:

- Apartment balconies above ground floor,
- Cemeteries,
- All commercial, and
- All industrial.

The MTO defines an Outdoor Living Area (OLA) as follows:

“Outdoor Living Area (OLA): means an area at ground level, adjacent to an NSA, intended and designed for the enjoyment of the outdoor environment, and readily accessible from the building. This area is typically situated in the backyard for a dwelling unit but may be situated on any side of the NSA. The usual distance from the dwelling unit wall is 3 m. The vertical height is 1.5 m above the existing ground surface. Other examples include outdoor swimming pool/tennis courts for hotels/motels. Where the Acoustical Specialist has explored all options (e.g. site visit, satellite imagery etc.) to identify the location of the OLA but it is still unknown, the side closest to the highway should be assumed. Paved areas for multiple dwelling residential units are not to be defined as an OLA.”

The selection of NSAs for the noise assessment is further discussed in Section 5.2.1.

3.3 ASSESSMENT OF CONSTRUCTION NOISE AND VIBRATION

Note that a detailed quantitative assessment of noise and vibration from construction has not been completed for this assessment. The following discussion of the applicable guidance

documents has been provided for information and to assist with scoping the contract documents for construction tendering.

3.3.1 Municipal

The City of Toronto addresses the issues of noise and vibration via the Toronto Municipal Code Chapter 591 (noise) [12] and Chapter 363-3.6 (construction vibrations) [13]. These are each discussed in greater detail below.

3.3.1.1 City of Toronto Noise By-Law

The City of Toronto Noise By-law (Municipal Code Chapter 591) establishes general and specific prohibitions on activities that may generate excessive noise, including time-of-day and location-based restrictions. Noise from construction activities is addressed in Section 591-2.3, which stipulates that construction or the operation of construction equipment that is clearly audible must not occur:

- From 7:00 p.m. to 7:00 a.m. the following day (except until 9:00 a.m. on Saturdays); and/or
- All day on Sundays and statutory holidays.

Section 591-3.1 provides general exemptions to the Noise By-law, including an exemption for “Government work”, defined as:

"Construction, rehabilitation or maintenance work conducted by the City, the Province of Ontario, the Government of Canada and any of its agencies or agents, including the operation of motor vehicles and equipment actually engaged in the work."

Based on this provision, overnight construction work is generally prohibited unless the Project is classified as Government work. If it is not classified as such and overnight work is anticipated, an exemption permit must be obtained. The procedure for obtaining an exemption permit is outlined in Section 591-3.2 of the By-law.

Except for activities involving continuous concrete pouring and large crane work, the exemption permit is subject to conditions that may include:

- Compliance with a noise mitigation plan,
- Monitoring of sound levels by City staff (at the applicant's expense), with compliance required with a sound level of 85 dBA or 105 dBC at 20 m from the source, and
- Specification of the location, equipment, and schedule of the permitted activity.

For continuous concrete pouring and large crane work, specific requirements apply (Section 591-3.2 F). In particular, overnight work is discouraged, and permit holders must provide notice to those within a 120 m radius of the activity at least seven days in advance.

3.3.1.2 City of Toronto Construction Vibration By-Law

The City of Toronto regulates construction-related vibrations under By-law No. 514-2008, codified in Municipal Code Chapter 363-3.6 (Construction Vibrations). The By-law specifies peak particle velocity (PPV) limits for construction-generated vibration, as summarized in Table 3.

Table 3: City of Toronto Prohibited Construction Vibrations

Frequency of Vibration (Hz)	Vibration Peak Particle Velocity (mm/s)
Less than 4	8
4 to 10	15
More than 10	25

To demonstrate compliance with the By-law, applicants must submit a Vibration Control Form as part of the construction permit application. Where warranted, the following elements may also be required:

- Pre-construction vibration monitoring,
- Vibration monitoring during construction, and
- A communications and complaint response program.

The Vibration Control Form identifies activities likely to generate vibrations that could affect buildings or structures outside the construction site. If such activities are identified, a preliminary study is required to delineate the zone of influence (ZOI) and identify any heritage or vibration-sensitive buildings within that zone. If the ZOI extends beyond the legal site boundaries, the proponent must:

- Conduct pre-construction consultation with affected parties,
- Monitor background vibration levels,
- Perform building inspections, and
- Prepare a report describing mitigation measures and a construction vibration monitoring plan.

Construction monitoring must be implemented in accordance with the approved plan. Additionally, the public must be notified at least one week in advance of the activity and provided with contact information for the City and the contractor to facilitate complaint reporting.

3.3.2 Provincial

The MECP does not directly regulate construction noise or vibration, as these are typically addressed at the municipal level. However, the MECP provides sound emission guidelines for several types of construction equipment through the following documents:

- Publication NPC-115: Construction Equipment [14], and
- Publication NPC-118: Motorized Conveyances [15].

These documents provide maximum sound emission levels for individual pieces of equipment at defined reference distances. They do not specify receptor-based permissible sound levels for overall construction activity. A summary of applicable sound level standards from these publications is provided in Table 4.

Table 4: Summary of Ontario MECP Construction Sound Level Guidance

Source	Equipment	Power Rating (kW)	Maximum Sound Level (dBA) ^[1]	NPC-103 Measurement Procedure	Measurement Distance (m)
NPC-115	Excavation Equipment, Dozers, Loaders, Backhoes or Other Equipment Capable of Being Used for Similar Application.	<75	83	NPC-103 Section 6 (Society of Automotive Engineers (SAE) J88a)	15
		>75	85		
	Pneumatic Pavement Breakers	All	85	NPC-103 Section 7 (Machinery and Equipment Manufacturers Association of Canada (MEMAC))	7
	Portable Air Compressors	All	76	NPC-103 Section 7 (MEMAC)	7
	Tracked Drills	All	100	NPC-103 Section 6 (SAE J88a)	15
NPC-118	Heavy Vehicles with Governed Diesel Engines	All	95	NPC-103 Section 9 (Canadian Standards Association (CSA) 107.22-M)	15

Notes:

[1] As measured using the MECP Publication NPC-103 [16] procedure identified in the adjacent column.

4.0 EXISTING ENVIRONMENT

4.1 AIR QUALITY SUMMARY

Existing air quality within the Study Area reflects its mixed urban land use and proximity to major transportation corridors. The area is influenced by emissions from on-road vehicle traffic, residential and commercial heating, local industrial activities, and broader regional sources.

Ambient air quality in the region is monitored by ECCC and the Ontario MECP through the National Air Pollution Surveillance (NAPS) Program. In Ontario, the MECP supports the NAPS Program by operating monitoring stations, collecting and validating data, and ensuring adherence to national calibration and quality assurance protocols. These stations provide representative data for key COPCs, including:

- Carbon monoxide (CO)
- Nitrogen dioxide (NO₂)
- Sulphur dioxide (SO₂)
- Particulate matter (PM_{2.5} and PM₁₀)
- Volatile organic compounds (VOCs)
- Polycyclic aromatic hydrocarbons (PAHs)

In the Project context, these pollutants are primarily associated with fuel combustion and vehicle emissions, with additional contributions from industrial activities, road dust, and construction-related sources.

The closest continuous NAPS monitoring station is MECP Toronto East (Station 60410), located approximately 2–3 km from the Study Area. This station monitors several key pollutants, including NO₂ and PM_{2.5}. Additional NAPS stations within the Greater Toronto Area provide data for other COPCs not monitored at Toronto East. In particular, SO₂ and CO data were obtained from the Toronto North – Downsview station (Station 60440), located approximately 15 km northwest of the Project site. No VOC or PAH monitoring stations are located within the Greater Toronto Area; the closest urban station with VOC and PAH data is in Hamilton.

4.1.1 Ambient Air Quality: CAC, VOC and PAH

Air quality data from Toronto East were used to characterize pre-Project conditions near the study area for the years between 2020 and 2024. Where data were unavailable at that location, records from Toronto North - Downsview were used to supplement the assessment. At Toronto East, nitrogen dioxide (NO₂) levels were generally moderate, with an average of approximately 18 µg/m³

and most elevated readings staying below $38 \mu\text{g}/\text{m}^3$ (90th percentile). Fine particulate matter ($\text{PM}_{2.5}$) averaged $7 \mu\text{g}/\text{m}^3$ over 24-hour periods, with most higher readings under $13 \mu\text{g}/\text{m}^3$. Since CO and SO_2 are not measured at Toronto East, data from Downsview were used. At this station, CO levels averaged around $239 \mu\text{g}/\text{m}^3$, with most elevated values below $332 \mu\text{g}/\text{m}^3$, while SO_2 levels were low, averaging $0.4 \mu\text{g}/\text{m}^3$ and remaining below $1 \mu\text{g}/\text{m}^3$ in most cases.

These findings reflect generally good air quality in the area, with occasional short-term increases likely linked to localized activity, or more specific regional air quality episodes (i.e., forest fires). A 5-year statistical summary of the available measured COPC concentrations is provided in Table 5.

Table 5: Summary of 2020-2024 Ambient Air Quality Monitoring

Station ID	Description	COPC	Period	5 Year Concentrations ($\mu\text{g}/\text{m}^3$) [1]					
				Avg	StDev	Min	Max	Median	P90
60440	Toronto North - Downsview	CO	1hr	239.4	93.0	57.3	2,416.0	217.6	332.1
			8hr	239.6	80.5	94.5	1,623.0	221.8	329.2
60410	Toronto East	NO_2	1hr	18.0	14.4	0.0	141.6	13.2	37.6
			24hr	18.0	9.5	1.6	67.4	15.7	30.7
60440	Toronto North - Downsview	SO_2	1hr	0.4	1.0	0.0	24.1	0.3	0.8
60410	Toronto East	$\text{PM}_{2.5}$	24hr	7.3	5.7	0.1	116.2	6.1	12.9
Notes: [1] Avg = average concentration ; StDev = standard deviation ; Min = minimum concentration ; Max = maximum concentration; Median = 50 th percentile; P90 = 90 th percentile									

Monitoring data VOCs and PAHs in Ontario are limited, with only a small number of stations tracking these pollutants—none of which are located in Toronto or near the Project site. Despite this limited spatial coverage, long-term monitoring data from Southern Ontario indicate that ambient concentrations of key VOCs (e.g., benzene, toluene, ethylbenzene, and xylenes) and priority PAHs (e.g., benzo[a]pyrene) have declined significantly over the past decade [17]. These reductions are broadly attributed to a combination of regulatory improvements, cleaner technologies, and overall declines in emissions from vehicles and industrial activities.

4.1.2 Federal APEI and NIR Emissions Inventory

Table 6 summarizes pre-Project emissions of CACs from Ontario's road transportation sector in 2013, based on data from the APEI maintained by ECCC [18]. These values provide an annualized regional pre-Project against which Project-related emissions can be compared. As shown, CO and NO_2 were the largest contributors by mass, with substantial emissions also reported for particulate matter and VOCs.

Table 6: Pre-Project Emissions of Criteria Air Contaminants (CACs) in Ontario Road Transportation

COPC	Annual Emissions (tonnes)
	2013
Carbon Monoxide (CO)	1,085,224
Sulphur Dioxides (SO ₂)	8,612
Nitrogen Dioxides (NO ₂)	173,392
Total Particulate Matter	10,735
Particulate Matter ≤10 micron (PM ₁₀)	10,735
Particulate Matter ≤2.5 microns (PM _{2.5})	6,951
Volatile Organic Compounds (VOC)	97,260

4.1.3 Greenhouse Gas Emissions

In 2023, GHG emissions from Ontario’s road transportation sector totaled approximately 41,197 kilotonnes of carbon dioxide equivalent (kt CO₂e), based on data from Canada’s 2024 NIR [19, 20]. This total includes direct emissions from on-road vehicles, excluding other transportation sources such as aviation, rail, marine, and off-road equipment. Road transportation remained the dominant contributor within Ontario’s transportation sector, accounting for approximately 84% of all transportation-related GHG emissions in 2023.

By comparison, in 2013 road transportation emissions totaled approximately 47,293 kt CO₂e, reflecting higher fuel consumption, less stringent emission controls, and lower adoption of clean technologies at the time. The 13% decline in GHG emissions between 2013 and 2023 illustrates the gradual decarbonization of the sector over the past decade, influenced by factors such as improved fuel efficiency standards, increased penetration of hybrid and zero-emission vehicles (ZEVs), and the implementation of federal and provincial clean fuel regulations.

Table 7 summarizes GHG emissions from Ontario’s road transportation sector by COPC for the years 2013 and 2023. As in previous years, carbon dioxide (CO₂) remains the dominant emission, consistent with the sector’s continued reliance on gasoline and diesel fuels. While methane (CH₄) and nitrous oxide (N₂O) are emitted in much smaller quantities, their higher global warming potentials (GWPs) contributed approximately 396 kt CO₂e in 2023.

Table 7: 2023 GHG by Road Transportation Sectors (Ontario)

COPC	Unit	Year 2013 (Pre-Project)	Year 2023 (Most Recent)
Carbon Dioxide (CO ₂)	kt	46,432.2	40,801.4
Methane (CH ₄)	kt	3.1	2.4
Nitrous Oxide (N ₂ O)	kt	2.9	1.2
Carbon Dioxide Equivalent (CO ₂ e)	kt CO ₂ e	47,292.5	41,196.9

The 2023 emissions profile represents the most current pre-Project conditions and reflects ongoing changes in vehicle technology, policy implementation, and consumer behavior. The 2013 profile serves as the reference year for evaluating future Project-related GHG impacts.

By comparison, the most recent transportation-related GHG emissions inventory for the City of Toronto totaled approximately 5,400 kt CO₂e in 2022, accounting for 35 percent of the city's total greenhouse gas emissions [21]. On-road vehicles, including passenger cars and light- and heavy-duty commercial vehicles, contributed 97 percent of these emissions.

4.2 NOISE SUMMARY

The existing noise environment within the Study Area is characteristic of a busy urban setting with a mix of residential, commercial, institutional, and industrial land uses. The dominant noise sources are associated with transportation activity, including:

- Road traffic on major arterial corridors such as Eglinton Avenue East, Victoria Park Avenue, Warden Avenue, and Birchmount Road,
- Local street traffic connecting residential and commercial areas,
- Rail operations linked to the Eglinton Crosstown LRT corridor,
- Aircraft overflights, which occasionally contribute to ambient noise levels, and
- Ongoing construction and redevelopment projects within the Golden Mile district.

Ambient sound levels in an urban environment typically exhibit a strong diurnal pattern, with higher levels during daytime hours due to increased traffic volumes and activity in commercial and institutional areas. Nighttime noise levels are generally lower but can remain elevated near major transportation corridors. Existing sound levels from road traffic have been included in the assessment results presented in Section 6.0.

Noise-sensitive receptors in the Study Area generally include residential neighbourhoods and institutional locations (e.g., childcare centres). Details of the sensitive receptor types included in the analysis are summarized in Section 5.2.1. Given the anticipated growth in population, redevelopment, and transportation activity, managing both construction-related and operational noise will be important to maintaining community livability and protecting sensitive receptors from undue noise impacts.

5.0 ASSESSMENT METHODOLOGY

This section outlines the methodologies used to assess potential air quality and noise impacts associated with the proposed road network improvements. The assessment considered both construction-phase and operational-phase conditions and was designed to quantify emissions and sound levels under both pre-Project and future planning scenarios. Methods were selected based on provincial guidelines and best practices to ensure consistency with regulatory expectations and support defensible conclusions.

5.1 AIR QUALITY

A screening-level assessment was conducted using an emissions burden analysis approach, as outlined in the MTO Air Quality Guide. This method quantifies the change in pollutant emissions attributable to the preferred transportation alternative by comparing a pre-Project condition (2013) to a future planning horizon (2041). The assessment focused on the following COPCs:

- **CACs:** carbon monoxide (CO), nitrogen dioxides (NO₂), sulphur dioxides (SO₂), volatile organic compounds (VOCs), particulate matter (PM_{2.5} and PM₁₀)
- **Air toxics:** formaldehyde, acetaldehyde, benzene, benzo(a)pyrene, 1,3-butadiene, and acrolein; and
- **GHGs:** carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄), including total carbon dioxide equivalents (CO₂e).

The air quality assessment was based on traffic modelling completed by HDR for the preferred alternative, which provided the total average annual vehicle kilometres travelled (VKT) and key traffic characteristics required for the burden analysis. The following key steps were undertaken in completing the assessment:

- **Emission factor estimation:** For the pre-Project year (2013) and future Project horizon year (2041), tailpipe and mechanically generated dust emission factors (in units of g/VKT) were estimated for the principal pollutants and greenhouse gases using the Motor Vehicle Emission Simulator (MOVES) model, version 5 [22] and United States Environmental Protection Agency (US EPA) road dust emission factors [23].

- **Emission calculation:** VKT data (by major vehicle type) and emission factors were integrated to calculate total COPC emissions for the pre-Project conditions and future conditions with the preferred alternative in place.
- **Comparative analysis:** Emissions associated with the preferred alternative were compared to pre-Project emissions and relevant regional emission inventories.

Additionally, a qualitative assessment of expected construction-related air quality impacts associated with the preferred alternative has been developed and is provided in Section 6.2.

5.1.1 Assessment Scenarios

The potential air quality impacts of the Project were assessed by estimating the annual mass emissions of key air contaminants under a pre-Project condition representing the year 2013, and a future build condition representing the year 2041, assuming full implementation of the proposed roadway infrastructure. The assumptions and inputs associated with each scenario are summarized below.

5.1.1.1 Pre-Project (2013)

The pre-Project air quality scenario was established to provide context for the future build condition. This scenario was based on 2013 traffic volumes and characteristics provided by HDR Inc. [24, 25, 26, 27, 28], which were used to estimate emissions of CACs, GHGs, VOCs, PAH and particulate matter (PM) for dispersion modeling. Based on the data provided by HDR, the modelling of pre-Project conditions accounts for traffic volumes on the following streets:

- | | |
|-------------------------|-----------------------------|
| • Ashtonbee Road, | • Lebovic Avenue, |
| • Birchmount Road, | • O'Connor Drive, |
| • Civic Road, | • Pharmacy Avenue, |
| • Craigton Drive, | • Sinnott Road, |
| • Eglinton Avenue East, | • Thermos Road, |
| • Hakimi Avenue, | • Victoria Park Avenue, and |
| • Jonesville Crescent, | • Warden Avenue. |

Based on information provided by HDR, the day/night traffic split applied to the AADT data was 91% daytime and 9% nighttime across all segments. HDR also provided total truck percentages for each segment, advising that these should be apportioned as 80% heavy trucks and 20%

medium trucks. The traffic data used in the pre-Project assessment are summarized in Appendix A.

5.1.1.2 Future Build (2041)

The future build air quality scenario reflects 2041 conditions with the Project infrastructure in place. Project-related modifications to the transportation network—namely the O’Connor Drive extension and Golden Mile Boulevard—were incorporated into the 2041 traffic projections provided by HDR [24, 25, 26, 27, 28]. These changes affect traffic patterns and volumes across the study area. The modelling of future-build conditions accounts for traffic volumes on the following streets (in alphabetical order):

- Ashtonbee Road,
- Birchmount Road,
- Craigton Drive,
- Eglinton Avenue East,
- Golden Mile Boulevard,
- Hakimi Avenue,
- Jonesville Crescent,
- Lebovic Avenue,
- O’Connor Drive (extended),
- Pharmacy Avenue,
- Sinnott Road,
- Thermos Road,
- Victoria Park Avenue, and
- Warden Avenue.

The same assumptions regarding the traffic data (i.e., 91% of traffic occurs during the daytime hours, the medium/heavy truck split and even split of traffic by direction) as applied in the pre-Project scenario were applied in the future build scenario. The traffic data used for the future build scenario are summarized in Appendix A.

5.1.2 Predictive Modelling Using MOVES

Air pollutant emissions from on-road transportation were estimated using the US EPA MOVES model, version 5 [22]. The model was applied using an airshed-based approach that encompassed the entire Project study area and the input datasets provided by HDR as noted above.

The assessment included a comprehensive set of COPCs, categorized as follows:

- **CACs:** carbon monoxide (CO), nitrogen dioxides (NO₂), sulphur dioxide (SO₂), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), represented by benzo[a]pyrene and particulate matter (PM_{2.5} and PM₁₀);

- **Air Toxics:** formaldehyde, acetaldehyde, benzene, benzo[a]pyrene, 1,3-butadiene, and acrolein; and
- **GHGs:** carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), including the total expressed as carbon dioxide equivalent (CO₂e).

Additional details on MOVES run specifications, source-type populations, fuel composition, and other input parameters are provided in Appendix A.

5.1.3 Paved Road Particulate Emissions

Particulate emissions from paved roads were estimated using a two-component approach that considered (1) resuspension of road surface material and (2) direct vehicle emissions (exhaust, brake wear, and tire wear). Emissions from the resuspension of loose material were calculated using the US EPA AP-42 empirical equation for paved roads (AP-42 Section 13.2.1 [23]):

$$E = [k(sL)^{0.91} \times (W)^{1.02}](1 - P/4N)$$

where:

E = emission factor for particulate matter

k = particle size multiplier (for PM₁₀ or PM_{2.5})

sL = surface silt loading (g/m²)

W = average fleet vehicle weight (tons)

P = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and

N = number of days in the averaging period (e.g., 365 for annual, 91 for seasonal, 30 for monthly).

The method uses fleet-average vehicle weight to represent the mix of vehicles using the road network [22, 23, 24, 25]. Surface silt loading values were selected based on typical conditions for public roads and informed by comparable studies [34].

Particulate emissions from exhaust, brake wear, and tire wear were estimated separately using the MOVES model as described in Section 5.1.2. Total paved road particulate emissions were determined by combining the calculated resuspended dust emissions and the direct vehicle emissions from the MOVES model.

5.2 NOISE

5.2.1 Identification of NSAs

5.2.1.1 Existing NSAs and Approved Developments

Existing NSAs were identified using recent aerial photography for the area. As noted in Section 3.2, an NSA must have an associated OLA to be included in the assessment. For houses, the OLA was placed on the side of the building with the greatest exposure to Project-related sources, at a horizontal offset of 3 m from the façade and at 1.5 m above grade in accordance with the MTO definition of an OLA.

For apartment buildings, the OLAs were similarly placed 3 m from the centre of the most exposed façade if surrounding yard was present. Where a shared amenity area (e.g., swimming pool or communal park) existed for a complex of apartment buildings, the point of reception was located in the portion of that area with the highest exposure to Project-related infrastructure, also at 1.5 m above grade. Consistent with MTO definitions, apartment balconies were not considered OLAs and were not included in the assessment. Apartment buildings with no identifiable OLA (e.g., surrounded by concrete lots) were excluded.

While the Golden Mile area is currently predominantly commercial, the City of Toronto anticipates a shift to mixed-use development in the future, as outlined in the GMSP [1]. The City of Toronto website for the GMSP includes a summary of the development applications submitted to within the study area. These applications were reviewed to identify projects that have received City Council approval, as only those developments can be reasonably represented by discrete future NSAs with confirmed OLAs. The remaining areas were assessed separately as discussed in Section 5.2.1.2. As of the time of this assessment, three such developments that had received City Council approval in the study area:

- 1460 Victoria Park Avenue [35],
- 1861 O'Connor Drive [36], and
- 1910 Eglinton Avenue East [37].

The development applications were reviewed in order to identify where the outdoor amenity areas (if any) were located for each approved development. The City of Toronto Planning & Development department maintains a website summarizing the development details for each development application including supporting documentation (each referenced in the above list). If a noise assessment was available for the development, then the OLA was referenced from that assessment to ensure consistency. Otherwise, the amenity areas were identified from the available architectural plans.

A summary of the receptor locations is provided with coordinates (referenced to MTM Zone 10) in Table 8. Figures showing the receptor locations are provided in Figure 2 and Figure 3.

Table 8: List of Existing and Planned Future Noise Receptors with OLAs

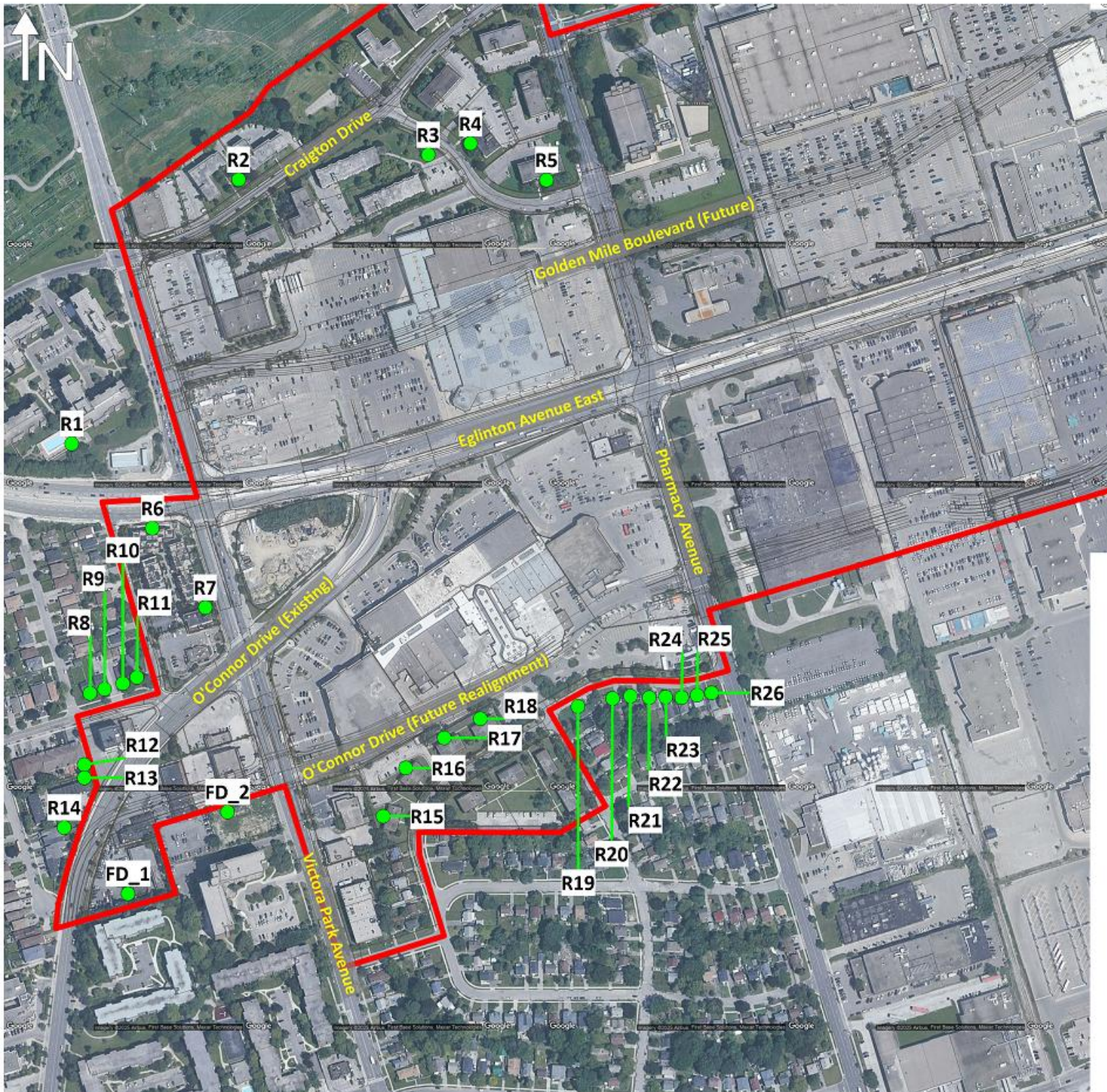
Name	ID	Coordinates (MTM Zone 10)	
		X (m)	Y (m)
Future Development (1861 O'Connor Drive)	FD_1	320618	4842181
Future Development (1460 Victoria Park Avenue)	FD_2	320710	4842256
Future Development (1910 Eglinton Avenue East)	FD_3A	321598	4842849
Future Development (1910 Eglinton Avenue East)	FD_3B	321586	4842888
Apartment (Goldengate Apartments)	R1	320566	4842595
Apartment (10-12 Craigton Drive)	R2	320720	4842838
Apartment (19-23 Craigton Drive)	R3	320895	4842861
Apartment (32 Craigton Drive)	R4	320934	4842871
Apartment (40 Craigton Drive)	R5	321004	4842838
Townhouses (1837 Eglinton Avenue East)	R6	320641	4842517
Childcare Centre (1492 Victoria Park Avenue)	R7	320689	4842444
Residential (30 Bartley Drive)	R8	320583	4842365
Residential (28 Bartley Drive)	R9	320597	4842369
Residential (24 Bartley Drive)	R10	320613	4842374
Residential (22 Bartley Drive)	R11	320626	4842380
Residential (31 Bartley Drive)	R12	320578	4842299
Residential (2 Leafy Woodway)	R13	320578	4842287
Residential (27 Warner Avenue)	R14	320559	4842241
Residential (14 Engelhart Crescent)	R15	320853	4842252
Residential (18 Engelhart Crescent)	R16	320874	4842296
Residential (22 Engelhart Crescent)	R17	320909	4842324
Residential (26 Engelhart Crescent)	R18	320943	4842342
Residential (1 Alvinston Road)	R19	321032	4842353
Residential (3 Alvinston Road)	R20	321064	4842360
Residential (5 Alvinston Road)	R21	321081	4842362

Name	ID	Coordinates (MTM Zone 10)	
		X (m)	Y (m)
Residential (7 Alvinston Road)	R22	321098	4842361
Residential (9 Alvinston Road)	R23	321113	4842362
Residential (11 Alvinston Road)	R24	321128	4842361
Residential (15 Alvinston Road)	R25	321142	4842363
Residential (17 Alvinston Road)	R26	321156	4842365
Residential (817 Birchmount Road)	R27	322741	4842963
Childcare Centre (835 Birchmount Road)	R28	322712	4843052
Townhouse (1043 Birchmount Road)	R29	322601	4843514

5.2.1.2 Future Land Use

It is recognized that the land use within the GMSP area will change dynamically in the future from a primarily commercial area to one of mixed use including residential developments. The specific locations and dimensions of buildings within the study area, as well as whether or not they are an NSA with a planned OLA, will depend on the development applications received and approved by City Council in the future. As such, it is not feasible to include discrete points of reception that are representative of future OLAs as it is not known where developments including an NSA will be, whether they will have an OLA associated with them and where that will be, or what the configuration of buildings surrounding them will be (i.e., degree of exposure of the OLA to the road network).

Future land use was therefore assessed generally using sound level contours to show where sound levels may be expected to increase above future no-build conditions by greater than 5 dBA. As there are practically unlimited options for how a future scenario would look in terms of building configurations throughout the GMSP Study Area, the modelling exercise was completed on a “free-field” basis (i.e., buildings were deactivated for these model runs). Separate contour plots have been developed for each of the “character areas” established in the GMSP.

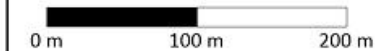


LEGEND:

- Golden Mile Secondary Plan Study Area
- Noise Receptor (OLA)

NOTES:

SCALE:



REVISIONS:

No.	Date	By	Revision

REFERENCE:

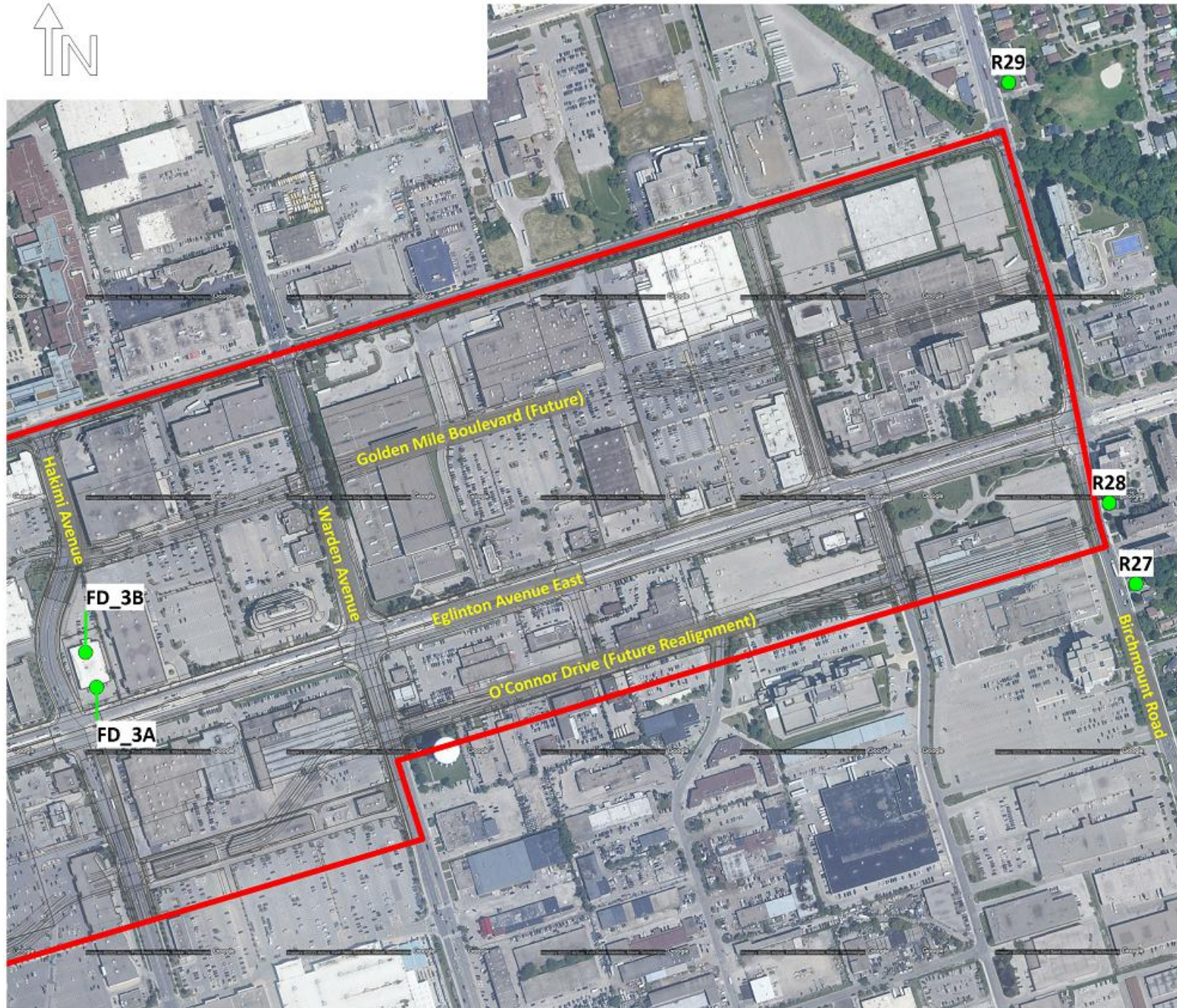
Imagery from Google Earth ©2025 Airbus,
First Base Solutions, Maxar Technologies



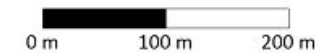
City of Toronto
ReNew Golden Mile

Noise Receptors (West Side)

Drawn By: NZS	Approved By: PLK	Figure No.: 2
Date: Jun. 2025	Project No.: SX21-0030	

**LEGEND:**Golden Mile Secondary
Plan Study Area

Noise Receptor (OLA)

NOTES:**SCALE:****REVISIONS:**

No.	Date	By	Revision

REFERENCE:Imagery from Google Earth ©2025 Airbus,
First Base Solutions, Maxar TechnologiesCity of Toronto
ReNew Golden Mile**Noise Receptors (East Side)**

Drawn By: N25	Approved By: PLK	Figure No.: 3
Date: Jun. 2025	Project No.: SX21-0030	

5.2.2 Assessment Scenarios

The potential noise impact of the Project was assessed by predicting noise levels at the nearest identified noise-sensitive areas NSAs with OLAs under three operating scenarios:

- Existing conditions (2025),
- Future conditions assuming the Project does not proceed (2041 future no-build),
- and future conditions assuming the Project proceeds (2041 future build).

Noise modelling was conducted using annual average daily traffic (AADT) data and vehicle characteristics provided for the assessment by HDR [24, 25, 26, 27, 28]. For existing and future no-build conditions, 2013 AADT data was pro-rated to represent 2025 and 2041 conditions using HDR-supplied traffic growth rates. For the 2041 future build scenario, the HDR-provided 2041 AADT forecasts were applied directly.

5.2.2.1 Existing (2025)

To provide context for the future noise scenarios, it is important to first establish the existing road traffic noise levels currently experienced at nearby sensitive receptors. (i.e., prior to the implementation of the Project). The existing acoustic environment at the NSAs was characterized through predictive modelling of traffic-related noise from major roads in the study area. This modelling was based on AADT volumes and truck percentages supplied by HDR. Details of the traffic noise modelling methodology are provided in Section 5.2.3. The modelling of existing conditions accounts for traffic volumes on the following streets (in alphabetical order):

- | | |
|-------------------------|-----------------------------|
| • Ashtonbee Road, | • Lebovic Avenue, |
| • Birchmount Road, | • O'Connor Drive, |
| • Civic Road, | • Pharmacy Avenue, |
| • Craigton Drive, | • Sinnott Road, |
| • Eglinton Avenue East, | • Thermos Road, |
| • Hakimi Avenue, | • Victoria Park Avenue, and |
| • Jonesville Crescent, | • Warden Avenue. |

According to HDR, a day/night traffic distribution of 91%/9% was applied to all road segments. For each segment, HDR provided a total truck percentage and advised that it be interpreted as comprising 80% heavy trucks and 20% medium trucks. According to HDR, a day/night traffic

distribution of 91%/9% was applied to all road segments. For each segment, HDR provided a total truck percentage and advised that it be interpreted as comprising 80% heavy trucks and 20% medium trucks.

This traffic data is consistent with that used in the pre-Project emissions analysis for the air quality assessment. The traffic volumes applied in the noise modelling for the existing conditions scenario, based on these assumptions, are summarized in Appendix B. Where applicable, roads were modeled with separate noise sources for each direction of travel (e.g., northbound and southbound modeled independently). In such cases, the directional traffic split was assumed to be 50% in each direction.

5.2.2.2 Future No-Build (2041)

In order to assess the impacts associated with the Project at the future horizon year of 2041, conditions must first be established for the same year in the absence of the Project (i.e., as though the project did not proceed, and the existing road layouts remain as-is). This scenario, termed the future no-build, provides a pre-Project condition for assessing the potential noise impacts associated with the Project.

In the future no-build scenario it has been assumed that existing traffic volumes on all of the roads listed in Section 5.2.2.1 will increase with population growth in the area. HDR indicated that an annual growth rate of 1% applied to the 2025 AADTs out to the horizon year of 2041 would be appropriate for this purpose, as per capita growth in the area according to City of Toronto projections is approximately 1% per annum. The road layouts in the future no-build model remained identical to those modelled for the existing scenario – only the traffic volumes changed. This represents the future condition that the NSAs would otherwise be exposed to if the Project were not to proceed, accounting only for traffic increases associated with population growth and no changes to existing transportation infrastructure or the existing buildings.

Details of the traffic noise model are provided in Section 5.2.3. The same assumptions regarding the traffic data (i.e., 91% of traffic occurs during the daytime hours, the medium/heavy truck split and even split of traffic by direction) as applied in the existing conditions scenario were applied in the future no-build scenario. The traffic data for the future no-build scenario is summarized in Appendix B.

5.2.2.3 Future Build (2041)

The future-build scenario represents future conditions in the same year as the future no-build year, but inclusive of the Project infrastructure changes. HDR provided a separate set of projected traffic volume data for use in the 2041 future-build scenario that accounts for the presence of the proposed new streets (i.e., the O'Connor Drive extension and the new Golden Mile Boulevard) and associated traffic relief on other east-west streets such as Eglinton Avenue East. The modelling of

future-build conditions accounts for traffic volumes on the following streets (in alphabetical order):

- Ashtonbee Road,
- Birchmount Road,
- Craigton Drive,
- Eglinton Avenue East,
- Golden Mile Boulevard,
- Hakimi Avenue,
- Jonesville Crescent,
- Lebovic Avenue,
- O'Connor Drive (extended),
- Pharmacy Avenue,
- Sinnott Road,
- Thermos Road,
- Victoria Park Avenue, and
- Warden Avenue.

Details of the traffic noise model are provided in Section 5.2.3. The same assumptions regarding the traffic data (i.e., 91% of traffic occurs during the daytime hours, the medium/heavy truck split and even split of traffic by direction) as applied in the existing and future no-build scenarios were applied in the future build scenario. Note that this information, as well as the road segments listed above, are the same as applied in the evaluation of pre-Project emissions for the air quality assessment. The traffic data for the future build scenario is summarized in in Appendix B.

5.2.3 Predictive Modelling

Modelling assessments of traffic noise in Ontario are typically completed using the Ontario MECP road traffic calculation method ORNAMENT as implemented in the computer model STAMSON. In STAMSON, each receptor is modelled individually based on its unique exposure to the road(s) under assessment. As such, this is a suitable model for the assessment of a small number of relatively straight roads at a limited number of receptor locations. The GMSP Study Area being assessed is approximately 120 ha and contains over 30 identified NSAs and numerous road segments (46 segments in the existing and future no-build scenarios, and 56 in the future build scenario). STAMSON does not lend itself well to studies of such complexity.

While the MOE/MTO Protocol does not identify a required calculation method, the MTO Noise Guide outlines that algorithms developed by the United States Federal Highway Administration (FHWA) for use in their Traffic Noise Model (TNM) [38] may be used for traffic noise assessment for projects under MTO oversight. It is assumed that this extends to road projects subject to Class EA under Ontario MECP oversight. The MTO Environmental Noise Guide [10] states that the TNM model must be used or “*TNM can be used together with any other software which is authorized by the FHWA or representative sample calculations can be provided to show similar results using the TNM software and the other software.*” The modelling for this Project utilized the TNM algorithms as implemented in the software program Cadna-A by its developer DataKustik GmbH [39]. The

rationale for selection of this platform and the required sample calculations showing similarity with the TNM software is provided in Appendix D. The TNM module in Cadna-A was found to accurately replicate the results from the most current TNM software (version 3.2).

The Cadna-A model was populated with an aerial photography basemap to assist with laying out the existing road configurations and placing receptors at their representative locations at the OLA of each identified NSA. Electronic design drawings of the planned reconfigured and new road alignments were provided by HDR in AutoCAD and Microstation formats and were overlaid in the model over the basemap to assist with plotting the future road configurations. Once plotted, each road was assigned its individual width and posted speed limit for use in the sound level calculations, and the traffic volumes as outlined in Appendix B were applied. All roads were assumed to be the TNM default “Average” pavement type. As the study area is mostly paved, the global ground absorption was set to be perfectly acoustically reflective (ground factor of $G=0$).

Buildings in the study area were included in the runs for the existing and planned approved future discrete receptor locations (i.e., those discussed in Section 5.2.1.1). If the proposed future alignment of the roads overlapped with an existing building, then that building was removed for the future build runs (but remained in place for the existing and future no-build runs).

Once the sound levels at the known receptors were completed, the buildings were switched off and sound level contours were run for the future no-build and future build scenarios on a 5 m x 5 m grid throughout the study area to provide information on potential future sound levels in the various “character areas” envisioned in the GMSP.

5.3 UNCERTAINTY

While the MOVES-based emissions modeling provides a robust forecast grounded in current policies and assumptions, actual future emissions may differ from those projected. Outcomes will depend on a range of factors, including the pace of electric vehicle adoption, fleet turnover, fuel composition, travel demand, and the effectiveness of policy implementation. Similarly, the extent and timing of technological change, behavioral shifts, and infrastructure investment may influence future emissions in ways that differ from modeled scenarios. These uncertainties reflect the inherent limitations of long-term forecasting.

Noise modeling results are also subject to uncertainty. Forecasted sound levels are based on available traffic data, assumed roadway configurations, vehicle mix, and speed profiles. Actual sound levels may vary depending on future design refinements, changes in traffic volumes, topography, building placement, or the installation of barriers. While the model provides reliable planning-level estimates, site-specific conditions and future land use changes may influence actual noise exposure.

6.0 MODELLING RESULTS AND ANALYSIS

This section presents the results of the air quality and noise impact assessments completed for the Project under both operational and construction phases. Section 6.1 summarizes impacts on air quality and noise during Project operation, including comparisons to baseline and future conditions. Section 6.2 outlines short-term impacts during construction and identifies recommended mitigation measures to minimize effects on nearby sensitive receptors.

6.1 OPERATIONAL PHASE

6.1.1 Air Quality

6.1.1.1 CAC and GHG Modelling Results

A comparison of total annual emissions between the 2013 Pre-Project Condition and the 2041 Future Build scenario, based on emissions modeling using the MOVES5 model combined with road dust emissions estimates, is presented in Table 9. The table summarizes total projected emissions for CACs, VOCs, select PAHs, and GHGs. Key results include:

- **Carbon Monoxide (CO):** decrease of 82.4%
- **Sulphur Dioxide (SO₂):** decrease of 88.6%
- **Nitrogen Dioxide (NO₂):** decrease of 72.5%
- **Particulate Matter:** PM_{2.5} and PM₁₀ are projected to decrease by 71.4% and 58.5%, respectively.
- **VOCs:** Substantial reductions, including benzene (-79.9%), acrolein (-86.4%), formaldehyde (-88.9%), 1,3-butadiene (-85.2%), and acetaldehyde (-80.9%)
- **Benzo(a)pyrene:** Decrease of 84.0%

Projected reductions in greenhouse gas (GHG) emissions are similarly substantial:

- **GHGs:** Carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) emissions are projected to decline by 72.2%, 80.7%, and 71.8%, respectively, with total CO₂e reductions approaching 258,527 tonnes per year.

These results reflect the combined influence of improved vehicle technology, fuel composition, and anticipated reductions in overall vehicle activity levels. Full model outputs are provided in Table 9.

Table 9: MOVES5 Criteria Air Contaminants, VOC and PAH Emission Predictions

COPC	2013 Existing (tonnes)	2041 Future Build (tonnes)	% Change 2013 to 2041
Criteria Contaminants			
Carbon Monoxide (CO)	24,797.8	4,367.9	-82.4%
Sulphur Dioxide (SO ₂)	5.9	0.7	-88.6%
Nitrogen Dioxide (NO ₂)	86.5	23.8	-72.5%
Particulate Matter ≤ 2.5 Microns (PM _{2.5})	43.8	12.5	-71.4%
Particulate Matter ≤ 10 Microns (PM ₁₀)	58.6	24.3	-58.5%
Volatile Organic Compounds (VOCs)			
Total VOCs	2,904.1	749.6	-74.2%
1,3-butadiene	16.5	2.4	-85.2%
Acetaldehyde	35.5	6.8	-80.9%
Acrolein	2.5	0.3	-86.4%
Benzene	81.5	16.4	-79.9%
Formaldehyde	26.3	2.9	-88.9%
Semi-Volatile Organic Compounds			
Benzo(a)pyrene	5.69E-04	9.10E-05	-84.0%
Greenhouse Gases			
Carbon Dioxide (CO ₂)	321.1	89.1	-72.2%
Methane (CH ₄)	0.3	0.1	-80.7%
Nitrous Oxide (N ₂ O)	0.1	3.0E-02	-71.8%
Carbon Dioxide Equivalent (CO ₂ e)	357.1	98.6	-72.4%

6.1.1.2 Contextualizing Project Emissions Within Provincial Forecasts

To assess the significance of the Project-specific emissions reductions, it is helpful to consider broader emissions forecasts for Ontario's transportation sector. Projections of CAC and GHG emissions to 2040 are based on ECCC 2024 modelling efforts. These are presented under two scenarios:

- Reference Case – assumes full implementation of policies and measures in place as of September 2022.

- Additional Measures Case – includes anticipated but not yet fully implemented initiatives.

Provincial-level emissions were estimated by allocating national transportation emissions based on Ontario's 2023 share, as detailed in Table 10.

6.1.1.2.1 Criteria Air Contaminants

As shown in Table 13, emissions of CACs across Canada are projected to change between 2013 and 2040, based on ECCC 2024 emissions projections [18]. Ontario-level emissions were estimated based on provincial shares of national road transportation emissions as of 2023, in the absence of published province-specific projections.

Table 10: Projected Emissions of Criteria Air Contaminants (CACs) in Ontario Road Transportation

COPC	Annual Emissions (tonnes)	
	2040 Reference	2040 Addition Measures
Carbon Monoxide (CO)	745,049	732,621
Sulphur Dioxides (SO ₂)	1,052	1,052
Nitrogen Dioxides (NO ₂)	109,309	92,731
Total Particulate Matter	6,878	6,565
Particulate Matter ≤10 micron (PM ₁₀)	6,878	6,565
Particulate Matter ≤2.5 microns (PM _{2.5})	3,722	3,457
Volatile Organic Compounds (VOC)	48,992	48,401

6.1.1.2.2 Greenhouse Gases

According to Canada's 2024 National Inventory Report (NIR) [19], GHG emissions from Ontario's road transportation component of the transportation sector are projected to decline significantly by 2040 relative to 2013 levels. As noted above, 2013 is used as the year representing pre-Project conditions, during which road transportation-related emissions were estimated at approximately 47,293 kilotonnes of carbon dioxide equivalents (kt CO₂e) [40]. By 2040, emissions are projected to decrease to 30,091 kt CO₂e under the Reference Scenario, representing a 36.4 percent reduction from 2013 levels. Under the more ambitious Additional Measures Scenario, emissions are projected to decline further to 26,035 kt CO₂e, amounting to a 44.9 percent reduction.

A summary of projected emissions under both scenarios is provided in Table 11.

Table 11: Projected GHG Emissions from Ontario Road Transportation (kt CO₂e)

COPC	Annual Emissions (kt)	
	2040 Reference	2040 Additional Measures
Carbon dioxide equivalents (CO ₂ e)	30,091	26,035

6.1.1.3 Data Interpretation

6.1.1.3.1 Interpretation of Forecasted Emission Trends

The emissions burden analysis indicates that implementation of the 2041 Future Build scenario will result in substantial reductions in emissions of CACs, GHGs, and key VOCs and PAHs, relative to the 2013 pre-Project period. These modeled reductions are generally consistent with broader long-term transportation emissions trends projected for Ontario and the City of Toronto. Several key drivers contribute to the magnitude of these reductions:

- Fleet Turnover and Emission Standards:** Over the forecast period, older higher-emitting vehicles are expected to be progressively replaced with newer vehicles meeting more stringent emission standards. This fleet turnover will continue to drive significant reductions in emissions of NO₂, CO, PM, VOCs, and GHGs. Notably, the 2013 on-road fleet used in MOVES included pre-2005 vehicles with substantially higher emissions; by 2041, most of the fleet is projected to consist of post-2020 vehicles with cleaner technologies. This fleet refresh effect alone contributes significantly to reductions in NO₂, CO, VOC and PM in modeled results.
- Growth of Zero-Emission Vehicles (ZEVs):** Ontario's transportation emissions reductions are heavily supported by national and provincial policies mandating the transition to zero-emission vehicles (ZEVs). Canada's national target of 100% ZEV sales by 2035 [41], along with supporting programs in Ontario [42], is projected to result in substantial market penetration of electric vehicles over the coming decades. The City of Toronto's TransformTO Net Zero Strategy anticipates that 35% of personal vehicles will be electric by 2030, with near full electrification expected by 2040 [7].
- Cleaner Fuel Standards:** Federal and provincial fuel regulations, including Canada's Clean Fuel Regulations [43] and Ontario's Cleaner Transportation Fuels Regulation [44] are reducing the carbon intensity of transportation fuels, providing additional GHG reductions beyond those achieved through fleet turnover.
- Decarbonization of the Electricity Grid:** Ontario's electricity grid is projected to further reduce carbon intensity through growth in renewable energy and declining reliance on natural gas [45]. This will amplify the GHG reduction benefits of transportation electrification.

- **Mode Shifts, Efficiency Improvements, and Vehicle Activity Changes:** Toronto's ongoing investments in public transit, active transportation infrastructure, and complete street policies are promoting a shift away from private vehicle use. Combined with advancements in vehicle efficiency and evolving urban mobility trends, these factors are expected to reduce vehicle-kilometres-travelled and associated emissions. Despite anticipated population growth, per-capita vehicle use is expected to decline due to mode shifts and transit investments. These trends are reflected in the relatively modest increases in AADT volumes used for the 2041 Future Build scenario [27].

Despite these trends, the Project's modeled reduction in CO₂e emissions of approximately 72% between 2013 and 2041 is notably greater than Ontario-wide forecasts [19]. As shown in Table 11, ECCC 2024 modelling projects a 36.4% reduction under the Reference Scenario and a 44.9% reduction under the Additional Measures Scenario for Ontario's road transportation sector by 2040.

While the MOVES model reflects significant improvements in vehicle fuel economy and emission standards, as well as assumptions regarding increasing adoption of electric vehicles (EVs), the actual rate of EV penetration in the Greater Toronto Area by 2041 remains uncertain and may differ from the scenario assumptions used in this analysis. Other factors that could contribute to overestimation of emissions reductions in the MOVES-based scenario include optimistic assumptions about fleet turnover rates, vehicle activity levels, fuel composition, and electrification timelines. Uncertainties in policy implementation, behavioral trends, and electricity grid decarbonization may also affect the accuracy of modeled outcomes.

In addition, the MOVES model was configured using the Alternative Vehicle and Fuel Technology (AVFT) table, which defines the distribution of vehicles by model year, source type, and fuel type—including gasoline-only, diesel, electric, hybrid, and flex-fuel vehicles. For this assessment, the AVFT table was populated using the MOVES (US) default projected future adoption rates. This conservative approach does not account for the additional anticipated increases in electric vehicle uptake or changes in fuel technology expected in Canada by 2041 and may overstate future Project emissions.

However, the projected reductions in transportation-related emissions appear generally aligned with targets and transition pathways outlined in the *TransformTO Net Zero Strategy* [7], which identifies transportation as a critical sector for deep decarbonization. Key strategy actions include:

- **Personal Vehicles:** 100% of new vehicle sales electric by 2030; full fleet turnover by 2040 (21% GHG reduction)
- **Commercial Vehicles:** 100% electrified by 2040 (8% GHG reduction)
- **Transit Vehicles:** Fully electrified by 2040 (3% GHG reduction)

- **Mode Shift Targets:** 75% of trips under 2 km by walking; 75% of trips under 5 km by bike or e-bike
- **Supporting Measures:** Free transit by 2040, arterial road tolling, and expanded remote work options.

6.1.1.3.2 Comparison to Future Provincial CAC/GHG Emissions

Understanding Ontario's projected trajectory of CAC and GHG emissions is essential to contextualizing the Projects relative impact. As one of the province's largest emissions sectors, road transportation is the focus of coordinated federal and provincial decarbonization efforts. To evaluate the Project's contribution, modeled emissions under the 2041 Future Build scenario were compared to Ontario's 2040 road transportation emissions forecast from the 2024 NIR Reference Scenario.

Based on MOVES modeling results (Table 12), Project-related emissions under the 2041 Future Build scenario are expected to represent a very small fraction of Ontario's forecasted road transportation emissions in 2040. For criteria air contaminants, Project contributions generally remain below 0.6%, with the highest relative contribution observed for VOCs at 1.5%, reflecting conservative assumptions in the MOVES model—particularly for evaporative emissions.

Other key pollutants such as CO (0.6%), PM₁₀ (0.35%), and PM_{2.5} (0.2%) contribute even smaller shares. Contributions for SO₂ and NO₂ are negligible, at 0.1% and 0.02%, respectively. For greenhouse gases, the Project is projected to emit approximately 98,586 tonnes of CO₂e annually, representing just 0.3% of Ontario's total forecasted road transportation emissions of 30.1 million tonnes in 2040 (NIR Reference Scenario). Looking ahead, the projected reductions in emissions of CACs, VOCs, and PAHs under the Future Build scenario are expected to support continued improvements in ambient air quality over time (see Table 5). While the annualized modeled emissions data are not directly comparable to ambient concentration data, the substantial projected reductions in CAC, VOC, and PAH emissions under the Future Build scenario are expected to contribute to corresponding improvements in ambient air quality over time. These reductions reflect the combination of measures (cleaner vehicle technologies, stricter emissions standards, etc.), which collectively support broader regional and national air quality trends toward lower concentrations of key pollutants.

In the context of the transportation sector, GHG mitigation strategies can extend beyond fleet turnover, ZEV adoption, and fuel decarbonization. Projects can also support mitigation through vegetation-based carbon sequestration, whereby properly managed native species along roadways absorb atmospheric CO₂ and store carbon in biomass and soils.

Table 12: Project Contribution to Ontario's 2040 Forecasted On-Road Transportation CAC Emissions

COPC	MOVES 2041 Future Build	Forecast 2040 (Reference)	Future Build/Forecast
	(tonnes)	(tonnes)	(%)
Criteria Air Contaminants			
Carbon Monoxide (CO)	4,367.9	745,049.2	0.6%
Sulphur Dioxide (SO ₂)	0.7	1,051.9	0.1%
Nitrogen Dioxide (NO ₂)	23.8	109,309.0	0.02%
Particulate Matter ≤ 10 Microns (PM ₁₀)	24.3	6,877.8	0.35%
Particulate Matter ≤ 2.5 Microns (PM _{2.5})	12.5	3,722.5	0.2%
Volatile Organic Compounds (VOCs)	749.6	48,991.7	1.5%
Greenhouse Gases			
Carbon Dioxide Equivalent (CO ₂ e)	98,585.8	30,091,427	0.3%

6.1.2 Noise

6.1.2.1 Noise Modelling Results

The results of the noise modelling for the existing, future no-build and future build scenarios at existing and planned future receptors are summarized in Table 13. In addition to the predicted sound levels, the table also shows the incremental difference between the predicted future no-build and future build sound levels. As shown, there were instances in which sound levels increased, decreased, and remained unchanged with the proposed Project in place.

As noted in Section 3.2, an investigation into mitigation measures is warranted if the future build sound level exceeds the objective level of 55 dBA and the increment between the predicted future no-build and future build scenarios is greater than 5 dBA. There were five such instances in the predictions, which are highlighted in Table 13 and discussed in Section 6.1.2.2.

Table 13: Summary of Predicted Existing and Future Sound Levels

Name	ID	Existing	Future No-Build	Future Build	Increment [1]
		[Leq (16-hr), dBA]	[Leq (16-hr), dBA]	[Leq (16-hr), dBA]	(dBA)
Future Development (1861 O'Connor Drive)	FD_1	47.6	48.3	48.6	0.3
Future Development (1460 Victoria Park Avenue)	FD_2	56.3	59.7	58.4	-1.3
Future Development (1910 Eglinton Avenue East)	FD_3A	63.9	56.4	57.2	0.8
Future Development (1910 Eglinton Avenue East)	FD_3B	57.0	55.5	56.3	0.8
Apartment (Goldengate Apartments)	R1	63.2	63.9	64.1	0.2
Apartment (10-12 Craigton Drive)	R2	56.7	57.4	58.3	0.9
Apartment (19-23 Craigton Drive)	R3	51.9	52.6	56.3	3.7
Apartment (32 Craigton Drive)	R4	51.6	52.3	56.1	3.8
Apartment (40 Craigton Drive)	R5	59.6	60.3	61.9	1.6
Townhouses (1837 Eglinton Avenue East)	R6	67.1	67.8	68.0	0.2
Childcare Centre (1492 Victoria Park Avenue)	R7	64.2	64.9	65.0	0.1
Residential (30 Bartley Drive)	R8	53.2	53.9	52.7	-1.2
Residential (28 Bartley Drive)	R9	54.1	54.7	53.6	-1.1
Residential (24 Bartley Drive)	R10	56.0	56.6	54.8	-1.8
Residential (22 Bartley Drive)	R11	57.4	58.1	56.2	-1.9
Residential (31 Bartley Drive)	R12	57.0	57.7	55.7	-2.0
Residential (2 Leafy Woodway)	R13	57.8	58.5	56.0	-2.5
Residential (27 Warner Avenue)	R14	59.6	60.3	59.8	-0.5
Residential (14 Engelhart Crescent)	R15	50.5	51.1	57.3	6.2
Residential (18 Engelhart Crescent)	R16	47.4	48.1	61.0	12.9
Residential (22 Engelhart Crescent)	R17	44.9	45.6	61.8	16.2
Residential (26 Engelhart Crescent)	R18	46.3	47.0	62.0	15.0
Residential (1 Alvinston Road)	R19	51.7	52.4	59.5	7.1
Residential (3 Alvinston Road)	R20	53.9	54.5	59.5	5.0
Residential (5 Alvinston Road)	R21	55.0	55.7	59.6	3.9

Name	ID	Existing	Future No-Build	Future Build	Increment [1]
		[Leq (16-hr), dBA]	[Leq (16-hr), dBA]	[Leq (16-hr), dBA]	(dBA)
Residential (7 Alvinston Road)	R22	55.9	56.6	59.7	3.1
Residential (9 Alvinston Road)	R23	56.8	57.5	60.0	2.5
Residential (11 Alvinston Road)	R24	57.8	58.5	60.4	1.9
Residential (15 Alvinston Road)	R25	59.3	60.0	61.4	1.4
Residential (17 Alvinston Road)	R26	61.9	62.6	63.5	0.9
Residential (817 Birchmount Road)	R27	66.0	66.1	65.7	-0.4
Childcare Centre (835 Birchmount Road)	R28	68.1	68.3	68.7	0.4
Townhouse (1043 Birchmount Road)	R29	65.8	66.5	66.5	0.0
Notes: [1] The increment presented is the difference between the Future No-Build and the Future Build scenarios. The existing sound levels are provided for information only. Grey highlighted cells refer to receptor locations that exceed the 5dBA increment					

6.1.2.2 Data Interpretation

The highlighted locations with future sound levels exceeding 55 dBA and with a predicted incremental increase in sound level of greater than 5 dBA are adjacent residential buildings located alongside the planned O'Connor Drive extension. There are two contributing factors to the increase in sound level. The primary reason is the construction and operation of the O'Connor Drive extension next to the receptors. Currently, there is no road adjacent to these receptors on the north side – they face the back of the Eglinton Square shopping mall. With the Project in place, there will be a 2-lane road operating where there was no road before, within 30-60 m of the affected locations, resulting in increased sound levels at these locations.

Furthermore, in the future no-build scenario, these locations are largely shielded from existing major roads by the Eglinton Square shopping centre, resulting in relatively low future no-build sound levels compared to the rest of the study area. The planned alignment of the O'Connor Drive extension passes through the shopping centre and so it was assumed for modelling purposes that the shopping centre would be removed for the future build scenario. The removal of this large building opened up exposure to the existing roads in the area, resulting in higher sound levels from roads other than the O'Connor Drive extension. Given these increments, it is recommended that the City of Toronto evaluate the feasibility of constructing and maintaining a noise barrier within the right-of-way for the O'Connor Drive extension between Victoria Park Avenue and Pharmacy Avenue during the detailed design stage of the study.

It should be noted that there are a number of receptors with sound levels that are predicted to decrease once the Project is in place (i.e., a negative increment between the future no-build and future build scenarios). Receptors with negative increments are largely located adjacent to the existing O'Connor Drive alignment, on and near Bartley Drive. The decrease in sound level is the result of the planned realignment of O'Connor Drive placing the road further away from these locations. O'Connor Drive was the dominant contributor to sound levels at these locations in the future no-build scenario and so moving it further away in the future build scenario resulted in an improvement in sound level.

As discussed in Section 5.2.1.2, the change in sound level for future land use throughout the GMSP area has been estimated by predicting free-field future no-build and future build sound levels across a receptor grid covering the study area and generating contours from the difference between the two grids. These plots are shown in Appendix C (Figure C-1 to C-10) and demonstrate that an increment of greater than 5 dBA is largely limited to within 10-15 m of the roads.

6.2 CONSTRUCTION

Construction activities associated with the Project will result in temporary, localized increases in both air pollutant concentrations and noise levels due to the use of heavy construction equipment and supporting activities. The scale and intensity of impacts will vary with construction phase, equipment use, meteorological conditions, and proximity to sensitive receptors.

Air quality impacts during construction will primarily result from fugitive dust emissions and combustion sources. Fugitive dust (PM_{10} , $PM_{2.5}$, TSP) will be generated through excavation, grading, stockpiling, material handling, and vehicle movement on both unpaved and paved surfaces. Wind erosion from exposed soils and stockpiles can also contribute, particularly during dry and windy conditions. Combustion emissions (NO_x , $PM_{2.5}$, CO, VOCs, SO_2 , GHGs) will be produced by diesel- and gasoline-powered equipment and vehicles, including excavators, bulldozers, graders, pavers, cranes, and trucks. Idling of equipment and stationary support units (such as generators) will also contribute to localized emissions.

Noise will result from the use of heavy construction equipment and materials transport. Primary noise sources will include site preparation and earthworks (excavators, bulldozers, graders, compactors), roadbed construction and paving (asphalt pavers, rollers, milling machines), material hauling (dump trucks, concrete mixers, delivery vehicles), and support equipment (portable generators, compressors). Noise emissions are expected to vary with construction intensity, with peak equipment sound levels occurring in close proximity to activities and equivalent continuous sound levels (Leq) fluctuating during daytime operations.

Without mitigation, localized exceedances of Ontario AAQCs for particulate matter ($PM_{2.5}$, PM_{10}) may occur near active construction areas, especially during high dust-generating activities and under unfavourable weather conditions. Transient odour and visibility reduction are also possible. Construction noise may cause temporary annoyance or disturbance to nearby sensitive receptors (residences, schools, healthcare facilities), particularly during peak activities if unmanaged. Noise levels could potentially exceed applicable municipal noise bylaw limits.

A comprehensive suite of management and mitigation measures is recommended to minimize air quality and noise impacts during construction. Measures should be consistent with applicable guidelines, standards, and recognized best practices. In particular, a Construction Air Quality and Noise Management and Mitigation Plan (AQNMMP) should be developed to provide a structured framework for mitigation, monitoring, and adaptive management. Table 14 provides a high-level summary of construction mitigation measures that should be considered.

Table 14: Summary of Construction Mitigation Measures

Source	Mitigation Measure / Management Action
Construction Air Quality and Noise Management and Mitigation Plan (AQNMMP)	• Develop and implement a Construction AQNMMP. • Include site-specific mitigation measures, monitoring and reporting protocols, and corrective actions. • Establish communication protocols and community liaison mechanisms. • Monitor performance and adjust mitigation as required based on real-time observations and stakeholder feedback.
Fugitive Dust Emissions	• Apply water or suitable dust suppressants on exposed surfaces and unpaved roads. • Cover or enclose stockpiles of fine materials. • Minimize drop heights when handling materials. • Stabilize exposed surfaces promptly (e.g., vegetation). • Use wind barriers / breaks where appropriate • Limit vehicle speeds.
Combustion Emissions	• Use modern, well-maintained equipment compliant with applicable emissions standards. • Implement anti-idling policy. • Conduct regular equipment maintenance to optimize combustion performance.
Noise Emissions	• Equip all machinery with effective exhaust mufflers. • Maintain equipment to minimize noise emissions. • Position stationary equipment as far as practicable from sensitive receptors. • Use portable noise barriers or acoustic enclosures where warranted. • Schedule high-noise activities during standard daytime hours only • Provide advance notice of noisy activities to nearby residents and businesses.
Overall Site Management	• Sequence construction activities to avoid cumulative peak emissions and noise. • Limit number of concurrently operating high-emission equipment near sensitive receptors. • Using appropriately sized equipment operated at optimal rated loads. • Regularly inspect and enforce mitigation practices on-site.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1.1 Air Quality

The air quality screening analysis indicates that, under the 2041 Future Build scenario, the Project is expected to result in substantial reductions in emissions of criteria air contaminants (CACs), greenhouse gases (GHGs), key volatile organic compounds (VOCs), and polycyclic aromatic hydrocarbons (PAHs), relative to the 2013 pre-Project conditions. These findings align with long-term trends in transportation-related emissions for both Ontario and the City of Toronto, and reflect the combined influence of several key drivers:

- **Fleet Turnover and Emission Standards:** Continued renewal of the vehicle fleet and the adoption of cleaner engine technologies are projected to significantly reduce emissions of nitrogen dioxides (NO₂), VOCs, particulate matter (PM), carbon monoxide (CO), and GHGs.
- **Growth of Zero-Emission Vehicles (ZEVs):** Policies at both the national and municipal levels aimed at accelerating the uptake of ZEVs will further reduce tailpipe emissions [7, 41, 42].
- **Cleaner Fuel Standards:** Federal Clean Fuel Regulations [43] and Ontario's Cleaner Transportation Fuels Regulation [44] will contribute to lower lifecycle carbon intensity of transportation fuels.
- **Decarbonization of the Electricity Grid:** Ongoing decarbonization of Ontario's electricity grid will enhance GHG reductions associated with increased transportation electrification [45].
- **Mode Shifts, Efficiency Improvements, and Vehicle Activity Changes:** Forecasted mode shifts towards public transit, active transportation, advancements in vehicle efficiency and overall reductions in 2041 per-capita vehicle use despite rising population will contribute to further emission reductions [27].

As a supplemental GHG mitigation strategy, it is recommended that managed vegetation (e.g., trees, shrubs, and native grasses) be incorporated along the Project corridors. Species selection and planting design should consider carbon uptake potential, growth rate, and site-specific conditions to maximize long-term sequestration benefits.

During the construction phase, air quality impacts are expected to be localized, intermittent, and temporary. With the implementation of industry best practices and standard mitigation measures – including dust suppression, regular equipment maintenance, and emissions controls – these impacts are anticipated to be effectively minimized. To ensure that air quality remains protective of nearby sensitive receptors, it is recommended that ongoing monitoring be undertaken and that

adaptive management of mitigation measures be applied throughout the construction period. Monitoring should include, but would not be limited to, a combination of:

- Visual inspections of dust-generating activities;
- Meteorological observations, such as wind speed and direction;
- Equipment maintenance logs; and
- Complaint response protocols to facilitate timely and responsive mitigation actions.

This proactive approach will support compliance with regulatory expectations and promote transparency with the surrounding community.

7.1.2 Noise

Predictive noise modeling indicates that the Project will have variable effects on existing and planned future sensitive receptors within the study area. Some locations are expected to experience improvements in the acoustic environment (i.e., reductions in sound levels), while others may encounter noticeable increases or negligible changes in ambient noise. At five receptor locations, sound levels are predicted to be above the objective threshold of 55 dBA and increase by greater than 5 dBA. It is therefore recommended that the City of Toronto evaluate the feasibility of constructing and maintaining a noise barrier within the right-of-way for the O'Connor Drive extension between Victoria Park Avenue and Pharmacy Avenue during the detailed design stage of the study.

Construction-related noise will be temporary and intermittent, varying according to the type and intensity of onsite activities. To minimize potential disturbance to nearby sensitive receptors, it is recommended that all construction adhere to applicable municipal noise and vibration by-laws. This includes the completion of required documentation, such as Zones of Influence (ZOI) forms under the vibration by-law and may include pre-construction and ongoing noise and vibration monitoring. These requirements should be clearly specified in construction tender documents. Additionally, proactive communication with affected communities and thoughtful scheduling of noisy activities will contribute to effective noise management during the construction phase.

8.0 STATEMENT OF LIMITATIONS

This report was prepared by Independent Environmental Consultants (the "Consultant") for the exclusive use of HDR Inc. (the "Client"), in accordance with the scope of work agreed upon for the purpose of supporting planning and decision-making under the Municipal Class Environmental Assessment process in Ontario.

The information, interpretations, and recommendations presented are based on professional judgment, available data, and applicable guidelines at the time of assessment. While reasonable care has been taken in the preparation of this report, the Consultant makes no warranty as to its completeness or suitability for use beyond its intended purpose.

This report should not be reproduced, distributed, or relied upon by any party other than the Client without the prior written consent of the Consultant. Unauthorized use or reliance on this report is at the sole risk of the user.

9.0 REFERENCES

- [1] City of Toronto, *By-Law 911-2020 Amendment 499 to the Official Plan*, vol. OPA 499. 2020. [Online]. Available: <https://www.toronto.ca/legdocs/bylaws/2020/law0911.pdf>
- [2] City of Toronto, “Golden Mile Transportation Master Plan,” Nov. 2019.
- [3] Ministry of Transportation Ontario, “Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects,” 2021.
- [4] MECP, “Ontario’s Ambient Air Quality Criteria.” [Online]. Available: <https://www.ontario.ca/page/ontarios-ambient-air-quality-criteria#fne>
- [5] Government of Ontario, *Environmental Protection Act, R.S.O. 1990, c. E. 19*. 2004. Accessed: May 02, 2023. [Online]. Available: <https://www.ontario.ca/laws/statute/90e19>
- [6] CCME, “Canadian Ambient Air Quality Standards (CAAQS).” Accessed: Sep. 02, 2024. [Online]. Available: <http://airquality-qualitedelair.ccme.ca/en/>
- [7] City of Toronto, “TransformTO Net Zero Strategy,” Dec. 2021.
- [8] City of Toronto, “Toronto Green Standard,” Version 4, May 2022.
- [9] MECP, “Environmental Noise Guideline - Stationary and Transportation Sources - Approval and Planning (NPC-300),” PIBS 9588e, Aug. 2013. [Online]. Available: <https://www.ontario.ca/page/environmental-noise-guideline-stationary-and-transportation-sources-approval-and-planning>
- [10] Ministry of Transportation Ontario, “Environmental Guide for Noise,” Feb. 2022.
- [11] Ministry of Transportation Ontario and Ontario Ministry of the Environment, “A protocol for dealing with noise concerns during the preparation, review and evaluation of provincial highways environmental assessments,” Feb. 1996.
- [12] City of Toronto, *Toronto Municipal Code Chapter 591 (Noise)*. 2024.
- [13] City of Toronto, *Toronto Municipal Code Chapter 363-3.6 (Construction Vibration)*. 2008.
- [14] Ontario Ministry of the Environment, “Model Municipal Noise Control By-Law: NPC-115 Construction Equipment,” 1978.
- [15] Ontario Ministry of the Environment, “Model Municipal Noise Control By-Law: NPC-118 Motorized Conveyances,” 1978.
- [16] Ontario Ministry of the Environment, “Model Municipal Noise Control By-Law: NPC-103 Procedures,” 1978.

- [17] MECP, “Air Quality in Ontario 2022 Report,” Nov. 2024. [Online]. Available: <https://www.ontario.ca/document/air-quality-ontario-2022-report>
- [18] ECCC, “Open Government Portal,” Canada’s Air Pollutant Emissions Inventory. Accessed: Jun. 15, 2025. [Online]. Available: <https://open.canada.ca/data/en/dataset/fa1c88a8-bf78-4fcb-9c1e-2a5534b92131>
- [19] ECCC, “National Inventory Report 1990–2022: Greenhouse Gas Sources and Sinks in Canada (Part 3),” Gatineau QC, En81-4/4E-PDF, 2024.
- [20] ECCC, “Open Government Portal,” Canada’s Official Greenhouse Gas Inventory. Accessed: Jun. 15, 2025. [Online]. Available: <https://open.canada.ca/data/en/dataset/779c7bcf-4982-47eb-af1b-a33618a05e5b>
- [21] City of Toronto, “City Of Toronto 2022 Sector-Based Emissions Inventory,” 2022.
- [22] US EPA, *Motor Vehicle Emission Simulator: MOVES5*. (Nov. 2024). Office of Transportation and Air Quality.
- [23] United States Environmental Protection Agency, “AP-42 Fifth Edition Volume I, Chapter 13.2.1 Paved Roads,” Jan. 2011.
- [24] Z. Brittany, “GMEA- Noise & AQ impact assessment,” 3Mar25.
- [25] M. Jamshaid, “GMEA- Noise & AQ impact assessment,” May 25, 2025.
- [26] Q. Zeng, “GMEA- Noise & AQ impact assessment,” May 08, 2025.
- [27] Q. Zeng, “GMEA- Noise & AQ impact assessment,” May 20, 2025.
- [28] Q. Zeng, “GMEA- Noise & AQ impact assessment,” May 21, 2025.
- [29] HDR, “Transportation Analysis Report ReNew Golden Mile: Reconfigured & New Major Streets EA City of Toronto (Draft),” Toronto, Canada, Jan. 2025.
- [30] US EPA, “The 2024 EPA Automotive Trends Report Greenhouse Gas Emissions, Fuel Economy, and Technology since 1975,” EPA-420-R-24-022, Nov. 2024.
- [31] US EPA, “The 2022 EPA Automotive Trends Report Greenhouse Gas Emissions, Fuel Economy, and Technology since 1975,” EPA-420-R-22-029, Dec. 2022.
- [32] US EPA, “2019 EPA Automotive Trends Report: Greenhouse Gas Emissions, Fuel Economy, and Technology since 1975,” EPA-420-R-20-006, Mar. 2020.
- [33] US EPA, “Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2016, Trends Report,” EPA-420-R-16-010, Nov. 2016. [Online]. Available: <https://www.fueleconomy.gov/feg/pdfs/420r16010.pdf>

- [34] US EPA, “Emission Factor Documentation for AP-42, Section 13.2.1 Paved Roads,” Measurement Policy Group Office of Air Quality Planning and Standards, Jan. 2011.
- [35] City of Toronto, “1861 O’CONNOR DR.” Accessed: May 08, 2025. [Online]. Available: <https://www.toronto.ca/city-government/planning-development/application-details/?id=4500897&pid=452438&title=1861%20O%27CONNOR%20DR>
- [36] City of Toronto, “1861 O’CONNOR DR.” Accessed: May 08, 2025. [Online]. Available: <https://www.toronto.ca/city-government/planning-development/application-details/?id=4500897&pid=452438&title=1861%20O%27CONNOR%20DR>
- [37] City of Toronto, “1910 EGLINTON AVE E.” Accessed: May 08, 2025. [Online]. Available: <https://www.toronto.ca/city-government/planning-development/application-details/?id=4774660&pid=14485&title=1910%20EGLINTON%20AVE%20E>
- [38] Federal Highway Administration, *Traffic Noise Model (TNM)*. (2023). [Online]. Available: https://www.fhwa.dot.gov/environment/noise/traffic_noise_model/tnm_v32/
- [39] DataKustik GmbH, *Cadna-A*. [Online]. Available: <https://www.datakustik.com/products/cadnaa/cadnaa>
- [40] ECCC, “National Inventory Report 1990–2013: Greenhouse Gas Sources and Sinks in Canada (Part 3),” Gatineau QC, En81-4/2013E-PDF, 2015.
- [41] ECCC, “2030 emissions reduction plan: Canada’s next steps to clean air and a strong economy,” Gatineau, QC, 2022.
- [42] EETP, “Ontario’s Clean Energy Opportunity Report Of The Electrification And Energy Transition Panel,” Dec. 2023.
- [43] Government of Canada, *Clean Fuel Regulations*, vol. SOR/2022-140. 2022.
- [44] Government of Ontario, *Cleaner Transportation Fuels: Renewable Content Requirements For Gasoline And Diesel Fuels*. 2020.
- [45] Government of Ontario, “Planning for electrification and the energy transition,” Ontario.ca.
- [46] Government of Ontario, *Greenhouse Gas Emissions Performance Standards*, vol. O.Reg. 241/19. 2024. [Online]. Available: <https://www.ontario.ca/laws/regulation/190241>

Appendix A

MOVES Model Input Data and Assumptions

A.1 MOVES5 Input Summary

MOVES requires numerous input parameters to generate representative emissions profiles. Key inputs and assumptions for this assessment include:

- **Land Use and Road Access:** The entire Project area was treated as *urban* with unrestricted access across all road segments.
- **Vehicle Fleet Composition:**
 - *Vehicle type distribution* for 2013 and 2041 was based on Ontario motor vehicle registration data. Data for Metro Toronto were combined with provincial vehicle type breakdowns to represent the expected vehicle mix.
 - *Vehicle age profiles* were also derived from the same dataset (see Table A.1 2014 Vehicle Age Distribution).
- **Vehicle Speeds:** MOVES requires vehicle speeds in 5 mph (8 km/h) increments. Speed profile data was not available from HDR; typical urban road speed assumptions from online data sources were applied uniformly to both scenarios.
- **Roadway Network:** HDR provided roadway network data for 2013 and 2041. Segment lengths were measured to the midpoint of intersections and cross-referenced for accuracy (Table A.2 presents individual segment lengths).
- **Traffic Volumes:** HDR provided average daily traffic volumes and truck percentages for each road segment for both the 2013 and 2041 scenarios (see Table A.2).
- **Temporal Patterns:** MOVES requires traffic flow distributions by hour, day, and month. Temporal profiles were developed using Project traffic count data (7:30 am to 6:00 pm). For overnight hours, a scaling factor of 0.7 was applied to reflect reduced nighttime traffic volumes, with the lowest assumed at 1:00 am.
- **Vehicle Operation Patterns:**
 - *Motorcycles:* 60% weekend, 40% weekday use (April–October).
 - *Passenger vehicles:* 60% weekday, 40% weekend use.
 - *Motorhomes:* 90% weekend, 10% weekday use (April–October).
 - *School buses:* Weekday operation only, excluding July–August, between 6:00 am and 6:00 pm.
 - *Non-school buses:* Operated equally across all days and seasons.

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- *Commercial vehicles*: 80% weekday, 20% weekend use.
 - **Meteorological Data**: MOVES requires hourly temperature and relative humidity data. Hourly data from the Toronto City station (Climate ID 6158355) was used:
 - *2013 scenario*: 2011–2015 hourly averages.
 - *2041 scenario*: 2020–2024 hourly averages.
(See Table A.3 for a summary of meteorological data.)
 - **Fuel Formulations**: MOVES defaults are U.S.-based; therefore, Erie County (Buffalo, NY) fuel formulations were used as a regional surrogate, reflecting similar fuel characteristics to those used in the Golden Mile area. A sample of the 2013 fuel formulation is provided in Table A.4.

Table A.1: Age Distribution (%) of Vehicles in Ontario, 2014

Age	Passenger	Motorcycle	Moped	Bus	Commercial	Trailer	Off Road	Snow Vehicle
0	2.121%	0.199%	0.000%	2.416%	1.511%	0.808%	0.245%	1.987%
1	7.287%	2.911%	0.239%	6.010%	7.267%	2.659%	3.257%	1.952%
2	7.662%	4.288%	0.835%	7.947%	6.491%	3.030%	3.688%	1.778%
3	6.898%	4.143%	0.477%	7.326%	6.042%	3.019%	3.557%	1.917%
4	6.399%	3.926%	0.239%	6.675%	7.146%	3.012%	3.500%	1.921%
5	7.388%	3.711%	1.074%	7.246%	6.683%	2.621%	2.365%	2.083%
6	6.220%	7.336%	1.790%	8.680%	4.895%	2.845%	4.447%	2.297%
7	6.951%	7.557%	0.955%	6.593%	6.257%	3.536%	5.539%	1.914%
8	7.082%	7.323%	1.432%	5.987%	6.459%	3.509%	6.540%	2.505%
9	6.442%	6.809%	7.160%	8.694%	5.796%	3.330%	5.715%	2.743%
10	6.204%	5.658%	16.945%	6.134%	5.423%	2.966%	5.646%	2.548%
11	5.015%	4.940%	4.654%	7.608%	5.130%	2.830%	6.035%	2.531%
12	5.366%	5.794%	2.745%	5.189%	5.150%	2.610%	4.839%	2.485%
13	4.399%	4.373%	3.699%	3.626%	4.047%	2.298%	3.900%	2.674%
14	3.178%	4.036%	13.484%	3.190%	3.341%	2.331%	4.444%	1.832%
15	2.858%	3.664%	3.341%	2.081%	3.433%	2.663%	3.641%	2.443%
16	1.847%	2.512%	2.625%	1.436%	2.719%	2.349%	2.535%	2.490%
17	1.448%	1.723%	0.358%	1.036%	2.492%	2.305%	1.708%	3.042%
18	1.022%	1.360%	0.119%	0.627%	1.764%	1.965%	1.235%	2.652%
19	0.538%	1.060%	0.239%	0.553%	1.217%	1.814%	1.433%	2.220%
20	0.455%	0.827%	0.239%	0.203%	1.224%	1.920%	1.345%	1.984%
21	0.313%	0.726%	0.000%	0.118%	0.903%	1.849%	1.111%	1.797%
22	0.238%	0.757%	0.358%	0.085%	0.589%	1.684%	1.309%	1.433%
23	0.214%	0.597%	0.239%	0.065%	0.504%	1.759%	1.226%	1.135%
24	0.167%	0.534%	0.119%	0.038%	0.396%	1.612%	1.224%	1.483%

Age	Passenger	Motorcycle	Moped	Bus	Commercial	Trailer	Off Road	Snow Vehicle
25	0.158%	0.568%	0.358%	0.112%	0.497%	1.914%	1.408%	1.560%
26	0.128%	0.535%	0.477%	0.050%	0.446%	2.038%	1.154%	1.429%
27	0.123%	0.577%	0.119%	0.032%	0.359%	1.915%	1.010%	1.181%
28	0.134%	0.569%	0.716%	0.026%	0.262%	1.806%	1.858%	0.977%
29	0.104%	1.046%	1.193%	0.024%	0.254%	1.580%	2.876%	0.826%
30	0.087%	1.424%	1.671%	0.012%	0.183%	1.529%	2.547%	0.676%
31	0.076%	1.518%	1.313%	0.009%	0.124%	1.401%	2.866%	0.523%
32	0.045%	1.312%	2.506%	0.000%	0.065%	1.163%	2.209%	0.627%
33	0.035%	1.277%	2.864%	0.003%	0.059%	1.043%	1.089%	1.088%
34	0.055%	0.772%	2.387%	0.024%	0.088%	1.364%	0.528%	1.448%
35	0.057%	0.514%	1.790%	0.009%	0.067%	1.754%	0.321%	3.118%
36	0.075%	0.439%	2.148%	0.006%	0.099%	1.684%	0.298%	3.242%
37	0.061%	0.416%	1.790%	0.003%	0.081%	1.475%	0.276%	2.465%
38	0.050%	0.313%	1.551%	0.000%	0.058%	1.412%	0.206%	2.580%
39	0.050%	0.244%	1.193%	0.006%	0.037%	1.476%	0.119%	2.562%
40+	1.051%	1.711%	14.558%	0.121%	0.440%	15.120%	0.751%	21.853%

Table A.2: Daily traffic Counts and Vehicle Travel Distances (2013)

Leg	Direction	Road	From	To	AADT	Distance (m)	% Trucks	# Trucks	DVKT	AVKT	DVMT	DVMT	DVMT	DVMT	DVMT	DVMT
											Motorcycle	Passenger	Motorhome	Bus	School Bus	Commercial
1	E-W	O' Connor Drive	St. Clair Avenue East	Victoria Park Avenue	22800	2220	4.2%	956	50,616	18,474,840	627.1	29427.5	108.7	89.0	55.7	1327.0
2	E-W	O' Connor Drive	Victoria Park Avenue	Proposed Street #1	19900	223	2.0%	398	4,438	1,619,761	55.0	2580.0	9.5	7.8	4.9	116.3
3	E-W	Civic Road	Warden Avenue	Sinnott Road	2000	587	5.0%	100	1,174	428,510	14.5	682.5	2.5	2.1	1.3	30.8
4	E-W	Eglington Avenue East	Sloane Avenue	Victoria Park Avenue	39500	886	4.2%	1,657	34,997	12,773,905	433.6	20346.8	75.1	61.6	38.5	917.5
5	E-W	Eglington Avenue East	Victoria Park Avenue	Proposed Street #1	37000	167	4.5%	1,665	6,179	2,255,335	76.5	3592.4	13.3	10.9	6.8	162.0
6	E-W	Eglington Avenue East	Proposed Street #1	Pharmacy Avenue	53900	263	5.0%	2,695	14,176	5,174,131	175.6	8241.6	30.4	24.9	15.6	371.7
7	E-W	Eglington Avenue East	Pharmacy Avenue	Hakimi Avenue	47700	506	4.0%	1,908	24,136	8,809,713	299.0	14032.5	51.8	42.5	26.5	632.8
8	E-W	Eglington Avenue East	Hakimi Avenue	Warden Avenue	43900	326	5.0%	2,195	14,311	5,223,661	177.3	8320.5	30.7	25.2	15.7	375.2
9	E-W	Eglington Avenue East	Warden Avenue	Thermos Road	41900	542	4.0%	1,676	22,710	8,289,077	281.3	13203.2	48.8	39.9	25.0	595.4
10	E-W	Eglington Avenue East	Thermos Road	Sinnott Road	40000	49	3.5%	1,400	1,960	715,400	24.3	1139.5	4.2	3.4	2.2	51.4
11	E-W	Eglington Avenue East	Sinnott Road	Birchmount Road	42600	237	7.0%	2,982	10,096	3,685,113	125.1	5869.8	21.7	17.8	11.1	264.7
12	E-W	Eglington Avenue East	Birchmount Road	Kennedy Road	42600	832	4.2%	1,787	35,443	12,936,768	439.1	20606.2	76.1	62.3	39.0	929.2
13	E-W	Jonesville Crescent	Eglington Avenue East	Victoria Park Avenue	11700	349	0.0%	0	4,083	1,490,405	50.6	2374.0	8.8	7.2	4.5	107.1
14	E-W	Craigton Drive	Victoria Park Avenue	Pharmacy Avenue	7400	458	1.5%	111	3,389	1,237,058	42.0	1970.4	7.3	6.0	3.7	88.9
15	E-W	Ashtonbee Road	Pharmacy Avenue	Hakimi Avenue	11600	559	6.0%	696	6,484	2,366,806	80.3	3770.0	13.9	11.4	7.1	170.0
16	E-W	Ashtonbee Road	Hakimi Avenue	Warden Avenue	15300	280	2.0%	306	4,284	1,563,660	53.1	2490.7	9.2	7.5	4.7	112.3
17	E-W	Ashtonbee Road	Warden Avenue	Thermos Road	11400	533	4.0%	456	6,076	2,217,813	75.3	3532.6	13.0	10.7	6.7	159.3
18	E-W	Ashtonbee Road	Thermos Road	Birchmount Road	10400	293	6.0%	624	3,047	1,112,228	37.8	1771.6	6.5	5.4	3.4	79.9
19	N-S	Victoria Park Avenue	St. Clair Avenue East	O' Connor Drive	25500	1578	2.5%	638	40,239	14,687,235	498.5	23394.5	86.4	70.8	44.2	1055.0
20	N-S	Victoria Park Avenue	O' Connor Drive	Eglington Avenue East	28700	268	3.0%	861	7,692	2,807,434	95.3	4471.8	16.5	13.5	8.5	201.7
21	N-S	Victoria Park Avenue	Eglington Avenue East	Craigton Drive	64400	231	4.0%	2,576	14,876	5,429,886	184.3	8649.0	31.9	26.2	16.4	390.0
22	N-S	Victoria Park Avenue	Craigton Drive	Lawrence Avenue East	32800	1788	3.0%	984	58,646	21,405,936	726.6	34096.3	125.9	103.2	64.5	1537.6
23	N-S	Proposed Street #1	O' Connor Drive	Eglington Avenue East	18000	229	2.0%	360	4,122	1,504,530	51.1	2396.5	8.8	7.3	4.5	108.1
24	N-S	Pharmacy Avenue	St. Clair Avenue East	Eglington Avenue East	22200	1833	2.0%	444	40,693	14,852,799	504.1	23658.2	87.4	71.6	44.7	1066.9
25	N-S	Pharmacy Avenue	Eglington Avenue East	Ashtonbee Road	51000	360	4.0%	2,040	18,360	6,701,400	227.5	10674.3	39.4	32.3	20.2	481.4
26	N-S	Pharmacy Avenue	Ashtonbee Road	Lawrence Avenue East	25000	1706	4.5%	1,125	42,650	15,567,250	528.4	24796.2	91.6	75.0	46.9	1118.2
27	N-S	Lebovic Avenue	Comstock Road	Eglington Avenue East	12300	731	4.3%	523	8,991	3,281,825	111.4	5227.4	19.3	15.8	9.9	235.7
28	N-S	Hakimi Avenue	Eglington Avenue East	Ashtonbee Road	12200	349	4.5%	549	4,258	1,554,097	52.7	2475.4	9.1	7.5	4.7	111.6
29	N-S	Hakimi Avenue	Ashtonbee Road	End Lot	600	246	0.0%	0	148	53,874	1.8	85.8	0.3	0.3	0.2	3.9
30	N-S	Warden Avenue	St. Clair Avenue East	Civic road	22000	1731	5.0%	1,100	38,082	13,899,930	471.8	22140.4	81.8	67.0	41.9	998.4
31	N-S	Warden Avenue	Civic Road	Eglington Avenue East	28700	102	5.5%	1,579	2,927	1,068,501	36.3	1702.0	6.3	5.1	3.2	76.8
32	N-S	Warden Avenue	Eglington Avenue East	Ashtonbee Road	60600	336	4.3%	2,576	20,362	7,431,984	252.3	11838.0	43.7	35.8	22.4	533.8
33	N-S	Warden Avenue	Ashtonbee Road	Bertrand Avenue	36700	275	3.5%	1,285	10,093	3,683,763	125.0	5867.7	21.7	17.8	11.1	264.6
34	N-S	Thermos Road	Eglington Avenue East	Ashtonbee Road	12400	335	5.0%	620	4,154	1,516,210	51.5	2415.1	8.9	7.3	4.6	108.9
35	N-S	Thermos Road	Ashtonbee Road	Bertrand Avenue	5900	271	5.0%	295	1,599	583,599	19.8	929.6	3.4	2.8	1.8	41.9

Leg	Direction	Road	From	To	AADT	Distance (m)	% Trucks	# Trucks	DVKT	AVKT	DVMT	DVMT	DVMT	DVMT	DVMT	DVMT
											Motorcycle	Passenger	Motorhome	Bus	School Bus	Commercial
36	N-S	Sinnott Road	Hymus Road	Civic Road	6800	854	5.0%	340	5,807	2,119,628	71.9	3376.2	12.5	10.2	6.4	152.3
37	N-S	Sinnott Road	Civic Road	Eglington Avenue East	6800	116	4.0%	272	789	287,912	9.8	458.6	1.7	1.4	0.9	20.7
38	N-S	Birchmount Road	St. Clair Avenue East	Eglington Avenue East	25800	1835	6.0%	1,548	47,343	17,280,195	586.5	27524.6	101.6	83.3	52.1	1241.2
39	N-S	Birchmount Road	Eglington Avenue East	Ashtonbee Road	51400	337	6.5%	3,341	17,322	6,322,457	214.6	10070.7	37.2	30.5	19.0	454.1
40	N-S	Birchmount Road	Ashtonbee Road	Bertrand Avenue	29100	274	6.0%	1,746	7,973	2,910,291	98.8	4635.6	17.1	14.0	8.8	209.0

Table A.3: Fuel Formulation

Model Year	Passenger Car				Passenger Truck				Light Commercial Truck			
	Gasoline	Diesel	Electricity	Ethanol	Gasoline	Diesel	Electricity	Ethanol	Gasoline	Diesel	Electricity	Ethanol
1950	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1951	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1952	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1953	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1954	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1955	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1956	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1957	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1958	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1959	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1960	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1961	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1962	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1963	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1964	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1965	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1966	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1967	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.81%	4.19%	0.00%	0.00%
1968	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.81%	4.19%	0.00%	0.00%
1969	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1970	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1971	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.81%	4.19%	0.00%	0.00%
1972	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.81%	4.19%	0.00%	0.00%

Model Year	Passenger Car				Passenger Truck				Light Commercial Truck			
	Gasoline	Diesel	Electricity	Ethanol	Gasoline	Diesel	Electricity	Ethanol	Gasoline	Diesel	Electricity	Ethanol
1973	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1974	99.31%	0.69%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.81%	4.19%	0.00%	0.00%
1975	98.20%	1.80%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1976	98.35%	1.65%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1977	98.71%	1.29%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.81%	4.19%	0.00%	0.00%
1978	98.49%	1.51%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.81%	4.19%	0.00%	0.00%
1979	96.88%	3.12%	0.00%	0.00%	98.61%	1.39%	0.00%	0.00%	95.82%	4.18%	0.00%	0.00%
1980	95.33%	4.67%	0.00%	0.00%	98.76%	1.24%	0.00%	0.00%	89.31%	10.69%	0.00%	0.00%
1981	92.36%	7.64%	0.00%	0.00%	94.93%	5.07%	0.00%	0.00%	98.06%	1.94%	0.00%	0.00%
1982	89.33%	10.67%	0.00%	0.00%	88.05%	11.95%	0.00%	0.00%	91.89%	8.11%	0.00%	0.00%
1983	92.27%	7.73%	0.00%	0.00%	92.34%	7.66%	0.00%	0.00%	92.32%	7.68%	0.00%	0.00%
1984	95.56%	4.44%	0.00%	0.00%	93.42%	6.58%	0.00%	0.00%	86.05%	13.95%	0.00%	0.00%
1985	96.63%	3.37%	0.00%	0.00%	94.68%	5.32%	0.00%	0.00%	86.90%	13.10%	0.00%	0.00%
1986	99.11%	0.89%	0.00%	0.00%	95.05%	4.95%	0.00%	0.00%	86.19%	13.81%	0.00%	0.00%
1987	98.72%	1.28%	0.00%	0.00%	97.67%	2.33%	0.00%	0.00%	93.50%	6.50%	0.00%	0.00%
1988	99.97%	0.03%	0.00%	0.00%	98.04%	1.96%	0.00%	0.00%	93.69%	6.31%	0.00%	0.00%
1989	99.91%	0.09%	0.00%	0.00%	97.41%	2.59%	0.00%	0.00%	93.76%	6.24%	0.00%	0.00%
1990	99.89%	0.11%	0.00%	0.00%	96.92%	3.08%	0.00%	0.00%	92.59%	7.41%	0.00%	0.00%
1991	99.72%	0.28%	0.00%	0.00%	96.60%	3.40%	0.00%	0.00%	91.87%	8.13%	0.00%	0.00%
1992	99.88%	0.12%	0.00%	0.00%	96.19%	3.81%	0.00%	0.00%	92.22%	7.78%	0.00%	0.00%
1993	99.93%	0.07%	0.00%	0.00%	95.75%	4.25%	0.00%	0.00%	90.55%	9.44%	0.00%	0.00%
1994	99.98%	0.02%	0.00%	0.00%	96.62%	3.38%	0.00%	0.00%	92.12%	7.88%	0.00%	0.00%
1995	99.91%	0.09%	0.00%	0.00%	96.09%	3.91%	0.00%	0.00%	90.83%	9.17%	0.00%	0.00%
1996	99.88%	0.12%	0.00%	0.00%	95.75%	4.25%	0.00%	0.00%	90.70%	9.30%	0.00%	0.00%
1997	99.91%	0.09%	0.00%	0.00%	95.55%	4.45%	0.00%	0.00%	89.87%	10.12%	0.00%	0.00%

Model Year	Passenger Car				Passenger Truck				Light Commercial Truck			
	Gasoline	Diesel	Electricity	Ethanol	Gasoline	Diesel	Electricity	Ethanol	Gasoline	Diesel	Electricity	Ethanol
1998	98.88%	0.22%	0.00%	0.90%	97.21%	1.28%	0.00%	1.51%	94.11%	4.49%	0.04%	1.36%
1999	98.12%	0.19%	0.00%	1.69%	90.99%	3.92%	0.00%	5.08%	86.31%	9.86%	0.02%	3.81%
2000	98.41%	0.31%	0.03%	1.25%	90.56%	2.97%	0.00%	6.47%	87.27%	7.73%	0.02%	4.99%
2001	98.68%	0.34%	0.04%	0.94%	92.15%	4.10%	0.00%	3.74%	88.18%	8.82%	0.02%	2.98%
2002	98.53%	0.46%	0.21%	0.79%	87.24%	3.47%	0.00%	9.29%	84.29%	8.48%	0.02%	7.21%
2003	98.16%	0.42%	0.01%	1.42%	85.74%	3.86%	0.00%	10.40%	84.01%	8.41%	0.00%	7.58%
2004	98.71%	0.34%	0.00%	0.95%	89.19%	4.06%	0.00%	6.75%	85.97%	9.27%	0.00%	4.76%
2005	98.10%	0.49%	0.02%	1.39%	91.05%	3.59%	0.00%	5.35%	86.98%	8.52%	0.00%	4.50%
2006	95.74%	0.69%	0.01%	3.55%	91.13%	4.40%	0.00%	4.47%	85.18%	9.98%	0.00%	4.84%
2007	96.91%	0.05%	0.02%	3.03%	85.63%	2.79%	0.00%	11.58%	81.57%	6.79%	0.00%	11.64%
2008	94.75%	0.07%	0.03%	5.15%	88.67%	3.00%	0.00%	8.32%	81.32%	8.02%	0.00%	10.66%
2009	94.65%	0.78%	0.02%	4.55%	84.10%	1.72%	0.00%	14.18%	76.56%	4.65%	0.00%	18.79%
2010	93.55%	1.06%	0.02%	5.37%	79.41%	1.33%	0.00%	19.27%	63.82%	3.48%	0.00%	32.70%
2011	90.14%	1.17%	0.19%	8.50%	75.73%	2.34%	0.00%	21.93%	62.30%	6.01%	0.01%	31.68%
2012	93.75%	1.26%	0.23%	4.76%	68.58%	2.64%	0.01%	28.76%	62.65%	5.62%	0.01%	31.72%
2013	93.44%	1.35%	0.61%	4.60%	69.40%	2.01%	0.01%	28.58%	59.43%	3.12%	0.00%	37.45%
2014	94.05%	1.33%	0.51%	4.10%	74.33%	2.29%	0.01%	23.37%	56.32%	5.16%	0.02%	38.51%
2015	94.95%	1.02%	0.84%	3.19%	80.33%	3.20%	0.01%	16.46%	70.91%	7.33%	0.00%	21.75%
2016	96.01%	0.09%	0.85%	3.05%	86.21%	3.00%	0.20%	10.59%	75.04%	6.49%	0.19%	18.27%
2017	97.04%	0.09%	1.29%	1.57%	85.81%	2.49%	0.17%	11.53%	74.61%	5.67%	0.20%	19.52%
2018	93.87%	0.09%	3.65%	2.39%	89.48%	2.48%	0.21%	7.83%	79.62%	5.45%	0.26%	14.67%
2019	93.94%	0.01%	3.21%	2.84%	91.67%	2.08%	0.27%	5.98%	76.84%	5.12%	0.15%	17.89%
2020	94.08%	0.00%	4.13%	1.79%	92.64%	1.69%	0.83%	4.85%	86.57%	3.36%	0.38%	9.69%
2021	91.53%	0.00%	5.90%	2.57%	91.06%	2.30%	2.57%	4.07%	86.46%	3.94%	0.84%	8.76%
2022	87.96%	0.00%	9.22%	2.82%	92.11%	2.10%	4.23%	1.56%	83.86%	5.01%	2.34%	8.78%

Model Year	Passenger Car				Passenger Truck				Light Commercial Truck			
	Gasoline	Diesel	Electricity	Ethanol	Gasoline	Diesel	Electricity	Ethanol	Gasoline	Diesel	Electricity	Ethanol
2023	82.56%	0.00%	16.26%	1.18%	86.54%	1.70%	6.71%	5.05%	83.30%	6.89%	5.61%	4.21%
2024	75.08%	0.00%	23.85%	1.07%	80.49%	1.67%	13.20%	4.64%	78.19%	6.86%	11.07%	3.88%
2025	76.05%	0.00%	22.86%	1.08%	80.93%	1.69%	12.75%	4.62%	78.43%	6.85%	10.86%	3.86%
2026	68.85%	0.00%	30.18%	0.97%	75.68%	1.66%	18.39%	4.28%	73.96%	6.81%	15.67%	3.57%
2027	64.53%	0.00%	34.56%	0.91%	72.02%	1.64%	22.30%	4.04%	70.75%	6.74%	19.13%	3.37%
2028	59.70%	0.00%	39.46%	0.84%	68.25%	1.65%	26.31%	3.79%	67.46%	6.71%	22.66%	3.17%
2029	51.52%	0.00%	47.76%	0.73%	61.05%	1.41%	34.16%	3.38%	59.50%	5.53%	32.14%	2.82%
2030	45.77%	0.00%	53.58%	0.65%	55.96%	1.20%	39.75%	3.09%	53.33%	4.39%	39.69%	2.58%
2031	42.49%	0.00%	56.90%	0.60%	48.07%	0.96%	48.32%	2.66%	44.89%	3.25%	49.64%	2.22%
2032	36.58%	0.00%	62.90%	0.52%	44.06%	0.84%	52.67%	2.43%	40.52%	2.63%	54.82%	2.03%
2033	43.08%	0.00%	56.31%	0.61%	52.97%	0.96%	43.15%	2.92%	48.05%	2.81%	46.70%	2.44%
2034	42.56%	0.00%	56.84%	0.60%	52.38%	0.95%	43.78%	2.89%	47.50%	2.79%	47.30%	2.41%
2035	40.27%	0.00%	59.16%	0.57%	47.33%	0.90%	49.18%	2.60%	43.38%	2.82%	51.62%	2.17%
2036	40.90%	0.00%	58.52%	0.58%	49.09%	0.92%	47.30%	2.69%	44.66%	2.76%	50.34%	2.25%
2037	40.65%	0.00%	58.77%	0.58%	48.33%	0.92%	48.10%	2.65%	44.02%	2.77%	51.00%	2.22%
2038	40.53%	0.00%	58.89%	0.58%	48.35%	0.92%	48.07%	2.66%	44.03%	2.78%	50.97%	2.22%
2039	40.78%	0.00%	58.64%	0.58%	48.41%	0.94%	47.99%	2.66%	44.08%	2.81%	50.89%	2.22%
2040	39.94%	0.00%	59.49%	0.57%	47.92%	0.94%	48.50%	2.64%	43.67%	2.82%	51.31%	2.20%
2041	39.91%	0.00%	59.52%	0.57%	47.78%	0.94%	48.65%	2.63%	43.54%	2.83%	51.43%	2.20%
2042	39.94%	0.00%	59.50%	0.57%	47.61%	0.94%	48.82%	2.62%	43.40%	2.84%	51.57%	2.19%
2043	40.16%	0.00%	59.26%	0.57%	47.68%	0.94%	48.76%	2.63%	43.45%	2.85%	51.51%	2.20%
2044	40.05%	0.00%	59.38%	0.57%	47.35%	0.95%	49.09%	2.61%	43.17%	2.86%	51.79%	2.18%
2045	40.61%	0.00%	58.81%	0.58%	47.54%	0.95%	48.88%	2.63%	43.34%	2.87%	51.60%	2.20%
2046	40.50%	0.00%	58.92%	0.58%	47.30%	0.96%	49.12%	2.62%	43.13%	2.87%	51.81%	2.19%
2047	40.26%	0.00%	59.16%	0.58%	47.16%	0.96%	49.27%	2.62%	43.01%	2.87%	51.94%	2.18%

Model Year	Passenger Car				Passenger Truck				Light Commercial Truck			
	Gasoline	Diesel	Electricity	Ethanol	Gasoline	Diesel	Electricity	Ethanol	Gasoline	Diesel	Electricity	Ethanol
2048	39.51%	0.00%	59.92%	0.57%	46.90%	0.97%	49.53%	2.60%	42.79%	2.88%	52.15%	2.17%
2049	39.19%	0.00%	60.24%	0.56%	46.86%	0.97%	49.56%	2.60%	42.76%	2.89%	52.18%	2.18%
2050	38.76%	0.00%	60.69%	0.56%	46.48%	0.98%	49.96%	2.59%	42.44%	2.90%	52.51%	2.16%
2051	38.76%	0.00%	60.69%	0.56%	46.48%	0.98%	49.96%	2.59%	42.44%	2.90%	52.51%	2.16%
2052	38.76%	0.00%	60.69%	0.56%	46.48%	0.98%	49.96%	2.59%	42.44%	2.90%	52.51%	2.16%
2053	38.76%	0.00%	60.69%	0.56%	46.48%	0.98%	49.96%	2.59%	42.44%	2.90%	52.51%	2.16%
2054	38.76%	0.00%	60.69%	0.56%	46.48%	0.98%	49.96%	2.59%	42.44%	2.90%	52.51%	2.16%
2055	38.76%	0.00%	60.69%	0.56%	46.48%	0.98%	49.96%	2.59%	42.44%	2.90%	52.51%	2.16%
2056	38.76%	0.00%	60.69%	0.56%	46.48%	0.98%	49.96%	2.59%	42.44%	2.90%	52.51%	2.16%
2057	38.76%	0.00%	60.69%	0.56%	46.48%	0.98%	49.96%	2.59%	42.44%	2.90%	52.51%	2.16%
2058	38.76%	0.00%	60.69%	0.56%	46.48%	0.98%	49.96%	2.59%	42.44%	2.90%	52.51%	2.16%
2059	38.76%	0.00%	60.69%	0.56%	46.48%	0.98%	49.96%	2.59%	42.44%	2.90%	52.51%	2.16%
2060	38.76%	0.00%	60.69%	0.56%	46.48%	0.98%	49.96%	2.59%	42.44%	2.90%	52.51%	2.16%

Appendix B

CadnaA TNM Noise Model Input Data (Traffic)

Existing (2025) Traffic Volumes

Street Name	Segment		AADT	Daytime Totals (91% of AADT)		Total Truck %	Medium/ Heavy Truck Split	Posted Speed Limit (kph)	Split by Direction in Noise Model (Y/N)
	Between	And		veh./16- hr	veh./hr				
Jonesville Crescent	Eglinton Avenue	Victoria Park Avenue	10,500	9,555	597	0.0%	20%/80%	40	N
Craigton Drive	Victoria Park Avenue	Pharmacy Avenue	6,700	6,097	381	1.5%	20%/80%	40	N
Ashtonbee Road	Pharmacy Avenue	Hakimi Avenue	10,400	9,464	592	6.0%	20%/80%	40	N
Ashtonbee Road	Hakimi Avenue	Warden Avenue	13,800	12,558	785	2.0%	20%/80%	40	N
Ashtonbee Road	Warden Avenue	Thermos Road	10,200	9,282	580	4.0%	20%/80%	40	N
Ashtonbee Road	Thermos Road	Birchmount Road	9,300	8,463	529	6.0%	20%/80%	40	N
Eglinton Avenue	Jonesville Crescent	Victoria Park Avenue	31,100	28,301	1,769	4.5%	20%/80%	50	Y
Eglinton Avenue	Victoria Park Avenue	O'Connor Drive	29,100	26,481	1,655	4.5%	20%/80%	50	Y
Eglinton Avenue	O'Connor Drive	Pharmacy Avenue	42,500	38,675	2,417	5.0%	20%/80%	50	Y
Eglinton Avenue	Pharmacy Avenue	Hakimi Avenue	37,600	34,216	2,139	4.0%	20%/80%	50	Y
Eglinton Avenue	Hakimi Avenue	Warden Avenue	34,600	31,486	1,968	5.0%	20%/80%	50	Y
Eglinton Avenue	Warden Avenue	Thermos Road	33,000	30,030	1,877	4.0%	20%/80%	50	Y
Eglinton Avenue	Thermos Road	Sinnott Road	31,500	28,665	1,792	3.5%	20%/80%	50	Y
Eglinton Avenue	Sinnott Road	Birchmount Road	33,600	30,576	1,911	7.0%	20%/80%	50	Y
Eglinton Avenue	Birchmount Road	Rosemount Drive	33,600	30,576	1,911	7.0%	20%/80%	50	Y
O'Connor Drive	Sunrise Avenue	Victoria Park Avenue	20,500	18,655	1,166	2.0%	20%/80%	40	N
O'Connor Drive	Victoria Park Avenue	Eglinton Square Parking	17,900	16,289	1,018	2.0%	20%/80%	40	N
O'Connor Drive	Eglinton Square Parking	Eglinton Avenue	14,200	12,922	808	2.0%	20%/80%	40	N

Street Name	Segment		AADT	Daytime Totals (91% of AADT)		Total Truck %	Medium/ Heavy Truck Split	Posted Speed Limit (kph)	Split by Direction in Noise Model (Y/N)
	Between	And		veh./16- hr	veh./hr				
Victoria Park Avenue	Sunrise Avenue	O'Connor Drive	22,900	20,839	1,302	2.5%	20%/80%	40	Y
Victoria Park Avenue	O'Connor Drive	Eglinton Avenue	25,800	23,478	1,467	3.0%	20%/80%	50	Y
Victoria Park Avenue	Eglinton Avenue	Plaza Parking	28,500	25,935	1,621	4.0%	20%/80%	50	Y
Victoria Park Avenue	Plaza Parking	Craigton Drive	29,400	26,754	1,672	4.0%	20%/80%	50	Y
Victoria Park Avenue	Craigton Drive	North of Craigton Drive	29,500	26,845	1,678	3.0%	20%/80%	50	Y
Pharmacy Avenue	South of Eglinton Avenue	Eglinton Avenue	20,000	18,200	1,138	2.0%	20%/80%	50	Y
Pharmacy Avenue	Eglinton Avenue	Plaza Parking	22,800	20,748	1,297	4.0%	20%/80%	50	Y
Pharmacy Avenue	Plaza Parking	Ashtonbee Road	23,000	20,930	1,308	4.0%	20%/80%	50	Y
Pharmacy Avenue	Ashtonbee Road	North of Ashtonbee Road	22,500	20,475	1,280	4.5%	20%/80%	50	Y
Lebovic Avenue	South of Eglinton Avenue	Eglinton Avenue	11,100	10,101	631	3.5%	20%/80%	50	Y
Hakimi Avenue	Eglinton Avenue	Plaza Parking	6,800	6,188	387	5.0%	20%/80%	50	Y
Hakimi Avenue	Plaza Parking	Ashtonbee Road	4,100	3,731	233	4.0%	20%/80%	50	Y
Hakimi Avenue	Ashtonbee Road	North of Ashtonbee Road	500	455	28	0.0%	20%/80%	50	Y
Warden Avenue	South of Civic Road	Civic Road	19,800	18,018	1,126	5.0%	20%/80%	50	Y
Warden Avenue	Civic Road	Eglinton Avenue	25,800	23,478	1,467	5.5%	20%/80%	50	Y
Warden Avenue	Eglinton Avenue	Plaza Parking	26,900	24,479	1,530	4.5%	20%/80%	50	Y
Warden Avenue	Plaza Parking	Ashtonbee Road	27,600	25,116	1,570	4.0%	20%/80%	50	Y
Warden Avenue	Ashtonbee Road	North of Ashtonbee Road	33,000	30,030	1,877	3.5%	20%/80%	50	Y
Thermos Road	Eglinton Avenue	Plaza Parking	5,600	5,096	319	5.0%	20%/80%	50	N

Street Name	Segment		AADT	Daytime Totals (91% of AADT)		Total Truck %	Medium/ Heavy Truck Split	Posted Speed Limit (kph)	Split by Direction in Noise Model (Y/N)
	Between	And		veh./16- hr	veh./hr				
Thermos Road	Plaza Parking	Ashtonbee Road	5,600	5,096	319	5.0%	20%/80%	50	N
Thermos Road	Ashtonbee Road	North of Ashtonbee Road	5,300	4,823	301	5.0%	20%/80%	50	N
Sinnott Road	South of Civic Road	Civic Road	6,100	5,551	347	5.0%	20%/80%	40	N
Sinnott Road	Civic Road	Eglinton Avenue	6,100	5,551	347	4.0%	20%/80%	40	N
Birchmount Road	South of Eglinton Avenue	Eglinton Avenue	23,200	21,112	1,320	7.0%	20%/80%	50	Y
Birchmount Road	Eglinton Avenue	Plaza Parking	23,600	21,476	1,342	7.0%	20%/80%	50	Y
Birchmount Road	Plaza Parking	Ashtonbee Road	22,600	20,566	1,285	6.0%	20%/80%	50	Y
Birchmount Road	Ashtonbee Road	North of Ashtonbee Road	26,200	23,842	1,490	6.0%	20%/80%	50	Y
Civic Road	Warden Avenue	Sinnott Road	1,800	1,638	102	5.0%	20%/80%	40	N

Future No-Build (2041) Traffic Volumes

Street Name	Segment		AADT	Daytime Totals (91% of AADT)		Total Truck %	Medium/ Heavy Truck Split	Posted Speed Limit (kph)	Split by Direction in Model (Y/N)
	Between	And		veh./16- hr	veh./hr				
Jonesville Crescent	Eglinton Avenue	Victoria Park Avenue	12,312	11,204	700	0.0%	20%/80%	40	N
Craigton Drive	Victoria Park Avenue	Pharmacy Avenue	7,856	7,149	447	1.5%	20%/80%	40	N
Ashtonbee Road	Pharmacy Avenue	Hakimi Avenue	12,195	11,097	694	6.0%	20%/80%	40	N
Ashtonbee Road	Hakimi Avenue	Warden Avenue	16,182	14,725	920	2.0%	20%/80%	40	N

Street Name	Segment		AADT	Daytime Totals (91% of AADT)		Total Truck %	Medium/ Heavy Truck Split	Posted Speed Limit (kph)	Split by Direction in Model (Y/N)
	Between	And		veh./16- hr	veh./hr				
Ashtonbee Road	Warden Avenue	Thermos Road	11,960	10,884	680	4.0%	20%/80%	40	N
Ashtonbee Road	Thermos Road	Birchmount Road	10,905	9,924	620	6.0%	20%/80%	40	N
Eglinton Avenue	Jonesville Crescent	Victoria Park Avenue	36,467	33,185	2,074	4.5%	20%/80%	50	Y
Eglinton Avenue	Victoria Park Avenue	O'Connor Drive	34,122	31,051	1,941	4.5%	20%/80%	50	Y
Eglinton Avenue	O'Connor Drive	Pharmacy Avenue	49,835	45,349	2,834	5.0%	20%/80%	50	Y
Eglinton Avenue	Pharmacy Avenue	Hakimi Avenue	44,089	40,121	2,508	4.0%	20%/80%	50	Y
Eglinton Avenue	Hakimi Avenue	Warden Avenue	40,571	36,920	2,307	5.0%	20%/80%	50	Y
Eglinton Avenue	Warden Avenue	Thermos Road	38,695	35,213	2,201	4.0%	20%/80%	50	Y
Eglinton Avenue	Thermos Road	Sinnott Road	36,936	33,612	2,101	3.5%	20%/80%	50	Y
Eglinton Avenue	Sinnott Road	Birchmount Road	39,399	35,853	2,241	7.0%	20%/80%	50	Y
Eglinton Avenue	Birchmount Road	Rosemount Drive	39,399	35,853	2,241	7.0%	20%/80%	50	Y
O'Connor Drive	Sunrise Avenue	Victoria Park Avenue	24,038	21,874	1,367	2.0%	20%/80%	40	N
O'Connor Drive	Victoria Park Avenue	Eglinton Square Parking	20,989	19,100	1,194	2.0%	20%/80%	40	N
O'Connor Drive	Eglinton Square Parking	Eglinton Avenue	16,651	15,152	947	2.0%	20%/80%	40	N
Victoria Park Avenue	Sunrise Avenue	O'Connor Drive	26,852	24,435	1,527	2.5%	20%/80%	40	Y
Victoria Park Avenue	O'Connor Drive	Eglinton Avenue	30,253	27,530	1,721	3.0%	20%/80%	50	Y
Victoria Park Avenue	Eglinton Avenue	Plaza Parking	33,418	30,411	1,901	4.0%	20%/80%	50	Y
Victoria Park Avenue	Plaza Parking	Craigton Drive	34,474	31,371	1,961	4.0%	20%/80%	50	Y
Victoria Park Avenue	Craigton Drive	North of Craigton Drive	34,591	31,478	1,967	3.0%	20%/80%	50	Y

Street Name	Segment		AADT	Daytime Totals (91% of AADT)		Total Truck %	Medium/ Heavy Truck Split	Posted Speed Limit (kph)	Split by Direction in Model (Y/N)
	Between	And		veh./16- hr	veh./hr				
Pharmacy Avenue	South of Eglinton Avenue	Eglinton Avenue	23,452	21,341	1,334	2.0%	20%/80%	50	Y
Pharmacy Avenue	Eglinton Avenue	Plaza Parking	26,735	24,329	1,521	4.0%	20%/80%	50	Y
Pharmacy Avenue	Plaza Parking	Ashtonbee Road	26,969	24,542	1,534	4.0%	20%/80%	50	Y
Pharmacy Avenue	Ashtonbee Road	North of Ashtonbee Road	26,383	24,009	1,501	4.5%	20%/80%	50	Y
Lebovic Avenue	South of Eglinton Avenue	Eglinton Avenue	13,016	11,844	740	3.5%	20%/80%	50	Y
Hakimi Avenue	Eglinton Avenue	Plaza Parking	7,974	7,256	453	5.0%	20%/80%	50	Y
Hakimi Avenue	Plaza Parking	Ashtonbee Road	4,808	4,375	273	4.0%	20%/80%	50	Y
Hakimi Avenue	Ashtonbee Road	North of Ashtonbee Road	586	534	33	0.0%	20%/80%	50	Y
Warden Avenue	South of Civic Road	Civic Road	23,217	21,128	1,320	5.0%	20%/80%	50	Y
Warden Avenue	Civic Road	Eglinton Avenue	30,253	27,530	1,721	5.5%	20%/80%	50	Y
Warden Avenue	Eglinton Avenue	Plaza Parking	31,542	28,704	1,794	4.5%	20%/80%	50	Y
Warden Avenue	Plaza Parking	Ashtonbee Road	32,363	29,450	1,841	4.0%	20%/80%	50	Y
Warden Avenue	Ashtonbee Road	North of Ashtonbee Road	38,695	35,213	2,201	3.5%	20%/80%	50	Y
Thermos Road	Eglinton Avenue	Plaza Parking	6,566	5,975	373	5.0%	20%/80%	50	N
Thermos Road	Plaza Parking	Ashtonbee Road	6,566	5,975	373	5.0%	20%/80%	50	N
Thermos Road	Ashtonbee Road	North of Ashtonbee Road	6,215	5,655	353	5.0%	20%/80%	50	N
Sinnott Road	South of Civic Road	Civic Road	7,153	6,509	407	5.0%	20%/80%	40	N
Sinnott Road	Civic Road	Eglinton Avenue	7,153	6,509	407	4.0%	20%/80%	40	N
Birchmount Road	South of Eglinton Avenue	Eglinton Avenue	27,204	24,755	1,547	7.0%	20%/80%	50	Y

Street Name	Segment		AADT	Daytime Totals (91% of AADT)		Total Truck %	Medium/ Heavy Truck Split	Posted Speed Limit (kph)	Split by Direction in Model (Y/N)
	Between	And		veh./16- hr	veh./hr				
Birchmount Road	Eglinton Avenue	Plaza Parking	27,673	25,182	1,574	7.0%	20%/80%	50	Y
Birchmount Road	Plaza Parking	Ashtonbee Road	26,500	24,115	1,507	6.0%	20%/80%	50	Y
Birchmount Road	Ashtonbee Road	North of Ashtonbee Road	30,722	27,957	1,747	6.0%	20%/80%	50	Y
Civic Road	Warden Avenue	Sinnott Road	2,111	1,921	120	5.0%	20%/80%	40	N

Future Build (2041) Traffic Volumes

Street Name	Segment		AADT	Daytime Totals (91% of AADT)		Total Truck %	Medium/ Heavy Truck Split	Poste d Speed Limit (kph)	Split by Directio n in Model (Y/N)
	Between	And		veh./16 -hr	veh./h r				
Jonesville Crescent	Eglinton Avenue	Victoria Park Avenue	8,400	7,644	478	0.0%	20%/80%	40	N
Craigton Drive	Victoria Park Avenue	Pharmacy Avenue	9,900	9,009	563	1.5%	20%/80%	40	N
Ashtonbee Road	Pharmacy Avenue	Hakimi Avenue	16,200	14,742	921	6.0%	20%/80%	40	N
Ashtonbee Road	Hakimi Avenue	Warden Avenue	20,500	18,655	1,166	2.0%	20%/80%	40	N
Ashtonbee Road	Warden Avenue	Thermos Road	16,200	14,742	921	4.0%	20%/80%	40	N
Ashtonbee Road	Thermos Road	Birchmount Road	14,000	12,740	796	6.0%	20%/80%	40	N
Eglinton Avenue	Jonesville Crescent	Victoria Park Avenue	37,500	34,125	2,133	4.5%	20%/80%	50	Y
Eglinton Avenue	Victoria Park Avenue	New Street	36,600	33,306	2,082	4.5%	20%/80%	50	Y
Eglinton Avenue	New Street	Pharmacy Avenue	33,900	30,849	1,928	5.0%	20%/80%	50	Y
Eglinton Avenue	Pharmacy Avenue	Hakimi Avenue	33,300	30,303	1,894	4.0%	20%/80%	50	Y

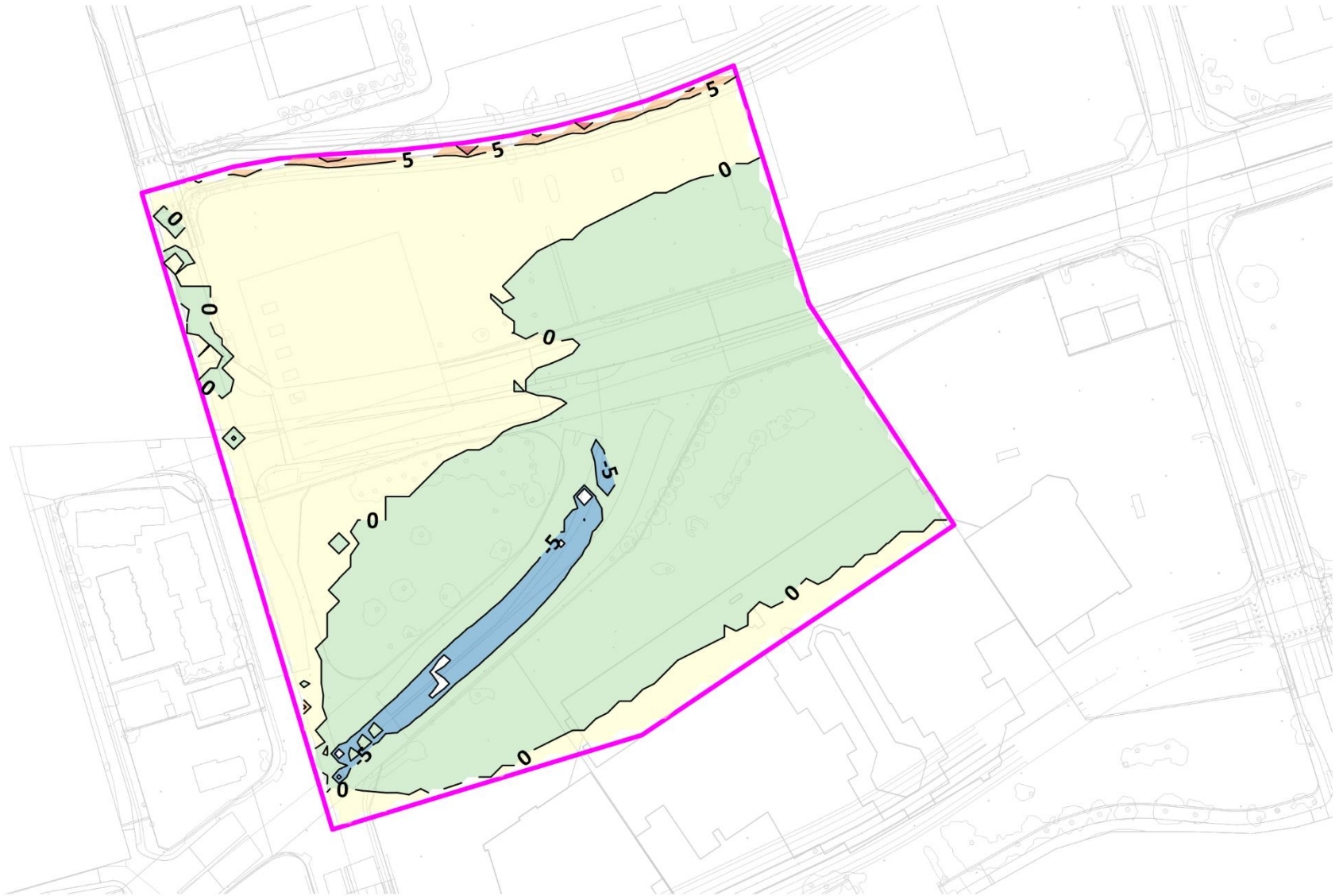
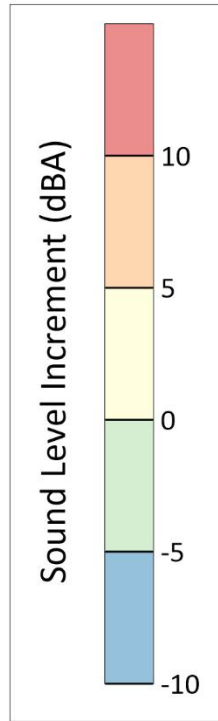
Street Name	Segment		AADT	Daytime Totals (91% of AADT)		Total Truck %	Medium/ Heavy Truck Split	Poste d Speed Limit (kph)	Split by Direction in Model (Y/N)
	Between	And		veh./16 -hr	veh./h r				
Eglinton Avenue	Hakimi Avenue	Warden Avenue	31,900	29,029	1,814	5.0%	20%/80%	50	Y
Eglinton Avenue	Warden Avenue	Thermos Road	27,800	25,298	1,581	4.0%	20%/80%	50	Y
Eglinton Avenue	Thermos Road	Sinnott Road	29,400	26,754	1,672	3.5%	20%/80%	50	Y
Eglinton Avenue	Sinnott Road	Birchmount Road	30,600	27,846	1,740	7.0%	20%/80%	50	Y
Eglinton Avenue	Birchmount Road	Rosemount Drive	35,600	32,396	2,025	7.0%	20%/80%	50	Y
O'Connor Drive	Sunrise Avenue	Victoria Park Avenue	25,400	23,114	1,445	2.0%	20%/80%	40	N
O'Connor Drive	Victoria Park Avenue	New Street	19,800	18,018	1,126	2.0%	20%/80%	40	N
O'Connor Drive	New Street	Pharmacy Avenue	16,600	15,106	944	2.0%	20%/80%	40	N
O'Connor Drive	Pharmacy Avenue	Lebovic Avenue	16,600	15,106	944	3.5%	20%/80%	40	N
O'Connor Drive	Lebovic Avenue	Warden Avenue	13,400	12,194	762	5.0%	20%/80%	40	N
O'Connor Drive	Warden Avenue	Sinnott Road	12,400	11,284	705	5.0%	20%/80%	40	N
O'Connor Drive	Sinnott Road	Birchmount Road	9,300	8,463	529	5.0%	20%/80%	40	N
Golden Mile Boulevard	Victoria Park Avenue	New Street	13,200	12,012	751	2.0%	20%/80%	40	N
Golden Mile Boulevard	New Street	Pharmacy Avenue	14,100	12,831	802	2.0%	20%/80%	40	N
Golden Mile Boulevard	Pharmacy Avenue	Hakimi Avenue	15,100	13,741	859	5.0%	20%/80%	40	N
Golden Mile Boulevard	Hakimi Avenue	Warden Avenue	13,900	12,649	791	5.0%	20%/80%	40	N
Golden Mile Boulevard	Warden Avenue	Thermos Road	14,000	12,740	796	5.0%	20%/80%	40	N

Street Name	Segment		AADT	Daytime Totals (91% of AADT)		Total Truck %	Medium/ Heavy Truck Split	Poste d Speed Limit (kph)	Split by Direction in Model (Y/N)
	Between	And		veh./16 -hr	veh./h r				
Golden Mile Boulevard	Thermos Road	Birchmount Road	11,600	10,556	660	5.0%	20%/80%	40	N
Victoria Park Avenue	Sunrise Avenue	O'Connor Drive	27,100	24,661	1,541	2.5%	20%/80%	50	Y
Victoria Park Avenue	O'Connor Drive	Eglinton Avenue	32,600	29,666	1,854	3.0%	20%/80%	50	Y
Victoria Park Avenue	Eglinton Avenue	Golden Mile Boulevard	32,600	29,666	1,854	4.0%	20%/80%	50	Y
Victoria Park Avenue	Golden Mile Boulevard	Craigton Drive	33,500	30,485	1,905	4.0%	20%/80%	50	Y
Victoria Park Avenue	Craigton Drive	North of Craigton Drive	36,500	33,215	2,076	3.0%	20%/80%	50	Y
Pharmacy Avenue	South of O'Connor Drive	O'Connor Drive	24,000	21,840	1,365	2.0%	20%/80%	50	Y
Pharmacy Avenue	O'Connor Drive	Eglinton Avenue	29,200	26,572	1,661	2.0%	20%/80%	50	Y
Pharmacy Avenue	Eglinton Avenue	Golden Mile Boulevard	27,700	25,207	1,575	4.0%	20%/80%	50	Y
Pharmacy Avenue	Golden Mile Boulevard	Ashtonbee Road	27,000	24,570	1,536	4.0%	20%/80%	50	Y
Pharmacy Avenue	Ashtonbee Road	North of Ashtonbee Road	33,800	30,758	1,922	4.5%	20%/80%	50	Y
Lebovic Avenue	South of O'Connor Drive	O'Connor Drive	19,900	18,109	1,132	5.0%	20%/80%	50	Y
Lebovic Avenue	O'Connor Drive	Eglinton Avenue	20,500	18,655	1,166	3.5%	20%/80%	50	Y
Hakimi Avenue	Eglinton Avenue	Golden Mile Boulevard	19,000	17,290	1,081	5.0%	20%/80%	50	Y
Hakimi Avenue	Golden Mile Boulevard	Ashtonbee Road	7,300	6,643	415	4.0%	20%/80%	50	Y
Hakimi Avenue	Ashtonbee Road	North of Ashtonbee Road	2,300	2,093	131	0.0%	20%/80%	50	Y
Warden Avenue	South of O'Connor Drive	O'Connor Drive	19,000	17,290	1,081	5.0%	20%/80%	50	Y

Street Name	Segment		AADT	Daytime Totals (91% of AADT)		Total Truck %	Medium/ Heavy Truck Split	Poste d Speed Limit (kph)	Split by Directio n in Model (Y/N)
	Between	And		veh./16 -hr	veh./h r				
Warden Avenue	O'Connor Drive	Eglinton Avenue	26,900	24,479	1,530	5.5%	20%/80%	50	Y
Warden Avenue	Eglinton Avenue	Golden Mile Boulevard	26,000	23,660	1,479	4.5%	20%/80%	50	Y
Warden Avenue	Golden Mile Boulevard	Ashtonbee Road	25,200	22,932	1,433	4.0%	20%/80%	50	Y
Warden Avenue	Ashtonbee Road	North of Ashtonbee Road	36,000	32,760	2,048	3.5%	20%/80%	50	Y
Thermos Road	Eglinton Avenue	Golden Mile Boulevard	4,400	4,004	250	5.0%	20%/80%	50	N
Thermos Road	Golden Mile Boulevard	Ashtonbee Road	5,300	4,823	301	5.0%	20%/80%	50	N
Thermos Road	Ashtonbee Road	North of Ashtonbee Road	13,200	12,012	751	5.0%	20%/80%	50	N
Sinnott Road	South of O'Connor Drive	O'Connor Drive	4,400	4,004	250	5.0%	20%/80%	40	N
Sinnott Road	O'Connor Drive	Eglinton Avenue	9,800	8,918	557	4.0%	20%/80%	40	N
Birchmount Road	South of O'Connor Drive	O'Connor Drive	22,900	20,839	1,302	5.0%	20%/80%	50	Y
Birchmount Road	O'Connor Drive	Eglinton Avenue	26,100	23,751	1,484	7.0%	20%/80%	50	Y
Birchmount Road	Eglinton Avenue	Golden Mile Boulevard	26,200	23,842	1,490	7.0%	20%/80%	50	Y
Birchmount Road	Golden Mile Boulevard	Ashtonbee Road	21,900	19,929	1,246	6.0%	20%/80%	50	Y
Birchmount Road	Ashtonbee Road	North of Ashtonbee Road	29,600	26,936	1,684	6.0%	20%/80%	50	Y

Appendix C

Predicted Free-Field Sound Level Increments (Future Land Use)



LEGEND

NOTES

SCALE



Drawn by:	Approved by:	Date:
NZS	PLK	June 2025

REFERENCE

Basemap: City of Toronto Open Data Portal
(3D massing, property boundaries)

REVISIONS

No.	Date	By	Revision

PROJECT NO.

SX21-0030

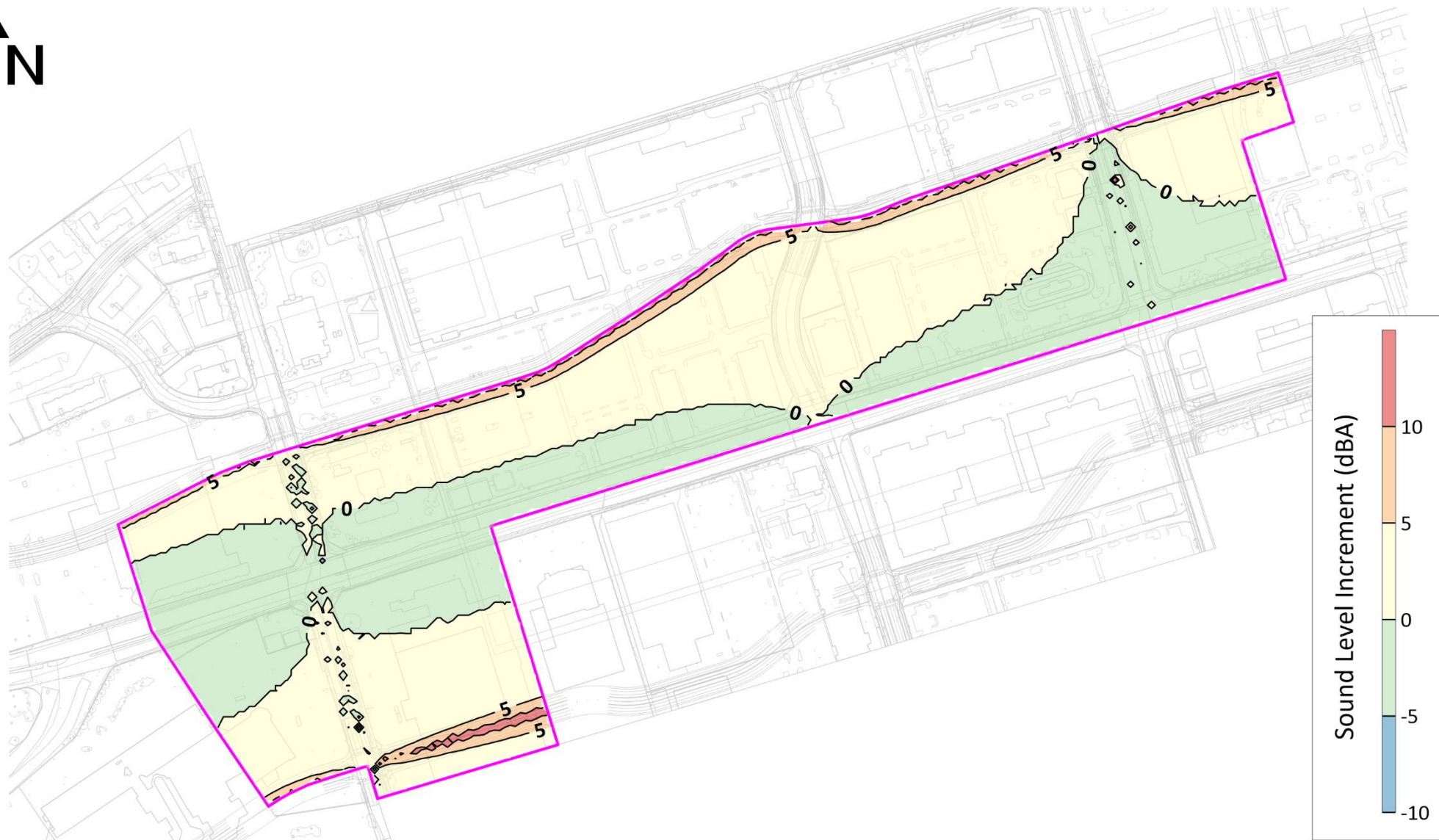


ReNew Golden Mile: Reconfigured and
New Major Streets EA

**Incremental Change in Sound Levels:
Character Area 1
Golden Mile Commercial Gateway**

FIGURE NO.

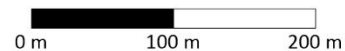
C-1



LEGEND

NOTES

SCALE



Drawn by:

NZS

Approved by:

PLK

Date:

June 2025

REFERENCE

Basemap: City of Toronto Open Data Portal
(3D massing, property boundaries)

REVISIONS

No.	Date	By	Revision

PROJECT NO.

SX21-0030



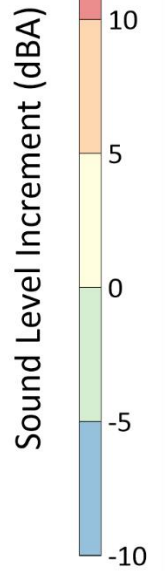
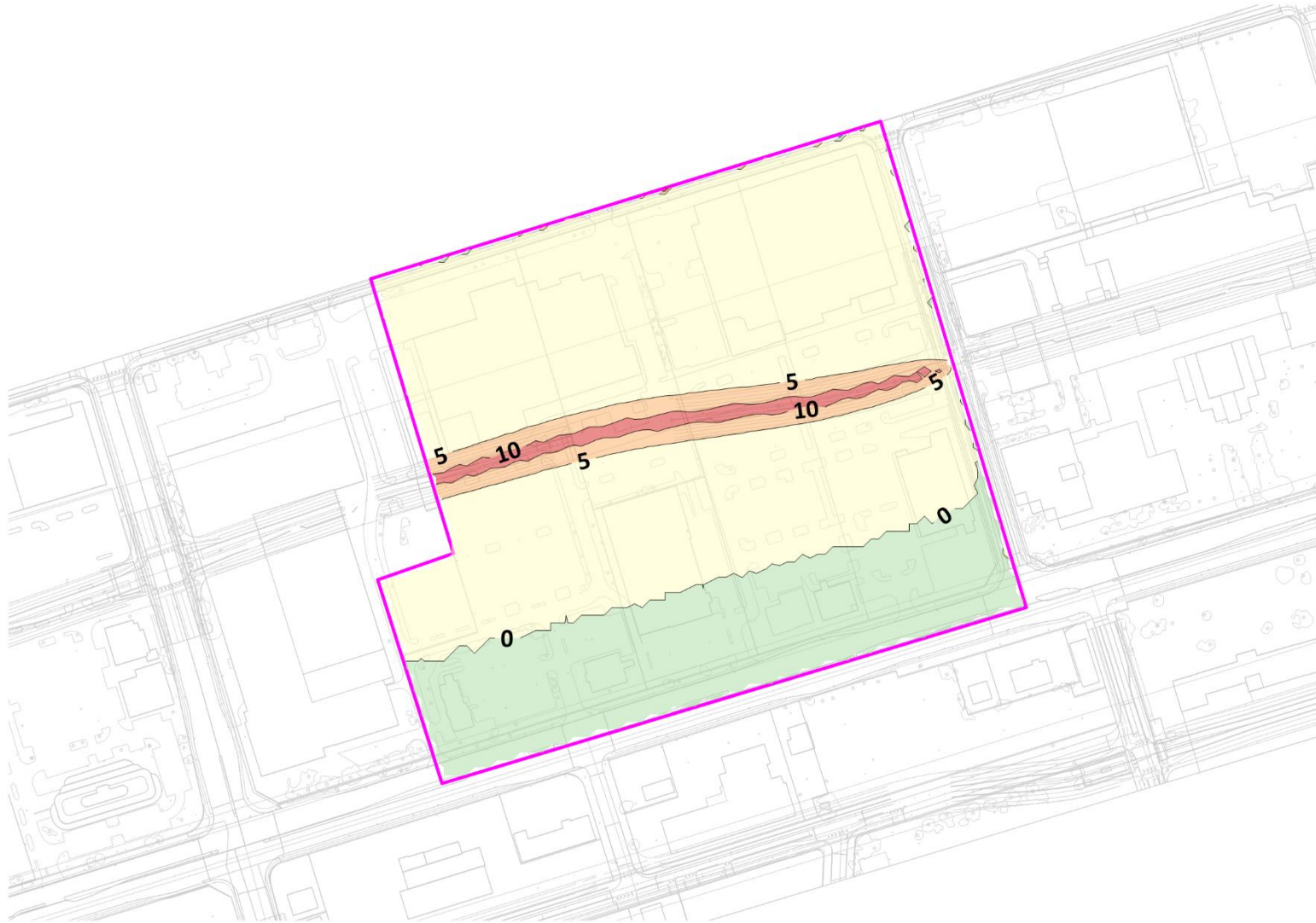
ReNew Golden Mile: Reconfigured and
New Major Streets EA

**Incremental Change in Sound Levels:
Character Area 2 (West)
Mixed Use Transit Node**

FIGURE NO.

C-2

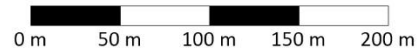




LEGEND

NOTES

SCALE



Drawn by:	Approved by:	Date:
NZS	PLK	June 2025

REFERENCE

Basemap: City of Toronto Open Data Portal
(3D massing, property boundaries)

REVISIONS

No.	Date	By	Revision

PROJECT NO.

SX21-0030

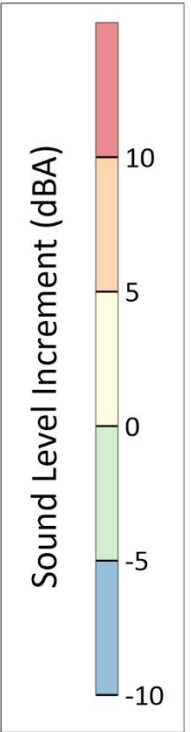
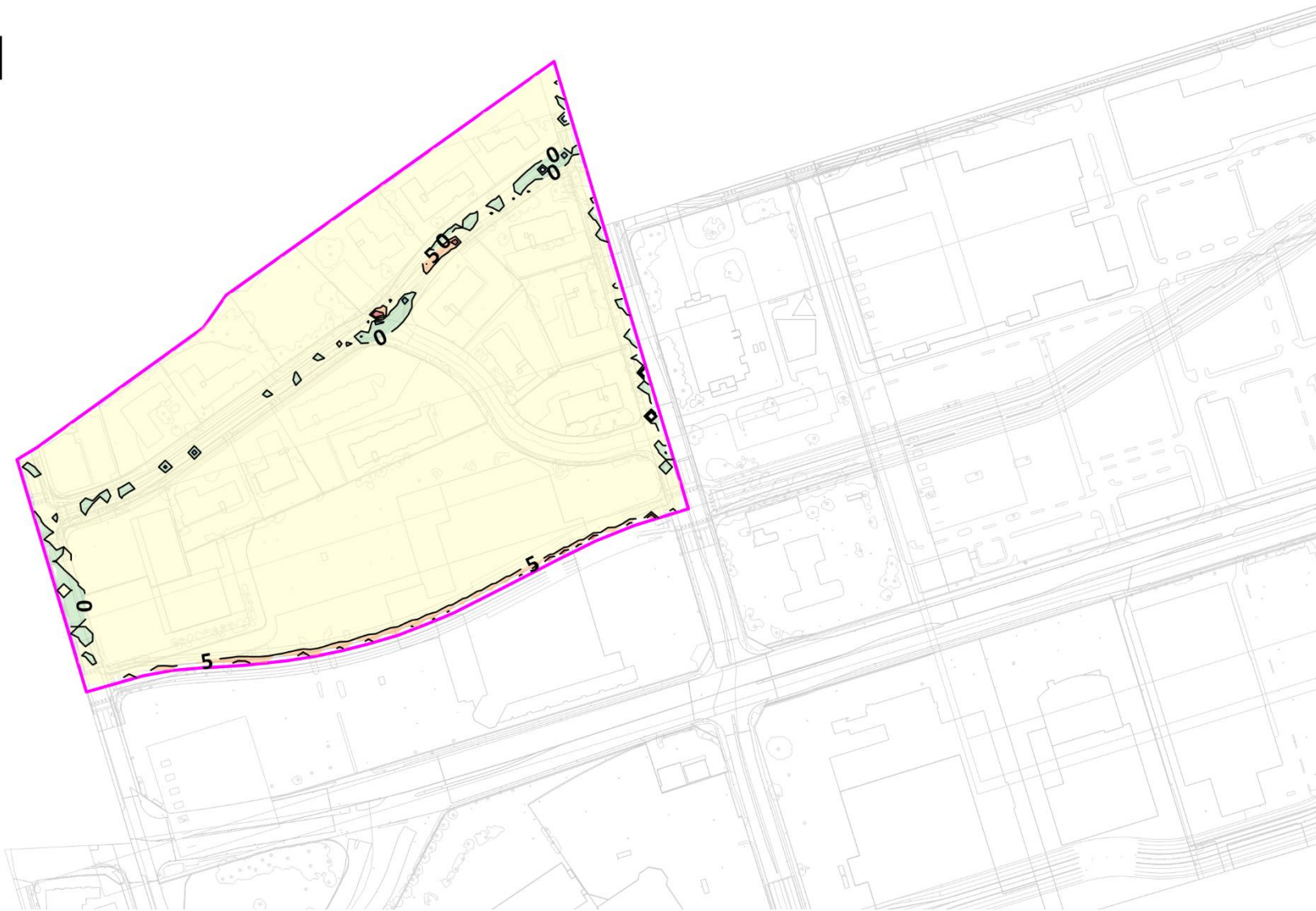


ReNew Golden Mile: Reconfigured and
New Major Streets EA

Incremental Change in Sound Levels:
Character Area 3
East Park Midrise and Tall
Building Community

FIGURE NO.

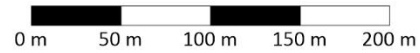
C-4



LEGEND

NOTES

SCALE



Drawn by:	Approved by:	Date:
NZS	PLK	June 2025

REFERENCE

Basemap: City of Toronto Open Data Portal
(3D massing, property boundaries)

REVISIONS

No.	Date	By	Revision

PROJECT NO.

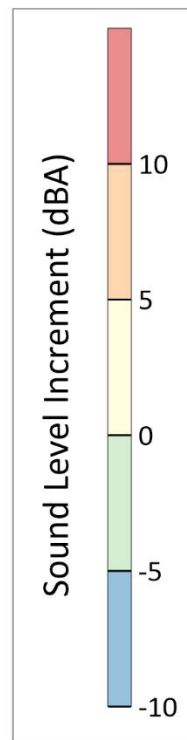
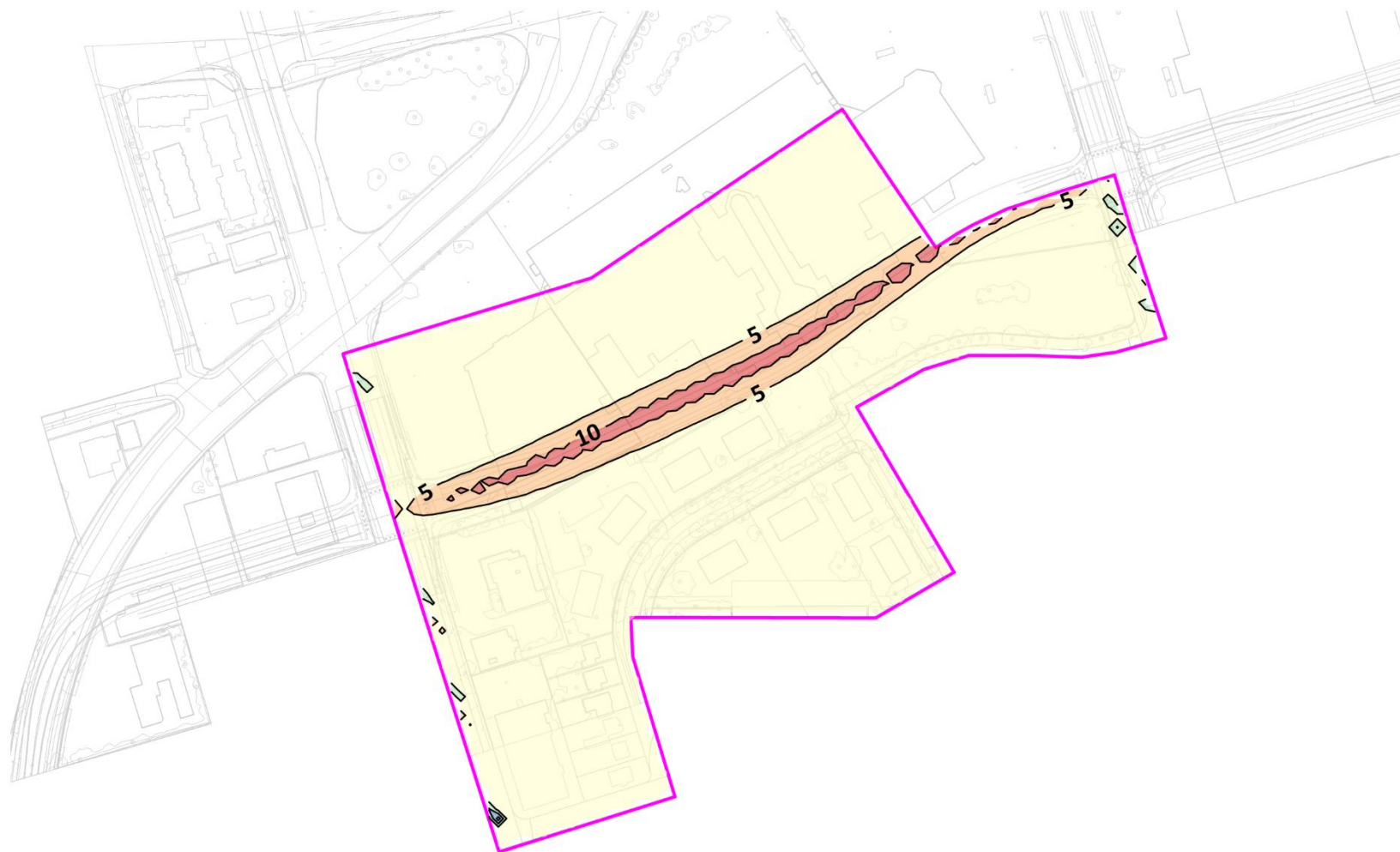
SX21-0030



ReNew Golden Mile: Reconfigured and
New Major Streets EA

**Incremental Change in Sound Levels:
Character Area 4
West Park and Meadoway
Transition Area**

FIGURE NO. C-5



LEGEND

NOTES

SCALE



Drawn by:	Approved by:	Date:
NZS	PLK	June 2025

REFERENCE

Basemap: City of Toronto Open Data Portal
(3D massing, property boundaries)

PROJECT NO.

SX21-0030

REVISIONS

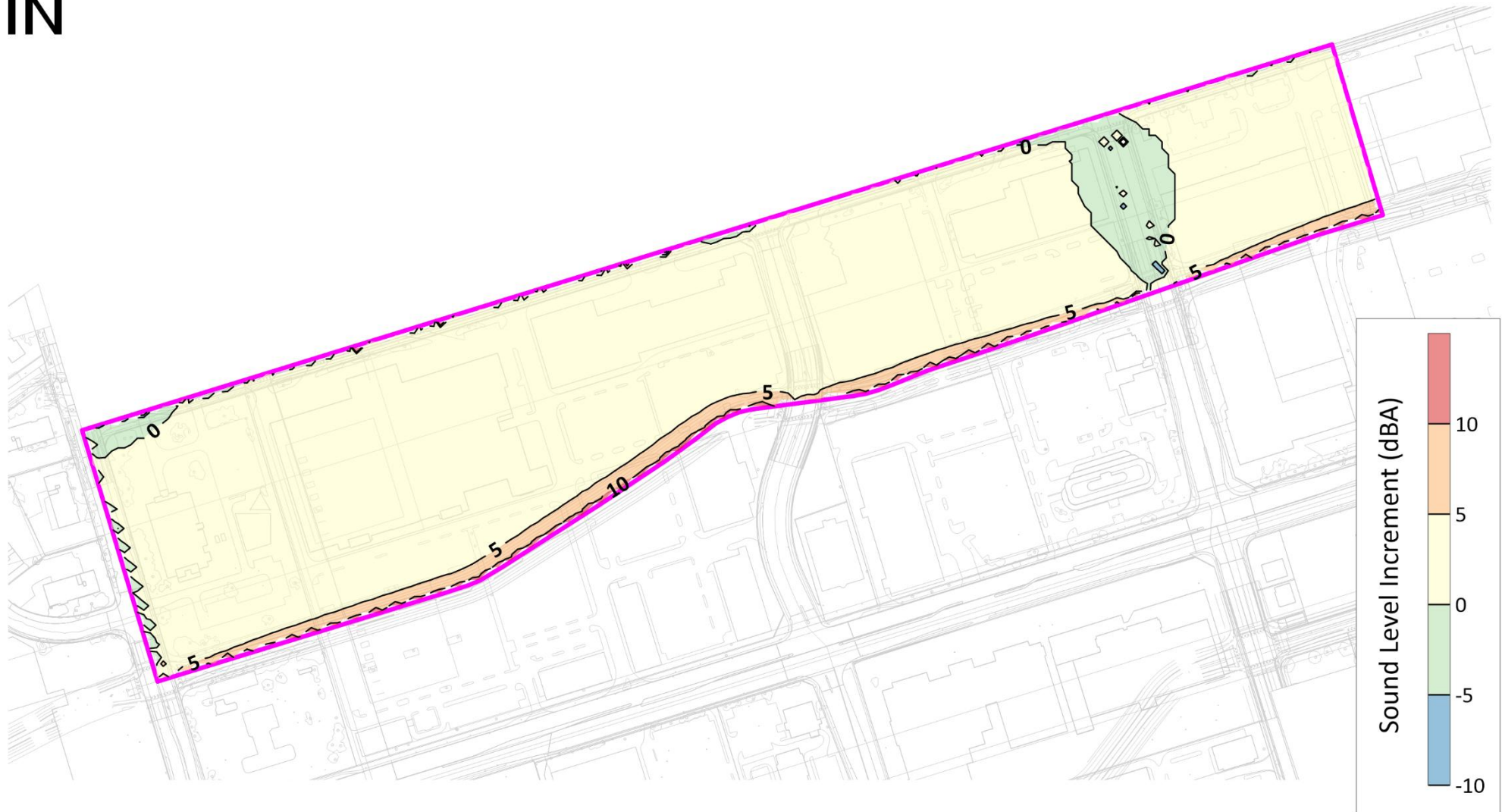
No.	Date	By	Revision



ReNew Golden Mile: Reconfigured and
New Major Streets EA

**Incremental Change in Sound Levels:
Character Area 5
O'Connor Drive Transition Area**

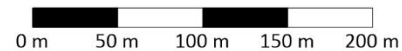
FIGURE NO. C-6



LEGEND

NOTES

SCALE



Drawn by:

NZS

Approved by:

PLK

Date:

June 2025

REFERENCE

Basemap: City of Toronto Open Data Portal
(3D massing, property boundaries)

REVISIONS

No.	Date	By	Revision

PROJECT NO.

SX21-0030

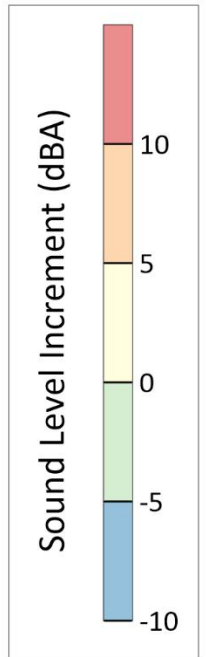
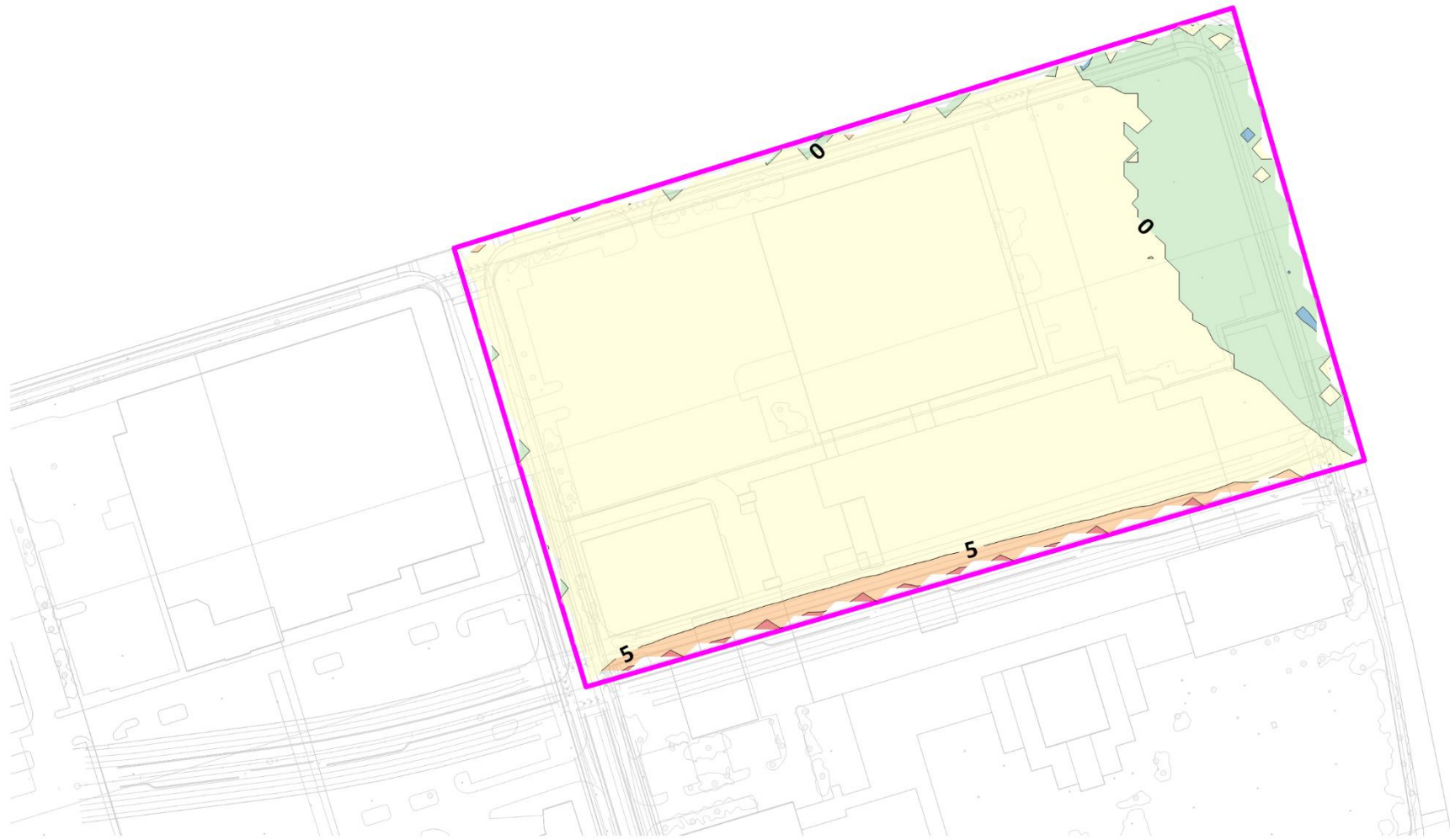


ReNew Golden Mile: Reconfigured and
New Major Streets EA

**Incremental Change in Sound Levels:
Character Area 6 (West)
Ashtonbee Transition Area**

FIGURE NO.

C-7



LEGEND

NOTES

SCALE



Drawn by:	Approved by:	Date:
NZS	PLK	June 2025

REFERENCE

Basemap: City of Toronto Open Data Portal
(3D massing, property boundaries)

REVISIONS

No.	Date	By	Revision

PROJECT NO.

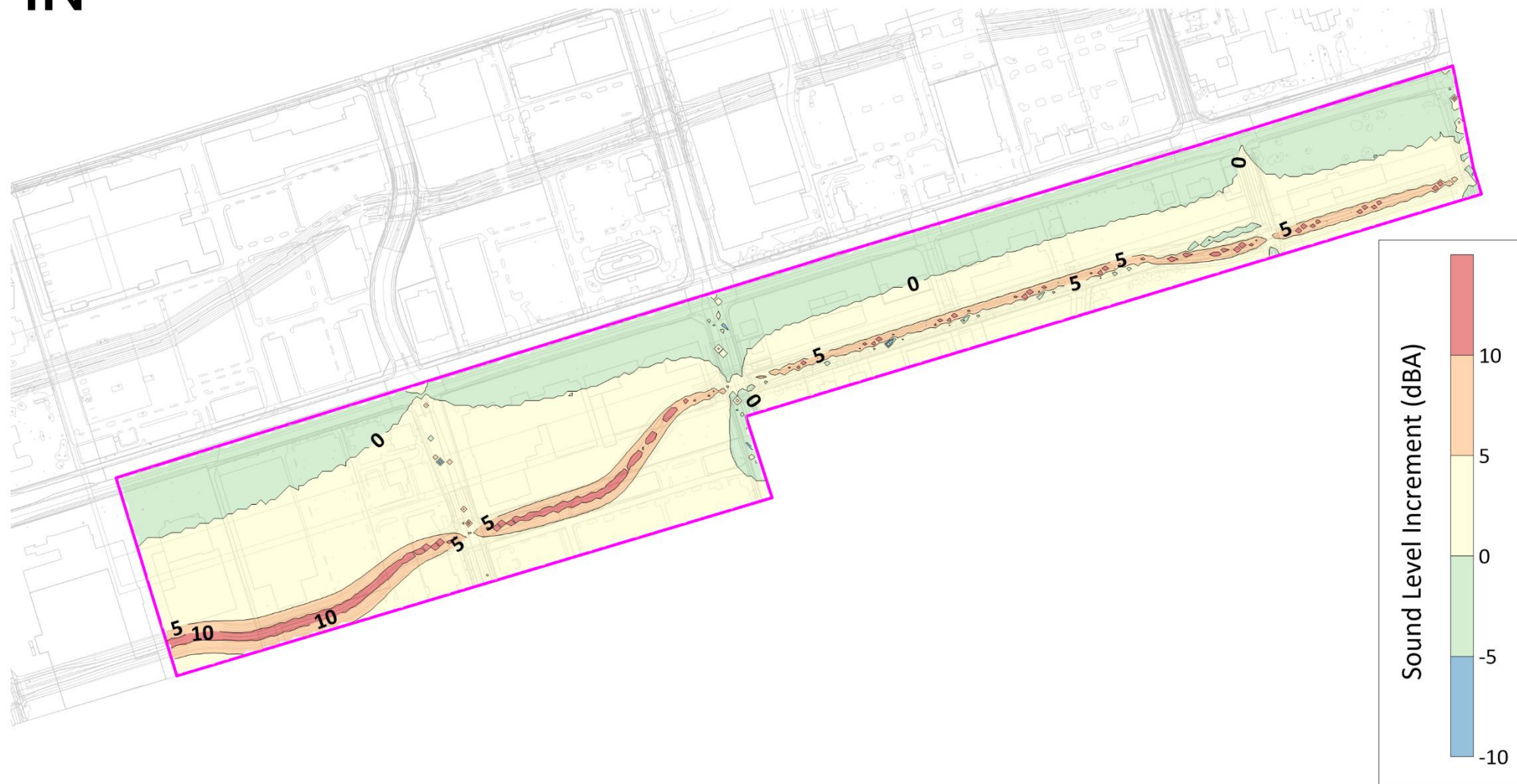
SX21-0030



ReNew Golden Mile: Reconfigured and
New Major Streets EA

**Incremental Change in Sound Levels:
Character Area 6 (East)
Ashtonbee Transition Area**

FIGURE NO. C-8



LEGEND

NOTES

SCALE



Drawn by:	Approved by:	Date:
NZS	PLK	June 2025

REFERENCE

Basemap: City of Toronto Open Data Portal
(3D massing, property boundaries)

REVISIONS

No.	Date	By	Revision

PROJECT NO.

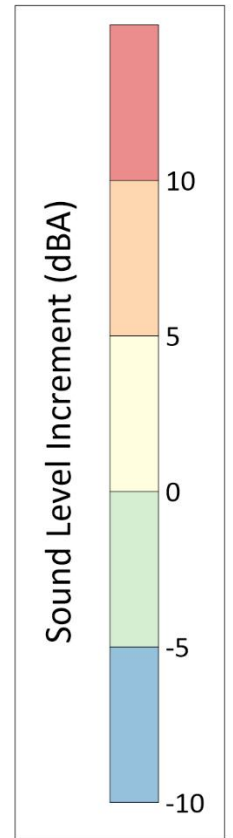
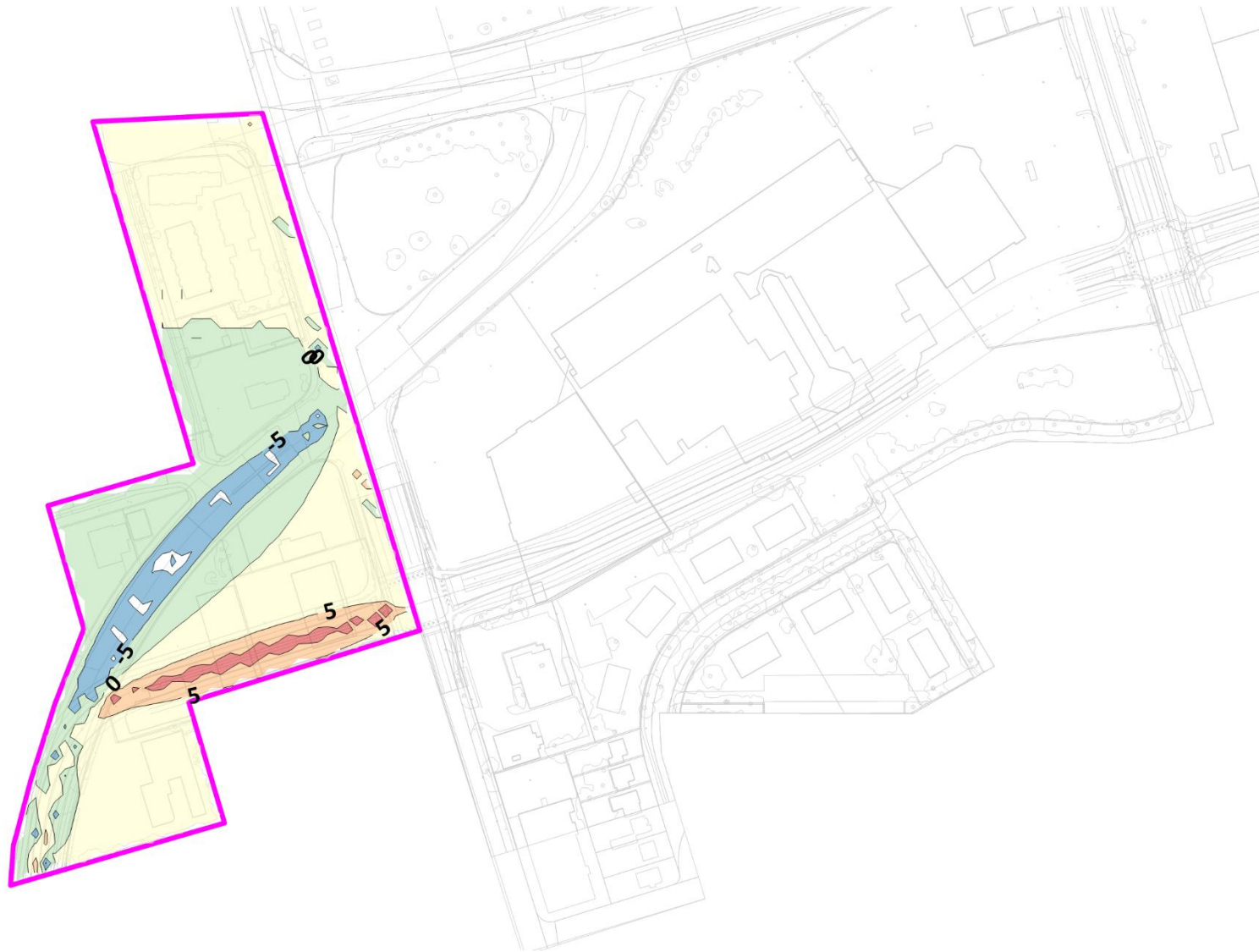
SX21-0030



ReNew Golden Mile: Reconfigured and
New Major Streets EA

**Incremental Change in Sound Levels:
Character Area 7
Employment Area**

FIGURE NO. C-9



LEGEND

NOTES

SCALE



Drawn by:	Approved by:	Date:
NZS	PLK	June 2025

REFERENCE

Basemap: City of Toronto Open Data Portal
(3D massing, property boundaries)

REVISIONS

No.	Date	By	Revision

PROJECT NO.

SX21-0030



ReNew Golden Mile: Reconfigured and
New Major Streets EA

**Incremental Change in Sound Levels:
Character Area 8
Victoria Park Avenue/O'Connor Drive
Intersection Area**

FIGURE NO.

C-10

Appendix D

Justification for Use of TNM Algorithms in Cadna-A

D.1 Justification for Use of TNM Algorithms in Cadna-A

The MTO *Environmental Guide for Noise* states that the TNM model must be used or “*TNM can be used together with any other software which is authorized by the FHWA or representative sample calculations can be provided to show similar results using the TNM software and the other software.*” The modelling for this Project utilized the TNM algorithms as implemented in the software program Cadna-A by its developer DataKustik GmbH. Cadna-A was selected over the TNM software program for the following reasons:

- The most recent version of TNM (version 3.2) does not allow for the import of aerial photography or external basemaps depicting Project infrastructure (e.g., polygon/polyline base files developed in Microstation, AutoCAD, or similar). These tend to be used to plot the existing and future layouts of roads as noise sources in the model, and so this missing functionality means that the sources would have to be plotted in an external software then entered manually into the TNM software.
- Manual entry of road sources in TNM is based on entering X, Y coordinate pairs for each node for each road (of which there can be many, depending on the complexity of the road layouts). TNM version 3.2 requires that a geographic coordinate system be selected from a fixed list, which are primarily U.S.-based projections. All of the supporting basemap data from HDR was provided in a geodetic coordinate system that does not appear to be supported by TNM (Canadian Modified Transverse Mercator (MTM) system), meaning that sources plotted externally using the provided base files would need to be re-projected to a system that is on the fixed list in TNM prior to manually entering them into TNM.
- The basemap native to TNM version 3.2 is an open street map. Aerial photography is a preferable basemap as it provides a clearer visual check that roads are set up accurately and also allows for receptor locations to be placed accurately (i.e., without having to plot them externally and re-Project their coordinates as noted above).

It should be noted that the most recent manual for Cadna-A indicates that the TNM algorithms are from TNM version 2.5, while the FHWA has since issued a newer version of the model. It was found however that the reference sound data for the vehicles relevant to this assessment (autos, medium trucks, and heavy trucks) have not changed between version 2.5 and version 3.2. The FHWA provides technical manuals for each release of TNM that demonstrates how the reference sound levels are calculated and provides the variables and equations to replicate the calculations. The data provided in the technical manuals for TNM 2.5 [1] [2] and TNM 3.2 [3] were used to independently calculate the reference sound level (A-weighted sound level at 50 ft perpendicular to an infinitely long road) for autos, medium trucks and heavy trucks for each model version and the results were identical. The calculations are shown in Appendix X.1.

An identical generic segment of road was modelled in both TNM version 3.2 and the TNM module in Cadna-A using traffic data from this assessment to confirm that the results are comparable. The details and results of this assessment are provided in Section B.2.

D.2 Sample Calculations

The MTO identifies that the TNM algorithms may be implemented in any software program provided that “*representative sample calculations can be provided to show similar results using the TNM software and the other software.*” The modelling supporting this study has been completed using the TNM algorithms as implemented in the software program Cadna-A by Datakustik GmbH. As required by MTO, this appendix provides sample calculations for an identical segment of road that was modelled both in Cadna-A and the most recent FHWA TNM software (version 3.2).

Both models required configuration prior to running and the parameters were set to be identical where applicable. Both models were set to consider an ambient temperature of 10°C and a relative humidity of 70%. The global ground type in TNM 3.2 was set to Pavement (the most acoustically hard or reflective option in TNM 3.2). The global ground type in Cadna-A was set to zero (perfectly reflective). Both models were configured to calculate based on hourly average traffic.

The modelled segment was based on the proposed Golden Mile Boulevard, which is approximately 2 km in total length and has a planned width of 3.3 m. The road was plotted in TNM, and the coordinates were used to set up an identical source in Cadna-A, as shown in the *Input Roadways* report following this discussion. Both were set up with a width of 3.3 m and “Average” pavement type. A total of five (5) receivers were set up with identical coordinates perpendicular to the centre of the plotted road. The first receptor was placed at a 15 m offset from the centre of the road, and the remaining four doubled in distance from the centre of the road (i.e., at 30 m, 60 m, 120 m and 240 m). Each receptor was placed at 1.5 m above the ground. Details from both models are shown in the *Sound-level Input: Receivers* report following this discussion.

The traffic volume data was selected from the segment with the highest AADT as provided by HDR, being the segment between Pharmacy Avenue and Hakimi Avenue with a total AADT of 15,100 and total truck percentage of 5%. As noted in Section 4.2.2.1 of the assessment report, HDR identified that the split between medium trucks and heavy trucks should be 20%/80% for all road segments, and that daytime traffic should be 91% of the total for all segments. The traffic inputs for both models are shown in the *Input Traffic for TNM Vehicles (LAeq)* report following this discussion.

The results of the modelling comparison are shown in the *Results: Sound Levels* report following this discussion and are summarized in Table B.1. As shown the Cadna-A model predicts within 0.0 to 0.2 dBA of the TNM model and is therefore considered to be an accurate representation of the FHWA software for purposes of this analysis.

Table D.1 Summary of Modelled Sound Levels for Model Comparison (TNM 3.2 vs Cadna-A TNM Module)

Name	LAeq (16-hr)			Coordinates		
	TNM v3.2	Cadna-A	Difference	X (m)	Y (m)	Z (m)
R15	63.0	63.2	0.2	637671	4843143	1.5
R30	60.3	60.4	0.1	637666	4843157	1.5
R60	57.3	57.3	0.1	637657	4843185	1.5
R120	53.9	54.0	0.0	637638	4843242	1.5
R240	50.1	50.1	0.0	637601	4843356	1.5

REPORT:

Sound-level Input: Receivers

TNM VERSION:

3.2.8741.34338

REPORT DATE:

28 May 2025

CALCULATED WITH:

TNM v3.2.8741.34338

CALCULATION DATE:

2025-05-28 3:28:59 PM

CASE:

Golden Mile Comparison

ORGANIZATION:

IEC

ANALYSIS BY:

Nick Shinbin

PROJECT/CONTRACT:

HDR Golden Mile

Receiver Name	Sequence Number	Nb. R.R.	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria				Active in Calc.	Notes
							Existing	Absolute	Relative	Noise		
			X	Y	Z		L _{Aeq}	Criterion	Criterion	Reduction Goal		
			[m]	[m]	[m]		[dBA]	[dBA]	[dBA]	[dBA]		
R15	1	1	637670.70	4843143.00	0.00	1.50	---	0	---	8	Y	
R30	2	1	637666.00	4843157.00	0.00	1.50	---	0	---	8	Y	
R60	3	1	637656.60	4843185.00	0.00	1.50	---	0	---	8	Y	
R120	4	1	637638.00	4843242.00	0.00	1.50	---	0	---	8	Y	
R240	5	1	637600.50	4843356.00	0.00	1.50	---	0	---	8	Y	

Receiver table from Cadna-A for coordinate comparison

Receiver

Close

Edit...

Sync. Graphic

Copy...

Print...

Font...

Help

Name	Sel.	M.	ID	Level Lr		Limit. Value		Land Use			Height	Coordinates			
				Day	Night	Day	Night	Type	Auto	Noise Type		X	Y	Z	
				(dBA)	(dBA)	(dBA)	(dBA)				(m)	(m)	(m)	(m)	
			R15	63.2	-65.6	0.0	0.0		x	Total	1.50	r	637670.70	4843143.00	1.50
			R30	60.3	-68.4	0.0	0.0		x	Total	1.50	r	637666.00	4843157.00	1.50
			R60	57.3	-71.2	0.0	0.0		x	Total	1.50	r	637656.60	4843185.00	1.50
			R120	53.9	-74.0	0.0	0.0		x	Total	1.50	r	637638.00	4843242.00	1.50
			R240	50.1	-76.5	0.0	0.0		x	Total	1.50	r	637600.50	4843356.00	1.50

REPORT:

Results: Sound Levels - No Barrier Objects

TNM VERSION

3.2.8741.34338

REPORT DATE:

28 May 2025

CALCULATED WITH:

TNM v3.2.8741.34338

CALCULATION DATE:

2025-05-28 3:28:59 PM

CASE:

Golden Mile
Comparison

ORGANIZATION:

IEC

UNITS:

Metric

ANALYSIS BY:

Nick Shinbin

DEFAULT GROUND TYPE:

Pavement

PROJECT/CONTRACT

HDR Golden Mile

ATMOSPHERICS:

10°C, 70%

Average pavement type shall be used unless a state

PAVEMENT TYPE(S) USED:

Average

highway agency substantiates the use of a different

type with approval FHWA.

Receiver				Modeled Traffic Noise Levels					
Name	No.	Nb. R.R.	Existing LAeq dBA						
				LAeq		Increase over Existing		Type of Impact	
				Calc.	Absolute Criterion	Calc.	Relative Criterion		
				dBA	dBA	dBA	dBA		
R15	1	1	---	63.0	0.0	---	---	Sound Level	
R30	2	1	---	60.3	0.0	---	---	Sound Level	
R60	3	1	---	57.3	0.0	---	---	Sound Level	
R120	4	1	---	53.9	0.0	---	---	Sound Level	
R240	5	1	---	50.1	0.0	---	---	Sound Level	

Results table from Cadna-A for comparison

Receiver

Close		Edit...		Sync. Graphic		Copy...		Print...		Font...		Help			
Name	Sel.	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
				Day	Night	Day	Night	Type	Auto	Noise Type		X	Y	Z	
				(dBA)	(dBA)	(dBA)	(dBA)				(m)	(m)	(m)	(m)	
			R15	63.2	-65.6	0.0	0.0		x	Total	1.50	r	637670.70	4843143.00	1.50
			R30	60.3	-68.4	0.0	0.0		x	Total	1.50	r	637666.00	4843157.00	1.50
			R60	57.3	-71.2	0.0	0.0		x	Total	1.50	r	637656.60	4843185.00	1.50
			R120	53.9	-74.0	0.0	0.0		x	Total	1.50	r	637638.00	4843242.00	1.50
			R240	50.1	-76.5	0.0	0.0		x	Total	1.50	r	637600.50	4843356.00	1.50

REPORT:	INPUT ROADWAYS		
TNM VERSION:	3.2.8741.34338	REPORT DATE:	28 May 2025
CALCULATED WITH:	TNM v3.2.8741.34338	CALCULATION DATE:	2025-05-28 2:43:00 PM
CASE:	Golden Mile Comparison	ORGANIZATION:	IEC
ANALYSIS BY:	Nick Shinbin	PROJECT/CONTRACT:	HDR Golden Mile

Roadway Name	Roadway Notes	Road Segment		Coordinates (pavement)			Width	Point Notes	Road Segment		
		Start Point							Road Category	Pavement Type	On Structure
		Name	Number	X	Y	Z					
				[m]	[m]	[m]	[m]				
Roadway-1		Point-0	0	636677.80	4842801.00	0.00	3.30		Mainline	Average	No
		Point-1	1	638673.30	4843456.00	0.00	3.30		Mainline	Average	No

Road (TNM)

Name: Golden Mile B

■ ID: GM3

SCS/Dist (m):

Emission:

○ Counts, MDTD:

Road Type:

● Exact Count Data:

Road: Geometry

x (m)	y (m)	z (m)	Ground (m)	Dist (m)	LSlope (%)
636677.80	4842801.00	0.00	0.00		
638673.30	4843456.00	0.00	0.00		

Interpolate Height from First/Last Point

First Point

☐ Last Point

OK

Cancel

OK

Cancel

<--

-->

Geometry...

Help

Master

▼

☑

REPORT:

INPUT TRAFFIC FOR TNM VEHICLES (LAeq)

TNM VERSION:

3.2.8741.34338

REPORT DATE:

28 May 2025

CALCULATED WITH:

TNM v3.2.8741.34338

CALCULATION DATE:

2025-05-28 3:28:59 PM

CASE:

Golden Mile Comparison

ORGANIZATION:

IEC

ANALYSIS BY:

Nick Shinbin

PROJECT/CONTRACT:

HDR Golden Mile

Roadway Name	Road Segment		Auto		Medium Truck		Heavy Truck		Bus		Motorcycle	
	Start Point		Volume	Speed	Volume	Speed	Volume	Speed	Volume	Speed	Volume	Speed
	Name	No.										
			[Veh/hr]	[km/h]	[Veh/hr]	[km/h]	[Veh/hr]	[km/h]	[Veh/hr]	[km/h]	[Veh/hr]	[km/h]
Roadway-1	Point-0	0	816	40	9	40	34	40	0	0	0	0
	Point-1	1	816	40	9	40	34	40	0	0	0	0

Road (TNM)

Name: Golden Mile Boulevard (Pharmacy to Hakimi)

ID: GM3

SCS/Dist (m): 3.3

Emission:

☐ Counts, MDTD: 0

Road Type: national 3.02

☒ Exact Count Data:

Number of Vehicles/Hour:

D: 858.80 E: 0.00 N: 0.00

Percentage Trucks/Buses (%):

D: 5.0 E: 0.0 N: 25.0

Percentage Motorcycles (%):

D: 0.0 E: 0.0 N: 0.0

☐ Ltraf.ref dB(A)

D: 59.8 E: 0.0 N: 0.0

Day Evening Night

Traffic Speed (km/h):

Auto: 40 ☐ Truck: 40

Road Surface: Average

☐ Throttle

Percentage of heavy vehicles:

Heavy Trucks (%):

D: 80.0 E: 0.0 N: 0.0

Buses (%):

D: 0.0 E: 0.0 N: 0.0

Master ☒

OK Cancel

Geometry... Help

Traffic volumes from Cadna-A for comparison:

858.8 total vehicles per hour, 5% trucks, of which 80% are heavy trucks and the remaining 20% are therefore medium trucks.

Therefore there are $858.8 \times 5\% \times 80\% = 34.3$ heavy trucks, and $858.8 \times 5\% \times 20\% = 8.6$ medium trucks. The remainder are autos ($858.8 - 34.3 - 8.6 = 815.9$ autos).

These are the same as the values in TNM (shown rounded in the table above).